



'Dust and Food, Volume 1' is the Spring 2018 Interactive Design Reader.

It has been compiled for the Yale Graphic Design courses 'Networks and Transactions' taught by Dan Michaelson, and 'Interaction Design and the Internet' taught by Laurel Schwulst.

Inside are readings used in both courses, as well as the transcripts from 'Vacuuming and Digesting', a public conversation series in Fall 2017 led by Dan Michaelson, Laurel Schwulst, and Ayham Ghraawi. The series discussed themes relevant to both classes.

This Spring 2018 edition was edited by Ayham Ghraawi, Ghayde Ghraawi, and Laurel Schwulst.

Dust and Food

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Conversation 1.

art.yale.edu

November 14, 2017, 1:30pm
Yale School of Art, ELK (32 Edgewood Ave)

Speakers (in order of appearance):

Dan Michaelson (Critic), Laurel Schwulst (Critic), Ayham Ghraoui (Fellow), Sheila Levrant de Bretteville (Director of Graphic Design), Bryce Wilner (Graphic Design '18), Lucy Lindsey (Sculpture, '17), Nilas Andersen (Graphic Design '18), Micah Barrett (Graphic Design '19), Nate Pyper (Graphic Design '18), Simone Cutri (Graphic Design '19)

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Introduction

DAN MICHAELSON: Should we start?

LAUREL SCHWULST: Yeah. Thanks everyone for coming. This is the first conversation of three in the Interactive Fall Series. Today we're talking about art.yale.edu.

But before we do that, we'll introduce ourselves. I'm Laurel. I teach interactive design to preliminary graduate students and undergrads in the spring. I have my own design practice now, but before that I worked with Dan's studio he co-founded, Linked by Air, for a long time.

AYHAM GHRAOWI: I think everyone knows me. I graduated last year from Graphic Design. I've been doing a fellowship at Yale this year. Responsibilities include hovering around this space and having countless projects that include this one.

DAN: I'm Dan. I've been teaching the interactive classes in the graduate program since 2005. I teach one class for first year grad students in the spring, Networks and Transactions, and then a follow-up class for second year grad students in the fall, Mobile Computing.

LAUREL: So, all of you might be wondering, "Why are we doing this?" We've been noticing a need for more interactive focus as the years go by. I've been teaching since 2013, and every year Dan and I say to each other, "We should link our classes more." But it always evades us. This year, with Ayham's help, we thought, "What if we have conversations in the Fall, record and then transcribe those conversations, and then that material becomes the 'food' for both of our class readers?" That way, everyone is on the same page with the foundational ideas we're talking about.

DAN: Like Laurel said, the conversations that come out of this series could be re-purposed into a kind of reader that all three of us use in our classes in the coming year. It's a generative project as well. Also, we definitely see this as a participatory project. Everyone feel free to chime in at any time.

Launch Date

LAUREL: Okay, great. I want to begin with the history of art.yale.edu, because we have Dan here who designed it with Tamara Maletic. When did the site launch?

DAN: art.yale.edu launched in 2006. I was a student here until 2002. Then I started teaching here in 2005. Around that time, the art school site was a kind of “brochure-ware” static site that acted as a view book. A committee at the school asked us if we wanted to redesign the site. So we made a proposal. Because we had such an intimate connection with the school already—I was teaching here, and Tamara, my partner, was also a graduate of this program, that’s where we met—we knew what a vibrant place it is and how students’ workspaces are always changing. So we had a few goals from the beginning: one was that the site would change all the time. Students are always making new work. We had this obvious thing in front us: this existing website for the school that was static and never changed at all. It didn’t reflect at all what was actually happening within the school.

If the site was going to be dynamic, we needed to be strategic. This is a small school within a much bigger university, so there is no real communications staff here. We figured out that the only way the site was going to have new content every day was if students made it. That’s where this radical idea emerged from. (Although now it feels like we’re exploiting the students and their creativity and skill in a desire to project a good image for the school.)

The administration had questions. For example, how would the site be safe? What happens if a student changes the school’s tuition or the admissions requirements?

We developed this system that could protect very selective areas of the site. We developed the site as a specific set of modules that emerged from an idea about security or permissions. It’s similar to leaving the building unlocked but locking certain file cabinets—it seems like a responsible way to run an institution. We have a very transparent, casual workplace, but you still want to keep the HR files private so people aren’t worried. That’s where this modular structure emerged from, in part. There had to be different permissions for different kinds of modules while still allowing students to edit every page.

There were a few design iterations. I recall our first versions were critiqued as being “too white” by Sheila and “too flat” by Jessica Stockholder, the director of the sculpture department, which was really useful advice. Now we have a really colorful, somewhat useful site.

SHEILA LEVRANT DE BRETTEVILLE: You always loved the wiki!

An Interface Linking Designer and User

DAN: Yeah. It's been sort of spinning since then. There are lots of stories we could tell about the site. Now 11 or 12 years later there are 3700 pages within the site. 828 students, staff, and faculty have worked on it. There have been 51,000 page versions—that's the time when someone has edited the page. The homepage has been edited 7400 times. Against that, there have been about 20 million page views. That's not to say that this is the most visited site in the world, but as a ratio of production to consumption, it's probably a pretty nice ratio.

AYHAM: We decided to use art.yale.edu as the topic for the first of our three conversations because it holds many themes we want to talk about in this conversation series. We were excited Dan would kick it off—I think it's significant that many of the ideas that drove that project were what Dan and Tamara were working on as grad students at Yale.

DAN: The site actually relates to themes Tamara was thinking about as a grad student more than me. Her thesis was called Detourism. She was really interested in nonlinear systems that describe how people move in the world. Almost like *dérive* or something—the ways people take paths that are known only to them, or that are surprising. Of course, they might be influenced by authority or government in some way, but people find ways to make their own unique paths.

An open-ended system, like the wiki Sheila mentioned, could be re-combined in so many ways with its kit of parts. You might say it's like a little box of toys or something—there are trillions of combinations that you could build. That has taken place. You can imagine the sort of map of what has happened with this site. If you tried to draw it as a flowchart or something like that, it would be the craziest Guy Debord diagram ever.

Tamara was exploring these ideas in many media. Not that her work looks anything formally like what art.yale.edu ended up looking like, but you could definitely draw a connection. If there's a connection for me, it was in the three-way structures: There's an interface that links the first component, the designer—who created the whole system and how it looks—with second, the user—who is working within that system. The user is making their own choices with their own agency. Then there's this third party, which is some kind of algorithm that's maintaining a relationship between those two things. That's the software that's running underneath the surface—that a designer puts in motion. But then it runs itself after that. That idea was quite present in some of what I was thinking and writing about as a student.

Looking back now, I can see how Linked by Air's view models that relationship—that we come back every so often and tweak it, reasserting ourselves as the third leg of the stool.

Identity of an Institution

LAUREL: What was the initial reception of the site? Both within the School of Art and then elsewhere?

DAN: In the very beginning, it won a design award from the AIGA (a graphic design trade group) not long after it launched. Many designers were inspired by it. Probably around a year after it launched, students began, among other things, using the site to create a fake school within a school. Students started something called the "Department of Anthology," which was a bootleg film series, and a number of "office hours" sprang up. That is, appropriated official, or quasi-official, language took over in some unexpected parts of the site. That was interesting, in an ironic way, that it bestowed power or language of power on the students.

AYHAM: You mentioned in a previous interview that art.yale.edu's audience is both current students and prospective students. And the site is a channel connecting the two. The interesting ways students use the site tell the public about the culture at Yale's School of Art. I'd also like to hear from everyone else: How has the site provided an image of the culture of the school? What kind of expectations did it set? And did the school meet them?

Personally, for me, the site did a lot in communicating the spirit of the school. It may not have been completely accurate, but it did communicate something "more" than other institutions of its type did.

Also, please feel free to be negative.

DAN: Yes, I also don't want to make it sound like I have only positive things to say about the site.

BRYCE WILNER: My experience before coming here was that I really enjoyed the site's energy. I did notice that it gives a good overview of what graphic design at Yale is like, but that's only one of the four graduate majors. I often wonder what other departments' experience of the site is because I don't see as many sculptors, photographers, and painters.

LUCY LINDSEY: I would say the site does not really provide an accurate idea of the work being produced by students in the entire school.

The main impression from the site is how incredibly different it is from any other school site. I've heard people say the site is particularly potent given Yale's status as a school, that is, in juxtaposition to the prestige, the history, and the Ivy League status.

AYHAM: How much do you think that's because of the type of imagery used on the site versus its structure as a wiki—students can change and contribute? How much is it one or the other, or is it both?

LUCY: The thing that's most immediately apparent is how it looks and that it moves. It seems like it's sort of pasted together. I think this primarily comes from it being a wiki, but exactly how to use it isn't immediately apparent.

I think if someone were to say, "We're redesigning the site," I would be aghast—not because I would be losing functionality but because what the site represents and says about the school. While the site doesn't always live up to what the school actually is, I would be sad to lose it, regardless.

NILAS ANDERSEN: To me it fits within the category of schools that have a little bit of anti-establishment aesthetic. Coming from Europe and looking at the Yale website, it looks very different, but also it looks European. It's completely different from any other American school. I think you see more of things like this in Europe, but not necessarily because they came before. They may have come after this.

AYHAM: I wonder if you could talk about the anti-establishment aesthetic. What are all the identities rolled into that? It's something very unique to making work on the web—that the identity isn't necessarily just a logo but there's specific ways of working that can communicate these ideas.

DAN: This site is a good example for how, just like you guys have been expressing, an identity of an institution can emerge not just through logo or visual form, but through user experience and the way in which the site evolves over time. It can have a relationship with other schools or maybe influence other schools or be influenced by them as a system.

This is a project that generates its own history. There are anecdotes that you can tell about this project because it's been around a while. Also a symbol, I think Lucy expressed it really well. It's both how people actually use it but also what it stands for—that this school is willing to do this in the first place. It shows the school's values.

Relevancy

LAUREL: I think it's pretty amazing art.yale.edu has been around since 2007. It's probably one of the oldest sites I know of this type. And around the web, I've seen students try to redesign it as a project.

AYHAM: Oh yeah. I've seen that too. As if there's something wrong, and we need to fix it.

SHEILA: Is there something that you'd imagine doing that would make it more current or is it current the way it is?

DAN: For one thing, it's not mobile responsive. It's true that for such a simple site it doesn't matter that much, but there are some basic ways in which people use the web now that are different than in 2007.

SHEILA: Is there one kind of way they use it now that's of interest to us or to you?

DAN: Well, mobile is one. But also it's been a process of just entropy over the years. This homepage is pretty far from what we envisioned.

Honestly, we didn't think very much about animated GIFs when we designed it. Now they're a huge part of the site. One day we received a really powerful email from someone who felt like the animated GIFs one particular day could trigger a seizure in himself. When we talked about "This site should appeal to prospective and current students," I don't know, you really have to think about it. Who did we imagine being our student body, and who does that leave out (regarding physical requirements, etc.)? So we're doing some technological work on figuring out how to ensure that the animated GIFs are safe.

There might be some visual things to tweak here and there. The calendar, which is such a huge part of the homepage, literally broke because of some external dependency. But this has led to this opportunistic, inventive, entrepreneurial solution where events are pasted one at a time onto the homepage. Which is neat, in its own way, but could be dialed back.

Formal Lineage

DAN: Touching on identity, and also where the site started, there are ways in which we did try to think about the site not only as an emergent, experiential

phenomenon. We had some ideas about identity in a visual sense in a very light way, too.

Specifically, when we launched the site, the background module (which we knew would be important) was divided into these three parts. You have a background, this photo background, and then this stripe that could also be a stripe or a semi-transparent color. It could be there and not be there. These three properties were just properties of the module. They still are actually. That's one aspect of the visual identity of the site, like typography, that's an opportunity available to you.

Another one, actually, was this little guy that was the "Yale School of Art" typeset image. That was a module which pretty soon after it launched would just get deleted every time. It would come back, and then someone would delete it.

In terms of the possibilities, you can go forward with a generative system like the CMS. Once you deleted it, it wasn't that easy to bring it back. You had to know what you were doing in order to bring it back. So we would bring it back sometimes, but if a student deleted it you wouldn't necessarily expect another student to bring it back in terms of usability. We were very clear this was not a logo for the school or anything, but it was a mark that we put on the site. There were internally some light aspects of identity, and they were meant to be somewhat erasable but also add a little bit of texture or presence.

The funny thing with the stripe is that not only did some people just stop using it, but also over the years, the way that the CSS was coded with the stripe, new browsers didn't even render it. It was basically a bug in the CSS. I don't think anyone even noticed because the stripe was optional in the first place. It wasn't until this year actually that I realized that the stripe had probably not been working for like three or four years. So I brought it back after the site recently crashed. Overall, it's been a fairly reliable site, but it crashed a couple weeks ago as part of the server migration thing.

A History of Itself

LAUREL: Were you worried you couldn't get the stripe back for a little bit?

DAN: Yes. There was this hysteria. I'm so involved with the art school on so many levels, but it's also our only client that we don't have a maintenance relationship with. Since designing this content management system for the

art school, we (my company Linked by Air, which went from two of us to like eight now) now use the CMS for lots of other clients—many with more traffic than art.yale.edu. But none of them are edited by as many people as the school of art. Typically, like at the Whitney Museum, 50 staff members are editing at most. We did another school last year, Columbia GSAPP. Some students do have the site there, sort of TAs and stuff like that who are tasked with different things. That's 60–100 people that work on the site, but it's still far less than the totally decentralized approach the school of art takes.

However, developing the technology, user interfaces, and attitude about allowing a lot of people edit the site turned out to be a nice way to think about communities within the institutions that we work for—even though those communities primarily consist of staff and not end users. When you talk about graduate students you could even consider yourself as staff in a way.

With virtually every one of our sites that use our CMS, we're interested in the way that these sites involve and unspool over time. We do really try to have an ongoing relationship with the institution itself so that when some

Yale School of Art - Warning! Seizure Possibility

30,859 views

Vincent Flanders
Published on Sep 9, 2010

Yes, art is about possibilities but the web is about limitations. This site's use of possibilities has limited its appeal to art-farts.

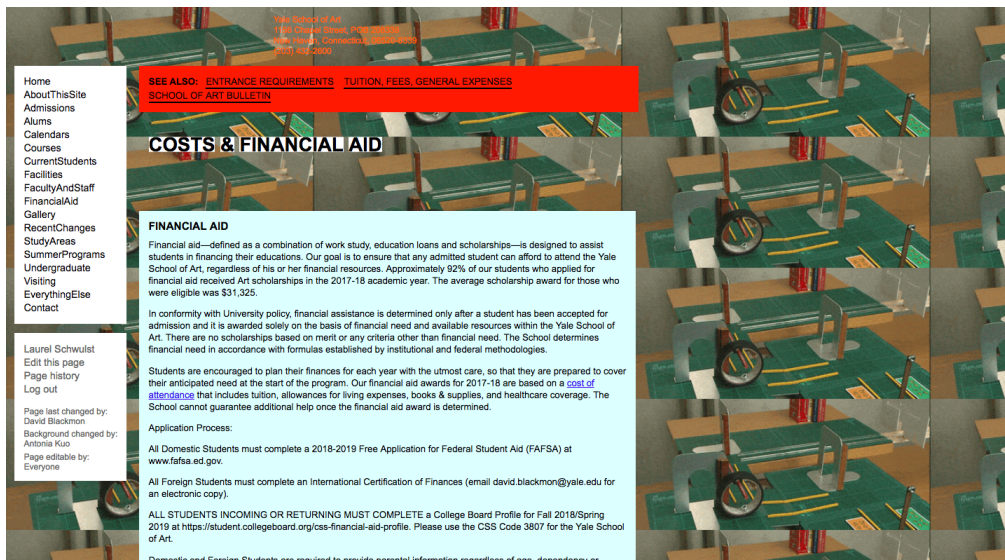
Category: Education

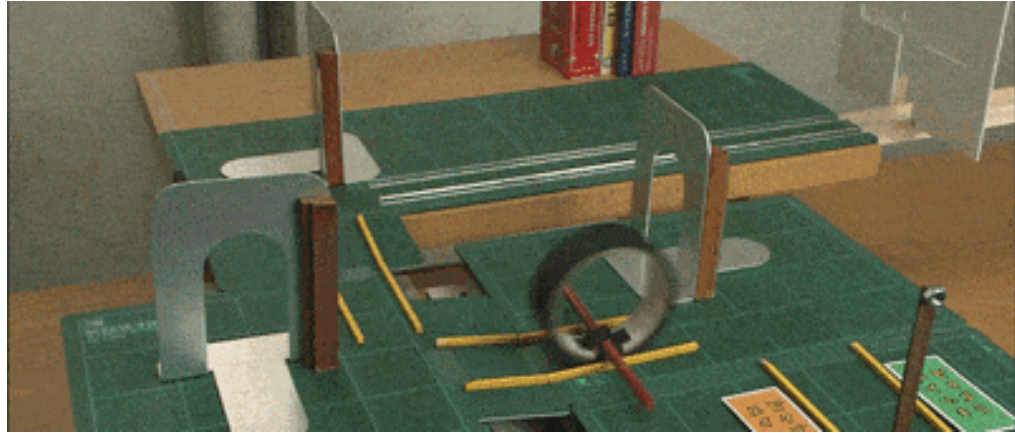
new module or new feature is needed, we're around to do it. That way the site can expand and evolve accordingly as well. Anyway, we don't have a relationship with art.yale.edu probably because I feel so connected anyway. So Sarah called, and we had to get back up to speed. For about a horrifying hour, it seemed like the database was lost with 11 years of work. It's a pretty important cultural artifact. These aren't just 128 random people. These 128 artists. I got it running again, thankfully.

I still don't totally know what's in the database. It's interesting with a sprawling site like this. It's still hard to put your finger on exactly what's in there—what's happened for the last 11 or 12 years. Which relates to some of these questions about even Facebook or Twitter. At a far, far larger scale, there's this mystery about launching a project. What actually happens with it over time? How the algorithms work or how it gets used can be omniscient.

AYHAM: The database almost being lost also contributes to the identity of it. The nice thing about the idea of the site growing over time, which is maybe a stereotype of the web in some way—that you just keep adding things and it keeps growing—is that things get lost. The identity could have been strategic in considering that deleting behavior. To have the ability to delete the “logo” contributes to that anti-establishment aesthetic—that behavior is part of the identity.

DAN: That's a great point. I think there's an aspect of entropy or loss that could be part of this. In theory, one thing that's really key to this content management system is that it keeps a version of history. So, students can be free to experiment because you can always go back and roll the page





"J: The relationship between the functional aspect of the Google search page and the decorative aspect of the Google search page ... can either reinforce each other, they can be in conflict with each other, one of them can disguise or mask the other. The "I'm feeling lucky" button sends a message of personal empowerment, which mystifies or disguises its function.

D: It's a common role for advertising and design: to make us comfortable with something we were previously uncomfortable."

Jack Balkin and Dan Michaelson conversation facilitated by Rob Mathews, "Sometimes it Looks like a Duck, Sometimes it Looks like a Rabbit" (2012)

back to what it was before. Every edit has the person's name signed to it, so that creates a sense of shared responsibility because there's attribution and because something is destructive. Even if somebody does delete that logo, you actually can go back in time to resurrect it. And anyone can do that just by clicking the history button.

AYHAM: I have a good example of that. We were signing up for a time slot to use Sam's Space once. Someone's time slot was deleted, and then replaced by someone else's name. All the students were fighting about whose spot it actually belonged to. Until we figured out you can just go through the versions and find out who actually deleted it and then hold them responsible.

Community

LAUREL: Speaking of shared responsibility, I was thinking about the school's community as a sort of garden. Gardens are about growth and caring for each plant, just as the school of art's site grows, there is a shared responsibility among the students/users.

I've been wondering about the link between this "academic art garden" website and the rest of the internet. Considering where things are at today in the world in 2017, with Trump and fake news, it makes me wonder what people stumbling onto the site today think, since often times the homepage does look quite "crazy." I like to think that the memes generated here are hopefully more responsible than the larger internet garden.

DAN: One of the other times the site crashed is in 2010. It's a kind of famous story. I guess Sarah's predecessor called Pat DeChiara in the middle of the night to say, "The site's down." We started digging into it, and it was down

because of how much traffic there was. There was so much traffic because it had been featured on Reddit, and it had been featured on Reddit because there's a website which is really quite interesting called webpagesthatsuck.com. Every year the guy from webpagesthatsuck.com nominates a few sites that are the suckiest ones of the year. Our site won in 2010. I don't know if you've already seen it, but there's a video. It's worth watching once a year.

DAN: The reddit thread was a good conversation. Someone points out what the footer says, which is that it's a wiki and keeps changing. It gets at this question of how a design can emerge from a governance, or from a social idea, and how you can judge one by the other in either direction if you want to.

Since this video, the site gets frequent hate mail. It's become a common assignment in maybe not very good design schools to redesign this site because faculty had found this site, webpagesthatsuck.com, when looking for sites to ask their students to redesign. So we'd get emails from students saying, "I redesigned the site, would you like to buy it?" And we personally get hate mail, which is totally valid, or at least valid on any given day.

I want to ask you all too: How do you think about your projects interfacing or extending outside of the school, either now or when you graduate? I talked a little bit about how the site also extended from work that we were doing as students. We started our partnership as students, and we began our relationship with the school as students.

This site played an interesting role in our portfolio when we would be pitching for new projects and showing our past work. For years, our instinct was, "This is the history of us." Arguably, Yale was one of the big first ones. With a lot of the clients that we were pitching, even with pretty progressive clients, you could see the enthusiasm drain from their faces based on what the site looked like. We tried to propose the idea of hundreds of editors onto their own institution, which we realized is actually not so much reassuring as alarming.

Thankfully, one of our second big commissions was the Whitney Museum's website, and their head of communications said, "I want a hot mess." The art school was really appealing to him, actually, and that was an opportunity for us to develop the CMS into something that was usable for another kind of institution.

We gradually became more and more cautious about showing the art school site during pitches. It became, in part, this site that was hugely

valuable for us as a design practice, because it created this software, this content management system that we could use for many other clients. It created a way of thinking by us that we've applied to many other clients and complicated social organisms like institutions. At times, it became a kind of liability for what it looked like. It's a big part of our history, but we don't emphasize it as much as we did when we were younger.

Governance

AYHAM: Do students feel more empowered with the Yale wiki versus staff using the Whitney's website? I guess we could ask everyone: Is there something about the site that makes you inclined to contribute and change it?

MICAH BARRETT: When I was looking at it a while ago, I was noticing some patterns with subtle little GIFs. Specifically the background image module. Some of them are pretty direct and obvious, like the background on the calendar page. Then I found myself really enjoying the financial aid background image, which is this really bizarre contraption GIF. You're moving through the site. I was starting to read it in a slightly different way which was really exciting.

AYHAM: You felt like there was some sort of meaning in someone putting that GIF on the financial aid page?

MICAH: Yeah, exactly.

SHEILA: Like Fischli & Weiss.

MICAH: A current student was leaving a secret message for me as a prospective student. I don't even remember what it was, but it was in either class listing in the background or the classroom page, someone put a really disgusted face. I was like, "Oh, is this a message? Should I be worried about this class?" That was enjoyable.

A Continuing Project

DAN: The site has been around for 12 years. For current students, for recent graduate, new faculty, for in-between generation: What do you guys think, are there early projects that defined how you thought about your career so far?

AYHAM: Personally, not yet. Art.yale.edu is timeless. It's not just a project that grows over time, that runs by itself, but as a designer—Dan, you can still

explore new ideas by interjecting in it every now and then. That's the way it seems to me.

DAN: It is a good model for a thesis or for an artistic practice in general, to just try to create things that are going to have some sort of durability just in itself as an object.

AYHAM: But it's going to ask you to come back every now and then...

DAN: Yeah.

AYHAM: ...to rethink. Maybe readjust your positions.

DAN: Absolutely.

The Messy and The Democracy

NATE PYPER: I wonder about the way that the site structure is a linear build up of information rather than something more lateral or collaborative. As you were saying, signing up for things on the website has actually caused me to feel resentment for people. Like, "You took my spot, but there's nothing I can really do about it." Could there be something more lateral in the way that information accrues or comes together that might also invite contributions from people outside the institution too?

DAN: That's a great point. There's a definite wall around the institution in a sense of us and them where there's a community of people that we trust to do the right thing with the site most of the time. Then there's everyone else we wouldn't want to open the doors to, who wouldn't have such an interest, such a self-interest in representing the school in a positive way. That's a very problematic attitude, absolutely.

One of the things that the site affords is flame wars. You have this succession that's on the homepage. Things will rapidly override each other rather than be a real time collaboration, which is maybe what you're alluding to. If you slow down a little bit, of course, the homepage consists of modules from many users all at the same time. It's not like each page is one single author but a real-time collaboration would be a real interesting next step.

NATE: Yeah. Something rather than revisionary is additive, or...

AYHAM: I feel like the site has a material quality. It still feels like a bulletin-board—the metaphor we used earlier to describe it. The signup sheet,

once someone signs up, it's there and permanent. It's not often that you see that kind of frequent, real time change on the web—where something suddenly appears right in front of you. Again, I think it's a strong metaphor but adapting the site...

DAN: Even the idea that the site is building history, which I'm focused on a lot, and sort of obsessed with (it's 59,000 versions and you can get back to any one of them). That has certain politics. But it's different than Snapchat or something, where you send a message and it's gone. It's just about the act of communication. The site seems to be about making a thing that grows. Even if there are some aspects of entropy, the major metaphor is growth.

AYHAM: Getting healthier.

DAN: Yeah. Just bigger and bolder and deeper.

LAUREL: The histories are layered on top of each other and there are no parallel histories. This year, I had to add a subtitle to my class, so now and it's called "Interaction Design: Multiplicity and the Internet." With "multiplicity," I mean there are many parallel histories happening simultaneously. (Although, come to think of it, it got shortened to "Interactive Design and the Internet.")

That makes me wonder, could something like this be added to this site just by adding another module? If we're going to keep this modular approach, I wonder if anyone has ideas for new modules that could fill these needs.

SIMONE CUTRI: I was thinking about the idea of an archive. For example, if you Google names of alumni you can still find their student pages on the site. But if you go on the website, it's not really so clear where they are.

In the same way that Laurel was talking about the idea of gardens and community, I still feel within the website, that there are separated gardens: a garden of graphic design, a garden of sculpture, etc. And today in this conversation, we're mostly from graphic design. I wonder if the website can talk about communities...

AYHAM: Of the whole school.

SIMON: ...of the whole school.

SHEILA: With the spirit of more interdisciplinarity actually going on, that

seems to run counter. It seems like the notion of how messy democracy is shouldn't get in the way of the kind of intentionality you have. That they could be concurrent in some way—to keep the messy and democracy at the same time.

Conversation 2.

Reliability: Preservation & Primary Secondary

November 28, 2017, 1:30pm
Yale School of Art, ELK (32 Edgewood Ave)

Speakers (in order of appearance):

Dan Michaelson (Critic), Ayham Ghraawi (Fellow), Simone Cutri (Graphic Design '19), Nilas Andersen (Graphic Design '18), Bryce Wilner (Graphic Design '18), Laurel Schwulst (Critic), Matt Wolff (Graphic Design '18), Nate Pyper (Graphic Design '18), Rosa McElheny (Graphic Design '19)

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Suggested reading:

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| 73 | Jill Lepore, "The Cobweb," The New Yorker (2015) |
| 88 | Alexander Galloway, "Jodi's Infrastructure," e-flux Journal #74 (2016) |

Vacuuming and Digesting: Reliability

I Preservation

- How does placing such significance on documentation affect your relationship to being online?
- Does documentation affect the work you are interested in and the work that you are making?
- Are there anxieties surrounding the possibility of losing material, or are there greater concerns with all of it being preserved?
- What should be preserved? What is valuable? And what do you consider a publication—something that was made intentionally public?
- What does it mean to archive something that is constantly changing?
- What kinds of preservation strategies are there? And what do they focus on? In creating an archive of the internet, is there a discrepancy between preserving 'surface' and preserving code?

II Primary or Secondary

- When do websites contain the content and when are they the content?
- What is our relationship to the infrastructure of the internet, are we more conscious of and interested in its 'Medium' or its 'Content'?

Introduction

DAN MICHAELSON: Today's umbrella topic is "reliability," which contains two other topics.

On the one hand, we're hoping to talk about issues of preservation in a digital context. This is relevant specifically to all of you, because almost all the work you make as a student in this program intersects with the digital—you're using a software program and/or a hardware device (your computer, RISO, etc.). How do you all think about preservation in that context? For your own work? And also with respect to the work of other artists, designers, makers, cultural producers?

On the other hand, we're thinking about a difference or gradation between making primary work and secondary work. As you all start to think about your thesis books that might document your own work, so too will you also be thinking about documenting your work. Inherently, there is a primary and a secondary, because you're objectifying your own work, to some extent. It's good to pull out some interesting themes from that idea. Documentation is never a neutral, crystal goblet.

Last week, we talked about art.yale.edu. We talked about the site's history function—that it versions everything—and some of the problems and shortcomings of that. Even though the content is versioned, web browsers are not. So we looked in some detail last time at some of the unreliability of that documentation, or some of the places where it breaks down a little bit, and what those old pages look like now is not exactly what they looked like at the time. We also talked about reliability in the literal sense—that these systems can just break and stop doing what you expect them to do. They may not be around forever. We also touched on reliability in the sense of trust. That is, what is in these systems isn't what you think it is. Can you really know what people are saying and communicating? What kind of cultures are evolving out of a system like this? There are going to be moments when that culture is doing things that are unhealthy or destructive or misleading. How do we work around that very contemporary condition?

Having monologued for five minutes now, I really hope that today's conversation is participatory. We are especially curious how this all connects to your own work.

AYHAM GHRAOWI: Institutions like the Internet Archive put such a significance on the idea of documenting and preserving the web because it's something that's changing, this includes unsolvable problems like links

breaking or web pages being taken down. It is a significant project to try to preserve that. How does this affect the relationship of being online? For example, sometimes screenshots of events that happened are important—so that it's preserved and documented so it can be referred to, maybe in a legal situation, or something more subtle.

More importantly, how does the documentation affect the work that you're interested in and making? We should talk about anxieties related to either your work being ephemeral or the possibility of losing the material. Or, is there greater anxiety that instead of being wiped away, all of it will be preserved? (I think this is especially relevant in this program. Particularly in regards to the thesis book's idea of reflecting and preserving the two years we're here, and having a legacy and putting that in the library.) Is there a greater concern of losing it all or preserving it in a library?

Then there are questions of what should be preserved. What is valuable? What do you consider a publication? So far, we are calling a publication "something that was made intentionally public."

Institutions like the Internet Archive aren't really concerned with publications, because they have this general idea of wanting to preserve and document everything. But national archives are more intentional about what specifically is valuable.

What does it mean to archive something that is constantly changing? What are the strategies? Is there a difference between documenting or screenshotting the surface of what you see versus preserving the code or the structure? What's primary and what's secondary? What's the difference between medium and content of the web? When do websites contain the content and when are they themselves the content?

I don't think we'll answer all of these questions, but they all have something to do with each other. I think we're also interested in how these questions relate to everyone's work and practice.

Fidelity of Documentation

SIMONE CUTRI: I have a question about the accessibility of these materials. We are talking about the digital, which is different than a library or some other physical system. So I'm wondering: how exactly can I access these archives?

DAN: That's a great point about intentionality. When you make a choice

about a mode of documentation, it's inevitably going to influence how accessible it is. So, if you're taking screen captures, the durability and fidelity are quite good, but screen captures are not searchable. And maybe a screen capture doesn't capture what's below the fold.

AYHAM: The documentation is an image, not the thing itself.

DAN: Exactly. One wonders what would happen if the Internet Archive were comprised entirely of screen captures. Would the fidelity be better? Probably. But it wouldn't be searchable in any way, and the storage issues would probably be huge.

AYHAM: The Internet Archive is actually difficult to use. While it's this monumental project of preserving everything, what's the use in it? If it's not accessible, what's the point?

LAUREL SCHWULST: That's funny because archive.org's motto is "Access Drives Preservation."

DAN: How do you guys actually back up? What are your archives physically right now, of your own work and online lives?

I mean, I have all of these DVDs—that's my thing. That's my carbon date stamp, my predecessor had floppy disks, my successors had hard drives. What do you guys have?

NILAS ANDERSEN: You have your work on DVDs?

DAN: Yeah.

AYHAM: We have that on the record, now, by the way.

BRYCE WILNER: The disk drive is very rapidly being phased out...

DAN: Yeah. I don't know if I can read those DVDs anymore. Also, DVDs get bit rot and have calibration issues.

NILAS: I have all of my stuff online. Like every single digital file.

AYHAM: But not public?

NILAS: Not public, no.

DAN: On Dropbox, or something?

NILAS: Yeah. DVDs are not public either.

LAUREL: Do you know where your actual servers are?

NILAS: No idea.

DAN: It's two o'clock.

BRYCE: That's a serious question, though, because I've heard stories of people archiving family photos. I forget the name of this one service, but it was used for archiving huge amounts of photos, and many people would use it for photos of their children. It went down for about a whole year, and people had no idea if they would get their photos back. For a lot of people, that service was their only storage.

I'm super unsatisfied with leaving all of my work on Dropbox, so I try to do a combination. I do use Dropbox, but I also back up on a hard drive as well.

AYHAM: Because, naturally, you're very concerned about losing all of your work.

BRYCE: Yeah, for sure. I assume I will have researchers. Well, I hope I have researchers, and I want them to be able to access that stuff.

MATT WOLFF: Do you scan your own journals? Do you take whatever you have tangible and make a digital file?

BRYCE: Whenever I use my computer, I feel like I'm constantly archiving everything I'm doing. I'm taking screenshots all the time of whatever I'm working on. And I'm putting writing into my journal, but also some of that goes into Are.na and some of it goes into the notes on my computer.

"But I'm always feeling that I've spent most of my life getting ready for something, honing skills and sensibilities for... what?"

Brian Eno, *A Year With Swollen Appendices* (1996)

Heap or Archive

AYHAM: That points to something I'm really interested in. What are the bounds of what people define as their work? Is it the finished project? Is it easier to describe when we're making books or posters or something? But what if your work is more fragmented than that, something like your journal entries you're considering part of your work? I'm assuming because of the way you're talking about it. Is that the case?

BRYCE: I think it's all definitely related.

AYHAM: Do they all have the same priority?

BRYCE: Maybe not the same priority, but they're worth preserving, in my opinion... or at least for the work I do.

LAUREL: It reminds me of Andy Warhol's time capsules. He would treat everything at a similar level, like stuff he picks up off the street, just throw it in a box and label it, then send it off into storage.

DAN: Yeah, it's like the modern condition: just throw it on the heap.

AYHAM: Toss it back.

DAN: And, like, get back to it sometime.

AYHAM: Does archiving this way cycle back to how you're making work?

SIMONE: I don't know. I'm not that organized. I have like seven files called "final, final, final."

AYHAM: It's not very accessible.

SIMONE: Yeah. I don't think anyone other than me could go through my files and understand.

MATT: There's an interesting distinction between the heap and the archive. The Internet Archive is a heap—it's not sorted and filtered and accessible via tagged metadata. It's just collected.

LAUREL: Even though The Internet Archive calls itself an archive, we seem to believe "an archive" does something different.

Accessibility and the Institution

DAN: We should start talking about people accessing your artwork.

We can differentiate these ways of archiving. In one way, you say, "Okay, that was something primary, and now I'm going to just step back mentally for a second and capture that moment—frame it," however fleeting that gesture is. Not that it's a lot of work. Versus the different condition of the

back-up being completely in the background—it might be an automated, bigger hard drive with some redundancy in the cloud so you're not anxious.

LAUREL: This makes me wonder: are any of you looking at previous theses in the library? Maybe as models or as counter-models? They might help you to imagine the time leap. You might begin to consider your thesis in the future, like, "When someone approaches my thesis in 15 or 50 years, I want them to have this feeling."

NILAS: I haven't looked at anything.

AYHAM: I notice it's happening less and less now.

NILAS: Someone told me that my undergraduate teacher once used one of my projects for her teaching. I actually really didn't like that teacher—we had a bad relationship—so I think that's weird that she's allowed to show my work. I had no control over the work that was made at the school. The school legally owns it.

MATT: That's the case with most universities, right? With most archives, once you give your work to the institution, you've relinquished the ability to sort of go back in and edit or touch.

AYHAM: I don't know what it's like here, but at my undergraduate art school they made it explicit to us that they have the right to keep the work if they want as well as to document it, catalog it, preserve it, and publish it.

NATE PYPER: I think that's a good question, too. What do we give up when we archive or when we compile our archives? We think about the bureaucracy and structures that have come before and are built to carry permission but don't necessarily have our best interests in mind. When is it appropriate to resist the archive?

DAN: We could talk about different kinds of archives. There's the archive that you own. There's the archive that does serve someone else. If you were to archive your work on art.yale.edu, who is that serving? It's a complicated question. Or, if it's in Dropbox, there's a bit of a funny ownership there, too. You don't physically have possession of it.

LAUREL: My answer to "What do you give up when you give an institution something to archive?" would be some sort of context—a specificity of how and where it would be used.

"Populist social media engines that blast media 'globally' to as many people as possible may be appropriate for corporate pop music, but they function contrary to everything Terre believes about cultivating and protecting the hyper-specificities of 'underground' and minor situations. Indiscriminate file sharing, YouTube and SoundCloud grant too much exposure with too little precision."

Terre Thaemlitz, "Please Don't Upload!" (2014)

DAN: When do we think about making our work public? What are the implications of making your work accessible, even in part? If I said to my classes, “I’d like there to be a real-time, public stream of your work in progress, and everybody in the world can watch it evolve” there would be a lot of resistance.

NILAS: Yeah.

DAN: It seems like some of you do value this “wall around the ivory tower” a little bit. But presumably not completely. On the other hand, if I said to you, this program is an ivory tower—nothing you do should go out and you shouldn’t have any interaction with the community, because you’re here to learn from each other and from faculty—you would say that’s kind of gross.

NILAS: I think it’s about the individual freedom in what you want. For some people, it makes sense. I know people in my class, our class, who document stuff and put it online and as they are here. I personally don’t do it. Growing up with the internet in the way that we all have here, we’re all changing our approaches to it. For example, Facebook is suddenly a lot bigger than it was when we joined. Once you put something out there, you lose control of it, and maybe some of us are hesitant about being public with stuff because we felt we’ve lost control of things. Especially in an educational situation, where you are here to change or develop, you might not relate or identify with the work you did two years before you came here, because being here can elicit a significant development. But also after your time here, you might develop further. If you’re a person who changes so much, then the identification, the internet as a mirror, can be frustrating.

AYHAM: But in that argument, what is being controlled? The identity of your work, or your own identity? In controlling what you make public, it implies that you’re also trying to construct a specific image.

NILAS: I’m controlling how I’m seen by others.

AYHAM: Yeah. I personally find that relationship hard to deal with as well.

You see people who are completely transparent—an archive that shows their process—and in a lot of ways that’s really freeing because there’s no concern about trying to construct this specific outside-facing message.

Context: Image, Medium and Content

NILAS: I think there's also another level to it, and I think that's what Laurel was talking about—context clues. If you're very serious about the context of your work, you might be concerned when the internet picks and chooses which specific parts it likes of your work, and that's what is dispersed and circulated through all these different circuits, and often the context is totally lacking because the description was lost. There's not three images—there's just that one that looked the coolest or was most interesting for some people.

AYHAM: Ideally, the content—or context—is also part of that image. The way you describe it, which is typical, is that the image that is made public is only the image of the posters. In a way, the context of the work should always be trailing behind it. It should be attached to it in some way, conceptually at least.

SIMONE: I don't know if you all know about it, I don't know who runs it, but there is this Tumblr...

AYHAM: Everyone always describes it that way, "I don't know who runs it, but there's this Tumblr..."

DAN: One of the people who said that actually runs it.

SIMONE: ...where everything has a tag, "Yale Graphic Design." Sometimes with your name, other times not.

NILAS: Most of the time without a name.

LAUREL: There are good things and bad things about that blog. We've talked among ourselves about it as perpetuating an image-heavy reputation of Yale.

Also, if you are someone like Nilas—who's not going to put an image of himself out there in the world—other people will. And when you Google "Nilas Andersen," the second or third result will be the Yale Graphic Design Tumblr, which could be cool, depending on how you look at it. But is that the way you want to be defined? Personally, I've flip-flopped on this so much. But at the end of the day, I decided, "Well, no one so far is making a Wikipedia page for Laurel Schwulst, so I'm going to just put the image I want right now so I can steer my course. People can see where I'm going and work with that vision."

DAN: I was going to say the same thing. That you would think the best response in 2017 to these reputation issues on the internet is additive.

AYHAM: Fight back.

DAN: Yeah, to put more compelling content online.

LAUREL: I think Kanye West said something like, “I am going to call myself a creative genius because no one else is going to.”

BRYCE: Reminds me of the artist Jeremy Bailey, who started calling himself a “famous new media artist” as an identity exploration.

NATE: I wonder, too, about being artists, designers, cultural producers, people who are putting things out into the world for other people to react to or look at... I was really enjoying the David Bennewith presentation. He does a lot of work that has some sort of historical reference—specifically mining or pulling from this history. Inevitably, when that work is disseminated, that history does not get shipped along with it. But it does gain new meaning, and it’s malleable in that way that it becomes richer for the willingness to put it out there without context.

AYHAM: It’s a very optimistic way to look at publishing work. I think there is some value to it, in approaching it that way, if you’re okay with the meaning changing and adjusting.

In these last few examples, I think we are still talking about images of work, or if the work is an image. In discussing this discrepancy between medium and content (primary and secondary), is there a way that a poster can exist as a poster in the world, but if you are sharing it, can you represent it differently—as content—rather than just the image of that poster?

I know that’s a big question, and that’s not to say that’s what your work is about, but I’m using that as an example to think about archiving and making public the content rather than the medium or the image.

DAN: Or the event. Not the event that’s described in the poster, but the event that the poster was hung, for example. You can document that the context is the content.

LAUREL: We talked about this artist in my class last year. Who is the artist that did the Guggenheim Kiss piece?

ROSA MCELHENY: Tino Sehgal.

LAUREL: Yeah, Tino Sehgal. He's all about "no documentation." It's all about what people tell each other.

AYHAM: There's a mythology in it.

LAUREL: Yeah, there's a mythology. If you're not about distributing your images, like Tino, you are balancing it with something else that gets distributed, like stories. Because as a creative practitioner... I think an important goal is to have an audience, right?

Audience

DAN: I wanted to mention that. This is an issue for the famous struggle for fine arts students. It's so tempting just to stay in your studio. But are you really an artist if you never show your work? You'd think that for graphic designers, that question would be heightened, since your work is communication and distribution.

What are we doing if we're not communicating and distributing? I can also see how the question is more fraught for graphic design, where "This is my one chance not to distribute." It's distribution from here on out!

NILAS: There's a big difference between the thing you make and put out in the world and the documentation of it. So, the poster is the actual thing, that and the image of the poster that I put online as the documentation to show on my portfolio. We make things that are public all of the time. I'm not saying that you shouldn't have graphic design portfolios, but there's a big difference there. Is my poster about being public globally, or is it about being public in the context that it was made for?

DAN: True. Assuming that it's a poster that actually had a context. Because we do also make work here that has an even narrower context. You could say, "Well, the context is the critique or my peer group around the school, the atrium, the sculpture building, or something."

BRYCE: I see what you mean. I tailor my output to what I think will work in a critique space. I don't think that's necessarily good, but I do it.

AYHAM: It is part of the culture here.

BRYCE: If I'm making a video, it's not going to be 15 minutes. It's going to

be 2 minutes, because I'm going to show it in a 45 minute review. I don't do a lot of performance work, but I see people's performance work suffer because, even if it was a great performance, it's not documented very well, and then the discussion becomes about how it was documented.

NILAS: Exactly.

DAN: It's a strength of the program that it establishes a community and has powerful common spaces, and a relatively externalized faculty and critics and stuff like that. But this idea of your audience being the Yale community is problematic and certainly has its limits. It's like the strongest point in the program, in a certain way.

AYHAM: Personally, I think the students are the primary audience. I think it's set up that way on purpose, that they are more so than faculty that are coming in from the outside. I think that community is comprised of the peers that are sitting around you.

So far, we've been talking about documentation of work. But we're also trying to be specifically concerned with interactive work, which is probably meant to be public in the first place. To your point, much of the interactive work is for the audience of the school but they also need to be public and online.

DAN: And with interactive work, we often don't have the skills or resources to scale it.

AYHAM: To speculate about the audience.

DAN: I don't focus in my classes on cross-browser compatibility. If a student wants to make an instructions page for their website, I might say, "Well, maybe that's not the thing you should really focus on." Nor do we do user research, or any of the other things before launching a website to the public. Their works exist in this gray area where the IP address might be public and some students do distribute their work, but the context is poorly defined.

AYHAM: You do emphasize in your class the documentation of the website—that it is typically a screenshot. It's more so a screenshot than documenting the code, right?

When I took the class, I thought that it was interesting that there was significant time spent on presenting the website through a series of screenshots and walking through it. We asked questions like, "How do you describe it to

someone who's not necessarily clicking around?" as part of that documentation strategy.

Distribution, Publishing, and Narrative

DAN: Yeah. The reason I emphasize hands-on programming in Networks and Transactions and actually building this thing is not primarily for distribution. It's so you can test the project. That's a word I sort of learned from Paul Elliman. That if you just make a mock-up, like we do in Mobile Computing (the class after Networks and Transactions), you would never really know whether your content management system or your social network has the potential to grow. At least by testing it with yourself or with some peers, you have some chance of evaluating and iterating on your design with some measure of success or failure. But that doesn't mean that your peer is necessarily the intended audience—they're just the test group. Or, they could be the intended audience, and for a lot of projects, they clearly are. Maybe you're making a pantry in the atrium, or something like that, and it's clearly for these 30 people. But my intention is also that these 30 people are also the test subjects for a potentially larger audience.

My expectation is also that the code is not going to work forever. Browsers might change. Whatever hosting set up you had might go away. You might not pay for it. It might go out of business. Furthermore, the people that you might want to show it to in the future—yourself, your colleagues, your biographer—might not have the time or the necessary guidance to move through the system and repeat that test. They also might not have the 30 people who are needed to actually test this thing. If we built a chat program, you need two people at least to see what it does, to experience it all. What happens if one person wants to know what you made? Documenting it in a secondary way—not just archiving the code and not just making sure that your server host runs forever (which, maybe you should also do)—but taking some pictures of it or taking a moving screen capture or making a book or slideshow or fictionalized short story or novel about it—could be good. These can be important ways to tell these stories.

That also loops back to this issue, "Just because you made an archive doesn't mean anyone can actually access it." Even if they can literally access it, like the Internet Archive, which is totally available to everybody, that doesn't mean you can actually work effectively with it.

AYHAM: You're emphasizing story. It's engaging to interact with because there's some narrative involved to the documentation.

DAN: Right. It may be an analogy for the context that Nilas is talking about. It's essential to fill that in, when your work in some way deals with user experience. It's an even bigger problem with interaction design or experience design than it is in poster design. It's a clearer problem, at least.

Have you guys approached this yet? How do you document the digital? When you make a project that lives online, is interactive, or changes over time... what are your strategies?

SIMONE: Video.

NILAS: I think almost all the websites I've made personally, not for class, I still have on my server.

DAN: You just keep it running?

NILAS: Yeah. They don't even have a password or anything. It's only me who has the URL. But for client work, that's definitely a different thing.

DAN: Yeah. It's going to be hard to put these things out. As you guys develop design practices that last for years and have a bigger and bigger output per month, that question becomes pretty intense. That and back-up hygiene. For example, Dropbox is probably a pretty good solution for one person. But it's definitely not cool at our company when individual staff use their own Dropboxes for back-up. It's a sort of institutional issue. Not because of ownership or something like that, but because if they move on, where are their files?

We recently got the first version of whitney.org booted up again. At the time, they were running it and, as we designed it to do, it was evolving gradually over time. We were still screen capturing it when we remembered to. For example, when there was a cool thing on the homepage, we would screen capture it. So, there's this vague documentation. Then at some point, they asked us to replace it with a new version and to replace the code.

So, we re-designed it again. Over the years, I've gone through a range of attitudes towards this kind of change and replacement—of staff turnover, of different design approaches in the studio. Everybody would always ask, "Weren't you sad to lose that design?" We really liked that first version of the design that we did for the Whitney Museum. So, isn't there a sense of loss when we have to delete it and replace it with something else? And there was. But pretty quickly it was also like, yeah, this is part of life. It's part of

our whole attitude about the first version of the Whitney site: that it would evolve and change. This is like another level of evolution.

Understanding our studio as a change engine in the same way that our CMS's are change engines has been interesting. We still have the code of the first version and a sanitized copy of the version of the database content from some arbitrary point in time. Recently I realized we didn't have good documentation of a particular feature that we had done—this membership feature that worked particularly well. It was particularly interesting, and I wanted to be able to talk about it. To get it back up and running, I had to get the code out of storage—which was not on a DVD—it was in GitHub. That was fine, but it also meant rolling back all of the software frameworks that were necessary to run that code, like older versions of the Ruby interpreter, older versions of ImageMagick, and all of the complexities of finding the exact sweet spot of versions that would actually work together—older versions of the MySQL database. And we don't even use MySQL anymore...

Finally, after a day of work, we got it running so we could retrospectively make those screen captures of this one interaction. There is kind of a nostalgia to the complexity of it.

AYHAM: Yes, and that's linked to the archive that is constantly changing. Especially with your studio, you set up these systems that change over time. It always implies incremental change. Subtle things are happening, and it's growing at a certain rate.

DAN: There are probably moments of bigger change, as well.

AYHAM: But that change is huge. How do you represent that jump? If you say, "I'm going to do a screenshot at noon every day," that's not going to document anything at all.

DAN: I've tried that a little bit, actually.

LAUREL: Maybe I can bring up the Cuban internet now?

AYHAM: We should close on that.

Moments of Punctuation

LAUREL: Just to cut to this chase—there's a great exhibition up at the Queens Museum. Everyone should visit. It's called *El Paquete Semanal*. It's a collaboration between two artists, American artist Julia Weist and

Cuban artist Nestor Siré. Basically, in Cuba there's a huge lack of internet. It's banned in private homes, and there are only a few public WiFi spots. So since 2007, there's been this underground internet, this "paquete," that circles around. The paquete is a one terabyte bundle of files—well, a lot of folders that contain content. According to the rules of the paquete, the content can't be pornographic and can't contain political messages. So, it has stuff like sports, soap operas, anime—all sorts of stuff. This paquete is distributed once a week. And what's super interesting is that it's distributed physically, so with hard drives, from person to person.

So getting back to the actual exhibition. These two artists started a once-a-month "art folder." So, through the guise of art, they were able to kind of get into some politics—that was their idea. The exhibition shows some of their art folder as well as an entire year of the Cuban internet, or 52 folders for the 52 weeks of the year, which you can take with you if you bring your own USB or hard drive.

I think the project brings up the idea of what happens when there isn't this never ending stream of information. You must go to the finite publication model.

DAN: There are moments of punctuation. I'm glad to end with that, because it links to this idea we discuss in Mobile Computing. This idea of this hard drive that's physically moving around this network. I think it's interesting that several of the readings in Mobile Computing this semester—which is a class that really deals with the front-end interface choices, even more, where as networks is the class that's more explicitly focused on these systems of change. But even in Mobile Computing, where we're focused on front-end choices, a lot of our readings have really emphasized the axis of time. Whether that's persistence of vision and the way that scan lines move down a screen, like Bill Viola talked about, or the persistence of history that might have formed the vernacular or material choices that you would make. Or, migration itself as a change agent, and a literal journey that takes time to complete a network just like the Cuban hard drives are, and one which also involves issues of trust. How do you know that the person on the other end of this network is describing truthful conditions or will take care of your information when they receive it or will pay it forward like they're supposed to?

Maybe, to also conclude on one other note. Nilas said that after Yale, you might develop further. You will, right? This is a certainty, so I think a question that you guys have to ask yourselves is, "How do you frame these moments of punctuation?" Or how do you make a plan or model for

"You're never ready, just go for it now!"

Kim Kardashian West,
Tweet 8:53 AM - 6 Jan 2018

yourself? So that even with the knowledge that you're never fully developed, and even with the healthy resistance that you have to creating a condition of complete transparency—which would be awful—how do you nevertheless make a periodic framing, or periodic publication that can put you out in the world and give you a chance to test things? And give you something that you can look back at, if not other people look back at? Because there's obviously not going to be a moment when you realize, "I'm done, this is it. Let's take a picture."

It may also be good to be changing the way you even frame your work. Changing your strategy towards punctuation.

AYHAM: Yeah, I think that's a great place to end, because it segues into the next one about attention and ubiquity and social networks.

LAUREL: The never ending stream.

AYHAM: The never ending stream.

DAN: The never ending stream.

LAUREL: Cool.

DAN: Thanks, guys.

AYHAM: Thank you.

Conversation 3.

Attention: Social Networks & Ubiquity

December 5, 2017, 1:00pm
Yale School of Art, ELK (32 Edgewood Ave)

Speakers (in order of appearance):

Laurel Schwulst (Critic), Dan Michaelson (Critic), Ayham Ghraoui (Fellow),
Nilas Andersen (Graphic Design '18), Bryce Wilner (Graphic Design '18),
Matt Wolff (Graphic Design '18), Katelyn Spinelli (Graphic Design '18)

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- 49 A Social Network's Social Contract
- 57 What can we do now?
- 58 A Tent in the Woods
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Suggested reading:

- 94 Charles Broskoski of Are.na interviewed by Laurel Schwulst, "Charles Broskoski on self-discovery that happens upon revisiting things you've accumulated over time," The Creative Independent (2017)
- 105 Mark Weiser and John Seely Brown, "The Coming Age of Calm Technology" (1996)

Vacuuming and Digesting: Attention

Ubiquity & Social networks

- Is the ubiquity of the smartphone a problem?
- How do you begin to define and describe “information overload”?
- In an endless sea of information, where many voices are shouting in a room so nothing can be heard clearly, what is the importance of the individual’s personal voice? How do you approach an extremely loud room?
- As a creator of future software, interfaces and UX, and language used on technological platforms, do you have a responsibility? What might be some of your approaches?
- Is *Frankenstein* a good metaphor for what has been happening to the internet and the social web?

“The Monster, we are startled to discover, is more frightening than we had imagined, precisely because he does not stumble or speak in monosyllables, because he can speak more rationally and more feelingly than we and his creator do, because his destructiveness is not separate from us but an aspect of ourselves, our responsibility.”

— Geroge Levine and UC Knoepflmacher,
The Endurance of Frankenstein

Introduction

LAUREL SCHWULST: Welcome to conversation three. It's the final one! Today's umbrella topic is "attention," which contains two other topics.

When we were thinking about what to ask everyone, and came up with this list of questions:

Is the ubiquity of the smartphone a problem?

How do you begin to define and describe information overload?

In an endless sea of information where many voices are shouting in a room so nothing can be heard clearly, what is the importance of the individual's personal voice?

How do you approach an extremely loud room?

As a creator of future software, interfaces, or UX in language used on technological platforms, what is your personal responsibility?

What are some ways to be generous as a designer or cultural practitioner, when there is already so much out there? (That comes from, directly, the reading where Cab says he thought making Are.na was the most generous thing he could do as an artist, because he comes from a background of having a personal artistic practice.)

And finally, how do you envision the internet in 2050, ideally and realistically?

Then, we came across this quote. Ayham brought this quote in, actually, so thanks.

AYHAM GHRAOWI: It's also a nod to Paul Elliman. He referenced it previously.

LAUREL: "The Monster, we are startled to discover, is more frightening than we had imagined, precisely because he does not stumble or speak in monosyllables, because he can speak more rationally and more feelingly than we and his creator do, because his destructiveness is not separate from but an aspect of ourselves, our responsibility."

Is Frankenstein a good metaphor for what has been happening to the internet and the social web? We think so.

And last time, we were talking about “preservation.” Our conversation left off with a discussion about how you punctuate your practice and show the world what you’re doing periodically.

Information Overload

Ayham: That’s a great way to start talking about this topic—being responsible for contributing to this information overload. We also wanted to specifically define “information overload.” Everyone usually nods and agrees when they say they’re surrounded by this endless sea of information, but what do they actually mean? What is that content, and what is its medium? What are people doing to contribute? Are they making “calm technology” to deal with that relationship?

DAN MICHAELSON: There are so many dystopian aspects of the current era. Mark Weiser and John Seely (who wrote the article “The Coming Age of Calm Technology”) call it the era of the personal computer—which is now the smartphone that’s in our pocket that fills every crack of so many people’s consciousness.

This era of social networks—I’m not sure if they are Frankenstein’s monster or if they’ve let Frankenstein’s monster through the door—exploit the openness of these systems to create something that’s pretty unknowable and scary. They seem, to a large extent, to have brought down a measure of democracy. And we listen to Zuckerberg apologizing, basically saying, “What have I wrought?” Almost in those words and promising to fix it.

AYHAM: At a certain point, Frankenstein’s monster says to his creator, “I will work at your destruction.” It’s gotten so out of hand.

DAN: Or has it? This is debatable and can sound quite reactionary, too.

If you all are going out into the world to build social platforms, or more generally, screen-based design, what’s your take on that context?

NILAS ANDERSEN: This is not an answer to one of these questions but generally on this topic. I have a quote from Andrew Prior, who is someone I don’t know much about, but he was interviewed at the Contemporary Condition Conference in Denmark.

He says the contemporary condition is about being able to access things from all moments in time. He says, “It creates a situation where we are sort of drowning in multiple media. Drowning in multiple temporalities and so the challenge of the contemporary condition is one about navigation. How do we navigate all these different materials and make sense of them?”

And I feel like the Frankenstein quote is about destruction, but this is simply a question about how to navigate. That might also speak to the envisioning of the internet in 2050. Maybe that’s an internet that’s developed in such a way that basically helps us navigate. The future internet is still an abundance of information, but it also filters for us.

AYHAM: It has an agenda.

NILAS: Yeah, and a tool for navigation. I imagine there will be more and more of that.

LAUREL: Today it seems like we’re doing more navigating than actually interacting with content, because there is so much of it.

BRYCE WILNER: To that point, when I hear the term “information overload,” I always pause and think to myself, “What is the information that I’m being overloaded with?” It’s not Proust. It’s not mathematical proofs. It’s not American history. It’s all the people around me who missed their train this morning. To that end, the fact that the smartphone affords people the ability to insert their thoughts into other peoples’ consciousnesses in that way—and the ubiquity of the smartphone—is a problem.

NILAS: But is this because we’re still adolescent in our relation to the smartphone and the ubiquity of this information?

Yesterday, I learned about Facebook launching this new messenger app for kids (because you can’t use Facebook under a certain age due to ads and stuff). This messenger doesn’t have ads because I assume they just want kids to be comfortable using Facebook so eventually they can’t live without it.

It made me think about how parents are teaching their children about media consumption. I’ve heard many parents aren’t letting their kids interact with social media until a relatively old age. One person mentioned their daughter wasn’t using Instagram or Facebook yet, and she was 13.

I wonder if the next generation will have a different, more mature approach. Because we are sorting through it all—we're still adolescent.

Community: Social Responsibility and Scale

DAN: The younger parents might have a healthier, conservative attitude towards media. And the kids themselves are better able to navigate that. That's kind of how it goes, right?

AYHAM: In "The Coming Age of Calm Technology," I love how they're consciously referring to writing as a technology. It's something so commonplace and unremarkable that we forget its impact on everyday life, it is so integrated.

I wonder about our responsibility with this information overload. Many of you are saying that you're not getting good information—that is, you're getting information you don't care about. Do you feel like you have any sort of agency or autonomy in navigating that? You do, right? That's the thing I think we're trying to discuss. I hope we have responsibility to control that.

BRYCE: I think about this a lot, and how much of that is my responsibility to filter my experience with the help of computer-based tools.

A nice distillation that relates to one of our readings is the difference between the two major social media apps that I use the most—Twitter and Are.na. Every single day, I wonder why I'm still using Twitter, and every single day, I thank whoever my god is that Are.na is a thing. It's nicely said in the interview, but it truly is powerful to see the things that you're interested in—collecting them yourself and maybe with other people—and watch that accumulate over time. You begin to notice meaningful patterns. I've been on Are.na for five years now. That's how much of my brain is on there, and I consult it every day for where to go next.

AYHAM: I don't really use Are.na, but a lot of people I know say similar things. I enjoy how the interview shows Cab's sincerity in building Are.na to do that. The fact that he was questioning himself as well as the others who were building it, "Would we actually use this? Do we want to use this?" It seems like such an unremarkable question, but it's important.

LAUREL: Maybe to play devil's advocate, though: Are.na still is a social network...

AYHAM: Yeah, that's what I'm curious about.

LAUREL: Whenever I see the little notification in the top, I do still get a little high. Maybe it's the "health-food" version of a high, but it's still a high.

AYHAM: He does emphasize it as an intellectual activity.

MATT WOLFF: What would happen if 100 million people used Are.na?

LAUREL: Yeah, it's not going to be the same.

MATT: That's the thing, like how long have you been on Twitter?

BRYCE: Longer than I've been on Are.na.

MATT: Yeah, so fast forward like another five years and that might happen.

AYHAM: What's Are.na in 2050?

BRYCE: It comes down to the people who are using it. Because there was a time when I thought Twitter was really beautiful, and now Are.na is also getting bigger, which terrifies me. But I also want Cab to be able to make money.

AYHAM: I think that's such a significant point. Again, it goes back to the first day, or the first conversation series, about how art.yale.edu was so much about the community of the school. And it works because there is a very distinct and specific community that you can draw a line around. Maybe meaning comes because the community is defined—it's not so open. But I'm not sure, and that sounds terrible to say.

MATT: That sort of sounds like what Facebook is getting a lot of push-back for. They've almost algorithmically defined what that community is that only you are seeing, like people who like similar things that you do.

LAUREL: It almost seems like there needs to be more fiction in the beginning. What if adding a friend was like 10 times harder?

AYHAM: Like it is in real life?

LAUREL: Yeah. You know, there just seems to be so much post work in defining your little community, because the original community is so easy to gain.

In the interview, I felt like one thing wasn't really resolved. Cab was getting

at this “T shaped knowledge.” And how, even on Are.na, it can be difficult to go really deep within your own thinking. That seems to me like a question of our time.

The Center and The Periphery

“The more we started thinking about this, the more we were led to a counterintuitive idea. Mark said we will always feel information overload unless we increase the amount of information that we have to process by a factor of at least ten. If you go by a factor of ten, then you stop thinking about putting more information on screens. It becomes more like driving down Skyline Drive; you can’t process all of the information in front of you, but through a synergistic relationship between the center and the periphery, you can reach through the information and on to the world with a sense of calm. You start thinking in a different way and that’s what got us focusing on how we process the total context.”

John Seely Brown, “Calm Technology: Then and Now” (2014)

“Calligraphy and Qigong have several things in common, aside from offering a slow but bright burn. In both, I’ve found myself negotiating a sweet spot between speed and precision. Go too fast, and you deviate from the line or the gesture. Go too slowly, and your movement gets sticky and loses grace. Both are exercises in tuning to various rhythms, initiating action at certain times from one’s center and at other times from the periphery.”

Tauba Auerbach, “(P)(E)(R)(S)(E)(V)(E)(R)(E)” (2017)

DAN: I was remembering earlier Vannevar Bush’s essay from 1945, “As We May Think,” which in many ways was a precedent for the calm technology article. In his proposal or speculation was not this cloud of networked devices, but this big, heavy, physical desk that had all the equipment inside it (including microfiche), and it would allow this deep learning, the “T” basically. It would allow learned intellectuals to follow each others’ paths through academic scholarship.

It’s interesting to think how we went from this deterministic physical, positivist model—one which also emerged out of nuclear war (I mean Vannevar Bush wrote that as like a side project from inventing the bomb)—and how we basically graduated to this unknowable cloud of content—this endless sea of information—and also one with such social problems that he couldn’t possibly have anticipated.

AYHAM: Well that’s why I’m always skeptical of the endless sea of information. I think there simply are ways to just focus. Maybe that’s us still getting out of our adolescent phase, as Nilas said.

If we’re using the analogy of the center and the periphery, there are advantages to both. Being able to swim around is important, but it’s also good to have developed ways where you can focus and unpack certain subjects. That is a positive aspect of these cloud networks and communication platforms. They do allow you ways to unpack and focus and dig deeper.

DAN: Maybe there’s a helpful relationship between the center and the periphery. We should allow our peripheral vision to play a part in what becomes our centers—what we focus on.

We sort of assume that there’s one monolithic social network that’s going to solve all these problems, but that’s not how our physical lives work. We read lots of different magazines or have lots of different overlapping real world social networks and media channels. We don’t expect any single one of those channels to provide every single perspective. The fact that there are different newspapers with different perspectives doesn’t mean that there’s a bubble problem.

Maybe the problem with Facebook is that it's this monolith that includes everyone and it's not just that they've created bubbles, but that they are using dark patterns to exploit those bubbles. I know those patterns are driven by what's going to make people feel good in terms of social identification and herd mentality. On Facebook, there is no editorial perspective—no sense of social responsibility—that you might expect from the most partisan printed newspaper.

NILAS: I'm curious about this sort of "social responsibility" in terms of Are.na. It's not exactly the same as anything else, but Are.na is developing into something different with more users. For example, people are starting to add some of my content into their "Pinterest-style" channels—you could call them "mood boards." I use Are.na often as a research tool with a lot of context. With more users who don't have the same approach, they easily use it while removing all context.

AYHAM: Both your points remind me that it is important—if we're talking about digging deep and focusing—that there be a difference in opinion. It's similar if you were doing research for an academic paper to be published—it's important to not ignore a differing opinion because that's how you make an argument.

DAN: Having access to the different opinions is important too. You have different newspapers or different TV channels that express highly partisan perspectives, but you can change the channel, or you can buy the other newspaper. With Facebook, you just can't very easily. There's so much friction to move to another channel on Facebook, which is a problem.

AYHAM: Is it possible to have differing opinions with just pure image collecting? Or does it all turn into Pinterest-style? When you say Pinterest, I think everyone already has an image in their mind what that collection looks like.

NILAS: Yeah.

AYHAM: There's a stereotype of that collection.

LAUREL: But at the same time, I can imagine myself as a teenager using Tumblr or something (although maybe even now Tumblr is dated) and doing something super naïve like that. I think there's some value in letting go of your images, or work, to an extent. For the people who are really dedicated, hopefully there will be a dedicated archive or book someday in addition

to the image stripped of all context. It's important to have layers to be accessible.

I was reading a really cheesy self-help book like six months ago about social media. It said, "give it up for a month. Don't delete your account or anything. And then, after the month, if you want to go back you can—just know the reason you decided to return." With Instagram for instance, I said to myself, "It's really annoying in some ways, but it's valuable to know what's up." Because I follow so many users I value, I get to see the overall zeitgeist—what's in the air. It's the periphery, and seeing it in bulk and zooming past you gives it value. It's good to be in touch with the periphery.

AYHAM: Going back to the question about the personal voice, which seems related, "How do you approach an extremely loud room?" Are you saying you're trying to focus in on someone's individual voice (as a listener), or are you a single voice contributing to that production (as a speaker)?

DAN: Is Cab's approach one way to think about it? I mean at the meta level. I think one of the things that's really nice about that interview is how he talks about the invention of Are.na as a curatorial choice. Like that's his content, that's his project.

AYHAM: And artwork. He's explicit about that.

DAN: Yeah, that's his perspective. If the rest of you can figure out how to have your own perspective inside Are.na, hopefully you can.

BRYCE: The artist, Jason Musson, said in a tweet, "Be the content you wish to see on the internet." I took that to mean, just because I'm on Twitter and seeing people tweet all of this, there's actually a lot of good stuff on Twitter. But there's also a lot of bad stuff—I think there's a lot, and you can say that about any social media platform. I just took that to mean that I don't have to participate in conversations I don't want to. I can just say the things I feel only I could be saying, and maybe some people will like that.

AYHAM: Yeah, and perhaps the people who like Twitter tend to be the people who don't tweet.

BRYCE: Oh, yeah that's interesting. The general attitude I get from every single person I follow on Twitter is that Twitter is not good.

MATT: A lot of people in one room talking about how they don't like the room that they're in.

"Gossip has always functioned as a making-public of private information, but these indiscretions are now not only circulated among peers, they are also surveilled and archived by systems far beyond our reach. The pleasure in gossip's telling had been accompanied, if not by a certainty of its destination, at least by a knowledge of its relative ephemerality. Gossip's record now lies not in marginalia but in server farms."

Sarah Hammerman, "Gossip as Communication System" (2017)

AYHAM: It's almost a joke—"No Exit."

A New Room, a New Monster

DAN: There's this tone of irony on Twitter. It's this kind of millennial tone, but it's so constant and unceasing and deadpan. Yeah, it does seem like 100 million people don't like Twitter, but they continue surfing it anyway.

MATT: But that's the thing with Are.na. If I'm following these metaphors correctly, then it's just a new room, and also a new Frankenstein. Is that right?

I was remembering the interview when Cab was talking about Del.icio.us, the death of Del.icio.us and then grabbing pieces of these corpse platforms and building them up again. It seems like a corollary. Is there a way to build a platform without the corpse of some other?

LAUREL: Good question. Well, Are.na technically wants Are.na to be as big as it could possibly be to give people something "good" to do on the internet. But as we've been saying, the larger scale might lead to its death. The software doesn't change, but the feeling completely changes when you're using it with 100 times more people. But maybe, according to Matt's perspective, that's okay because platforms are meant to die and be replaced by others using their corpses.

AYHAM: In the narrative of the monster having more agency and getting out of control, is agency linked in that metaphor with scale? That it's a little more self aware?

KATELYN SPINELLI: I don't use Are.na, but I understand how it's this curated thing with a strong sense of community. If it goes out of control, will it be doing something other than its original purpose?

NILAS: Yeah, don't post Are.na on 4Chan.

MATT: Yeah, can't everything turn into 4Chan? What stops Are.na from turning into 4Chan? Just goodwill?

NILAS: There is some intention, but then there are parts that don't work, and it could become like a virus or whatever and affect the whole thing. I feel like if like 4Chan community started interacting with Are.na, it could be devastating.

DAN: It always starts with good intentions. All these projects, including

"I felt that as a culture we were extremely youth-oriented and not willing or able to accept death or dying as a part of life. The rites of mourning, which in more primitive and older cultures were very much a part of life, have been suppressed in our modern times. In the design of the memorial, a fundamental goal was to be honest about death, since we must accept that loss in order to begin to overcome it. The pain of the loss will always be there, it will always hurt, but we must acknowledge the death in order to move on."

Maya Lin, "Making of the Memorial" (2000)

Facebook, all start with good intentions. But yeah—is there anything structural in Are.na that makes it deeper or slower? I mean some things. It's hard to imagine those things stopping a 4Chan community.

AYHAM: I wonder if that's related to the social responsibility question. As a founder, should you consider pulling the plug as part of your responsibility?

BRYCE: I definitely think so. Knowing when to stop is super important.

Ayham: Curious to hear Dan talk about this idea of the healthy ecosystem and the growing applications—do you consider this?

DAN: That's a great question. When is sunsetting a social network a positive act? I certainly have that reaction to all the mea culpas from Twitter and Facebook, thinking to myself, "These guys are super rich. Why don't they just turn the thing off?" It's kind of terrible, and I know it's realistically hard to do.

BRYCE: In that respect, I find Del.icio.us a very interesting example because it's something that was cut off before it could prosper. Not in the way we consider social networks now, but during its time it was quite influential—obviously among a very small and dedicated user base, however.

I never really got into it, but friends of mine and people who I see talk about it on the internet really valued it, and then it stopped. Then they had to build something else like it.

DAN: So maybe its death was actually a good thing, if that's what you're getting at? The forest fire allowing a new thing to grow could potentially be a good thing. The idea of all these new platforms being like Frankensteins of the old ones. Can be good, can be bad.

Expiration Date

LAUREL: In my own periphery, I'm noticing people starting to approach their projects more with a specific end date, for instance. For example, recently a potential client of my roommate's was talking about making a publication that's specifically nine issues long, and that's all it's going to be. I think people are a lot more aware of the life of things and how finitude is meaningful.

DAN: That was a big realization in social network platforms, too. Like with the expiring message of Snapchat, suddenly people realized actually it's a

good thing. Because everybody thought, “Oh, having my stuff archived on my blog forever, that’s fantastic.” And there’s sort of a complete transformation now—having my stuff expire immediately is fantastic. But this idea of having a platform expire seems like a logical next step.

AYHAM: It does seem important to highlight that Del.icio.us ceased to exist because Yahoo leaked a presentation slide that said they were going to get rid of it. Then there was a mass exodus. And that seemed like such a unique thing that couldn’t have been planned.

Is there a way sunsetting could happen in the software as part of the plan for the project? I feel like even signifying an end date wouldn’t have the mass exodus that this Yahoo slide created. It was such an interesting thing.

LAUREL: And would people participate in your platform if you told them it was only going to live for two years?

DAN: Ah, well that’s the problem.

BRYCE: People are using Peach right now. I don’t use Peach myself, but apparently there’s a rumor circulating among its users that says it’s going to go down any day now. But people still use it.

LAUREL: Best platform out there.

KATELYN: Actually, if that were the case, I think people would approach these websites a lot differently. There’s this humanistic aspect that it doesn’t live forever, and so you feel a sense of shared responsibility or maintenance.

DAN: You’d use it, but you wouldn’t invest in it. That seems like it could be totally healthy.

A Social Network’s Social Contract

NILAS: That depends on what kind of platform it is. Are.na works as an archive in a way—it’s a growing research platform that makes more sense the longer you use it. But something like Snapchat is completely different and has a different purpose.

I was thinking about the Frankenstein monster thing. One part that’s missing is the body metaphor. When talking about governments or democracy, you talk about a head and body that are connected so it works well. But

sometimes there's a decapitated head, and the body's usually still there. I think we should talk about users and responsibility.

For example, a country works well only if its users are happy with how things work and they want to participate. In Denmark, we pay a high tax, and most people are happy with that because we get these nice things out of it, and blah blah blah.

I think this is related to the issues people are experiencing on Twitter and Facebook—that you can basically do anything because there are no stakes for you as a user. I wonder if that's something Are.na needs. Right now, it doesn't have a language around what's the responsibility of using this website. Right now, they're making it so that you have to pay for having private content, but what if you had to pay simply to be able to use it? What would that mean?

So how do you nurture these ideas of responsibility and community? Because wouldn't Are.na not turn into a monster if everyone using it had...

AYHAM: A tax?

NILAS: Yeah.

DAN: This is a slight tangent related to the attention economy, and I think Cab touches on it. The business model for most of these platforms is about growth in order to sell ads. If their user base is growing to sell ads, therefore their whole social contract is going to be geared towards click bait. So if you want a different social mechanism, then steer away from advertising as the thing that drives your state and your economy.

I think Nilas's point is totally right on. All of these social networks have really poor constitutions compared to the US constitution, any other state constitution, or any city charter.

Part of that is intentional because they have duplicitous social contracts where there's some kind of constitution that says, "Okay this is the kind of post that's acceptable." You know, "Your name is always gonna be attached to the post." And then there's this other contract, which is "For every 100,000 of you, we're gonna sell an advertisement to someone who doesn't even participate in this social network." You have that latent infrastructure. It's hidden infrastructure, and it's in real economies as well. Right now, social platform founders seem far behind government and city founders.

NILAS: Why is that? Because people are writing constitutions all the time for a lot of countries. There are few who are very good at doing that in the UN and the EU.

BRYCE: So, from what I'm gathering, it sounds like we think the internet in 2050 is going to be a series of centralized taxed entities.

KATELYN: You wouldn't necessarily have to tax a community. Instead of money, maybe they could tend to the garden or contribute something else—they could be responsible for some aspect of maintaining it.

LAUREL: Something other than money, like shared responsibility.

KATELYN: Maybe taxes is the easy way of just doing that.

DAN: It really depends on scale. You could have no taxation or a full constitution when you only have 100 users, but once you have a million users you really should have one.

AYHAM: It's regulation. The big discussion now about these large social networks is how they're finally being critiqued due in part to the election and the effect it had on the user's trust in their news feeds.

DAN: It's regulation, but it's also civil rights and a system for legislature and change. It's sustainability and due process. A lot of these things are not just top down regulation—they are social contracts.

But also, like Katelyn suggested, there are other ways. Where I live, we have block association that's the most casual thing ever. It's an email list, and questions come up like, "Who pays for the bouncy castle?" and "Should we clean up the sidewalk a little bit more?" and "A film crew paid off someone \$1000 to shoot a TV show on the block, so should we put that money into the bouncy castle fund? Or do we give it to the food pantry on the corner?" And someone was like, "We'll take a vote." And someone else was like, "Voting is not the appropriate way to do this."

Anyway, you work those things out in a totally casual way, and that's appropriate for a network of a couple hundred people.

AYHAM: But does that happen on these social networks? Where there are smaller scale, local communities that have their own contracts within the bigger scheme of the network?

LAUREL: On Are.na, I'm part of a group that advises where Are.na should go next.

BRYCE: Yeah. We, and probably a handful of other people who pay to use Are.na...

AYHAM: You're that separate group.

BRYCE: Yeah, so we're put into like a channel where we also have closer contact with the people who run it and are consulted when there are design changes.

AYHAM: Really?

LAUREL: Yeah, I gave them \$300 four years ago when they asked for it. So I was placed in this group.

AYHAM: I guess my point is about the hierarchy established. I think the internet and social networks always have this image of egalitarianism. That's what the network used to be the definition of, but something like a premium account, like what you both have, implies that—

BRYCE: Class becomes a huge issue.

AYHAM: But they talk about it in positive ways.

BRYCE: Well, yeah, I mean the same way that Nilas spoke of taxation in Denmark. You pay, and then you expect high returns from your government.

AYHAM: Yeah.

BRYCE: Except that's probably not going to work the same way in the US.

DAN: Well, you pay because you want there to be more longevity for the platform and because you want the platform to avoid falling into that attention advertising model.

MATT: Isn't that like buying stock in a company? And then if you buy enough stock early enough, you're on the board of trustees or whatever?

BRYCE: Yeah.

MATT: It sounds like you're trustees of Are.na.

BRYCE: It's not like they consult me for everything, but, sure.

DAN: Illuminati.

BRYCE: With the internet in 2050 thing, I do see money becoming even more of an influence in the way users interact with the things that they use.

AYHAM: Money and class and hierarchy.

BRYCE: Yeah, and then class becomes an even bigger issue on the internet than it already is. That's scary to me, too.

AYHAM: That's worth thinking about.

BRYCE: Sure.

KATELYN: Did you say class?

BRYCE: Class, yeah.

KATELYN: So like memberships?

NILAS: Who can afford it and who can't afford it.

AYHAM: Who will even make that first step to pay for something?

NILAS: In Denmark, the educational system is public—you don't pay for it—it's in the taxation. Apart from some private schools on the elementary level, we have this thing after elementary school called "after school," which is like a one year thing. It's kind of like a boarding school, but it's rooted in community and social values and so on. They're private, so you have to pay to attend one. But you can apply without the money, and they'll look at your financial situation and give you funds, which is similar to applying here. So you don't have a class difference in that system.

And I wonder: can parts of the internet work like that in the future? It requires a big infrastructure and bureaucracy, but what if you could apply to be a member of Are.na even though you couldn't afford to pay \$100 a month to use it?

BRYCE: I remember in class a little while ago you said something to the effect of, “Your user-ship on the internet,” like you put that thing on your computer. Who made that thing that tracks what citizen you are on the internet versus where you are physically?

NILAS: Oh, James Bridle, the project “Citizen Ex.”

BRYCE: And you figured out you were a US Citizen. The US is not a socialist country, and I don’t see it becoming one any time soon, although I hope it does. If there’s any kind of governing structure applied to the internet, right now it’s probably gonna be a disgusting capitalist maybe fascist state that is the internet.

DAN: I don’t think there needs to be a governing structure applied to the internet as a whole, and it doesn’t have to come from a state either. I guess my point was that, when you start a social network, you ought to have established a governing structure within it. And hopefully you made it a progressive one that expresses your values or your voice.

AYHAM: Yeah, I guess we do have to be specific about this, we are talking about these platforms, not the internet in general.

DAN: And also the government doesn’t mean the state, and doesn’t mean a nation state.

NILAS: In regards to the question of generosity—can you even make these types of platforms and explain, using language...? Because that’s the thing with Are.na—it’s not really telling you what it is, per se. You can read in a blog post and on the about page, but in the interface and how it’s designed, it’s not really telling you about responsibility and whatnot.

Can you make this kind of platform where when you sign up, you read, or it’s presented in a way so it’s not like terms and conditions, but you’re presented to, like, these are the values of the thing?

AYHAM: Like a citizenship test.

DAN: Why not? Citizenship. People that are natural born don’t take that, but they certainly get plenty of propaganda.

NILAS: We start to hide the personality of a website more and more. For example, I was on the New Inquiry, and I was wondering, “What do the founders actually say about this?” And they don’t really say anything.

AYHAM: They try to be neutral.

NILAS: I was also looking at similar kinds of new critical online journals, and they were also very vague.

AYHAM: That's a really good point.

NILAS: Cab has a lot of thought put into this, but he's not really talking about it on the platform.

AYHAM: It's not in the interface.

DAN: Can I tell you something though? I'm not sure myself, but are there affordances in the Are.na interface that would, that do at least go part way towards enacting the values that Cab wants?

LAUREL: I'm not sure, off the top of my head. One thing I've always liked is that the following and follower counts are always sort of inaccurate since channels can't follow you back.

I remember, Bryce, you have this quote you like that's about Are.na, which goes: "There's no wrong way to use Are.na." It sounds really beautiful when you first say it, but then you think of all the potential darkness, and there's a huge red flag.

Today, I rediscovered an old reading by Gene McHugh, and so I typed in "McHugh" into the search bar in Are.na to see if there was anything else by him. I found a picture of an almost nude model whose last name was McHugh, and I clicked on that, and then I found all these channels that were about the ideal female figure. There wasn't enough information or context to figure out if it was a worthwhile channel, despite being somewhat pornographic.

AYHAM: Right, it's only images.

LAUREL: Are.na's decision to display images rather than text is also significant. (That differentiates them from Pinboard.) But choosing images leads to a whole world of possibilities, potentially good or bad.

DAN: What's that site that closed recently? ffffound.com. That was pretty heavy on ideal female form because it was an image collector.

AYHAM: Is that why they shut it down?

"The democratic culture of the Internet (blogs, YouTube, Wikipedia, etc.) is increasingly a part of daily life. If somebody wants their voice heard, they can do it with a couple of clicks. However, as this democratic culture creates more instantaneously available media on a daily basis than anyone could possibly consume in a lifetime, a tension emerges in which each of these individual units of media is transformed into noise. In this scenario, both Proust and pornography flatten out in value to right around zero — each just a drop of water in a continuously expanding ocean. ... There are so many people shouting in the room that one voice cannot be heard clearly. For a contemporary artist, this scenario poses an interesting problem."

Gene McHugh, Post Internet (excerpt) (2010)

"If you don't take care of yourself online, someone else will. That someone is likely not a peer but a megacorporation that is tracking and selling your preferences in a silent auction, a government surveilling your movements and religious affiliations, or a hacker collective that feels entitled to publish your sexual indiscretions. That someone probably already is."

Paul Ford, "Reboot the World" (2016)

NILAS: In the end, it basically turned into a porn site.

BRYCE: Like three images down on the front page there was porn.

DAN: I assume, or at least at the time, I assumed that was because it was image based.

AYHAM: Yeah, and the ease of using it.

LAUREL: Perhaps it's part of our responsibility as people on this "Are.na board" to do something about this. Could we suggest something in the interface to Cab, maybe?

BRYCE: Would it also be our responsibility, as users, if we saw something questionable, to comment or contact that person directly, saying "Hey, maybe this isn't helping"?

LAUREL: That's a good point.

DAN: All of those things can have such dark sides. This is why there's a pretty complicated constitution and social contract, and somewhere as rich as the US, that really establishes how to think about free speech.

AYHAM: And it takes a level of investment to understand it, know it, and apply it.

DAN: And it also gets to that peripheral question, too. There are all kinds of ways to accommodate pornography and free speech in an actual country where you can, you know, sell things in a store behind a curtain. There are so many different domains of privacy that people can navigate.

AYHAM: They are laws. They are enacted as laws.

DAN: Sometimes enacted as laws, sometimes it's social convention. Often enforced as laws and there's just not nearly that much texture in a social network, where everything demands your attention. You can't turn away, or you can't choose what room you want to walk into so easily.

LAUREL: Sometimes I wish I had more control over the room before I walk in. For example, when I sign onto Are.na, sometimes I only want to work on my own stuff versus getting the barrage of notifications, which are more and more as Are.na grows.

This is similar to me wanting to open my email and being able to freeze time for a moment. I don't want to see new emails that come in. Maybe I can do this with the "mail" app and turning off my WiFi momentarily...

MATT: Maybe let's jump back to Frankenstein for a minute. I think it's interesting that the doctor's solution was to leave and go to Antarctica, trying to be a recluse as much as possible, and it didn't work. He couldn't escape.

LAUREL: Yeah, and a bunch of Silicon Valley executives are trying to get to private islands.

AYHAM: I want to clarify. When I said, "I will work at your destruction," it was the monster saying that to the creator. So, if the creator escapes to Antarctica or a private island, there's a spirit that will always be there, continuing to effect him.

What can we do now?

DAN: In wrapping up, it'd be nice to think about formal solutions to this or ways to act as practitioners within that domain. In the calm technology article, they accidentally talk about the connection between electricity and text.

How do you even make typographic choices or UX choices that afford good behaviors or afford a set of values? Or that afford a kind of transparency? It's important to browse the internet or social platforms in a way where things are not so hidden from you. You should understand why things are being presented to you and not having things funneled away from you for ulterior motives.

There will always be ulterior motives, but it's important to shift the balance there. How might we use that mission to drive design choices? Even initial design choices, potentially. To show the seams, create a clarity, or to support contracts in some way?

One thing that the Frankenstein metaphor evokes for me what is the type of positivist creation Frankenstein is. I mean, yes, it's a monster that runs out of control. But with the Russia spectra right now, or with any sort of exploit by trolls that we've been talking about recently, how ironic is it that you take this unknowable postmodern cloud of contemporary social networks, and then something totally retrograde like the KGB or a troll or Frankenstein's monster, and just sort of walk through that cloud and exploit it and turn it into something potentially so horrible?

LAUREL: Let's go back to the question, "What can we do now?", because this problem seems so huge. I found the calm technology article actually quite calming and sort of optimistic. How do we make the loud room calm?

DAN: Or how to slow down, as Cab says. How can we make designs that encourage slowness rather than speed?

LAUREL: Is it all about adding more friction, adding tax?

KATELYN: Maybe there's just a delay.

DAN: Actual delay.

LAUREL: Like a disposable camera.

A Tent in the Woods

DAN: I like the idea of calm technology, but I wouldn't find it calm. His evocation of like a million devices around us, constantly oscillating and vibrating with information that we don't need. His best example is the Natalie Jeremijenko ribbon. That is a cool peripheral way to see the quantity of network traffic, but what could be a better example of information we don't need to know?

It was really striking how we are seeing an age of ubiquitous computing come to pass. These devices are starting to exist. You can buy the internet connected refrigerator that he's talking about, but that's so swamped by the revenge of the personal computer, which is the smartphone that demands all your attention like a PC does, and that you totally give a name and a special colorful case to and form a special bond with.

AYHAM: A one-to-one relationship.

DAN: A one-to-one intimate relationship as we've been talking about in Mobile Computing. It's such a dominant paradigm, and I don't think he could have predicted it. But the promise of being able to turn away, as he suggests, is very calming: the idea of the periphery. I was thinking about that a lot as we were designing e-books, actually. Just what is the difference between reading something on a phone or a tablet or a desktop versus reading the same thing in paper? Personally, I do both, I go back and forth, but the one thing you don't really do with the phone is encounter it somewhere.

There's that feeling of sitting down on the couch and being like, "Oh there's my copy of the New Yorker." And it was already there. For me, that's what he's talking about when he's talking about periphery. You can make a choice to turn to that, not turn to that, or to turn away from it when you want. It's not this one thing that absorbs you.

"I once heard Leon Botstein, the President of Bard College, compare books to stairs. 'They've invented the elevator,' he said, 'but sometimes you still walk up.'"

NILAS: And then there's more. That's only one affordance to it. It's not fighting for...

Orit Gat, "Screen. Image. Text." Rhizome (2012)

AYHAM: A book can also hold a door open.

NILAS: Well, yeah.

BRYCE: It's frustrating when text messages show up on your book.

NILAS: Yes, exactly. That's my point.

BRYCE: I don't think anything I ever do with my smartphone will be considered a calm technology. But the pieces of technology that calm me are just things that do the one thing that I turn to that thing for.

"Hypertext can be difficult to read. And to teach: the vast majority of my students have visceral reactions against hypertext every time I introduce them to it. Some of what they hate, of course, may be attributed to the general appearance of datedness that most of the classic hypertexts. ... But when pressed to think beyond the slowness, the small window, the pixelated fonts, what my students most often voice is their sense of disorientation, their lostness within the world of the text. They stab randomly at it, trying to find their way somewhere; they wander aimlessly, trying to make sense of their paths; they finally give up, not at all sure how much of the text they've actually read, or what they should have taken from it."

MATT: I was just thinking about Facebook again. The architecture of Facebook is being compared to a casino in that there's all these flashing lights and rewards and you get all these notifications and likes and there are all these photos you can look at or other rooms where all of sudden there's a magician onstage doing card tricks for you.

NILAS: But it's just one long casino you just walk through and walk through and walk through...

MATT: Yeah, but it's a casino you can easily get lost in or not realize you're still inside the casino. They hide the exit really well, so it's difficult to opt out. If you're trying to leave, they're like, "No, no, no, your friends are going to miss you." They put their photos up.

Kathleen Fitzpatrick, *Planned Obsolescence Publishing, Technology, and the Future of the Academy* (2011)

AYHAM: It's funny. I'm getting confused about whether you're talking about actual casinos.

MATT: Yeah, for sure. That's my point. We're talking about this room thing, and Facebook is this casino room. The alternative sounds kind of like a tent in the woods or something.

AYHAM: Yeah, isolated.

MATT: Yeah. You don't want to be in a room with other people. You want to be in a room by yourself.

NILAS: So maybe we need more tents.

AYHAM: Yeah. In the woods.

NILAS: And fewer casinos.

MATT: I'm also thinking about this app my girlfriend uses. I think it's just called Moon. She installed it a year or two ago, and periodically she gets notifications from the moon. The moon says, "French fries are great"—these kind of non-sequiturs. When she opens the app, it tells her the moon cycle. It just reminds you that it's there every now and then in these strange ways.

DAN: The app is an interesting mention within the context of the phone. An app compared to the internet is a little bit like making a tent in the woods. A thing that's supposed to do one thing and one thing well, and you're perfectly comfortable deleting once you've exhausted it.

BRYCE: Rather than moving to a cabin in the woods, do we just want places to be alone on our devices then?

DAN: Yeah.

AYHAM: I think that's you turning off your WiFi when using your email, Laurel.

LAUREL: Yeah.

DAN: So, we're designers not recluses, or we might be designers and recluses. But to the extent that we make things for other people, my question is, "What would it mean to get into tent building?"

Could you make a living at that? Is that even what you're talking about? If you're selling tents to a million other people all day? Because are we talking about that or are we talking about going to live in your own tent?

LAUREL: Also, why isn't there a smart phone that just has the basics—maps, phone, text, that's it? Like, why hasn't Muji or IKEA made a smartphone?

AYHAM: When you're talking about reading. I was just reminded of a story about Immanuel Kant that claims he created all his works at the age of 50, because at that point he'd read everything that needed to be read in the 18th century. That idea is bizarre to us when we think about this endless stream of content. We have this need to know how we're going to read all of it. But the idea that someone was able to create the works that he did because he was like, "Okay, I read everything I needed to read. Now I can start." It's such a bizarre thing to compare to wherever we're at now.

NILAS: The other way around is that writing is over, and we don't need to write anymore.

AYHAM: Right. Oh yeah, maybe. Less things to read back then.

NILAS: What's his name? James Joyce? That's basically what he did, I think. He's thought writing that makes sense was so over.

Not Only a Critic

DAN: Well, that's definitely a good place to stop. I would end by saying we aren't and can't simply be critics and outside observers. Most of us might not have the luxury of defining a new hardware device, a new nation state, or even platform that has critical mass.

But I think the thing to think about is: how do you express values that are positive? At least in the meantime, and within the sphere of influence that we have as designers? Even as you're working within those systems, you're potentially working to deconstruct the bad systems.

AYHAM: Part two of the series.

DAN: Part two, yeah. To be continued. This has been really fun. Hopefully, besides being food for thought for all of our future careers, it's food for thought for you work next semester or next year in the program. And yeah, cool, maybe we'll do it again next year.

AYHAM: Yeah. Thanks for joining us.

DAN: Yeah, thanks a lot.

LAUREL: Thanks.

Sometimes it looks like a duck, sometimes it looks like a rabbit: Governance structures in graphic design, decorative form in law, and schools in the public sphere

Jack Balkin: Have graphic designers moved toward producing platforms, instead of producing contained works?

Dan Michaelson: Yes, and that's where the focus of my classes lies in particular.

J: What kind of platforms might you teach your students how to create?

D: One project in my class is to make a content management system. That's a very open-ended project, but the problems are straightforward: you've got to figure out what the content should be, and that's a decision up to each individual designer in this case. But to create a healthy ecosystem around that content, you've got to figure out how are you asking users to enter and structure their content, how are you transforming that content through algorithm, and finally how you're presenting that content.

J: It sounds to me like a lot of what they're doing is they're engaged in software design?

D: To me there's a fuzzy spectrum between graphic design, which might ask: "what does the interface look like?", and software design, which asks: "what's the algorithm beneath the surface that's organizing the data."

J: So we begin the conversation with the transformation of graphic design from an earlier model (things like advertisements or posters). You're saying, "What do I do as a graphic designer, when I'm asked by a client not to create a single unitary object, but to create a platform which others in the business will use. We want it to be functional for the goals that the client wants, but we also want it have aesthetic consistency and appeal." That's what you're trying to do right now?

D: We can think of it a little more broadly. It should have a feeling that isn't just a visual feeling, but a feeling about the way it works and the cultural messages it's transmitting. And it should evolve over time in a healthy way. When you come back to this platform a year from now, it could be worse or it could be better, and we're engineering something that's going to be better.

J: A lot of that depends on two things: first, the amount of leeway put into the original system. And second, the ability of the system to be generative. You can have a system that has a lot of leeway, but you can't build anything with it, because you haven't included the tools to build something new.

It's the placement of these generative tools in the system that allows you to be surprised

when you come back in a year. Do you think there's a natural analogy between this and game design? An interesting game allows participants to do something the game designer had not imagined.

D: That's often our goal.

J: The problem of platform design is like a miniature problem of governance. When you create a platform for other people to use, they're not going to call you at 3:00am every night. Basically you've left it in their hands. Most of what you're doing is giving them the ability to build out the site to whatever they need, and to prevent them from wrecking it, crashing it, or exploiting other people. In a game context you have what are called "exploits," which is where somebody uses the software functionality to gain an advantage which others consider unfair. But in your context I assume this never happens? Somebody might crash the platform you create, but you never get the idea of people within the client creating problems like that.

D: They certainly might. We can talk about the Yale School of Art's own website as an example. When the school asked my company to redesign it, we knew the school was an incredibly vibrant community, where students unceasingly develop new ideas about what art should be. So the website should be as dynamic as that. It should give prospective and current students a window onto what it's like there. To accomplish that the website should be updated daily, but the school has no staff to do that. So we empowered all the students, staff, and faculty of the school to create and edit all the pages of the website. I'm using the word "empowered" somewhat provocatively here.

J: When you say you "empowered" them, what you did precisely was to give them all accounts, and the accounts gave them the right to perform certain operations on the site.

D: We did that, and we did a little bit more. We also designed a system that would be easy enough for everybody to edit those pages without any technical training. In fact it's sort of fun to use. When you make a page, the system ensures that it's always somehow within our overall design for the website. But the process of editing also feels creative. So there's a back and forth between our authorship as designers of the platform, and individual authorship by people who make pages. That's empowering in one sense, which is that it lets you make something bigger than you knew how to make, because of the engineering of this tool.

J: In the context of a platform like that, what empowerment means is precisely the ability to make things given the rules of the game you set up. In your case, the constraints that you're placing on users are that whatever they produce will more or less be aesthetically consistent with the overall plan you had in mind. It might have certain elements that are continuous through what they produce, it might have constraints on what kinds of colors

or shapes, what kind of content they can upload. Those kinds of things are potential rule sets.

D: In fact those encoded rules are what makes it fun to use this system, because if you had to make every design decision all the time or write your own HTML code to make a page, of course that kind of freedom is overwhelming in a number of ways.

To continue the story, the website has lived for six or seven years now and it still feels new in many ways, which is remarkable. Some people say it's the best website they've ever seen. Yet as more and more people have used the site it has evolved in several ways. One is that there are some trends in the kinds of artworks that people make in the school, that can be aggressive. Students at times have been interested in florescent, collaged images for example, or they're interested in political imagery that might be startling. So the website begins to look like their work.

J: Tell me what kind of things went wrong with the site.

D: The site gets hate mail on days when the design of it has become particularly startling. Those can be legitimate complaints. "This whole website is flashing at me. Someone might have a seizure, and I can't find what I'm looking for." On the other hand not everyone is a good critic. It may be easy to find what you're looking for, you just assume it's not because some graphics have a bad association for you.

J: Does the staff take responsibility for the complaints and how people feel about it? In other words, does the buck stop with them ultimately?

D: Maybe, but I'm not sure they'd say that. The language on the website says the individual authors of each piece of content are responsible for it.

The way we've resolved conflicts up to now has been informal. Do you remember the controversy in the art school a couple years ago when an undergraduate artist claimed to have made work using blood from an abortion? At the time I noticed someone had put a dancing baby animated GIF on the art school website. So I simply told that person and said I thought it was unhelpful to the conversation.

J: What you are putting into the ethos of graphic design is actually the creation of a governance structure. There is a particular set of tasks that you want to achieve. You're creating a space in which people can do things, they're trying to create aesthetic effects, to be amusing, witty, profound, emotionally affecting, whatever their goals are, but you've created a place for them to do that. There are certain rules. Some of the rules are built into the code, that is, they just can't do certain things because the code doesn't let them do it, and certain things are enabled by the code, and they could actually do things more powerfully if the code was changed to allow them to do it. But that's just the

part of the governance that's produced by the software. There is also a set of communal norms that develop as the space proceeds through time. These communal norms are not necessarily predictable from the original design.

And to some extent, it's the participants who govern themselves through informal communication with each other, their give-and-take with each other. They are relying on the fact that most of the people who work there understand themselves to be part of a community, and won't demand more than they should. It is possible that someone might behave badly, or they might behave in a way that is insensitive to others. At that point, there will be other varying social norms that will be brought to bear on that person in order to get them to behave. So that is another kind of governance, the governance of social norms.

So we have the governance of the code, which is largely the designer's doing, and which both constrains and enables, on the one hand. And then we have the governance of the community that is using that code, based on social norms and the idea that people want to be well thought of. And finally, the third story is one of charismatic authority, a professional authority, in which you have a student who is not behaving. He doesn't seem to be able to pick up the cues about how to behave in this particular kind of conversation about abortion, for example, so you actually show up, and say, "I am your teacher," or "I am a person you respect," and I'm saying "Don't do this." You are relying on these forms of authority in order to get the student to back down. Which, I take it in this case, he did.

That that is another form of governance, it is the governance of a structure outside of the graphic design teacher-student relationship, which is basically parasitic on your position in the university and the student's position in the university. And possibly based upon the student's sense of respect for you as an artist, or someone who knows more than they do.

You can think about a graphic design project like the one you are describing through the lens of art or creativity, but we have just shown how the project can also be viewed through the lens of governance. What looks like a graphic design project is actually a governance structure, which has multiple overlapping forms of power and authority.

D: Of course we could also look at it the opposite way. In my classes I'm trying to convince students that what looks like a governance structure is actually a graphic design project.

J: Exactly! That is exactly right. We can look at it in two equal ways. It is a duck-or-rabbit situation. Sometimes it looks like a duck, sometimes it looks like a rabbit.

Is there anyone who has thought that what was done on the site was illegal?

D: Yes, I'm sure that at times copyright law has been broken during the use of this website.

J: There is a further background set of power relations: the state. For example, there are questions about who is responsible if copyrighted material is uploaded onto the site. Is it the student who uploaded the material, or the school, or the university? Are the individuals who work in the art department responsible? Or is the original designer responsible, for having created a system that made it so easy for people to violate copyright?

You are always doing all of this stuff—these various intersecting governance structures we call the graphic design project—against the background of the law. So the graphic design project is not only itself a mini-world of governance, with multiple overlapping forms of authority, it's also embedded in a larger system of governance, which is the state.

D: We could go a little bit further. Graphic design interacts with the law not only through code functionality, social norms, and charismatic authority, but also through the formal qualities of the interface design. Does the visual design encourage you to make collages of other people's work, or does the visual design frame images in thumbnails? You actually hinted at this perspective early on.

J: Depending on how you design the tool kit and how you display the result of operations within the system, people will be tempted or driven to do things one way rather than another, because of the aesthetic consequences of what they do.

D: That's right. So that suggests another question about trying to predict and influence consequences. You observed that these systems are so complicated and chaotic that we can't predict what's going to happen a few years down the road. But we can influence it a little bit, or we can influence some qualities of it.

Taking another step back, I wonder whether there is an analogy to the interpretive function of law. When does the role for lawyers or law students extend to trying to shift the cultural landscape, creating a system of governance better than the one that preceded it? Does this only happen in legislatures, which is where we expect it to happen?

J: I think the idea of interpretation is not appropriately posed here yet. Let's talk about the different forms of power and authority that were implicit in your platform. Remember we had the code, we had the community norms, we had the institutional and charismatic authority, and underpinning it was the the power of the state, the regulations of the state as to who would be responsible for what was done on the platform. It's a very complex

picture. It's going to turn out that the issue of interpretation will look different with respect to each of these.

Suppose we think about the question of the code, the basic design. Code-based systems of power are rigid. At the code level, the kind of interpretation we think of with respect to law doesn't apply. It either works or it catastrophically fails.

On the other hand, when we move to the second form of authority, the authority of community norms, we are back in interpretation space. As people act within the space, and they add new art and do things to other people's art, norms emerge. The software may not limit the kind of operations they can do, but as a matter of norms, they might consider it impolite to do something to somebody else's work, for example to change too much of it. And unlike the code, people can have arguments over whether the norms have been breached or not.

D: If what you can do is make thumbnails, what happens when someone creates a mosaic of many thumbnails to create a larger image. You can exploit the possibilities afforded by the code to create outcomes that are—it's not a catastrophic failure, I would say, and may or may not be a failure.

J: That is a creative—

D: It may be a failure, though. You can imagine cases where it is debatable as to whether that kind of creative abuse of the system is healthy or unhealthy.

J: So the world of interpretation arises at the moment when you have norms that can be argued about. The argument is not about whether the code permits it, it's about whether you and I should do it.

D: True. But when something does go wrong, when people agree that the behavior of the system is unhealthy, what can happen is someone calls me to change the code. So there are linkages among these layers of governance.

J: And at that point, you they are asking you to make a normative judgment about whether or not the code is being appropriately used. And if you agree that it is being inappropriately used, what do you do?

D: We alter the design, or we alter the code. Either could be appropriate to adjust the balances within this ecosystem so it works better moving forward.

J: So what you've done is you've readjusted the code substrate—you've readjusted the part of the governance scheme that is in code—

D: And in code, could also be what it looks like, right...?

J: Right. The appearance is emergent from the code.

D: That's right.

J: And then you hope it will have a beneficial effect on the norms.

Similarly, we talked about the authority of the institution in which the space is located. The university, for example. Or the student-teacher relationship. This is a social configuration and also subject to interpretation. With the student who posted the dancing baby, what first looks like "It would be better if you didn't do this," turns into a discussion about how the student is supposed to behave toward you and is the student in fact behaving inappropriately.

D: True. There is a rule against censorship in the art school which predates the website. I didn't delete it for him, or tell him he had to delete it. I told him it would be better for the school if it weren't there. A distinction which is certainly subject to interpretation.

J: You are saying, I'm not in violation of the preexisting norms about censorship of students. You can imagine the student pushing saying, if this is not an attempt to censor me, then what is?

D: Right.

J: That is the sphere in which interpretation occurs. Finally, when we think about the substrate of state power, and the laws about who would be responsible and whether the uploading particular images would violate copyright and all of that, that's also in the realm of interpretation, because it is not like code in the on-off sense, it's like norms. The laws of the state are like the norms of the community, or the professional norms of the institution. They just happen to be in a different location.

D: To finish the story of what happened at the school of art: some years after the launch, we noticed that the website was down and displaying its test pattern error page. The site had been featured on Reddit and the traffic had crashed it. And the reason for that was because it had been nominated as the worst website of 2010, and had won.

J: Why was it nominated as the worst website of 2010?

D: Mainly because it was so graphically aggressive, as far as I can tell.

J: So everything was attributed—the site, its design, the whole thing—to what happened to be on the site at that particular time.

D: That's true, and it's an interesting mistake, but the site is also like that often. So it's not an unfair opinion, either.

J: We have been talking about norms and the locations of the norms, and how they are embedded in other systems of norms. The story about Reddit is interesting because it's a story in which this site, for the community of students within Yale, was also embedded in the public sphere outside of Yale. You could have made it only available to the Yale community.

D: Right. We had said we wanted the site to be well-liked by two groups: people in the School of Art community, and people who want to join that community, that is, prospective students.

J: By inserting it into the public sphere, you made a conscious decision. The site was no longer understood as an exercise, a part of students' education. It was thrown into a conversation about appropriate norms in the public sphere in general. Not about appropriate behavior within the confines of the university.

D: Right. And people may even debate the success of the site as a system of governance. My favorite comment from the Reddit thread was: "Hey, this is a wiki, you can't blame the designers, it's changing all the time." And its reply: "Well, now we know that's not a good idea."

J: They said, in effect, somebody screwed up the code. "They didn't design it the right way in the first place."

D: It was a great conversation.

J: So here is another sphere of interpretation. Because it's contestable. People could dispute what the norms are, their application, and their values.

What's the relationship between aesthetics and governance in the design of a site like Twitter or Google?

D: There is a relationship between form and function, which is famously slippery. The formal choice to limit the size of the input box on Twitter becomes a functional choice that users should adapt to that limitation. Ways of speaking within that limitation then become extremely creative.

J: Do the decorative elements of the design play any role in authority, power, governance?

D: I was wondering whether that was more of what you were getting at, when you used the word "aesthetic."

J: What we are doing is, we are breaking this out into little bits. We talked about form and function, and we now talk about decorative elements and their role.

D: For example, Google's famously minimal visual design, does that result in governing norms that are different than a site that is more visually rich?

J: Is that just a matter of "Oh I like it," or "I didn't like it"? To what extent when you think about graphic design are you thinking about the political effects of design choices?

D: On the one hand, Google's absolute simplicity makes it easier to scan the search results to find what you're looking for from a seemingly unedited list. But at the same time, the feeling that the design is minimal, also telegraphs the idea of that function. So people get the impression that Google values their judgment. The aesthetic design gives the impression of democracy.

J: On one hand we have what we might call the power relations of the design, that comes from its function, and on the other hand, we have the decorative features which either can reinforce or conflict with these functional aspects.

D: Form can also mask a hidden function. That seemingly transparent list of search results has been pre-processed for you in ways that can be pretty opaque.

J: We can think about law in terms of its structure: its penalties and pains, its incentive forms, its subsidizations and refusals to subsidize, the use of channeling functions, framing, effects. All of those features makes law a governance system, like graphic design. Law also has another realm, the realm of social meaning. That is what we are analogizing to the decorative aspect, the blank screen in Google. It has a semiotic feature: What do things mean? What do they seem to be like? What do they symbolize? If you think about law in those terms, the number of associations is just overflowing: what courtrooms look like, what kind of clothing lawyers wear, how police wear their uniforms, how you design a prison, how legislatures meet in these huge buildings.

And it would have the same kind of relationship that you just explained to me in the relationship between the functional aspect of the Google search page, and the decorative aspect of the Google search page. These things can either reinforce each other, they can be in conflict with each other, one of them can disguise or mask the other. The "I'm feeling lucky" button sends a message of personal empowerment, which mystifies or disguises its function.

D: It's a common role for advertising and design: to make us comfortable with

something we were previously uncomfortable with.

J: It makes us acquiesce, it makes us accept, in the same way as the relationship between the social meanings produced by legal institutions, and the functional aspects of the power relations in legal relationships. It might even be inappropriate to divide them. In practice they might just be merged in ways that are very difficult to sort out.

Law has its effects through creation of social meaning. And its social meaning then creates confidence, acquiescence, docility, fear, expectation, patriotism, it has all these effects on populations. Lawyers who like to be tough guys like to say it's all about incentives in the simple sense of whether or not it would cost me or it would cost me less. But it's also about what things mean, how you apprehend what is going on before you. So when you apprehend Google, the page, what you see before you is a clean page that appears to put you in the driver's seat. It creates the image of your empowerment. It's not just a question of incentives. It's a question of what the Google page means to you.

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By Jill Lepore

Malaysia Airlines Flight 17 took off from Amsterdam at 10:31 A.M. G.M.T. on July 17, 2014, for a twelve-hour flight to Kuala Lumpur. Not much more than three hours later, the plane, a Boeing 777, crashed in a field outside Donetsk, Ukraine. All two hundred and ninety-eight people on board were killed. The plane's last radio contact was at 1:20 P.M. G.M.T. At 2:50 P.M. G.M.T., Igor Girkin, a Ukrainian separatist leader also known as Strelkov, or someone acting on his behalf, posted a message on VKontakte, a Russian social-media site: "We just downed a plane, an AN-26." (An Antonov 26 is a Soviet-built military cargo plane.) The post includes links to video of the wreckage of a plane; it appears to be a Boeing 777.

Two weeks before the crash, Anatol Shmelev, the curator of the Russia and Eurasia collection at the Hoover Institution, at Stanford, had submitted to the Internet Archive, a nonprofit library in California, a list of Ukrainian and Russian Web sites and blogs that ought to be recorded as part of the archive's Ukraine Conflict collection. Shmelev is one of about a thousand librarians and archivists around the world who identify possible acquisitions for the Internet Archive's subject collections, which are stored in its Wayback Machine, in San Francisco. Strelkov's VKontakte page was on Shmelev's list. "Strelkov is the field commander in Slaviansk and one of the most important figures in the conflict," Shmelev had written in an e-mail to the Internet Archive on July 1st, and his page "deserves to be recorded twice a day."

On July 17th, at 3:22 P.M. G.M.T., the Wayback Machine saved a screenshot of Strelkov's VKontakte post about downing a plane. Two hours and twenty-two minutes later, Arthur Bright, the Europe editor of the *Christian Science Monitor*, tweeted a picture of the screenshot, along with the message "Grab of Donetsk militant Strelkov's claim of downing what appears to have been MH17." By then, Strelkov's VKontakte

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page had already been edited: the claim about shooting down a plane was deleted. The only real evidence of the original claim lies in the Wayback Machine.

The average life of a Web page is about a hundred days. Strelkov's "We just downed a plane" post lasted barely two hours. It might seem, and it often feels, as though stuff on the Web lasts forever, for better and frequently for worse: the embarrassing photograph, the regretted blog (more usually regrettable not in the way the slaughter of civilians is regrettable but in the way that bad hair is regrettable). No one believes any longer, if anyone ever did, that "if it's on the Web it must be true," but a lot of people do believe that if it's on the Web it will stay on the Web. Chances are, though, that it actually won't. In 2006, David Cameron gave a speech in which he said that Google was democratizing the world, because "making more information available to more people" was providing "the power for anyone to hold to account those who in the past might have had a monopoly of power." Seven years later, Britain's Conservative Party scrubbed from its Web site ten years' worth of Tory speeches, including that one. Last year, BuzzFeed deleted more than four thousand of its staff writers' early posts, apparently because, as time passed, they looked stupider and stupider. Social media, public records, junk: in the end, everything goes.

Web pages don't have to be deliberately deleted to disappear. Sites hosted by corporations tend to die with their hosts. When MySpace, GeoCities, and Friendster were reconfigured or sold, millions of accounts vanished. (Some of those companies may have notified users, but Jason Scott, who started an outfit called Archive Team—its motto is "We are going to rescue your shit"—says that such notification is usually purely notional: "They were sending e-mail to dead e-mail addresses, saying, 'Hello, Arthur Dent, your house is going to be crushed.'") Facebook has been around for only a decade; it won't be around forever. Twitter is a rare case: it has arranged to archive all of its tweets at the Library of Congress. In 2010, after the announcement, Andy Borowitz tweeted, "Library of Congress to acquire entire Twitter archive—will rename itself Museum of Crap." Not long after that, Borowitz abandoned that Twitter account. You might, one day, be able to find his old tweets at the Library of Congress, but not anytime soon: the Twitter Archive is not yet open for research. Meanwhile, on the Web, if you click on a link to Borowitz's tweet about the Museum of Crap, you get this message: "Sorry, that page doesn't exist!"

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The Web dwells in a never-ending present. It is—elementally—ethereal, ephemeral, unstable, and unreliable. Sometimes when you try to visit a Web page what you see is an error message: “Page Not Found.” This is known as “link rot,” and it’s a drag, but it’s better than the alternative. More often, you see an updated Web page; most likely the original has been overwritten. (To overwrite, in computing, means to destroy old data by storing new data in their place; overwriting is an artifact of an era when computer storage was very expensive.) Or maybe the page has been moved and something else is where it used to be. This is known as “content drift,” and it’s more pernicious than an error message, because it’s impossible to tell that what you’re seeing isn’t what you went to look for: the overwriting, erasure, or moving of the original is invisible. For the law and for the courts, link rot and content drift, which are collectively known as “reference rot,” have been disastrous. In providing evidence, legal scholars, lawyers, and judges often cite Web pages in their footnotes; they expect that evidence to remain where they found it as their proof, the way that evidence on paper—in court records and books and law journals—remains where they found it, in libraries and courthouses. But a 2013 survey of law- and policy-related publications found that, at the end of six years, nearly fifty per cent of the URLs cited in those publications no longer worked. According to a 2014 study conducted at Harvard Law School, “more than 70% of the URLs within the Harvard Law Review and other journals, and 50% of the URLs within United States Supreme Court opinions, do not link to the originally cited information.” The overwriting, drifting, and rotting of the Web is no less catastrophic for engineers, scientists, and doctors. Last month, a team of digital library researchers based at Los Alamos National Laboratory reported the results of an exacting study of three and a half million scholarly articles published in science, technology, and medical journals between 1997 and 2012: one in five links provided in the notes suffers from reference rot. It’s like trying to stand on quicksand.

The footnote, a landmark in the history of civilization, took centuries to invent and to spread. It has taken mere years nearly to destroy. A footnote used to say, “Here is how I know this and where I found it.” A footnote that’s a link says, “Here is what I used to know and where I once found it, but chances are it’s not there anymore.” It doesn’t matter whether footnotes are your stock-in-trade. Everybody’s in a pinch. Citing a Web page as the source for something you know—using a URL as evidence—is ubiquitous. Many people find themselves doing it three or four times before breakfast and five times more before lunch. What happens when your evidence vanishes by dinnertime?

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The day after Strelkov's "We just downed a plane" post was deposited into the Wayback Machine, Samantha Power, the U.S. Ambassador to the United Nations, told the U.N. Security Council, in New York, that Ukrainian separatist leaders had "boasted on social media about shooting down a plane, but later deleted these messages." In San Francisco, the people who run the Wayback Machine posted on the Internet Archive's Facebook page, "Here's why we exist."

The address of the Internet Archive is archive.org, but another way to visit is to take a plane to San Francisco and ride in a cab to the Presidio, past cypresses that look as though someone had drawn them there with a smudgy crayon. At 300 Funston Avenue, climb a set of stone steps and knock on the brass door of a Greek Revival temple. You can't miss it: it's painted wedding-cake white and it's got, out front, eight Corinthian columns and six marble urns.

"We bought it because it matched our logo," Brewster Kahle told me when I met him there, and he wasn't kidding. Kahle is the founder of the Internet Archive and the inventor of the Wayback Machine. The logo of the Internet Archive is a white, pedimented Greek temple. When Kahle started the Internet Archive, in 1996, in his attic, he gave everyone working with him a book called "The Vanished Library," about the burning of the Library of Alexandria. "The idea is to build the Library of Alexandria Two," he told me. (The Hellenism goes further: there's a partial backup of the Internet Archive in Alexandria, Egypt.) Kahle's plan is to one-up the Greeks. The motto of the Internet Archive is "Universal Access to All Knowledge." The Library of Alexandria was open only to the learned; the Internet Archive is open to everyone. In 2009, when the Fourth Church of Christ, Scientist, decided to sell its building, Kahle went to Funston Avenue to see it, and said, "That's our logo!" He loves that the church's cornerstone was laid in 1923: everything published in the United States before that date lies in the public domain. A temple built in copyright's year zero seemed fated. Kahle hops, just slightly, in his shoes when he gets excited. He says, showing me the church, "It's *Greek*."

Kahle is long-armed and pink-cheeked and public-spirited; his hair is gray and frizzled. He wears round wire-rimmed eyeglasses, linen pants, and patterned button-down shirts. He looks like Mr. Micawber, if Mr. Micawber had left Dickens's London in a time machine and landed in the Pacific, circa 1955, disguised as an American tourist.

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Instead, Kahle was born in New Jersey in 1960. When he was a kid, he watched “The Rocky and Bullwinkle Show”; it has a segment called “Peabody’s Improbable History,” which is where the Wayback Machine got its name. Mr. Peabody, a beagle who is also a Harvard graduate and a Nobel laureate, builds a WABAC machine—it’s meant to sound like a UNIVAC, one of the first commercial computers—and he uses it to take a boy named Sherman on adventures in time. “We just set it, turn it on, open the door, and there we are—or *were*, really,” Peabody says.

When Kahle was growing up, some of the very same people who were building what would one day become the Internet were thinking about libraries. In 1961, in Cambridge, J. C. R. Licklider, a scientist at the technology firm Bolt, Beranek and Newman, began a two-year study on the future of the library, funded by the Ford Foundation and aided by a team of researchers that included Marvin Minsky, at M.I.T. As Licklider saw it, books were good at displaying information but bad at storing, organizing, and retrieving it. “We should be prepared to reject the schema of the physical book itself,” he argued, and to reject “the printed page as a long-term storage device.” The goal of the project was to imagine what libraries would be like in the year 2000. Licklider envisioned a library in which computers would replace books and form a “network in which every element of the fund of knowledge is connected to every other element.”

In 1963, Licklider became a director at the Department of Defense’s Advanced Research Projects Agency (now called DARPA). During his first year, he wrote a seven-page memo in which he addressed his colleagues as “Members and Affiliates of the Intergalactic Computer Network,” and proposed the networking of ARPA machines. This sparked the imagination of an electrical engineer named Lawrence Roberts, who later went to ARPA from M.I.T.’s Lincoln Laboratory. (Licklider had helped found both B.B.N. and Lincoln.) Licklider’s two-hundred-page Ford Foundation report, “Libraries of the Future,” was published in 1965. By then, the network he imagined was already being built, and the word “hyper-text” was being used. By 1969, relying on a data-transmission technology called “packet-switching” which had been developed by a Welsh scientist named Donald Davies, ARPA had built a computer network called ARPANET. By the mid-nineteen-seventies, researchers across the country had developed a network of networks: an internetwork, or, later, an “internet.”

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Kahle enrolled at M.I.T. in 1978. He studied computer science and engineering with Minsky. After graduating, in 1982, he worked for and started companies that were later sold for a great deal of money. In the late eighties, while working at Thinking Machines, he developed Wide Area Information Servers, or WAIS, a protocol for searching, navigating, and publishing on the Internet. One feature of WAIS was a time axis; it provided for archiving through version control. (Wikipedia has version control; from any page, you can click on a tab that says “View History” to see all earlier versions of that page.) WAIS came before the Web, and was then overtaken by it. In 1989, at CERN, the European Particle Physics Laboratory, in Geneva, Tim Berners-Lee, an English computer scientist, proposed a hypertext transfer protocol (HTTP) to link pages on what he called the World Wide Web. Berners-Lee toyed with the idea of a time axis for his protocol, too. One reason it was never developed was the preference for the most up-to-date information: a bias against obsolescence. But the chief reason was the premium placed on ease of use. “We were so young then, and the Web was so young,” Berners-Lee told me. “I was trying to get it to go. Preservation was not a priority. But we’re getting older now.” Other scientists involved in building the infrastructure of the Internet are getting older and more concerned, too. Vint Cerf, who worked on ARPANET in the seventies, and now holds the title of Chief Internet Evangelist at Google, has started talking about what he sees as a need for “digital vellum”: long-term storage. “I worry that the twenty-first century will become an informational black hole,” Cerf e-mailed me. But Kahle has been worried about this problem all along.

“I’m completely in praise of what Tim Berners-Lee did,” Kahle told me, “but he kept it very, very simple.” The first Web page in the United States was created at SLAC, Stanford’s linear-accelerator center, at the end of 1991. Berners-Lee’s protocol—which is not only usable but also elegant—spread fast, initially across universities and then into the public. “Emphasized text like this is a hypertext link,” a 1994 version of SLAC’s Web page explained. In 1991, a ban on commercial traffic on the Internet was lifted. Then came Web browsers and e-commerce: both Netscape and Amazon were founded in 1994. The Internet as most people now know it—Web-based and commercial—began in the mid-nineties. Just as soon as it began, it started disappearing.

And the Internet Archive began collecting it. The Wayback Machine is a Web archive, a collection of old Web pages; it is, in fact, *the* Web archive. There are

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others, but the Wayback Machine is so much bigger than all of them that it's very nearly true that if it's not in the Wayback Machine it doesn't exist. The Wayback Machine is a robot. It crawls across the Internet, in the manner of Eric Carle's very hungry caterpillar, attempting to make a copy of every Web page it can find every two months, though that rate varies. (It first crawled over this magazine's home page, newyorker.com, in November, 1998, and since then has crawled the site nearly seven thousand times, lately at a rate of about six times a day.) The Internet Archive is also stocked with Web pages that are chosen by librarians, specialists like Anatol Shmelev, collecting in subject areas, through a service called Archive It, at archive-it.org, which also allows individuals and institutions to build their own archives. (A copy of everything they save goes into the Wayback Machine, too.) And anyone who wants to can preserve a Web page, at any time, by going to archive.org/web, typing in a URL, and clicking "Save Page Now." (That's how most of the twelve screenshots of Strelkov's VKontakte page entered the Wayback Machine on the day the Malaysia Airlines flight was downed: seven captures that day were made by a robot; the rest were made by humans.)

I was on a panel with Kahle a few years ago, discussing the relationship between material and digital archives. When I met him, I was struck by a story he told about how he once put the entire World Wide Web into a shipping container. He just wanted to see if it would fit. How big is the Web? It turns out, he said, that it's twenty feet by eight feet by eight feet, or, at least, it was on the day he measured it. How much did it weigh? Twenty-six thousand pounds. He thought that *meant* something. He thought people needed to *know* that.

Kahle put the Web into a storage container, but most people measure digital data in bytes. This essay is about two hundred thousand bytes. A book is about a megabyte. A megabyte is a million bytes. A gigabyte is a billion bytes. A terabyte is a million million bytes. A petabyte is a million gigabytes. In the lobby of the Internet Archive, you can get a free bumper sticker that says "10,000,000,000,000 Bytes Archived." Ten petabytes. It's obsolete. That figure is from 2012. Since then, it's doubled.

The Wayback Machine has archived more than four hundred and thirty billion Web pages. The Web is global, but, aside from the Internet Archive, a handful of fledgling commercial enterprises, and a growing number of university Web archives, most Web

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archives are run by national libraries. They collect chiefly what's in their own domains (the Web Archive of the National Library of Sweden, for instance, includes every Web page that ends in ".se"). The Library of Congress has archived nine billion pages, the British Library six billion. Those collections, like the collections of most national libraries, are in one way or another dependent on the Wayback Machine; the majority also use Heritrix, the Internet Archive's open-source code. The British Library and the Bibliothèque Nationale de France backfilled the early years of their collections by using the Internet Archive's crawls of the .uk and .fr domains. The Library of Congress doesn't actually do its own Web crawling; it contracts with the Internet Archive to do it instead.

The church at 300 Funston Avenue is twenty thousand square feet. The Internet Archive, the building, is open to the public most afternoons. It is, after all, a library. In addition to housing the Wayback Machine, the Internet Archive is a digital library, a vast collection of digitized books, films, television and radio programs, music, and other stuff. Because of copyright, not everything the Internet Archive has digitized is online. In the lobby of the church, there's a scanning station and a listening room: two armchairs, a coffee table, a pair of bookshelves, two iPads, and two sets of headphones. "You can listen to anything here," Kahle says. "We can't put all our music on the Internet, but we can put everything here."

Copyright is the elephant in the archive. One reason the Library of Congress has a very small Web-page collection, compared with the Internet Archive, is that the Library of Congress generally does not collect a Web page without asking, or, at least, giving notice. "The Internet Archive hooovers," Abbie Grotke, who runs the Library of Congress's Web-archive team, says. "We can't Hoover, because we have to notify site owners and get permissions." (There are some exceptions.) The Library of Congress has something like an opt-in policy; the Internet Archive has an opt-out policy. The Wayback Machine collects every Web page it can find, unless that page is blocked; blocking a Web crawler requires adding only a simple text file, "robots.txt," to the root of a Web site. The Wayback Machine will honor that file and not crawl that site, and it will also, when it comes across a robots.txt, remove all past versions of that site. When the Conservative Party in Britain deleted ten years' worth of speeches from its Web site, it also added a robots.txt, which meant that, the next time the Wayback Machine tried to crawl the site, all its captures of those speeches went away, too. (Some have since

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been restored.) In a story that ran in the *Guardian*, a Labour Party M.P. said, “It will take more than David Cameron pressing delete to make people forget about his broken promises.” And it would take more than a robots.txt to entirely destroy those speeches: they have also been collected in the U.K. Web Archive, at the British Library. The U.K. has what’s known as a legal-deposit law; it requires copies of everything published in Britain to be deposited in the British Library. In 2013, that law was revised to include everything published on the U.K. Web. “People put their private lives up there, and we actually don’t want that stuff,” Andy Jackson, the technical head of the U.K. Web Archive, told me. “We don’t want anything that you wouldn’t consider a publication.” It is hard to say quite where the line lies. But Britain’s legal-deposit laws mean that the British Library doesn’t have to honor a request to stop collecting.

Legal-deposit laws have been the standard in Western Europe for centuries. They provide national libraries with a form of legal protection unavailable to the Library of Congress, which is not strictly a national library; also, U.S. legal-deposit laws have exempted online-only works. “We are citadels,” Gildas Illien, the former Web archivist at the Bibliothèque Nationale de France, told me. The Internet Archive is an invaluable public institution, but it’s not a national library, either, and, because the law of copyright has not kept up with technological change, Kahle has been collecting Web sites and making them freely available to the public without the full and explicit protection of the law. “It’s extremely audacious,” Illien says. “In Europe, no organization, or very few, would take that risk.” There’s another feature to legal-deposit laws like those in France, a compromise between advocates of archiving and advocates of privacy. Archivists at the BnF can capture whatever Web pages they want, but those collections can be used only in the physical building itself. (For the same reason, you can’t check a book out of the Bibliothèque Nationale de France; you have to read it there.) One result is that the BnF’s Web archive is used by a handful of researchers, a few dozen a month; the Wayback Machine is used by hundreds of thousands of people a day.

In 2002, Kahle proposed an initiative in which the Internet Archive, in collaboration with national libraries, would become the head of a worldwide consortium of Web archives. (The Internet Archive collects from around the world, and is available in most of the world. Currently, the biggest exception is China—“I guess because we have materials on the archive that the Chinese government would rather not have its citizens see,” Kahle says.) This plan didn’t work out, but from that failure came the

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International Internet Preservation Consortium, founded in 2003 and chartered at the BnF. It started with a dozen member institutions; there are now forty-nine.

Something else came out of that consortium. I talked to Illien two days after the massacre in Paris at the offices of *Charlie Hebdo*. “We are overwhelmed, and scared, and even taking the subway is terrifying, and we are scared for our children,” Illien said. “The library is a target.” When we spoke, the suspects were still at large; hostages had been taken. Illien and his colleagues had started a Web archive about the massacre and the world’s response. “Right now the media is full of it, but we know that most of that won’t last,” he said. “We wrote to our colleagues around the world and asked them to send us feeds to these URLs, to Web sites that were happening, right now, in Paris, so that we could collect them and historians will one day be able to see.” He was very quiet. He said, “When something like that happens, you wonder what you can do from where you sit. Our job is memory.”

The plan to found a global Internet archive proved unworkable, partly because national laws relating to legal deposit, copyright, and privacy are impossible to reconcile, but also because Europeans tend to be suspicious of American organizations based in Silicon Valley ingesting their cultural inheritance. Illien told me that, when faced with Kahle’s proposal, “national libraries decided they could not rely on a third party,” even a nonprofit, “for such a fundamental heritage and preservation mission.” In this same spirit, and in response to Google Books, European libraries and museums collaborated to launch Europeana, a digital library, in 2008. The Googleplex, Google’s headquarters, is thirty-eight miles away from the Internet Archive, but the two could hardly be more different. In 2009, after the Authors Guild and the Association of American Publishers sued Google Books for copyright infringement, Kahle opposed the proposed settlement, charging Google with effectively attempting to privatize the public-library system. In 2010, he was on the founding steering committee of the Digital Public Library of America, which is something of an American version of Europeana; its mission is to make what’s in libraries, archives, and museums “freely available to the world . . . in the face of increasingly restrictive digital options.”

Kahle is a digital utopian attempting to stave off a digital dystopia. He views the Web as a giant library, and doesn’t think it ought to belong to a corporation, or that anyone

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should have to go through a portal owned by a corporation in order to read it. “We are building a library that is us,” he says, “and it is ours.”

When the Internet Archive bought the church, Kahle recalls, “we had the idea that we’d convert it into a library, but what does a library look like anymore? So we’ve been settling in, and figuring that out.”

From the lobby, we headed up a flight of yellow-carpeted stairs to the chapel, an enormous dome-ceilinged room filled with rows of oak pews. There are arched stained-glass windows, and the dome is a stained-glass window, too, open to the sky, like an eye of God. The chapel seats seven hundred people. The floor is sloped. “At first, we thought we’d flatten the floor and pull up the pews,” Kahle said, as he gestured around the room. “But we couldn’t. They’re just too beautiful.”

On the wall on either side of the altar, wooden slates display what, when this was a church, had been the listing of the day’s hymn numbers. The archivists of the Internet have changed those numbers. One hymn number was 314. “Do you know what that is?” Kahle asked. It was a test, and something of a trick question, like when someone asks you what’s your favorite B track on the *White Album*. “Pi,” I said, dutifully, or its first three digits, anyway. Another number was 42. Kahle gave me an inquiring look. I rolled my eyes. Seriously? But it is serious, in a way. It’s hard not to worry that the Wayback Machine will end up like the computer in Douglas Adams’s *“Hitchhiker’s Guide to the Galaxy,”* which is asked what is the meaning of “life, the universe, and everything,” and, after thinking for millions of years, says, “Forty-two.” If the Internet can be archived, will it ever have anything to tell us? Honestly, isn’t most of the Web trash? And, if everything’s saved, won’t there be too much of it for anyone to make sense of any of it? Won’t it be useless?

The Wayback Machine is humongous, and getting humongouser. You can’t search it the way you can search the Web, because it’s too big and what’s in there isn’t sorted, or indexed, or catalogued in any of the many ways in which a paper archive is organized; it’s not ordered in any way at all, except by URL and by date. To use it, all you can do is type in a URL, and choose the date for it that you’d like to look at. It’s more like a phone book than like an archive. Also, it’s riddled with errors. One kind is created when the dead Web grabs content from the live Web, sometimes because Web archives often crawl different parts of the same page at different times: text in one year, photographs

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in another. In October, 2012, if you asked the Wayback Machine to show you what cnn.com looked like on September 3, 2008, it would have shown you a page featuring stories about the 2008 McCain-Obama Presidential race, but the advertisement alongside it would have been for the 2012 Romney-Obama debate. Another problem is that there is no equivalent to what, in a physical archive, is a perfect provenance. Last July, when the computer scientist Michael Nelson tweeted the archived screenshots of Strelkov's page, a man in St. Petersburg tweeted back, "Yep. Perfect tool to produce 'evidence' of any kind." Kahle is careful on this point. When asked to authenticate a screenshot, he says, "We can say, 'This is what we know. This is what our records say. This is how we received this information, from which apparent Web site, at this IP address.' But to actually say that this happened in the past is something that we can't say, in an ontological way." Nevertheless, screenshots from Web archives have held up in court, repeatedly. And, as Kahle points out, "They turn out to be much more trustworthy than most of what people try to base court decisions on."

You can do something more like keyword searching in smaller subject collections, but nothing like Google searching (there is no relevance ranking, for instance), because the tools for doing anything meaningful with Web archives are years behind the tools for creating those archives. Doing research in a paper archive is to doing research in a Web archive as going to a fish market is to being thrown in the middle of an ocean; the only thing they have in common is that both involve fish.

The Web archivists at the British Library had the brilliant idea of bringing in a team of historians to see what they could do with the U.K. Web Archive; it wasn't all that much, but it was helpful to see what they *tried* to do, and why it didn't work. Gareth Millward, a young scholar interested in the history of disability, wanted to trace the history of the Royal National Institute for the Blind. It turned out that the institute had endorsed a talking watch, and its name appeared in every advertisement for the watch. "This one advert appears thousands of times in the database," Millward told me. It cluttered and bogged down nearly everything he attempted. Last year, the Internet Archive made an archive of its .gov domain, tidied up and compressed the data, and made it available to a group of scholars, who tried very hard to make something of the material. It was so difficult to recruit scholars to use the data that the project was mostly a wash. Kahle says, "I give it a B." Stanford's Web archivist, Nicholas Taylor, thinks it's a chicken-and-

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egg problem. “We don’t know what tools to build, because no research has been done, but the research hasn’t been done because we haven’t built any tools.”

The footnote problem, though, stands a good chance of being fixed. Last year, a tool called Perma.cc was launched. It was developed by the Harvard Library Innovation Lab, and its founding supporters included more than sixty law-school libraries, along with the Harvard Berkman Center for Internet and Society, the Internet Archive, the Legal Information Preservation Alliance, and the Digital Public Library of America. Perma.cc promises “to create citation links that will never break.” It works something like the Wayback Machine’s “Save Page Now.” If you’re writing a scholarly paper and want to use a link in your footnotes, you can create an archived version of the page you’re linking to, a “permalink,” and anyone later reading your footnotes will, when clicking on that link, be brought to the permanently archived version. Perma.cc has already been adopted by law reviews and state courts; it’s only a matter of time before it’s universally adopted as the standard in legal, scientific, and scholarly citation.

Perma.cc is a patch, an excellent patch. Herbert Van de Sompel, a Belgian computer scientist who works at the Los Alamos National Laboratory, is trying to reweave the fabric of the Web. It’s not possible to go back in time and rewrite the HTTP protocol, but Van de Sompel’s work involves adding to it. He and Michael Nelson are part of the team behind Memento, a protocol that you can use on Google Chrome as a Web extension, so that you can navigate from site to site, and from time to time. He told me, “Memento allows you to say, ‘I don’t want to see this link where it points me to today; I want to see it around the time that this page was written, for example.’” It searches not only the Wayback Machine but also every major public Web archive in the world, to find the page closest in time to the time you’d like to travel to. (“A world with one archive is a really bad idea,” Van de Sompel points out. “You need redundancy.”) This month, the Memento group is launching a Web portal called Time Travel. Eventually, if Memento and projects like it work, the Web will have a time dimension, a way to get from now to then, effortlessly, a fourth dimension. And then the past will be inescapable, which is as terrifying as it is interesting.

At the back of the chapel, up a short flight of stairs, there are two niches, arched alcoves the same shape and size as the stained-glass windows. Three towers of computers stand within each niche, and ten computers are stacked in each tower: black,

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rectangular, and humming. There are towers like this all over the building; these are only six of them. Still, this is *it*.

Kahle stands on his tiptoes, sinks back into his sneakers, and then bounds up the stairs. He is like a very sweet boy who, having built a very fine snowman, drags his mother outdoors to see it before it melts. I almost expect him to take my hand. I follow him up the stairs.

“Think of them as open stacks,” he says, showing me the racks. “You can walk right up to them and touch them.” He reaches out and traces the edge of one of the racks with the tip of his index finger. “If you had all the words in every book in the Library of Congress, it would be about an inch, here,” he says, measuring the distance between his forefinger and thumb.

Up close, they’re noisy. It’s mainly fans, cooling the machines. At first, the noise was a problem: a library is supposed to be quiet. Kahle had soundproofing built into the walls.

Each unit has a yellow and a green light, glowing steadily: power indicators. Then, there are blue lights, flickering.

“Every time a light blinks, someone is uploading or downloading,” Kahle explains. Six hundred thousand people use the Wayback Machine every day, conducting two thousand searches a second. “You can *see* it.” He smiles as he watches. “They’re glowing books!” He waves his arms. “They glow when they’re being read!”

One day last summer, a missile was launched into the sky and a plane crashed in a field. “We just downed a plane,” a soldier told the world. People fell to the earth, their last passage. Somewhere, someone hit “Save Page Now.”

Where is the Internet’s memory, the history of our time?

“It’s right *here!*” Kahle cries.

The machine hums and is muffled. It is sacred and profane. It is eradicable and unbearable. And it glows, against the dark. ♦

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Jill Lepore is a staff writer and a professor of history at Harvard. “The Secret History of Wonder Woman” is her latest book. [Read more »](#)

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Alexander R. Galloway

Jodi's Infrastructure

01/06

One might query any contemporary artist and, as a kind of litmus test, ask the following series of questions: Do you think of yourself as primarily working “on” the digital or primarily “within” it? Is the computer incidental to your work, a tool like any other? Or is the computer at the heart of what you do? Shall art orient itself toward the digital? Or shall art merely live inside the digital, while concerning itself with other topics entirely?

Digital aesthetics can refer to the “medium” of the digital, that is, all the tools and technologies that populate contemporary life. At the same time, digital aesthetics can refer to context, that is, a “digital context” or a “net condition” – the latter being the title of an influential 1999 net art exhibition at the ZKM in Karlsruhe. Artists have their own particular ideas about digital aesthetics, of course, as do computer scientists. Sometimes these ideas overlap and sometimes they don’t. Can digitality be beautiful? How hopeless a question to pursue: it depends on so many complicated things, not least of them the definitions of digitality and beauty.

Technologists tend to wrestle with similar issues. Some programmers or engineers think of the machine as a tool to be used in pursuit of some larger design strategy. Thus there are many workaday technologists for whom digitality is a “context” or “condition,” with all of its attendant issues, from proletarianization and exploitation (be it unpaid overtime in Silicon Valley or harsh working conditions at Foxconn) to new forms of empowerment via social networking and communication in the public sphere. Still, when technologists reflect on themselves, when they narrate their own project, they tend to favor medium over context. I’m thinking of a text like *The Art of Computer Programming*, Donald Knuth’s monumental treatise on computer science. Here “art” is an entirely self-referential activity, and beauty is defined through the virtues of functionality, elegance, and simplicity. Context still matters, of course, but code derives its beauty, its very identity, from an analysis of function and its accurate formalization in logical and mathematical structures. (G. H. Hardy’s classic hymn to pure mathematics, *A Mathematician’s Apology*, is the literary obverse to Knuth, but it promulgates a similar set of virtues.)

Two basic activities emerge. A person may work “on” the digital or “within” it. In the former, one’s attention is directed from the outside in, taking the medium itself as its object, while in the latter one takes the perspective of the medium itself, radiating attention outward to other contexts and environments. To generalize from this, the first position (working “on”) is labeled modern or, when applied to art and

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aesthetics, modernist. And the latter position (working “within”) is labeled non-modern, be it premodern, postmodern, or some other alternative.

In the modern “on” mode, infrastructure is everything. Content dissolves into context, and context itself becomes content. Hence the great mantra of modernity is “there is no content” – or, as Marshall McLuhan famously put it, “the medium is the message” – since all content is overwhelmed by context. By contrast, in the non-modern, premodern, or postmodern mode of working “within,” content is what it is, no more and no less. Here content provides its own context, and the environment grows in accordance with the emergent emanations of the inside. No larger transcendental category arrives like a conquistador to command and encompass it from outside. For the non-modern, the message is the message. And any other loftiness – from heaven above to down below – will always be legible right there within it. Indeed, only a modern would ever invent the word “content” in the first place.

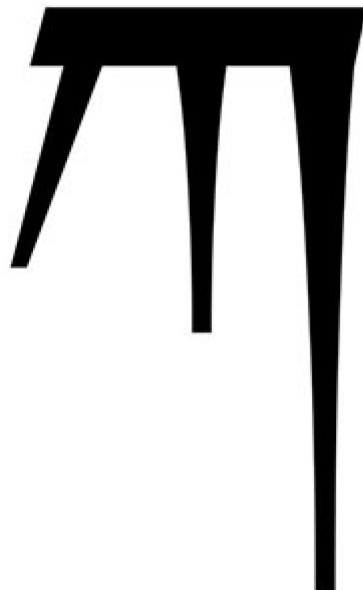
Are mathematicians modernists? Perhaps they are, given the way in which math tends to return continuously to its own formal construction. We know that Plato, that great

devotee of math, was the first “modern” in this sense, as anachronistic as that may sound. But what about computer art? Is it modernist as well? Here the answer is not so clear, with modernist tendencies evident in certain micro-movements (late 1990s net art for instance) while less evident in others.

Where does the artist duo Jodi (or Jodi.org) stand in all of this? The answer seems clear enough. They are moderns through and through. There is no Jodi work that is not oriented toward the digital as its object and material. There is no Jodi work that is not on and about the material. They display in abundance that great modernist virtue of self-referentiality. The material of their work is quite simply the material itself.

Still, digitality in art today is, for the most part, not modernist. In contemporary art, digitality typically doesn’t signal medium specificity or a reflection on art’s conditions of possibility. Digitality today is usually understood in terms of the flexibility or inconstancy of the substrate (the so-called crisis of indexicality), or alternately in terms of network phenomena like circulation and dispersal (following the interesting work of David Joselit or Seth Price), or simply as a form of ambient environment, feeding and inflecting the kind of work being

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xn--5cd.com

Jodi, *IDN* (a screenshot of the work), 2015. Copyright: Jodi.org

made.

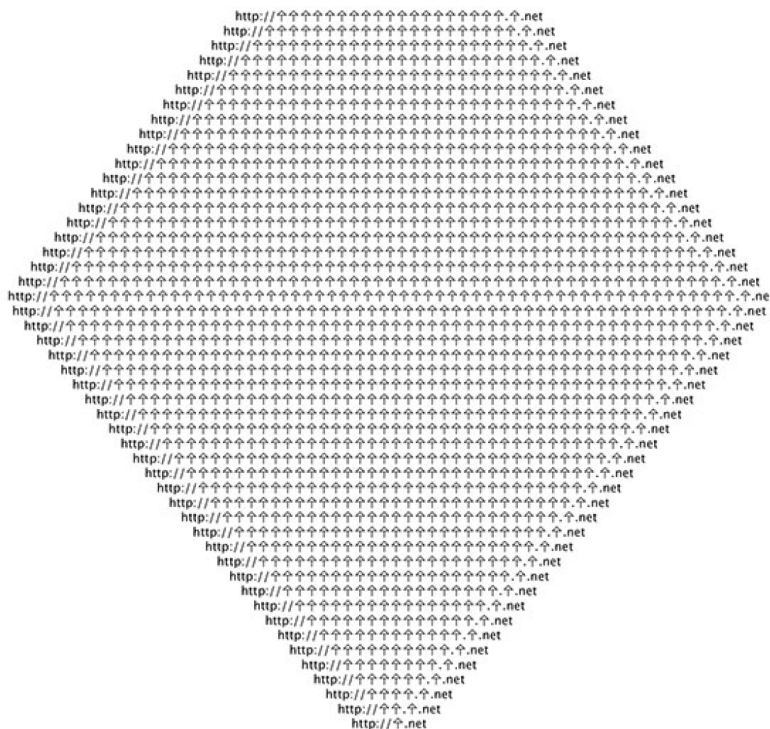
Jodi are thus stubbornly out of step with the dominant rhythms of contemporary art. Less obsessed with the cultural or social effects of new media, Jodi orient themselves toward the specificities of hardware and software. The resulting aesthetic is, in this way, not entirely specified by the artists' subjective impulses. Instead, the texture of code and computation takes over, and computing itself – its strange logic, its grammar and structure, and often its shape and color – produces the aesthetic.

Jodi's *IDN* is chiefly concerned with the infrastructure of the Web. The work focuses on two technologies, the Internationalized Domain Name (IDN) implementation (which lends its name to Jodi's project) and Unicode, the universal character encoding standard. Jodi have made works about domain names in the past. "Wrong Browser" is a series of web browsers with names like "CO.JP" alluding to the top-level domains used for countries around the world; each browser renders a different series of abstract compositions, while frustrating the user's sense of interactivity. A different project, "LVY," is a group of three dubious domain names (LinhedIn.com, Vodacone.com, YouTuhb.com) that guide the user to an enigmatic, shivering

animation. Or, in an early work labeled simply *map* (map.jodi.org), the duo provided a low-tech mapping of the landscape of domains and sites that most interested them at the time, sites like re-move.org or irrational.org.

As for Unicode, the character forms and glyphs of computer alphabets have long been exploited for their graphical qualities. ASCII art arranges the letters and punctuation of the ASCII character set into a crude palette of tones from light to dark, drawing pictures from the tones. And games like *Dwarf Fortress* use exotic glyphs to represent characters and objects. A system of "expanded punctuation" has also long been used to convey mood in text, both online and off (via the typewriter), using simple emoticons like ;) and more complex faces and pictures like (˘_˘) or _(ツ)_/. After the gradual adoption of Unicode, applications and operating systems could render a vast array of graphical signs, both for all the world's alphabets but also a variety of icons and emoji. Gamers quickly learned simple hacks for usernames and text chatting, adding a bit of flare with a name like "Κίττηη" (instead of Kitten). Artists Jörg Piringer and Nick Montfort have both made work that plumbs the length and breadth of various encoding schemes, from Unicode and ASCII to the character-encoding

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Jodi, *IDN* (a screenshot of the work), 2015. Copyright: Jodi.org

system used on the Commodore 64. The newly developed programming language Swift has also added Unicode support, not simply in what the language can compute but in the very text of the source code itself. In Swift the number 3.141592 may be assigned to a variable named π rather than pi, a small but significant distinction. Indeed it may be assigned to an emoji, a kanji character, or anything else available in Unicode. Swift's support for Unicode has facilitated new kinds of source-code chicanery beyond anything seen in the most notorious Perl poetry of yore.

Infrastructure changes slowly. Even as word processors and other applications began to support Unicode, many of the internet's internal technologies were late adopters. The IDN standard, only in use since 2010, was designed to allow Unicode characters within domain names, both top-level suffixes and server names. Thus, after the implementation of IDN, users may surf to pages with addresses ending in .pð instead of .ru (Russia) or .中國 instead of .cn (China). Likewise each server and hostname may be rendered in languages that don't use the Latin alphabet, such as Arabic or Greek. Still, the apparent universality of IDN is something of an illusion. Certain characters are prohibited outright to help avoid phishing attacks using similar looking glyphs. And, in fact, each Unicode domain is transcoded into an ASCII string behind the scenes. ASCII's much smaller character set,

consisting of the letters A–Z, the numerical digits 0–9, plus a few forms of simple punctuation, is considered to be simpler and more difficult to spoof. And, given that the Web was built on ASCII, it is easier to add Unicode support as a special form of ASCII encoding than change the Web's entire naming technology. For instance, a browser aimed at a Unicode address like “xn--417a.net,” will first translate the address to the corresponding ASCII version, in this case “xn--417a.net,” and then fetch that address instead. In other words, even if a user sees Chinese or Russian characters on the screen, it's still ASCII underneath.

Jodi's IDN is a series of websites using single Unicode glyphs as domain names, all under the .net or .com top-level domains. Besides the primary glyph domains, additional websites are referenced via internal links. For example, 𐀀.com refreshes to 𐀁.com which refreshes back to 𐀀.com in a continuous loop. A few of the domains are as yet still empty, and a few others proffer short messages or other information. 𐀀.com and 𐀁.com both simply repeat the project's opening salutation, that “Apache is functioning normally.”

The majority of pages produce graphical compositions that animate slowly in the browser via the HTTP “refresh” command. Some of them, like 𐀀.com, animate solely in the address bar of the browser. Others, like 𐀁.com or 𐀂.net, produce

Jodi, IDN (a screenshot of the work), 2015. Copyright: Jodi.org

matters. And they are technologists who insist that the beauty of code comes not from function and elegance but from a different set of virtues – dysfunction and inelegance to be sure, but also confusion and excitement, violence and energy. The result is not so much a mechanization of art, nor that clumsy concept “the art of the machine,” but a much more simple and mundane reality: the computer as medium.

x

A shorter version of this article was first published by West Den Haag.

06/06

Alexander R. Galloway is a writer and computer programmer working on issues in philosophy, technology, and theories of mediation. Professor of Media, Culture, and Communication at New York University, he is author of several books on digital media and critical theory, including *The Interface Effect* (Polity, 2012). His collaboration with Eugene Thacker and McKenzie Wark, *Excommunication: Three Inquiries in Media and Mediation*, has recently been published by the University of Chicago Press. With Jason E. Smith, Galloway co-translated the Tiqqun book *Introduction to Civil War* (Semiotext[e], 2010). For ten years he worked with RSG on *Carnivore*, *Kriegspiel*, and other software projects.

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October 25, 2017 - At this time when you can access almost every piece of information in the world, what is the best possible thing to do? Charles Broskoski co-created Are.na, an online tool and community attempting to answer this question. Before focusing on Are.na full-time, Broskoski was a software engineer at Artsy and previously studied fine art at Parsons School of Design.



As told to Laurel Schwulst, 3393 words.

Tags: Art, Technology, Collaboration, Education.

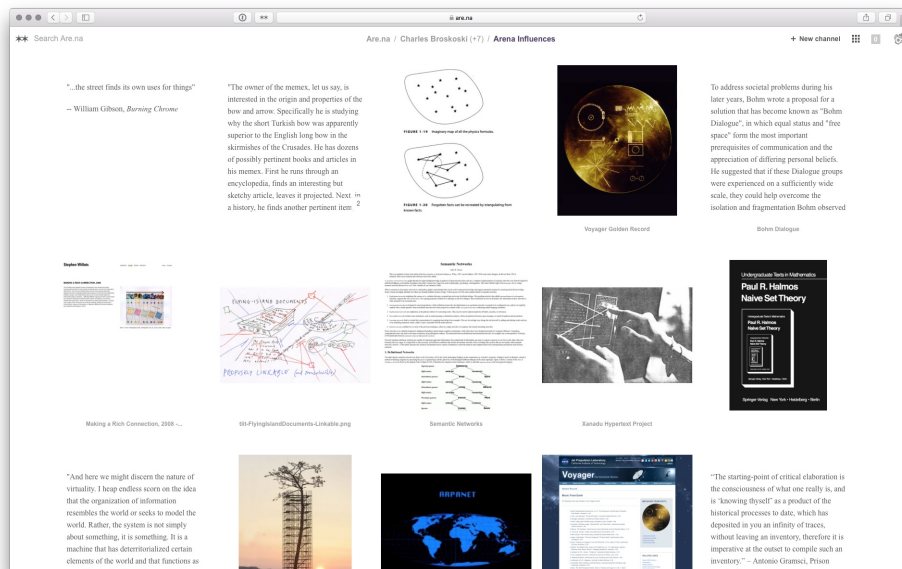
Charles Broskoski on self-discovery that happens upon revisiting things you've accumulated over time

How do you normally describe to someone completely new to Are.na ... what Are.na is?

I usually say something along the lines of, "It's a platform for doing research online." The person will usually ask, "What do you mean by research?" and I will reply, "Like the kind of research you are doing when you find yourself going down a Wikipedia hole. It's a way to put images, text, links, and files into a visual space where you can make sense of what you are looking at on the internet."

Yeah, it seems like communicating Are.na is an evolving game, as seen in "How do you describe Are.na at a party?". Do you have any favorite submissions to that channel?

There are so many good descriptions in that channel. Karly's "Research as leisure activity" is good. I also like Toby's "it's like having an API for your mind." But I think my favorite is Damon's "a toolkit for assembling new worlds from the scraps of the old," as it's both beautiful and also something that would be hilariously awkward to say to someone at a party.



<https://www.are.na/charles-broskoski/arena-influences>

How did Are.na come to be?

Around 2006, I met John Michael Boling through a social bookmarking website called Del.icio.us. Your Del.icio.us profile ended up being a nice representation of what you were interested in and actively thinking about.

Del.icio.us let you see the constellation of people with similar interests. For example, maybe you see that 20 other people saved the same link you did. Then you can look through these peoples' saved links and learn about things you had never considered before. I met John Michael simply through us saving many of the same links and finding there was a lot of overlap.

Were you a student around then?

Yeah. Cory Arcangel, who was my professor at the time, introduced me to Del.icio.us. He made everyone in class use it. The first part of class was everyone talking through some links they found on the internet. People would bring in things that may not seem interesting at first, but Cory was amazing at parsing out why something might be interesting. It showed you it's important to think deeply about why you like what you like.

"You're in college and should be interested in everything" was Cory's whole point with the link sharing. You have to open your brain to many different things and investigate them. It's the primary time when you can develop those ideas and habits for the rest of your life.

So what happened to Del.icio.us?

Yahoo, who owned Del.icio.us, accidentally leaked a slide about their plans to "sunset" Del.icio.us late in 2010. Immediately almost everyone using it was done and left.

At that time, John Michael was working at Rhizome, and I was trying to be an artist. We started talking about what a platform would be like that could replace Del.icio.us, or replace our community that we had found on Del.icio.us.

Del.icio.us made us realize the importance of archiving casual web (and other) research. That process has a lot of positive effects that are hard to explain until you've built a habit out of it. For one, there's a self-discovery that happens when you revisit things you've accumulated over a period of time. You look back and begin to recognize patterns in your own thinking.



<https://www.are.na/block/2638>

"I believe that we, that this planet, hasn't seen its Golden Age. Everybody says its finished ... art's finished, rock and roll is dead, God is dead. Fuck that! This is my chance in the world. I didn't live back there in Mesopotamia, I wasn't there in the Garden of Eden, I wasn't there with Emperor Han, I'm right here right now and I want now to be the Golden Age ...if only each generation would realise that the time for greatness is right now when they're alive ... the time to flower is now." -Patti Smith

<https://www.are.na/block/3088>

Around that time after graduating, I was trying to be an artist. Right after my first solo show, I thought to myself, "I never want to do this again." I liked making art, but I didn't like the career part.

When I came back from my show, John Michael, who was also my roommate, had met a friend through his family. This friend was J. Stuart Moore. He had founded a company called Sapient, which when it started, was like an upstart rival to IBM in the 90s. Stuart's big thing was solving problems within these organizations. Sapient had a set of tools and processes they would go through to get to the root of a problem and work from there. Stuart's idea was that if you could containerize knowledge, like break knowledge down into chunks, then you could reuse those chunks to solve problems in different ways.

John Michael and Stuart started talking. John Michael saw some overlaps between what we were thinking about with Are.na and what Stuart was thinking about with his informational building blocks.

Eventually, I began coding some rough prototypes for John Michael and Stuart. At that point, we didn't talk about how it would be a business or even how it would function on a practical, user, or human level. It was really, really utopian.

Those days we asked questions like, "How does a person be their best self on the internet?" and "How do you get on the internet and solve your own problems to find the life you want to live?"

Then we brought Dena [Yago] and Damon [Zucconi] on, and we started working together. Stuart lived in Manchester, MA, and we all would go to his house for weeks at a time.

We had one lunch where we were by ourselves, without Stuart. We were talking and wondered, "Could we use any of this stuff? Are we personally interested in this as a platform?" And at the time, the consensus was, "No." That realization marked a shift. We started thinking about others who tried similar things, such as Ted Nelson's Xanadu. We started using Are.na to research these references, which was cool.

Around then, Chris [Sherron] and Dan [Brewster] joined. Together we readjusted Are.na so that we would like using it. We decided Are.na should be a generic system anyone can plug any kind of information into.

We also realized Are.na had to work even if there's no one else around, or without the social component. Throughout our process, we would periodically return to the question, "Would we use this?"

That question seems like it was an important guide.

Definitely. We would go back and forth. We would make it something we would use, and then things would get off again, from our perspective. We reached a head at a certain point. Our disagreements with Stuart were about what type of person should be on the platform, what they should be doing, and what's allowed. We wanted anything to be allowed and there not to be a hierarchy, or telling someone what's important or not. Stuart was very much the opposite, and he wanted to control the quality. We wanted to do that, but in a more cultural way, by getting our friends excited and using Are.na. If people we thought were interesting and smart put their brains on it, we thought the quality would emerge in an organic way.

When we reached this point, we were worried Stuart was just going to fire all of us. But he said, "You guys can take it and run with it," which was really amazing. We lost him as a collaborator but took control of the company.

Wow.

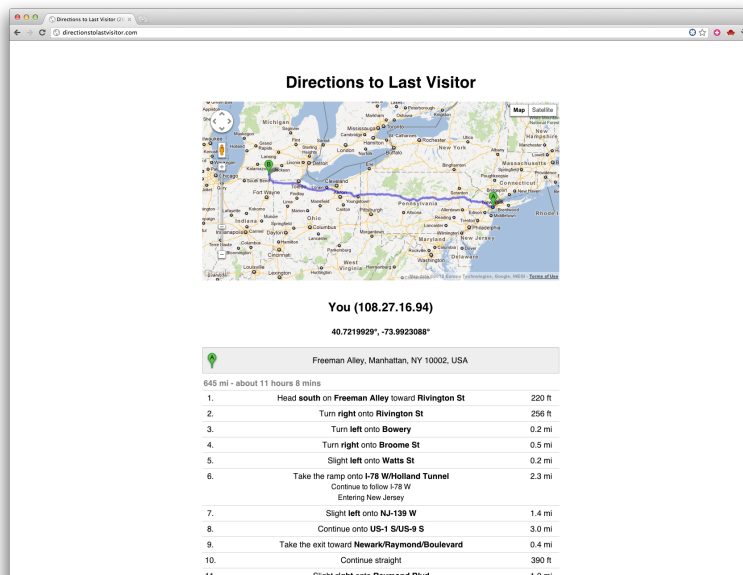
We still talk to him and he's been very helpful. But at that point, a lot of us were totally burned out. We didn't really do anything with it for a year. We just kept paying the server bills, but we didn't work on it for a while. Then, I think it was 2014, I thought, "If no one else is going to do anything, then I'm just going to..."

Can you speak more to that decision? I remember you already made the decision before that you definitely didn't want an art career, right?

Before when I was working on my solo show, I was thinking about what it means to be generous as an artist. At the time, I thought it was about being really personal or really open. Like to the point of being diaristic, or sharing images of me and my family.

Towards the end of making that show, I decided, "No, it's actually about tools. It's actually removing myself entirely and making things for other people to do stuff." I decided making tools is the nicest thing you can do as an artist. So Are.na still feels like a natural extension of where I was going as an artist.

Are.na has changed the way I think. I continue to think about things the same way I would as if I were making art, but I just don't make art. The thoughts come, and I try and articulate them as best as I can (using Are.na most of the time). I put things together and "build a world of thought" that way.



Directions to Last Visitor, 2011

The last piece of art I made, *Directions to Last Visitor*, was a website that would give you Google Maps directions to the last person who visited the piece. It's not online anymore because the domain name expired, but the idea was about connecting two people. Like Are.na, it was a type of conduit.

I liked how your team kept on returning to this question, "Would we actually use this?" as a guiding principle. It also seems like a technique of zooming out to understand what's actually important. Do you have other "zooming-out" techniques you use today?

When we started, we had the privilege of getting all of our smart friends using the platform. Now we're interested in what it takes to get the average Instagram user, for instance, to be interested in using Are.na. It's a very cheesy phrase, but we sometimes ask, "How can we make being smart cool?". That is, how can we make casual research-seeking out new knowledge just for the sake of it—a part of an everyday process for a normal internet user?

It's a really tricky problem, because it's as much a cultural issue as it is a product or technology issue. Attention is a finite resource, and how we choose to spend our attention online is, in some ways, a direct reflection of where human culture has gone in an era where access to information is basically unlimited. We are very much in our teenage years—that is, we suddenly have all these new capabilities and it's really easy to just run wild. But there seems to be a shift taking place in mainstream conversation about what effect the average behavior that most social media platforms promote has on human society at large.

The biggest compliment for us is when someone describes Are.na as healthy. We want to cultivate a culture about being curious and going deeper when necessary. We think the feeling of, "I'm interested in this weird topic and I'm going to see how far that interest goes" is way better than, for instance, putting up a picture and getting 50 likes or something.

It's like showing the world which way you're going. Doing that can be really hard when you're only focused on an output.

Yes, it's between "showing the world" and "showing yourself" to the world.

I feel like I have to constantly remind myself of the things I'm actually interested in. Sometimes I wonder if there's a problem with being too curious. That is, when you feel like you're interested in everything. While we do want to cultivate a curiosity, we also think about encouraging more sustained, deep thinking.

It reminds me of "T-shaped" knowledge. Artsy, a start-up I worked at for a while, was particularly interested in hiring engineers who demonstrated this. Like the shape of a "T" suggests, someone with T-shaped knowledge knows many things on a surface level, but then one or very few things very deeply.

What was your involvement with Artsy like?

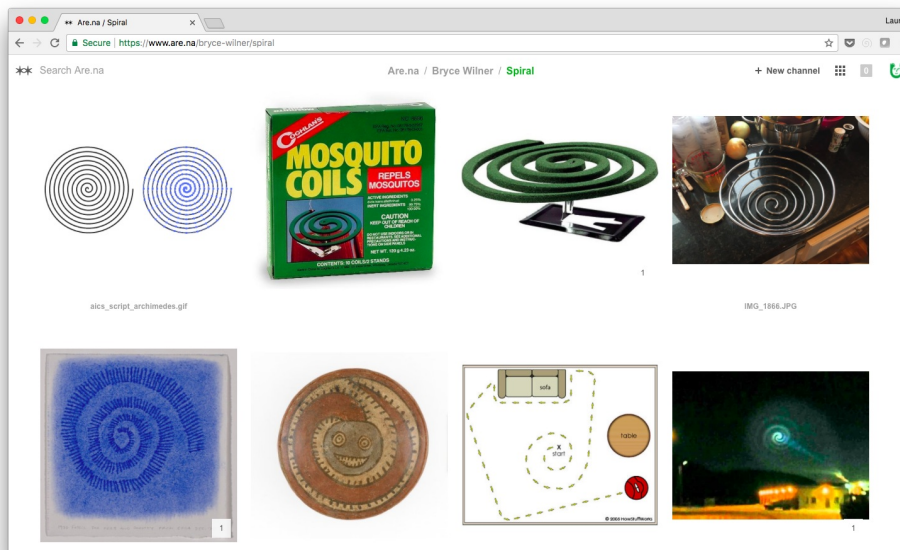
After the first leg of Are.na ended, Damon started working at Artsy as a software engineer. I would ask him advice in updating Are.na's technical architecture. I was developing mostly alone on Are.na then. I thought, "Well, if I can't figure this out very quickly, and do Are.na as a full-time thing, then I can get a job at Artsy if I learn its stack," which is what happened.

Artsy's militant philosophy on open source was very influential for Are.na. Many people at Artsy believe that if it's useful to one person, it's worth making open source. Before that, everything on Are.na was closed. When we shifted to the open source model, the immediate feeling was about everyone judging the bad code you're writing. But the reality is that no one will do that, and no one cares.

The mobile app we're working on now is all open source. People can look through and see exactly what we're working on at any given moment. I doubt anyone does, but it's a possibility.

After you committed to working on Are.na again, how did Are.na's "second life" go from there?

I reached out to Daniel [Pianetti], who I met through Are.na, and also all the other people who had worked on Are.na before: Dena, Damon, John Michael, and Chris. I said something like, "I'm going to keep going, do you want to join me?"



<https://www.are.na/dryce-wilner/spiral>

We started thinking about making Are.na sustainable. We thought people who used Are.na should know that there was a business behind it, and that there was a way Are.na could sustain itself and function in the world in a way that made sense, pragmatically and morally.

Right now, we make money by selling premium accounts. But there is the reality of needing to be able to fund our existence until that model reaches a certain point. So in early 2017 we started talking to people about what getting a capital investment would look like. Chris Barley and I had talked maybe four or five times before, because Consortia, his research, strategy, and design company, was using Are.na for their own work. We talked very generally about the state of the internet. I told him we were going to begin looking for investment and that we had never done it before and we didn't know what we were doing. Shortly after he said, "I'm thinking about investing in Are.na."

Recently we've also been focusing on the [Are.na Blog](#), edited by Meg Miller. Most of the posts are nothing directly about Are.na the product—we hope it's outward-facing in that way.

Would you describe Are.na as a start-up?

Yeah, I think that's the easiest shorthand. When we started looking for funding, we were also looking at grants and institutional models. However, we realized there's a time cost to applying to those things, and the money is much less.

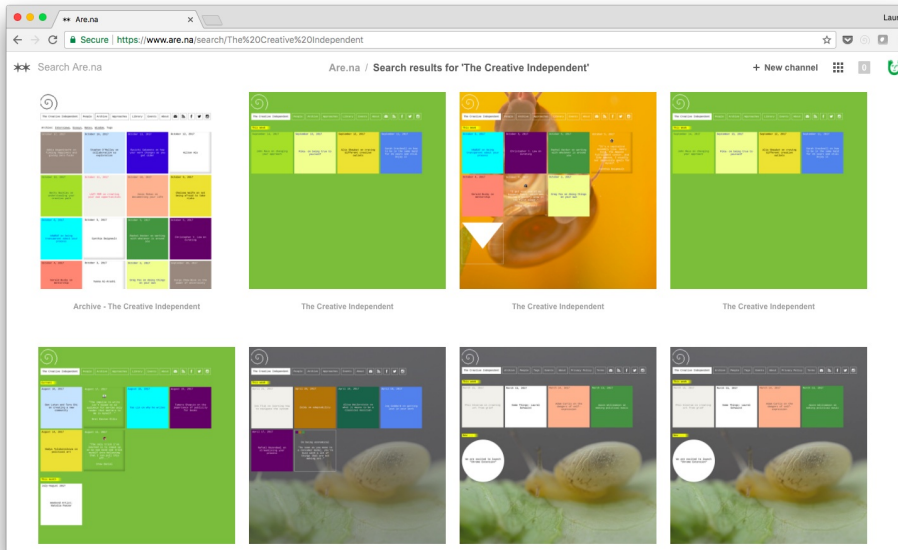
With the way some venture capitalists market themselves now, we started feeling like there's common ground we could have with certain firms, where it's more about long-term goals and less about shorter-term, explosive growth.

One of these common grounds is the current state of social media. Any normal person, at some point, will complain about what social media addiction has done to them.

My take is that it boils down to bad business models. If it's going to be explosive growth first, and then you've got to tack on something to make money afterwards, it's always going to be advertising. That's always going to be terrible because it means that in order to keep going, you have to keep people coming back as many times as possible. In other words, you're motivated to make people addicted. And yes, venture capitalists are partially responsible for this. But now, it's clear that people are getting sick of this situation. Most people you talk to are simply done with it, and smart venture capitalists can see this shift as well.

So in terms of having the start-up as a model or using that term as a way to frame ourselves—yes, it's the easiest way to explain to someone on first meeting what we are doing. But we are also trying to build community and culture, and we are motivated to make that as big as we possibly can because we want to give a real alternative to an everyday person as to what one can do on the social internet.

Maybe "providing an alternative," isn't the best way to phrase it. We're not only interested in what that thing could look like—but what the primary activity could be.



<https://www.are.na/search/The%20Creative%20Independent>

Do you view Are.na as a lifelong project?

Yes, I think so. Personally, I'm pretty set on promoting life-long education as the most important thing. Getting people to be curious, in this time when you can access almost every piece of information in the world, is the best possible thing to do to try to help all humans.

It's crazy how things feel in the absolute opposite direction right now in regards to the internet and social media. I feel it myself. It's hard to get yourself into that zone where you're deeply investigative. But it's important. And when you do it, you know it's good.

Is there anything in particular you do to transport yourself into that zone?

I recently learned Einstein used to do something specific. To get his brain in the zone, he would bring together two very different things to see what the connection was between them. Are.na at its best is really good for that. So if I haven't used Are.na in a more concentrated way in a while, I'll just make a channel. Sometimes it doesn't work out, but I'll make a channel that's very fuzzy. I'll start to put stuff in it and just see where it goes.

Part II Suggested conversation readings

Name

Charles Broskoski

Vocation

Co-founder of Are.na

Fact

At this time when you can access almost every piece of information in the world, what is the best possible thing to do? Charles Broskoski co-created Are.na, an online tool and community attempting to answer this question. Before focusing on Are.na full-time, Broskoski was a software engineer at Artsy and previously studied fine art at Parsons School of Design.



A (sampling of a) few of Cab's favorite things:

Damon Zucconi, both the CTO of Are.na and one of my favorite artists since I first came across his work in 2006. A few samples:

<http://damonzucconi.com/artworks/boring-average-interesting>
<http://work.damonzucconi.com/edge-transfer/#/rhea-and-dione>
<http://damonzucconi.com/artworks/10-seconds-to-each-point>
<http://damonzucconi.com/artworks/one-thing-comes-after-the-other>
<https://thecreativeindependent.com/weekends/year-by-damon-zucconi>

The Once and Future King by T.H. White. I found this sitting out in a stack free books a few blocks away from my house. When I started reading it, it felt like the perfect book for me at the time. It's an adaptation of the King Arthur legends, written from 1938-1941, and has all these anachronistic references to World War II (in one part Merlin mentions "the American administration"). On a related note, I also love my neighborhood, Clinton Hill in Brooklyn.

This channel on Are.na: <https://www.are.na/alex-singh/a-catalogue-of-simple-pleasures>

Exploits of the Incomparable Mulla Nasrudin by Idries Shah. A collection of jokes and very short stories featuring Nasrudin, the wise-fool of Middle Eastern folklore (he has some similarities to Merlin). Idries Shah was trying to push Sufi philosophy in the 50s and 60s and was into the idea of teaching stories, that is, a narrative form that could serve as a vehicle for more complex types of psychological knowledge. Nasrudin stories fall into that category, you can read the stories over and over and always find a new take on them.

M.E.S.H., Exasthrus (Pane). My ol' friend James Whipple's track on the Pan Records compilation *Mono No Aware*. Also the song with James K and Eve Essex "Stretch Deep" is extremely good. Actually, the whole album is good.

Pat Brennen, Celebrity Tropical Fish, 1991. I skateboarded for maybe 15 years. This part came out before I started skating, but I probably watch it more than any other skateboard part. Something about the combination of depressing classical music, kinda sketchy style but still progressive skateboarding, and the amateur filming and editing. It's really such a perfect skate video part. The 2010s version of this is Ryan Sublette's part in Depression Session.

This line from the Ta-Nehisi Coates book, *Between the World and Me*: "I was made for the library, not the classroom. The classroom was a jail of other people's interests. The library was open, unending, free."

1/24/2018 Bits flowing through the wires of a computer network are invisible; a "network monitor" is a tool that let's those bits be seen. At SIGGRAPH 95, the largest co...

THE COMING AGE OF CALM TECHNOLOGY[1]

Mark Weiser and John Seely Brown

Xerox PARC

October 5, 1996

INTRODUCTION

The important waves of technological change are those that fundamentally alter the place of technology in our lives. What matters is not technology itself, but its relationship to us.

In the past fifty years of computation there have been two great trends in this relationship: the mainframe relationship, and the PC relationship. Today the Internet is carrying us through an era of widespread *distributed computing* towards the relationship of *ubiquitous computing*, characterized by deeply imbedding computation in the world. Ubiquitous computing will require a new approach to fitting technology to our lives, an approach we call "calm technology".

This article briefly describes the relationship trends, and then expands on the challenges of designing for calm using both the center and the periphery of our perception and the world.

The Major Trends in Computing	
Mainframe	many people share a computer
Personal Computer	one computer, one person
<i>Internet - Widespread Distributed Computing</i>	<i>. . . transition to . . .</i>
Ubiquitous Computing	many computers share each of us

PHASE I - THE MAINFRAME ERA

The first era we call "mainframe", to recall the relationship people had with computers that were mostly run by experts behind closed doors. Anytime a computer is a scarce resource, and must be negotiated and shared with others, our relationship is that of the mainframe era. There is mainframe computing today: a shared office PC, and the great physical simulations of everything from weather to virtual reality, have in common sharing a scarce resource. If lots of people share a computer, it is mainframe computing.

PHASE II - THE PC ERA

The second great trend is that of the personal computer. In 1984 the number of people using personal computers surpassed the number of people using shared computers.[2] The personal computing relationship is personal, even intimate. You have *your* computer, it contains your stuff, and you interact directly and deeply with it. When doing personal computing you are occupied, you are not doing something else. Some people name their PC - many people curse or complain to their PC.

The personal computer is most analogous to the automobile - a special, relatively expensive item, that while it may "take you where you want to go", requires considerable attention to operate. And just as one can own several cars, one can own several personal computers: for home, for work, and for the road. Any computer with

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which you have a special relationship, or that fully engages or occupies you when you use it, is a personal computer. Most handheld computers, such as the Zaurus, the Newton, or the Pilot, are today still used as personal computers. A \$500 network computer is still a personal computer.

TRANSITION - THE INTERNET AND DISTRIBUTED COMPUTING

A lot has been written about the Internet and where it is leading. We will say only a little. The Internet is deeply influencing the business and practice of technology. Millions of new people and their information have become interconnected. Late at night, around 6am while falling asleep after twenty hours at the keyboard, the sensitive technologist can sometimes hear those 35 million web pages, 300 thousand hosts, and 90 million users shouting "pay attention to me!"

Interestingly, the Internet brings together elements of the mainframe era and the PC era. It is client-server computing on a massive scale, with web clients the PCs and web servers the mainframes (without the MIS department in charge). Although transitional, the Internet is a massive phenomena that calls to our best inventors, our most innovative financiers, and our largest multinational corporations. Over the next decade the results of the massive interconnection of personal, business, and government information will create a new field, a new medium, against which the next great relationship will emerge.

PHASE III - THE UC ERA

The third wave of computing is that of ubiquitous computing, whose cross-over point with personal computing will be around 2005-2020[3]. The "UC" era will have lots of computers sharing each of us. Some of these computers will be the hundreds we may access in the course of a few minutes of Internet browsing. Others will be imbedded in walls, chairs, clothing, light switches, cars - in everything. UC is fundamentally characterized by the connection of things in the world with computation. This will take place at a many scales, including the microscopic[4].

There is much talk today about "thin clients," meaning lightweight Internet access devices costing only a few hundred dollars. But UC will see the creation of *thin servers*, costing only tens of dollars or less, that put a full Internet server into every household appliance and piece of office equipment. The next generation Internet protocol, IPv6[5], can address more than a thousand devices for every atom on the earth's surface[6]. We will need them all.

The social impact of imbedded computers may be analogous to two other technologies that have become ubiquitous. The first is writing, which is found everywhere from clothes labels to billboards. The second is electricity, which surges invisibly through the walls of every home, office, and car. Writing and electricity become so commonplace, so unremarkable, that we forget their huge impact on everyday life. So it will be with UC.

Two harbingers of the coming UC era are found in the imbedded microprocessor, and the Internet. It is easy to find 40 microprocessors in a middle class home in the U.S.A. today. They will be found in the alarm clocks, the microwave oven, the TV remote controls, the stereo and TV system, the kid's toys, etc. These do not yet qualify as UC for two reasons: they are mostly used one at a time, and they are still masquerading as old-style devices like toasters and clocks. But network them together and they are an enabling technology for UC. Tie them to the Internet, and now you have connected together millions of information sources with hundreds of information delivery systems in your house. Clocks that find out the correct time after a power failure, microwave ovens that download new recipes, kids toys that are ever refreshed with new software and vocabularies, paint that cleans off dust and notifies you of intruders, walls that selectively dampen sounds, are just a few possibilities.

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The UC will bring information technology beyond the big problems like corporate finance and school homework, to the little annoyances like Where are the car-keys, Can I get a parking place, and Is that shirt I saw last week at Macy's still on the rack? Many researchers are working towards this new era - among them our work at Xerox PARC, MIT's AI-oriented "Things That Think" program[7], the many mobile and wearable computing programs[8] (many funded by ARPA), and the many companies integrating computation into everyday objects, including Mattel and Disney.

What qualifies these as fundamental trends? First, they are about basic human relationships, and so are trends about what matters to us, what we cannot avoid. Second, they have the property of building upon one another. It is apparent that the mainframe relationship will never die completely away, nor the personal computing relationship. Each is used as a ground for the next trend, confirming its importance in its own mode of decline. Third, they are each bountiful sources of innovation, and have required reopening old assumptions, and re-appropriating old technology into new contexts.

It has been said many times that PC operating systems are about twenty years behind mainframe operating systems - but this statement misunderstands what happens in technological revolutions. The radically new context of the PC - uncontrolled room, uncontrolled third party software, uncontrolled power, third party hardware components, retail sales, low-cost requirements, frequent upgrades - meant that mainframe technologies required considerable adaptation. The era of ubiquitous computing is already starting to see old assumptions questioned top to bottom in computer systems design. For instance, our work on ubiquitous computers required us to introduce new progress metrics such as MIPS/Watt and Bits/Sec/M³. (After over a decade of stagnation, MIPS/Watt has improved over a hundred-fold in the past three years.) Research from radios to user interface, from hardware to theory, are impacted by the changed context of ubiquity.[9]

The most potentially interesting, challenging, and profound change implied by the ubiquitous computing era is a focus on *calm*. If computers are everywhere they better stay out of the way, and that means designing them so that the people being shared by the computers remain serene and in control. Calmness is a new challenge that UC brings to computing. When computers are used behind closed doors by experts, calmness is relevant to only a few. Computers for personal use have focused on the excitement of interaction. But when computers are all around, so that we want to compute while doing something else and have more time to be more fully human, we must radically rethink the goals, context and technology of the computer and all the other technology crowding into our lives. Calmness is a fundamental challenge for all technological design of the next fifty years. The rest of this paper opens a dialogue about the design of calm technology.

CALM TECHNOLOGY

Designs that encalm and inform meet two human needs not usually met together. Information technology is more often the enemy of calm. Pagers, cellphones, news-services, the World-Wide-Web, email, TV, and radio bombard us frenetically. Can we really look to technology itself for a solution?

But some technology does lead to true calm and comfort. There is no less technology involved in a comfortable pair of shoes, in a fine writing pen, or in delivering the New York Times on a Sunday morning, than in a home PC. Why is one often enraging, the others frequently encalming? We believe the difference is in how they engage our attention. Calm technology engages both the *center* and the *periphery* of our attention, and in fact moves back and forth between the two.

THE PERIPHERY

We use "periphery" to name what we are attuned to without attending to explicitly.[10] Ordinarily when driving our attention is centered on the road, the radio, our passenger, but not the noise of the engine. But an unusual

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noise is noticed immediately, showing that we were attuned to the noise in the periphery, and could come quickly to attend to it.

It should be clear that what we mean by the periphery is anything but on the fringe or unimportant. What is in the periphery at one moment may in the next moment come to be at the center of our attention and so be crucial. The same physical form may even have elements in both the center and periphery. The ink that communicates the central words of a text also peripherally clues us into the genre of the text though choice of font and layout.

A calm technology will move easily from the periphery of our attention, to the center, and back. This is fundamentally encalming, for two reasons.

First, by placing things in the periphery we are able to attune to many more things than we could if everything had to be at the center. Things in the periphery are attuned to by the large portion of our brains devoted to peripheral (sensory) processing. Thus the periphery is informing without overburdening.

Second, by recentring something formerly in the periphery we take control of it. Peripherally we may become aware that something is not quite right, as when awkward sentences leave a reader tired and discomforted without knowing why. By moving sentence construction from periphery to center we are empowered to act, either by finding better literature or accepting the source of the unease and continuing. Without centering the periphery might be a source of frantic following of fashion; with centering the periphery is a fundamental enabler of calm through increased awareness and power.

Not all technology need be calm. A calm videogame would get little use; the point is to be excited. But too much design focuses on the object itself and its surface features without regard for context. We must learn to design for the periphery so that we can most fully command technology without being dominated by it.

Our notion of technology in the periphery is related to the notion of affordances, due to Gibson[11] and applied to technology by Gaver[12] and Norman[13]. An affordance is a relationship between an object in the world and the intentions, perceptions, and capabilities of a person. The side of a door that only pushes out *affords* this action by offering a flat pushplate. The idea of affordance, powerful as it is, tends to describe the surface of a design. For us the term "affordance" does not reach far enough into the periphery where a design must be attuned to but not attended to.

THREE SIGNS OF CALM TECHNOLOGY

Technologies encalm as they empower our periphery. This happens in two ways. First, as already mentioned, a calming technology may be one that easily moves from center to periphery and back. Second, a technology may enhance our *peripheral reach* by bringing more details into the periphery. An example is a video conference that, by comparison to a telephone conference, enables us to attune to nuances of body posture and facial expression that would otherwise be inaccessible. This is encalming when the enhanced peripheral reach increases our knowledge and so our ability to act without increasing information overload.

The result of calm technology is to put us at home, in a familiar place. When our periphery is functioning well we are tuned into what is happening around us, and so also to what is going to happen, and what has just happened. This is a key property of information visualization techniques like the cone tree,[14] that are filled with detail yet engage our pre-attentive periphery so we are never surprised. The periphery connects us effortlessly to a myriad of familiar details. This connection to the world we called "locatedness", and it is the fundamental gift that the periphery gives us.

EXAMPLES OF CALM TECHNOLOGY

We now consider a few designs in terms of their motion between center and periphery, peripheral reach, and locatedness. Below we consider inner office windows, Internet Multicast, and the Dangling String.

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INNER OFFICE WINDOWS



We do not know who invented the concept of glass windows from offices out to hallways. But these inner windows are a beautifully simple design that enhances peripheral reach and locatedness.

The hallway window extends our periphery by creating a two-way channel for clues about the environment. Whether it is motion of other people down the hall (its time for a lunch; the big meeting is starting), or noticing the same person peeking in for the third time while you are on the phone (they really want to see me; I forgot an appointment), the window connects the person inside to the nearby world.

Inner windows also connect with those who are outside the office. A light shining out into the hall means someone is working late; someone picking up their office means this might be a good time for a casual chat. These small clues become part of the periphery of a calm and comfortable workplace.

Office windows illustrate a fundamental property of motion between center and periphery. Contrast them with an open office plan in which desks are separated only by low or no partitions. Open offices force too much to the center. For example, a person hanging out near an open cubicle demands attention by social conventions of privacy and politeness.

There is less opportunity for the subtle clue of peeking through a window without eavesdropping on a conversation. The individual, not the environment, must be in charge of moving things from center to periphery and back.

The inner office window is a metaphor for what is most exciting about the Internet, namely the ability to locate and be located by people passing by on the information highway, while retaining partial control of the context, timing, and use of the information thereby obtained.

INTERNET MULTICAST

A technology called Internet Multicast[15] may become the next World Wide Web (WWW) phenomenon. Sometimes called the MBone (for Multicast backBONE), multicasting was invented by a then graduate student at Stanford University, Steve Deering.

Whereas the World Wide Web (WWW) connects only two computers at a time, and then only for the few moments that information is being downloaded, the MBone continuously connects many computers at the same time. To use the familiar highway metaphor, for any one person the WWW only lets one car on the road at a time, and it must travel straight to its destination with no stops or side trips. By contrast, the MBone opens up streams of traffic between multiple people and so enables the flow of activities that constitute a neighborhood. Where a WWW browser ventures timidly to one location at a time before scurrying back home again a few milliseconds later, the MBone sustains ongoing relationships between machines, places, and people.

Multicast is fundamentally about increasing peripheral reach, derived from its ability to cheaply support multiple multimedia (video, audio, etc.) connections all day long. Continuous video from another place is no longer

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television, and no longer video-conferencing, but more like a window of awareness. A continuous video stream brings new details into the periphery: the room is cleaned up, something important may be about to happen; everyone got in late today on the east coast, must be a big snowstorm or traffic tie-up.

Multicast shares with videoconferencing and television an increased opportunity to attune to additional details. Compared to a telephone or fax, the broader channel of full multimedia better projects the person through the wire. The presence is enhanced by the responsiveness that full two-way (or multiway) interaction brings.

Like the inner windows, Multicast enables control of the periphery to remain with the individual, not the environment. A properly designed real-time Multicast tool will offer, but not demand. The MBone provides the necessary partial separation for moving between center and periphery that a high bandwidth world alone does not. Less is more, when less bandwidth provides more calmness.

Multicast at the moment is not an easy technology to use, and only a few applications have been developed by some very smart people. This could also be said of the digital computer in 1945, and of the Internet in 1975. Multicast in our periphery will utterly change our world over the next fifty years.

DANGLING STRING

Bits flowing through the wires of a computer network are ordinarily invisible. But a radically new tool shows those bits through motion, sound, and even touch. It communicates both light and heavy network traffic. Its output is so beautifully integrated with human information processing that one does not even need to be looking at it or be very near to it to take advantage of its peripheral clues. It takes no space on your existing computer screen, and in fact does not use or contain a computer at all. It uses no software, only a few dollars in hardware, and can be shared by many people at the same time. It is called the "Dangling String".



Created by artist Natalie Jeremijenko, the "Dangling String" is an 8 foot piece of plastic spaghetti that hangs from a small electric motor mounted in the ceiling. The motor is electrically connected to a nearby Ethernet cable, so that each bit of information that goes past causes a tiny twitch of the motor. A very busy network causes a madly whirling string with a characteristic noise; a quiet network causes only a small twitch every few seconds. Placed in an unused corner of a hallway, the long string is visible and audible from many offices without being obtrusive. It is fun and useful. At first it creates a new center of attention just by being unique. But this center soon becomes peripheral as the gentle waving of the string moves easily to the background. That the string can be both seen and heard helps by increasing the clues for peripheral attunement.

The dangling string increases our peripheral reach to the formerly inaccessible network traffic. While screen displays of traffic are common, their symbols require interpretation and attention, and do not peripheralize well. The string, in part because it is actually in the physical world, has a better impedance match with our brain's peripheral nerve centers.

IN CONCLUSION

It seems contradictory to say, in the face of frequent complaints about information overload, that more information could be encalming. It seems almost nonsensical to say that the way to become attuned to more information is to attend to it less. It is these apparently bizarre features that may account for why so few designs properly take into account center and periphery to achieve an increased sense of locatedness. But such designs are crucial as we move into the era of ubiquitous computing. As we learn to design calm technology, we will enrich not only our space of artifacts, but also our opportunities for being with other people. When our world is filled with interconnected, imbedded computers, calm technology will play a central role in a more humanly empowered twenty-first century.

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A Pattern Language is the second in a series of books which describe an entirely new attitude to architecture and planning. The books are intended to provide a complete working alternative to our present ideas about architecture, building, and planning—an alternative which will, we hope, gradually replace current ideas and practices.

volume 1 THE TIMELESS WAY OF BUILDING

volume 2 A PATTERN LANGUAGE

volume 3 THE OREGON EXPERIMENT

Center for Environmental Structure

BERKELEY, CALIFORNIA

A PATTERN LANGUAGE
TOWNS • BUILDINGS • CONSTRUCTION

A PATTERN LANGUAGE

TOWNS • BUILDINGS • CONSTRUCTION

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with

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USING THIS BOOK

A PATTERN LANGUAGE

It is shown there, that towns and buildings will not be able to become alive, unless they are made by all the people in society, and unless these people share a common pattern language, within which to make these buildings, and unless this common pattern language is alive itself.

In this book, we present one possible pattern language, of the kind called for in *The Timeless Way*. This language is extremely practical. It is a language that we have distilled from our own building and planning efforts over the last eight years. You can use it to work with your neighbors, to improve your town and neighborhood. You can use it to design a house for yourself, with your family; or to work with other people to design an office or a workshop or a public building like a school. And you can use it to guide you in the actual process of construction.

The elements of this language are entities called patterns. Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.

For convenience and clarity, each pattern has the same format. First, there is a picture, which shows an archetypal example of that pattern. Second, after the picture, each pattern has an introductory paragraph, which sets the context for the pattern, by explaining how it helps to complete certain larger patterns. Then there are three diamonds to mark the beginning of the problem. After the diamonds there is a headline, in bold type. This

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Volume 1, *The Timeless Way of Building*, and Volume 2, *A Pattern Language*, are two halves of a single work. This book provides a language, for building and planning; the other book provides the theory and instructions for the use of the language. This book describes the detailed patterns for towns and neighborhoods, houses, gardens, and rooms. The other book explains the discipline which makes it possible to use these patterns to create a building or a town. This book is the sourcebook of the timeless way; the other is its practice and its origin.

The two books have evolved very much in parallel. They have been growing over the last eight years, as we have worked on the one hand to understand the nature of the building process, and on the other hand to construct an actual, possible pattern language. We have been forced by practical considerations, to publish these two books under separate covers; but in fact, they form an indivisible whole. It is possible to read them separately. But to gain the insight which we have tried to communicate in them, it is essential that you read them both.

The Timeless Way of Building describes the fundamental nature of the task of making towns and buildings.

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headline gives the essence of the problem in one or two sentences. After the headline comes the body of the problem. This is the longest section. It describes the empirical background of the pattern, the evidence for its validity, the range of different ways the pattern can be manifested in a building, and so on. Then, again in bold type, like the headline, is the solution—the heart of the pattern—which describes the field of physical and social relationships which are required to solve the stated problem, in the stated context. This solution is always stated in the form of an instruction—so that you know exactly what you need to do, to build the pattern. Then, after the solution, there is a diagram, which shows the solution in the form of a diagram, with labels to indicate its main components.

After the diagram, another three diamonds, to show that the main body of the pattern is finished. And finally, after the diamonds there is a paragraph which ties the pattern to all those smaller patterns in the language, which are needed to complete this pattern, to embellish it, to fill it out.

There are two essential purposes behind this format. First, to present each pattern connected to other patterns, so that you grasp the collection of all 253 patterns as a whole, as a language, within which you can create an infinite variety of combinations. Second, to present the problem and solution of each pattern in such a way that you can judge it for yourself, and modify it, without losing the essence that is central to it.

Let us next understand the nature of the connection between patterns.

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The patterns are ordered, beginning with the very largest, for regions and towns, then working down through neighborhoods, clusters of buildings, buildings, rooms and alcoves, ending finally with details of construction.

This order, which is presented as a straight linear sequence, is essential to the way the language works. It is presented, and explained more fully, in the next section. What is most important about this sequence, is that it is based on the connections between the patterns. Each pattern is connected to certain "larger" patterns which come above it in the language; and to certain "smaller" patterns which come below it in the language. The pattern helps to complete those larger patterns which are "above" it, and is itself completed by those smaller patterns which are "below" it.

Thus, for example, you will find that the pattern ACCESSIBLE GREEN (60), is connected first to certain larger patterns: SUBCULTURE BOUNDARY (13), IDENTIFIABLE NEIGHBORHOOD (14), WORK COMMUNITY (41), and QUIET BACKS (59). These appear on its first page. And it is also connected to certain smaller patterns: POSITIVE OUTDOOR SPACE (107), TREE PLACES (171), and GARDEN WALL (173). These appear on its last page.

What this means, is that IDENTIFIABLE NEIGHBORHOOD, SUBCULTURE BOUNDARY, WORK COMMUNITY, and QUIET BACKS are incomplete, unless they contain an ACCESSIBLE GREEN; and that an ACCESSIBLE GREEN is itself incomplete, unless it contains POSITIVE OUTDOOR SPACE, TREE PLACES, and a GARDEN WALL.

And what it means in practical terms is that, if you

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want to lay out a green according to this pattern, you must not only follow the instructions which describe the pattern itself, but must also try to embed the green within an IDENTIFIABLE NEIGHBORHOOD or in some SUBCULTURE BOUNDARY, and in a way that helps to form QUIET BACKS; and then you must work to complete the green by building in some POSITIVE OUTDOOR SPACE, TREE PLACES, and a GARDEN WALL.

In short, no pattern is an isolated entity. Each pattern can exist in the world, only to the extent that is supported by other patterns: the larger patterns in which it is embedded, the patterns of the same size that surround it, and the smaller patterns which are embedded in it.

This is a fundamental view of the world. It says that when you build a thing you cannot merely build that thing in isolation, but must also repair the world around it, and within it, so that the larger world at that one place becomes more coherent, and more whole; and the thing which you make takes its place in the web of nature, as you make it.

Now we explain the nature of the relation between problems and solutions, within the individual patterns.

Each solution is stated in such a way that it gives the essential field of relationships needed to solve the problem, but in a very general and abstract way—so that you can solve the problem for yourself, in your own way, by adapting it to your preferences, and the local conditions at the place where you are making it.

For this reason, we have tried to write each solution in a way which imposes nothing on you. It contains only those essentials which cannot be avoided if you really

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want to solve the problem. In this sense, we have tried, in each solution, to capture the invariant property common to all places which succeed in solving the problem.

But of course, we have not always succeeded. The solutions we have given to these problems vary in significance. Some are more true, more profound, more certain, than others. To show this clearly we have marked every pattern, in the text itself, with two asterisks, or one asterisk, or no asterisks.

In the patterns marked with two asterisks, we believe that we have succeeded in stating a true invariant: in short, that the solution we have stated summarizes a *property* common to *all possible ways* of solving the stated problem. In these two-asterisk cases we believe, in short, that it is not possible to solve the stated problem properly, without shaping the environment in one way or another according to the pattern that we have given—and that, in these cases, the pattern describes a deep and inescapable property of a well-formed environment.

In the patterns marked with one asterisk, we believe that we have made some progress towards identifying such an invariant: but that with careful work it will certainly be possible to improve on the solution. In these cases, we believe it would be wise for you to treat the pattern with a certain amount of disrespect—and that you seek out variants of the solution which we have given, since there are almost certainly possible ranges of solutions which are not covered by what we have written.

Finally, in the patterns without an asterisk, we are certain that we have *not* succeeded in defining a true

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invariant—that, on the contrary, there are certainly ways of solving the problem different from the one which we have given. In these cases we have still stated a solution, in order to be concrete—to provide the reader with at least one way of solving the problem—but the task of finding the true invariant, the true property which lies at the heart of all possible solutions to this problem, remains undone.

We hope, of course, that many of the people who read, and use this language, will try to improve these patterns—will put their energy to work, in this task of finding more true, more profound invariants—and we hope that gradually these more true patterns, which are slowly discovered, as time goes on, will enter a common language, which all of us can share.

You see then that the patterns are very much alive and evolving. In fact, if you like, each pattern may be looked upon as a hypothesis like one of the hypotheses of science. In this sense, each pattern represents our current best guess as to what arrangement of the physical environment will work to solve the problem presented. The empirical questions center on the problem—does it occur and is it felt in the way we have described it?—and the solution—does the arrangement we propose in fact resolve the problem? And the asterisks represent our degree of faith in these hypotheses. But of course, no matter what the asterisks say, the patterns are still hypotheses, all 253 of them—and are therefore all tentative, all free to evolve under the impact of new experience and observation.

Let us finally explain the status of this language, why

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we have called it “A Pattern Language” with the emphasis on the word “A,” and how we imagine this pattern language might be related to the countless thousands of other languages we hope that people will make for themselves, in the future.

The Timeless Way of Building says that every society which is alive and whole, will have its own unique and distinct pattern language; and further, that every individual in such a society will have a unique language, shared in part, but which as a totality is unique to the mind of the person who has it. In this sense, in a healthy society there will be as many pattern languages as there are people—even though these languages are shared and similar.

The question then arises: What exactly is the status of this published language? In what frame of mind, and with what intention, are we publishing this language here? The fact that it is published as a book means that many thousands of people can use it. Is it not true that there is a danger that people might come to rely on this one printed language, instead of developing their own languages, in their own minds?

The fact is, that we have written this book as a first step in the society-wide process by which people will gradually become conscious of their own pattern languages, and work to improve them. We believe, and have explained in *The Timeless Way of Building*, that the languages which people have today are so brutal, and so fragmented, that most people no longer have any language to speak of at all—and what they do have is not based on human, or natural considerations.

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We have spent years trying to formulate this language, in the hope that when a person uses it, he will be so impressed by its power, and so joyful in its use, that he will understand again, what it means to have a living language of this kind. If we only succeed in that, it is possible that each person may once again embark on the construction and development of his own language—perhaps taking the language printed in this book, as a point of departure.

And yet, we do believe, of course, that this language which is printed here is something more than a manual, or a teacher, or a version of a possible pattern language. Many of the patterns here are archetypal—so deep, so deeply rooted in the nature of things, that it seems likely that they will be a part of human nature, and human action, as much in five hundred years, as they are today. We doubt very much whether anyone could construct a valid pattern language, in his own mind, which did not include the pattern *ARCADIES* (119) for example, or the pattern *ALCOVES* (179).

In this sense, we have also tried to penetrate, as deep as we are able, into the nature of things in the environment: and hope that a great part of this language, which we print here, will be a core of any sensible human pattern language, which any person constructs for himself, in his own mind. In this sense, at least a part of the language we have presented here, is the archetypal core of all possible pattern languages, which can make people feel alive and human.

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SUMMARY OF THE LANGUAGE

A pattern language has the structure of a network. This is explained fully in *The Timeless Way of Building*. However, when we use the network of a language, we always use it as a *sequence*, going through the patterns, moving always from the larger patterns to the smaller, always from the ones which create structures, to the ones which then embellish those structures, and then to those which embellish the embellishments. . . .

Since the language is in truth a network, there is no one sequence which perfectly captures it. But the sequence which follows, captures the broad sweep of the full network; in doing so, it follows a line, dips down, dips up again, and follows an irregular course, a little like a needle following a tapestry.

The sequence of patterns is both a summary of the language, and at the same time, an index to the patterns. If you read through the sentences which connect the groups of patterns to one another, you will get an overview of the whole language. And once you get this overview, you will then be able to find the patterns which are relevant to your own project.

And finally, as we shall explain in the next section, this sequence of patterns is also the "base map," from

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which you can make a language for your own project, by choosing the patterns which are most useful to you, and leaving them more or less in the order that you find them printed here.



We begin with that part of the language which defines a town or community. These patterns can never be "designed" or "built" in one fell swoop—but patient piecemeal growth, designed in such a way that every individual act is always helping to create or generate these larger global patterns, will, slowly and surely, over the years, make a community that has these global patterns in it.

1. INDEPENDENT REGIONS

within each region work toward those regional policies which will protect the land and mark the limits of the cities;

2. THE DISTRIBUTION OF TOWNS
3. CITY COUNTRY FINGERS
4. AGRICULTURAL VALLEYS
5. LACE OF COUNTRY STREETS
6. COUNTRY TOWNS
7. THE COUNTRYSIDE

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SUMMARY OF THE LANGUAGE

through city policies, encourage the piecemeal formation of those major structures which define the city;

8. MOSAIC OF SUBCULTURES
9. SCATTERED WORK
10. MAGIC OF THE CITY
11. LOCAL TRANSPORT AREAS

build up these larger city patterns from the grass roots, through action essentially controlled by two levels of self-governing communities, which exist as physically identifiable places;

12. COMMUNITY OF 7000
13. SUBCULTURE BOUNDARY
14. IDENTIFIABLE NEIGHBORHOOD
15. NEIGHBORHOOD BOUNDARY

connect communities to one another by encouraging the growth of the following networks;

16. WEB OF PUBLIC TRANSPORTATION
17. RING ROADS
18. NETWORK OF LEARNING
19. WEB OF SHOPPING
20. MINI-BUSES

establish community and neighborhood policy to control the character of the local environment according to the following fundamental principles;

21. FOUR-STORY LIMIT

SUMMARY OF THE LANGUAGE

22. NINE PER CENT PARKING
23. PARALLEL ROADS
24. SACRED SITES
25. ACCESS TO WATER
26. LIFE CYCLE
27. MEN AND WOMEN
- both in the neighborhoods and the communities, and in between them, in the boundaries, encourage the formation of local centers;
28. ECCENTRIC NUCLEUS
29. DENSITY RINGS
30. ACTIVITY NODES
31. PROMENADE
32. SHOPPING STREET
33. NIGHT LIFE
34. INTERCHANGE
- around these centers, provide for the growth of housing in the form of clusters, based on face-to-face human groups;
35. HOUSEHOLD MIX
36. DEGREES OF PUBLICNESS
37. HOUSE CLUSTER
38. ROW HOUSES
39. HOUSING HILL
40. OLD PEOPLE EVERYWHERE

SUMMARY OF THE LANGUAGE

- between the house clusters, around the centers, and especially in the boundaries between neighborhoods, encourage the formation of work communities;
41. WORK COMMUNITY
42. INDUSTRIAL RIBBON
43. UNIVERSITY AS A MARKETPLACE
44. LOCAL TOWN HALL
45. NECKLACE OF COMMUNITY PROJECTS
46. MARKET OF MANY SHOPS
47. HEALTH CENTER
48. HOUSING IN BETWEEN
- between the house clusters and work communities, allow the local road and path network to grow informally, piecemeal;
49. LOOPED LOCAL ROADS
50. T JUNCTIONS
51. GREEN STREETS
52. NETWORK OF PATHS AND CARS
53. MAIN GATEWAYS
54. ROAD CROSSING
55. RAISED WALK
56. BIKE PATHS AND RACKS
57. CHILDREN IN THE CITY

SUMMARY OF THE LANGUAGE

in the communities and neighborhoods, provide public open land where people can relax, rub shoulders and renew themselves;

- 58. CARNIVAL
- 59. QUIET BACKS
- 60. ACCESSIBLE GREEN
- 61. SMALL PUBLIC SQUARES
- 62. HIGH PLACES
- 63. DANCING IN THE STREET
- 64. POOLS AND STREAMS
- 65. BIRTH PLACES
- 66. HOLY GROUND

in each house cluster and work community, provide the smaller bits of common land, to provide for local ver-sions of the same needs;

- 67. COMMON LAND
- 68. CONNECTED PLAY
- 69. PUBLIC OUTDOOR ROOM
- 70. GRAVE SITES
- 71. STILL WATER
- 72. LOCAL SPORTS
- 73. ADVENTURE PLAYGROUND
- 74. ANIMALS

within the framework of the common land, the clusters, and the work communities encourage transformation of

SUMMARY OF THE LANGUAGE

the smallest independent social institutions: the families, workgroups, and gathering places. The family, in all its forms;

- 75. THE FAMILY
- 76. HOUSE FOR A SMALL FAMILY
- 77. HOUSE FOR A COUPLE
- 78. HOUSE FOR ONE PERSON
- 79. YOUR OWN HOME

the workgroups, including all kinds of workshops and offices and even children’s learning groups;

- 80. SELF-GOVERNING WORKSHOPS AND OFFICES

- 81. SMALL SERVICES WITHOUT RED TAPE

- 82. OFFICE CONNECTIONS

- 83. MASTER AND APPRENTICES

- 84. TEENAGE SOCIETY

- 85. SHOPFRONT SCHOOLS

- 86. CHILDREN’S HOME

the local shops and gathering places.

- 87. INDIVIDUALLY OWNED SHOPS

- 88. STREET CAFE

- 89. CORNER GROCERY

- 90. BEER HALL

- 91. TRAVELER’S INN

- 92. BUS STOP

SUMMARY OF THE LANGUAGE

- 93. FOOD STANDS
- 94. SLEEPING IN PUBLIC

This completes the global patterns which define a town or a community. We now start that part of the language which gives shape to groups of buildings, and individual buildings, on the land, in three dimensions. These are the patterns which can be “designed” or “built”—the patterns which define the individual buildings and the space between buildings; where we are dealing for the first time with patterns that are under the control of individuals or small groups of individuals, who are able to build the patterns all at once.

The first group of patterns helps to lay out the overall arrangement of a group of buildings: the height and number of these buildings, the entrances to the site, main parking areas, and lines of movement through the complex;

- 95. BUILDING COMPLEX
- 96. NUMBER OF STORIES
- 97. SHIELDED PARKING
- 98. CIRCULATION REALMS
- 99. MAIN BUILDING
- 100. PEDESTRIAN STREET
- 101. BUILDING THOROUGHFARE
- 102. FAMILY OF ENTRANCES
- 103. SMALL PARKING LOTS

SUMMARY OF THE LANGUAGE

fix the position of individual buildings on the site, within the complex, one by one, according to the nature of the site, the trees, the sun: this is one of the most important moments in the language;

- 104. SITE REPAIR
- 105. SOUTH FACING OUTDOORS
- 106. POSITIVE OUTDOOR SPACE
- 107. WINGS OF LIGHT
- 108. CONNECTED BUILDINGS
- 109. LONG THIN HOUSE

within the buildings’ wings, lay out the entrances, the gardens, courtyards, roofs, and terraces: shape both the volume of the buildings and the volume of the space between the buildings at the same time—remembering that indoor space and outdoor space, yin and yang, must always get their shape together;

- 110. MAIN ENTRANCE
- 111. HALF-HIDDEN GARDEN
- 112. ENTRANCE TRANSITION
- 113. CAR CONNECTION
- 114. HIERARCHY OF OPEN SPACE
- 115. COURTYARDS WHICH LIVE
- 116. CASCADE OF ROOFS
- 117. SHELTERING ROOF
- 118. ROOF GARDEN

SUMMARY OF THE LANGUAGE

when the major parts of buildings and the outdoor areas have been given their rough shape, it is the right time to give more detailed attention to the paths and squares between the buildings;

- I19. ARCADES
- I20. PATHS AND GOALS
- I21. PATH SHAPE
- I22. BUILDING FRONTS
- I23. PEDESTRIAN DENSITY
- I24. ACTIVITY POCKETS
- I25. STAIR SEATS
- I26. SOMETHING ROUGHLY IN THE MIDDLE
- I27. INTIMACY GRADIENT
- I28. INDOOR SUNLIGHT
- I29. COMMON AREAS AT THE HEART
- I30. ENTRANCE ROOM
- I31. THE FLOW THROUGH ROOMS
- I32. SHORT PASSAGES
- I33. STAIRCASE AS A STAGE
- I34. ZEN VIEW
- I35. TAPESTRY OF LIGHT AND DARK

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SUMMARY OF THE LANGUAGE

within the framework of the wings and their internal gradients of space and movement, define the most important areas and rooms. First, for a house;

- I36. COUPLE’S REALM
- I37. CHILDREN’S REALM
- I38. SLEEPING TO THE EAST
- I39. FARMHOUSE KITCHEN
- I40. PRIVATE TERRACE ON THE STREET
- I41. A ROOM OF ONE’S OWN
- I42. SEQUENCE OF SITTING SPACES
- I43. BED CLUSTER
- I44. BATHING ROOM
- I45. BULK STORAGE

then the same for offices, workshops, and public buildings;

- I46. FLEXIBLE OFFICE SPACE
- I47. COMMUNAL EATING
- I48. SMALL WORK GROUPS
- I49. RECEPTION WELCOMES YOU
- I50. A PLACE TO WAIT
- I51. SMALL MEETING ROOMS
- I52. HALF-PRIVATE OFFICE

add those small outbuildings which must be slightly independent from the main structure, and put in the access from the upper stories to the street and gardens;

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SUMMARY OF THE LANGUAGE	SUMMARY OF THE LANGUAGE
153. ROOMS TO RENT	172. GARDEN GROWING WILD
154. TEENAGER’S COTTAGE	173. GARDEN WALL
155. OLD AGE COTTAGE	174. TRELLISED WALK
156. SETTLED WORK	175. GREENHOUSE
157. HOME WORKSHOP	176. GARDEN SEAT
158. OPEN STAIRS	177. VEGETABLE GARDEN
	178. COMPOST
prepare to knit the inside of the building to the outside, by treating the edge between the two as a place in its own right, and making human details there;	go back to the inside of the building and attach the neces- sary minor rooms and alcoves to complete the main rooms;
159. LIGHT ON TWO SIDES OF EVERY ROOM	179. ALCOVES
160. BUILDING EDGE	180. WINDOW PLACE
161. SUNNY PLACE	181. THE FIRE
162. NORTH FACE	182. EATING ATMOSPHERE
163. OUTDOOR ROOM	183. WORKSPACE ENCLOSURE
164. STREET WINDOWS	184. COOKING LAYOUT
165. OPENING TO THE STREET	185. SITTING CIRCLE
166. GALLERY SURROUND	186. COMMUNAL SLEEPING
167. SIX-FOOT BALCONY	187. MARRIAGE BED
168. CONNECTION TO THE EARTH	188. BED ALCOVE
	189. DRESSING ROOM
decide on the arrangement of the gardens, and the places in the gardens;	fine tune the shape and size of rooms and alcoves to make them precise and buildable;
169. TERRACED SLOPE	190. CEILING HEIGHT VARIETY
170. FRUIT TREES	
171. TREE PLACES	
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SUMMARY OF THE LANGUAGE

- 191. THE SHAPE OF INDOOR SPACE
- 192. WINDOWS OVERLOOKING LIFE
- 193. HALF-OPEN WALL
- 194. INTERIOR WINDOWS
- 195. STAIRCASE VOLUME
- 196. CORNER DOORS

give all the walls some depth, wherever there are to be alcoves, windows, shelves, closets, or seats;

- 197. THICK WALLS
- 198. CLOSETS BETWEEN ROOMS
- 199. SUNNY COUNTER
- 200. OPEN SHELVES
- 201. WAIST-HIGH SHELF
- 202. BUILT-IN SEATS
- 203. CHILD CAVES
- 204. SECRET PLACE

At this stage, you have a complete design for an individual building. If you have followed the patterns given, you have a scheme of spaces, either marked on the ground, with stakes, or on a piece of paper, accurate to the nearest foot or so. You know the height of rooms, the rough size and position of windows and doors, and you know roughly how the roofs of the building, and the gardens are laid out.

The next, and last part of the language, tells how to

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SUMMARY OF THE LANGUAGE

make a buildable building directly from this rough scheme of spaces, and tells you how to build it, in detail.

Before you lay out structural details, establish a philosophy of structure which will let the structure grow directly from your plans and your conception of the buildings;

- 205. STRUCTURE FOLLOWS SOCIAL SPACES
- 206. EFFICIENT STRUCTURE
- 207. GOOD MATERIALS
- 208. GRADUAL STIFFENING

within this philosophy of structure, on the basis of the plans which you have made, work out the complete structural layout; this is the last thing you do on paper, before you actually start to build;

- 209. ROOF LAYOUT
- 210. FLOOR AND CEILING LAYOUT
- 211. THICKENING THE OUTER WALLS
- 212. COLUMNS AT THE CORNERS
- 213. FINAL COLUMN DISTRIBUTION

put stakes in the ground to mark the columns on the site, and start erecting the main frame of the building according to the layout of these stakes;

- 214. ROOT FOUNDATIONS
- 215. GROUND FLOOR SLAB
- 216. BOX COLUMNS

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SUMMARY OF THE LANGUAGE

- 217. PERIMETER BEAMS
- 218. WALL MEMBRANES
- 219. FLOOR-CEILING VAULTS
- 220. ROOF VAULTS

within the main frame of the building, fix the exact positions for openings—the doors and windows—and frame these openings;

- 221. NATURAL DOORS AND WINDOWS
- 222. LOW SILL
- 223. DEEP REVEALS
- 224. LOW DOORWAY
- 225. FRAMES AS THICKENED EDGES

as you build the main frame and its openings, put in the following subsidiary patterns where they are appropriate;

- 226. COLUMN PLACE
- 227. COLUMN CONNECTION
- 228. STAIR VAULT
- 229. DUCT SPACE
- 230. RADIANT HEAT
- 231. DORMER WINDOWS
- 232. ROOF CAPS

put in the surfaces and indoor details;

- 233. FLOOR SURFACE
- 234. LAPPED OUTSIDE WALLS

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SUMMARY OF THE LANGUAGE

- 235. SOFT INSIDE WALLS
- 236. WINDOWS WHICH OPEN WIDE
- 237. SOLID DOORS WITH GLASS
- 238. FILTERED LIGHT
- 239. SMALL PANES
- 240. HALF-INCH TRIM

build outdoor details to finish the outdoors as fully as the indoor spaces;

- 241. SEAT SPOTS
- 242. FRONT DOOR BENCH
- 243. SITTING WALL
- 244. CANVAS ROOFS
- 245. RAISED FLOWERS
- 246. CLIMBING PLANTS
- 247. PAVING WITH CRACKS BETWEEN THE STONES
- 248. SOFT TILE AND BRICK

complete the building with ornament and light and color and your own things;

- 249. ORNAMENT
- 250. WARM COLORS
- 251. DIFFERENT CHAIRS
- 252. POOLS OF LIGHT
- 253. THINGS FROM YOUR LIFE

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CHOOSING A LANGUAGE FOR YOUR SUBJECT

a porch onto the front of his house. This is the way the language, and its patterns, helped to generate this porch.

I started with PRIVATE TERRACE ON THE STREET (140). That pattern calls for a terrace, slightly raised, connected to the house, and on the street side. SUNNY PLACE (161) suggests that a special place on the sunny side of the yard should be intensified and made into a place by the use of a patio, balcony, outdoor room, etc. I used these two patterns to locate a raised platform on the south side of the house.

To make this platform into an OUTDOOR ROOM (163), I put it half under the existing roof overhang, and kept a mature pyracantha tree right smack in the middle of the platform. The overhead foliage of the tree added to the roof-like enclosure of the space. I put a wind screen of fixed glass on the west side of the platform too, to give it even more enclosure.

I used SIX-FOOT BALCONY (167) to determine the size of the platform. But this pattern had to be used judiciously and not blindly—the reasoning for the pattern has to do with the minimum space required for people to sit comfortably and carry on a discussion around a small side-table. Since I wanted space for at least two of these conversation areas—one under the roof for very hot or rainy days, and one out under the sky for days when you wanted to be full in the sun, the balcony had to be made 12 x 12 feet square.

NOW PATHS AND GOALS (120): Usually, this pattern deals with large paths in a neighborhood, and comes much earlier in a language. But I used it in a special way. It says that the paths which naturally get formed by people's walking, on the land, should be preserved and intensified. Since the path to our front door cut right across the corner of the place where I had planned to put the platform, I cut the corner of the platform off.

The height of the platform above the ground was determined by CEILING HEIGHT VARIETY (190). By building the platform approximately one foot above the ground line, the ceiling height of the covered portion came out at between 6 and 7 feet—just right for a space as small as this. Since this height above the ground level is just about right for sitting, the pattern FRONT DOOR BENCH (242) was automatically satisfied.

There were three columns standing, supporting the roof over

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CHOOSING A LANGUAGE
FOR YOUR PROJECT

All 253 patterns together form a language. They create a coherent picture of an entire region, with the power to generate such regions in a million forms, with infinite variety in all the details.

It is also true that any small sequence of patterns from this language is itself a language for a smaller part of the environment; and this small list of patterns is then capable of generating a million parks, paths, houses, workshops, or gardens.

For example, consider the following ten patterns:

PRIVATE TERRACE ON THE STREET (140)
SUNNY PLACE (161)
OUTDOOR ROOM (163)
SIX-FOOT BALCONY (167)
PATHS AND GOALS (120)
CEILING HEIGHT VARIETY (190)
COLUMNS AT THE CORNERS (212)
FRONT DOOR BENCH (242)
RAISED FLOWERS (245)
DIFFERENT CHAIRS (251)

This short list of patterns is itself a language: it is one of a thousand possible languages for a porch, at the front of a house. One of us chose this small language, to build

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CHOOSING A LANGUAGE FOR YOUR SUBJECT

the old porch. They had to stay where they are, because they hold the roof up. But, following COLUMNS AT THE CORNERS (212), the platform was very carefully tailored to their positions—so that the columns help define the social spaces on either side of them.

Finally, we put a couple of flower boxes next to the “front door bench”—it’s nice to smell them when you sit there—according to RAISED FLOWERS (245). And the old chairs you can see in the porch are DIFFERENT CHAIRS (251).

You can see, from this short example, how powerful and simple a pattern language is. And you are now, perhaps ready to appreciate how careful you must be, when you construct a language for yourself and your own project.



The finished porch

The character of the porch is given by the ten patterns in this short language. In just this way, each part of the environment is given its character by the collection of patterns which we choose to build into it. The character of what you build, will be given to it by the language of patterns you use, to generate it.

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CHOOSING A LANGUAGE FOR YOUR SUBJECT

For this reason, of course, the task of choosing a language for your project is fundamental. The pattern language we have given here contains 253 patterns. You can therefore use it to generate an almost unimaginably large number of possible different smaller languages, for all the different projects you may choose to do, simply by picking patterns from it.

We shall now describe a rough procedure by which you can choose a language for your own project, first by taking patterns from this language we have printed here, and then by adding patterns of your own.

1. First of all, make a copy of the master sequence (pages xix–xxxiv) on which you can tick off the patterns which will form the language for your project. If you don’t have access to a copying machine, you can tick off patterns in the list printed in the book, use paper clips to mark pages, write your own list, use paper markers—whatever you like. But just for now, to explain it clearly, we shall assume that you have a copy of the list in front of you.

2. Scan down the list, and find the pattern which best describes the overall scope of the project you have in mind. This is the starting pattern for your project. Tick it. (If there are two or three possible candidates, don’t worry: just pick the one which seems best: the others will fall in place as you move forward.)

3. Turn to the starting pattern itself, in the book, and read it through. Notice that the other patterns mentioned by name at the beginning and at the end, of the pattern you are reading, are also possible candidates for your language. The ones at the beginning will tend to be “larger” than your project. Don’t include them, unless

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you have the power to help create these patterns, at least in a small way, in the world around your project. The ones at the end are "smaller." Almost all of them will be important. Tick all of them, on your list, unless you have some special reason for not wanting to include them.

4. Now your list has some more ticks on it. Turn to the next highest pattern on the list which is ticked, and open the book to that pattern. Once again, it will lead you to other patterns. Once again, tick those which are relevant—especially the ones which are "smaller" that come at the end. As a general rule, do not tick the ones which are "larger" unless you can do something about them, concretely, in your own project.

5. When in doubt about a pattern, don't include it. Your list can easily get too long: and if it does, it will become confusing. The list will be quite long enough, even if you only include the patterns you especially like.

6. Keep going like this, until you have ticked all the patterns you want for your project.

7. Now, adjust the sequence by adding your own material. If there are things you want to include in your project, but you have not been able to find patterns which correspond to them, then write them in, at an appropriate point in the sequence, near other patterns which are of about the same size and importance. For example, there is no pattern for a sauna. If you want to include one, write it in somewhere near BATHING ROOM (144) in your sequence.

8. And of course, if you want to change any patterns, change them. There are often cases where you may have a personal version of a pattern, which is more true, or

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CHOOSING A LANGUAGE FOR YOUR SUBJECT

more relevant for you. In this case, you will get the most "power" over the language, and make it your own most effectively, if you write the changes in, at the appropriate places in the book. And, it will be most concrete of all, if you change the name of the pattern too—so that it captures your own changes clearly.

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Suppose now that you have a language for your project. The way to use the language depends very much on its scale. Patterns dealing with towns can only be implemented gradually, by grass roots action; patterns for a building can be built up in your mind, and marked out on the ground; patterns for construction must be built physically, on the site. For this reason we have given three separate instructions, for these three different scales. For towns, see page 3; for buildings, see page 463; for construction, see page 935.

The procedures for each of these three scales are described in much more detail with extensive examples, in the appropriate chapters of *The Timeless Way of Building*. For the town—see chapters 24 and 25; for an individual building—see chapters 20, 21, and 22; and for the process of construction which describes the way a building is actually built see chapter 23.

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greater, and more personal things than any rose—and the poem illuminates the person, and the rose, because of this connection. The connection not only illuminates the words, but also illuminates our actual lives.

O Rose thou art sick,
The invisible worm,
That flies in the night
In the howling storm:
Has found out thy bed
Of crimson joy:
And his dark secret love
Does thy life destroy.

WILLIAM BLAKE

The same exactly, happens in a building. Consider, for example, the two patterns **BATHING ROOM** (144) and **STILL WATER** (71). One defines a part of a house where you can bathe yourself slowly, with pleasure, perhaps in company; a place to rest your limbs, and to relax. The other is a place in a neighborhood, where this is water to gaze into, perhaps to swim in, where children can sail boats, and splash about, which nourishes those parts of ourselves which rely on water as one of the great elements of the unconscious.

Suppose now, that we make a complex of buildings where individual bathing rooms are somehow connected to a common pond, or lake, or pool—where the bathing room merges with this common place; where there is no sharp distinction between the individual and family processes of the bathing room, and the common pleasure of the common pool. In this place, these two patterns

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Finally, a note of caution. This language, like English, can be a medium for prose, or a medium for poetry. The difference between prose and poetry is not that different languages are used, but that the same language is used, differently. In an ordinary English sentence, each word has one meaning, and the sentence too, has one simple meaning. In a poem, the meaning is far more dense. Each word carries several meanings; and the sentence as a whole carries an enormous density of interlocking meanings, which together illuminate the whole.

The same is true for pattern languages. It is possible to make buildings by stringing together patterns, in a rather loose way. A building made like this, is an assembly of patterns. It is not dense. It is not profound. But it is also possible to put patterns together in such a way that many many patterns overlap in the same physical space: the building is very dense; it has many meanings captured in a small space; and through this density, it becomes profound.

In a poem, this kind of density, creates illumination, by making identities between words, and meanings, whose identity we have not understood before. In "O Rose thou art sick," the rose is identified with many

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exist in the same space; they are identified; there is a compression of the two, which requires less space, and which is more profound than in a place where they are merely side by side. The compression illuminates each of the patterns, sheds light on its meaning; and also illuminates our lives, as we understand a little more about the connections of our inner needs.

But this kind of compression is not only poetic and profound. It is not only the stuff of poems and exotic statements, but to some degree, the stuff of every English sentence. To some degree, there is compression in every single word we utter, just because each word carries the whisper of the meanings of the words it is connected to. Even "Please pass the butter, Fred" has some compression in it, because it carries overtones that lie in the connections of these words to all the words which came before it.

Each of us, talking to our friends, or to our families, makes use of these compressions, which are drawn out from the connections between words which are given by the language. The more we can feel all the connections in the language, the more rich and subtle are the things we say at the most ordinary times.

And once again, the same is true in building. The compression of patterns into a single space, is not a poetic and exotic thing, kept for special buildings which are works of art. It is the most ordinary economy of space. It is quite possible that all the patterns for a house might, in some form be present, and overlapping, in a simple one-room cabin. The patterns do not need to be strung out, and kept separate. Every building, every room,

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every garden is better, when all the patterns which it needs are compressed as far as it is possible for them to be. The building will be cheaper; and the meanings in it will be denser.

It is essential then, once you have learned to use the language, that you pay attention to the possibility of compressing the many patterns which you put together, in the smallest possible space. You may think of this process of compressing patterns, as a way to make the cheapest possible building which has the necessary patterns in it. It is, also, the only way of using a pattern language to make buildings which are poems.

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TOWNS

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process which we believe is compatible with this piecemeal approach.

1. The core of the planning process we propose is this: The region is made up of a hierarchy of social and political groups, from the smallest and most local groups—families, neighborhoods, and work groups—to the largest groups—city councils, regional assemblies.

Imagine for example a metropolitan region composed very roughly of the following groups, each group a coherent political entity:

- A. The region: 8,000,000 people.
- B. The major city: 500,000 people.
- C. Communities and small towns: 5–10,000 people each.
- D. Neighborhoods: 500–1000 people each.
- E. House clusters and work communities: 30–50 people each.
- F. Families and work groups: 1–15 people each.

2. *Each group makes its own decisions about the environment it uses in common.* Ideally, each group actually owns the common land at its "level." And higher groups do not own or control the land belonging to lower groups—they only own and control the common land that lies *between* them, and which serves the higher group. For instance, a community of 7000 might own the public land lying between its component neighborhoods, but not the neighborhoods themselves. A cooperative house cluster would own the common land between the houses, but not the houses themselves.

3. Each of these groups takes responsibility for those patterns relevant to its own internal structure.

Thus, we imagine, for example, that the various

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We begin with that part of the language which defines a town or a community. These patterns can never be "designed" or "built" in one fell swoop—but patient piecemeal growth, designed in such a way that every individual act is always helping to create or generate these larger global patterns, will, slowly and surely, over the years, make a community that has these global patterns in it.



The first 94 patterns deal with the large-scale structure of the environment: the growth of town and country, the layout of roads and paths, the relationship between work and family, the formation of suitable public institutions for a neighborhood, the kinds of public space required to support these institutions.

We believe that the patterns presented in this section can be implemented best by piecemeal processes, where each project built or each planning decision made is sanctioned by the community according as it does or does not help to form certain large-scale patterns. *We do not believe that these large patterns, which give so much structure to a town or of a neighborhood, can be created by centralized authority, or by laws, or by master plans.* We believe instead that they can emerge gradually and organically, almost of their own accord, if every act of building, large or small, takes on the responsibility for gradually shaping its small corner of the world to make these larger patterns appear there.

In the next few pages we shall describe a planning

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TOWNS

groups we have named might choose to adopt the following patterns:

- A. Region:
 - INDEPENDENT REGIONS
 - DISTRIBUTION OF TOWNS
 - CITY COUNTRY FINGERS . . .
 - MOSAIC OF SUBCULTURES
 - SCATTERED WORK
 - THE MAGIC OF THE CITY . . .
- B. City:
 - COMMUNITY OF 7000
 - SUBCULTURE BOUNDARY . . .
- C. Community:
 - 4. Each neighborhood, community, or city is then free to find various ways of persuading its constituent groups and individuals to implement these patterns gradually.

In every case this will hinge on some kind of incentive. However, the actual incentives chosen might vary greatly, in their power, and degree of enforcement. Some patterns, like CITY COUNTRY FINGERS, might be made a matter of regional law—since nothing less can deter money-hungry developers from building everywhere. Other patterns, like MAIN GATEWAY, BIRTH PLACES, STILL WATER, might be purely voluntary. And other patterns might have various kinds of incentives, intermediate between these extremes.

For example, NETWORK OF PATHS AND CARS, ACCESSIBLE GREENS, and others might be formulated so that tax breaks will be given to those development projects which help to bring them into existence.

5. As far as possible, implementation should be loose and voluntary, based on social responsibility, and not on legislation or coercion.

Suppose, for example, that there is a citywide decision

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to increase industrial uses in certain areas. Within the process here defined, the city could not implement this policy over the heads of the neighborhoods, by zoning or the power of eminent domain or any other actions. They can suggest that it is important, and can increase the flow of money to any neighborhoods willing to implement this larger pattern. They can implement it, in short, if they can find local neighborhoods willing to see their own future in these terms, and willing to modify their own environment to help make it happen locally. As they find such neighborhoods, then it will happen gradually, over a period of years, as the local neighborhoods respond to the incentives.

6. Once such a process is rolling, a community, having adopted the pattern HEALTH CENTER, for example, might invite a group of doctors to come and build such a place. The team of users, designing the clinic would work from the HEALTH CENTER pattern, and all the other relevant patterns that are part of the community's language. They would try to build into their project any higher patterns that the community has adopted—NINE PER CENT PARKING, LOCAL SPORTS, NETWORK OF PATHS AND CARS, ACCESSIBLE GREEN, etc.

7. It is of course possible for individual acts of building to begin working their way toward these larger communal patterns, even before the neighborhood, community, and regional groups are formed.

Thus, for example, a group of people seeking to get rid of noisy and dangerous traffic in front of their houses might decide to tear up the asphalt, and build a GREEN STREET there instead. They would present their case to

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the traffic department based on the arguments presented in the pattern, and on an analysis of the existing street pattern.

Another group wanting to build a small communal workshop, in a neighborhood currently zoned for residential use only, can argue their case based on SCATTERED WORK, SETTLED WORK, etc., and possibly get the city or zoning department to change the zoning regulation on this matter, and thereby slowly work toward introducing patterns, one at a time within the current framework of codes and zoning.

We have worked out a partial version of this process at the Eugene campus of the University of Oregon. That work is described in Volume 3, *The Oregon Experiment*. But a university is quite different from a town, because it has a single centralized owner, and a single source of funds. It is inevitable, therefore, that the process by which individual acts can work together to form larger wholes without restrictive planning from above, can only partly be put into practice there.

The theory which explains how large patterns can be built piecemeal from smaller ones, is given in Chapters 24 and 25 of *The Timeless Way of Building*.

At some time in the future, we hope to write another volume, which explains the political and economic processes needed to implement this process fully, in a town.

I INDEPENDENT REGIONS**



IO

*Do what you can to establish a world government,
with a thousand independent regions, instead of
countries;*

I. INDEPENDENT REGIONS

TOWNS

Metropolitan regions will not come to balance until each one is small and autonomous enough to be an independent sphere of culture.

There are four separate arguments which have led us to this conclusion: 1. The nature and limits of human government. 2. Equity among regions in a world community. 3. Regional planning considerations. 4. Support for the intensity and diversity of human cultures.

1. There are natural limits to the size of groups that can govern themselves in a human way. The biologist J. B. S. Haldane has remarked on this in his paper, "On Being the Right Size":

... just as there is a best size for every animal, so the same is true for every human institution. In the Greek type of democracy all the citizens could listen to a series of orators and vote directly on questions of legislation. Hence their philosophers held that a small city was the largest possible democratic state. ... (J. B. S. Haldane, "On Being the Right Size," *The World of Mathematics*, Vol. II, J. R. Newman, ed. New York: Simon and Schuster, 1956, pp. 962-67).

It is not hard to see why the government of a region becomes less and less manageable with size. In a population of N persons, there are of the order of N^2 person-to-person links needed to keep channels of communication open. Naturally, when N goes beyond a certain limit, the channels of communication needed for democracy and justice and information are simply too clogged, and too complex; bureaucracy overwhelms human processes.

And, of course, as N grows the number of levels in the hierarchy of government increases too. In small countries like Denmark there are so few levels, that any private citizen can have access to the Minister of Education. But this kind of direct access is quite impossible in larger countries like England or the United States.

We believe the limits are reached when the population of a region reaches some 2 to 10 million. Beyond this size, people become remote from the large-scale processes of government. Our estimate may seem extraordinary in the light of modern history: the nation-states have grown mightily and their governments hold power over tens of millions, sometimes hundreds of millions, of people. But these huge powers cannot claim to have a natural size.

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They cannot claim to have struck the balance between the needs of towns and communities, and the needs of the world community as a whole. Indeed, their tendency has been to override local needs and repress local culture, and at the same time aggrandize themselves to the point where they are out of reach, their power barely conceivable to the average citizen.

2. Unless a region has at least several million people in it, it will not be large enough to have a seat in a world government, and will therefore not be able to supplant the power and authority of present nation-states.

We found this point expressed by Lord Weymouth of Westminster, England, in a letter to the *New York Times*, March 15, 1973:

WORLD FEDERATION: A THOUSAND STATES

... the essential foundation stone for world federation on a democratic basis consists of regionalization within centralized government. ... This argument rests on the idea that world government is lacking in moral authority unless each delegate represents an approximately equal portion of the world's population. Working backward from an estimate of the global population in the year 2000, which is anticipated to rise to the 10,000 million mark, I suggest that we should be thinking in terms of an ideal regional state at something around ten million, or between five and fifteen million, to give greater flexibility. This would furnish the U.N. with an assembly of equals of 1000 regional representatives: a body that would be justified in claiming to be truly representative of the world's population.

Weymouth believes that Western Europe could take some of the initiative for triggering this conception of world government. He looks for the movement for regional autonomy to take hold in the European Parliament at Strasbourg; and hopes that power can gradually be transferred from Westminster, Paris, Bonn, etc., to regional councils, federated in Strasbourg.

I am suggesting that in the future we shall see England split down into Kent, Wessex, Mercia, Anglia and Northumbria, with an independent Scotland, Wales and Ireland, of course. Other European examples will include Brittany, Bavaria and Calabria. The national identities of our contemporary Europe will have lost their political significance.

3. Unless the regions have the power to be self-governing, they

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I INDEPENDENT REGIONS

will not be able to solve their own environmental problems. The arbitrary lines of states and countries, which often cut across natural regional boundaries, make it all but impossible for people to solve regional problems in a direct and humanly efficient way.

An extensive and detailed analysis of this idea has been given by the French economist Gravier, who has proposed, in a series of books and papers, the concept of a Europe of the Regions, a Europe decentralized and reorganized around regions which cross present national and subnational boundaries. (For example, the Basel-Strasbourg Region includes parts of France, Germany, and Switzerland; the Liverpool Region includes parts of England and parts of Wales). See Jean-François Gravier, "L'Europe des régions," in 1965 Internationale Regio Planertagung, Schriften der Regio 3, Regio, Basel, 1965, pp. 211-22; and in the same volume see also Emrys Jones, "The Conflict of City Regions and Administrative Units in Britain," pp. 223-35.

4. Finally, unless the present-day great nations have their power greatly decentralized, the beautiful and differentiated languages, cultures, customs, and ways of life of the earth's people, vital to the health of the planet, will vanish. In short, we believe that independent regions are the natural receptacles for language, culture, customs, economy, and laws and that each region should be separate and independent enough to maintain the strength and vigor of its culture.

The fact that human cultures within a city can only flourish when they are at least partly separated from neighboring cultures is discussed in great detail in *MOSAIC OF SUBCULTURES* (8). We are suggesting here that the same argument also applies to regions—that the regions of the earth must also keep their distance and their dignity in order to survive as cultures.

In the best of medieval times, the cities performed this function. They provided permanent and intense spheres of cultural influence, variety, and economic exchange; they were great communes, whose citizens were co-members, each with some say in the city's destiny. We believe that the independent region can become the modern polis—the new commune—that human entity which provides the sphere of culture, language, laws, services, economic exchange, variety, which the old walled city or the polis provided for its members.

TOWNS

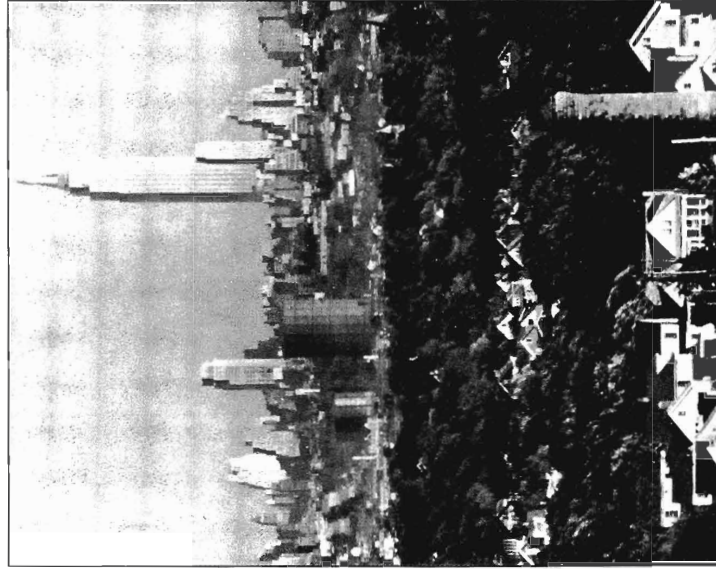
Therefore:

Wherever possible, work toward the evolution of independent regions in the world; each with a population between 2 and 10 million; each with its own natural and geographic boundaries; each with its own economy; each one autonomous and self-governing; each with a seat in a world government, without the intervening power of larger states or countries.



Within each region encourage the population to distribute itself as widely as possible across the region—THE DISTRIBUTION OF TOWNS (2)

2 THE DISTRIBUTION OF TOWNS



within each region work toward those regional policies which will protect the land and mark the limits of the cities:

2. THE DISTRIBUTION OF TOWNS
3. CITY COUNTRY FINGERS
4. AGRICULTURAL VALLEYS
5. LACE OF COUNTRY STREETS
6. COUNTRY TOWNS
7. THE COUNTRYSIDE

. . . consider now the character of settlements within the region: what balance of villages, towns, and cities is in keeping with the independence of the region—INDEPENDENT REGIONS (1)?



If the population of a region is weighted too far toward small villages, modern civilization can never emerge; but if the population is weighted too far toward big cities, the earth will go to ruin because the population isn't where it needs to be, to take care of it.

Two different necessities govern the distribution of population in a region. On the one hand, people are drawn to cities: they are drawn by the growth of civilization, jobs, education, economic growth, information. On the other hand, the region as a social and ecological whole will not be properly maintained unless the people of the region are fairly well spread out across it, living in many different kinds of settlements—farms, villages, towns, and cities—with each settlement taking care of the land around it. Industrial society has so far been following only the first of these necessities. People leave the farms and towns and villages and pack into the cities, leaving vast parts of the region depopulated and undermaintained.

In order to establish a reasonable distribution of population within a region, we must fix two separate features of the distribution: its statistical character and its spatial character. First, we must be sure that the statistical distribution of towns, by size, is appropriate: we must be sure that there are many small towns and few large ones. Second, we must then be sure that the spatial distribution of towns within the region is appropriate: we must be sure that the towns in any given size category are evenly spread out across the region, not highly concentrated.

In practice, the statistical distribution will take care of itself. A large number of studies has shown that the natural demographic and political and economic processes at work in city growth and population movement will create a distribution of

TOWNS

towns with many small towns and few large ones; and indeed, the nature of this distribution does correspond, roughly, to the logarithmic distribution that we propose in this pattern. Various explanations have been given by Christaller, Zipf, Herbert Simon, and others; they are summarized in Brian Berry and William Garrison, "Alternate Explanations of Urban Rank-Size Relationships," *Annals of the Association of American Geographers*, Vol. 48, March 1958, No. 1, pp. 83–91.

Let us assume, then, that towns will have the right distribution of sizes. But are they adjacent to one another, or are they spread out? If all the towns in a region, large, medium, and small, were crammed together in one continuous urban area, the fact that some are large and some are small, though interesting politically, would have no ecological meaning whatsoever. As far as the ecology of the region is concerned, it is the *spatial* distribution of the towns which matters, not the statistics of political boundaries within the urban sprawl.

Two arguments have led us to propose that the towns in any one size category should be uniformly distributed across the region: an economic argument and an ecological argument.

Economic. All over the world, underdeveloped areas are facing economic ruin because the jobs, and then the people, move toward the largest cities, under the influence of their economic gravity. Sweden, Scotland, Israel, and Mexico are all examples. The population moves toward Stockholm, Glasgow, Tel Aviv, Mexico City—as it does so, new jobs get created in the city, and then even more people have to come to the city in search of jobs. Gradually the imbalance between city and country becomes severe. The city becomes richer, the outlying areas continuously poorer. In the end the region may have the highest standard of living in the world at its center, yet only a few miles away, at its periphery, people may be starving.

This can only be halted by policies which guarantee an equal sharing of resources, and economic development, across the entire region. In Israel, for example, there has been some attempt to pour the limited resources with which the government can subsidize economic growth into those areas which are most backward economically. (See "Urban Growth Policies in Six

2 THE DISTRIBUTION OF TOWNS

European Countries," Urban Growth Policy Study Group, Office of International Affairs, HUD, Washington, D.C., 1972.)

Ecological. An overconcentrated population, in space, puts a huge burden on the region's overall ecosystem. As the big cities grow, the population movement overburdens these areas with air pollution, strangled transportation, water shortages, housing shortages, and living densities which go beyond the realm of human reasonableness. In some metropolitan centers, the ecology is perilously close to cracking. By contrast, a population that is spread more evenly over its region minimizes its impact on the ecology of the environment, and finds that it can take care of itself and the land more prudently, with less waste and more humanity:

This is because the actual urban superstructure required per inhabitant goes up radically as the size of the town increases beyond a certain point. For example, the *per capita* cost of high rise flats is much greater than that of ordinary houses; and the cost of roads and other transportation routes increases with the number of commuters carried. Similarly, the *per capita* expenditure on other facilities such as those for distributing food and removing wastes is much higher in cities than in small towns and villages. Thus, if everybody lived in villages the need for sewage treatment plants would be somewhat reduced, while in an entirely urban society they are essential, and the cost of treatment is high. Broadly speaking, it is only by decentralization that we can increase self-sufficiency—and self-sufficiency is vital if we are to minimize the burden of social systems on the ecosystems that support them. The Ecologist, *Blueprint for Survival*, England: Penguin, 1972, pp. 52–53.)

Therefore:

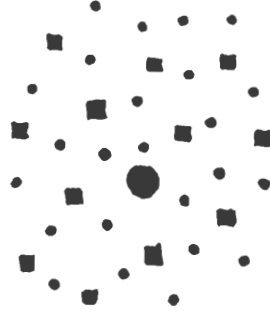
Encourage a birth and death process for towns within the region, which gradually has these effects:

1. The population is evenly distributed in terms of different sizes—for example, one town with 1,000,000 people, 10 towns with 100,000 people each, 100 towns with 10,000 people each, and 1000 towns with 100 people each.
2. These towns are distributed in space in such a way that within each size category the towns are homogeneously distributed all across the region.

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TOWNS

This process can be implemented by regional zoning policies, land grants, and incentives which encourage industries to locate according to the dictates of the distribution.

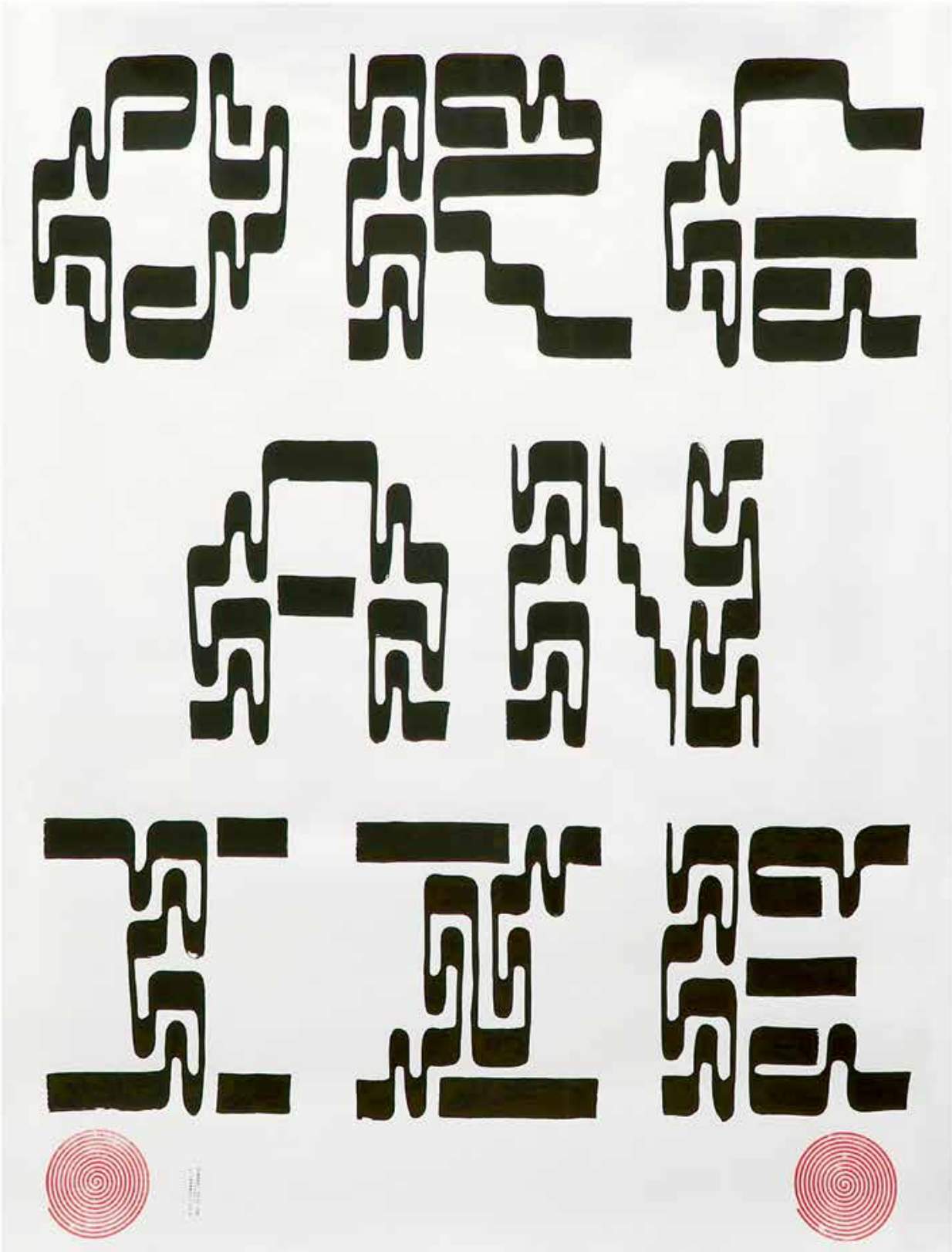


towns of 1,000,000 – 250 miles apart
towns of 100,000 – 80 miles apart
towns of 10,000 – 25 miles apart
towns of 1,000 – 8 miles apart



As the distribution evolves, protect the prime agricultural land for farming—AGRICULTURAL VALLEYS (4); protect the smaller outlying towns, by establishing belts of countryside around them and by decentralizing industry, so that the towns are economically stable—COUNTRY TOWNS (6). In the larger more central urban areas work toward land policies which maintain open belts of countryside between the belts of city—CITY COUNTRY FINGERS (3). . .

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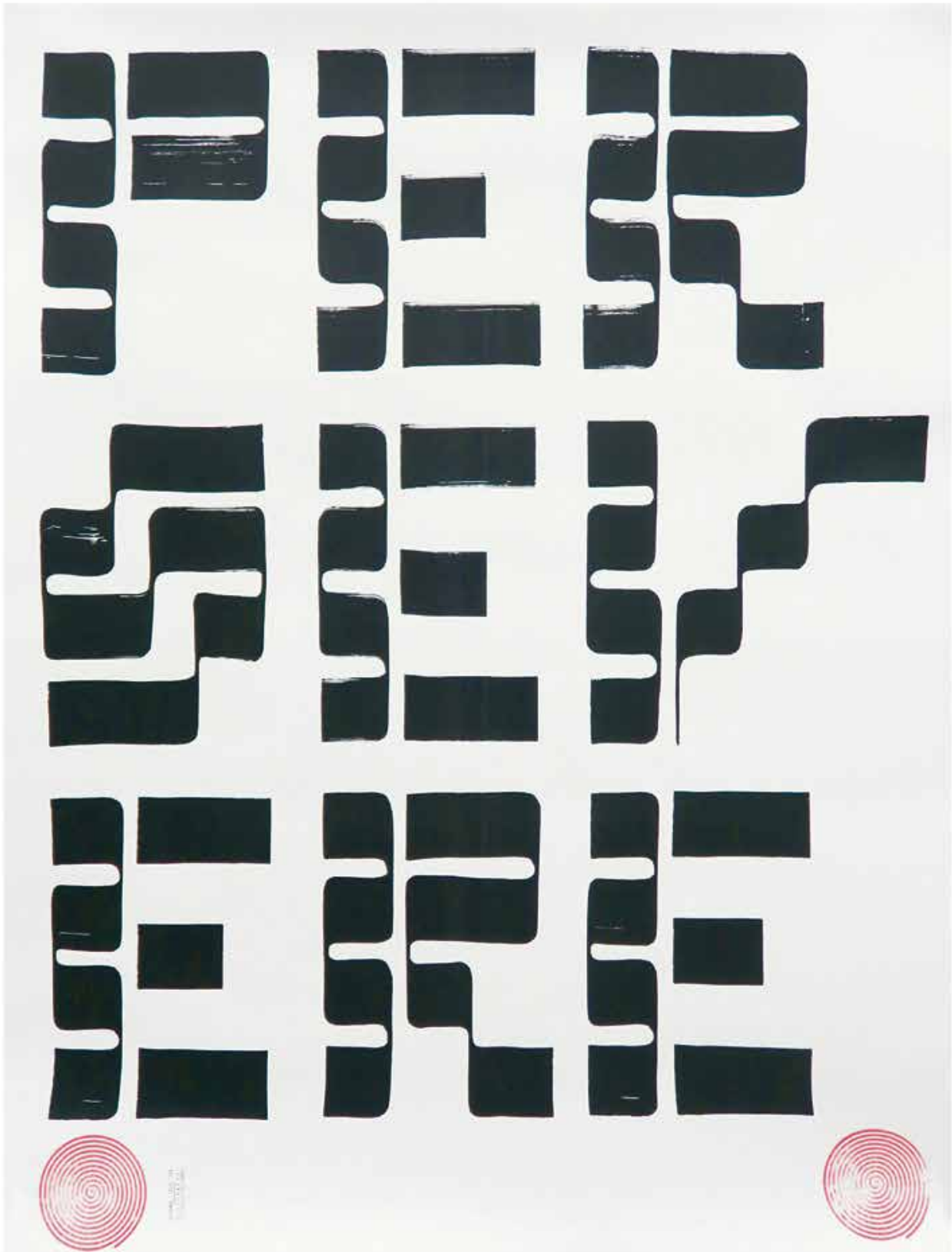
Part III Course readings for ‘Networks and Transactions’
and ‘Interaction Design and the Internet’
Taub Auerbach: (P)(E)(R)(S)(E)(V)(E)(R)(E)

This bulletin appears in lieu of an op-ed solicited by the paper of record, which the author couldn’t quite bring herself to write at the time (November 2016), but didn’t intend to ignore, for reasons she has since come to understand through the material fact of writing itself.

All posters: laser print and rubber stamps, 48 × 36 in., 2017, available to purchase from www.diagonalpress.com.

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Cover: ORGANIZE I, calligraphy poster to support 8 BALL COMMUNITY.



PERSEVERE I, calligraphy poster to support COMMITTEE TO PROTECT JOURNALISTS

September 20, 2017

My favorite exercise in Daniel T. Ames's *Compendium of Practical and Ornamental Penmanship* shows the word "persevere" written in lower-case script. Each letter is surrounded by a loop, similar to the "a" in the @ symbol. The loops are all the same, but the letters are different, so the exercise teaches you to maintain a rhythm amidst otherwise varying circumstances.



About a year ago I moved studios, which prompted me to go through all the work I'd made as an adult — or at least the drafts and margins of projects that had remained in my possession. I was horrified to discover (amongst many other things) that I had, at some point, stopped drawing. Growing up and into my early 20s, I would have been drawing any time I was sitting. For three years I worked in a sign shop called New Bohemia Signs, and I was proud that we did everything by hand the old fashioned way. I swore it would never happen, but I guess eventually I got seduced by the speed of my computer like everyone else.

Last summer, in an effort to revive my hand, I started doing a daily calligraphy practice. I may have been a decent sign painter at one point, but I was never a very good calligrapher. It was frustrating in the extreme. I quickly developed a habit of doing Ames's persevere exercise at the end of every session, because by that point it was a message I badly needed to hear.

Slowly, this word took over my calligraphy sessions. It changed shape and scale, and the rhythm of the loops transformed into some kind of omnipresent oscillation. As I wrote, I'd imagine saying the word to various people I both knew and didn't know. The pen sounded like it was whispering along in a conspiratorial voice. I never mastered Ames's exercise, but I made up many more of my own. Each one built on the last, leaving me with mountains of new "fonts."

In the last year, calligraphy has become the time during which I reflect on



PERSEVERE II, Calligraphy poster to support GEMS (Girls Education and Mentoring Services)

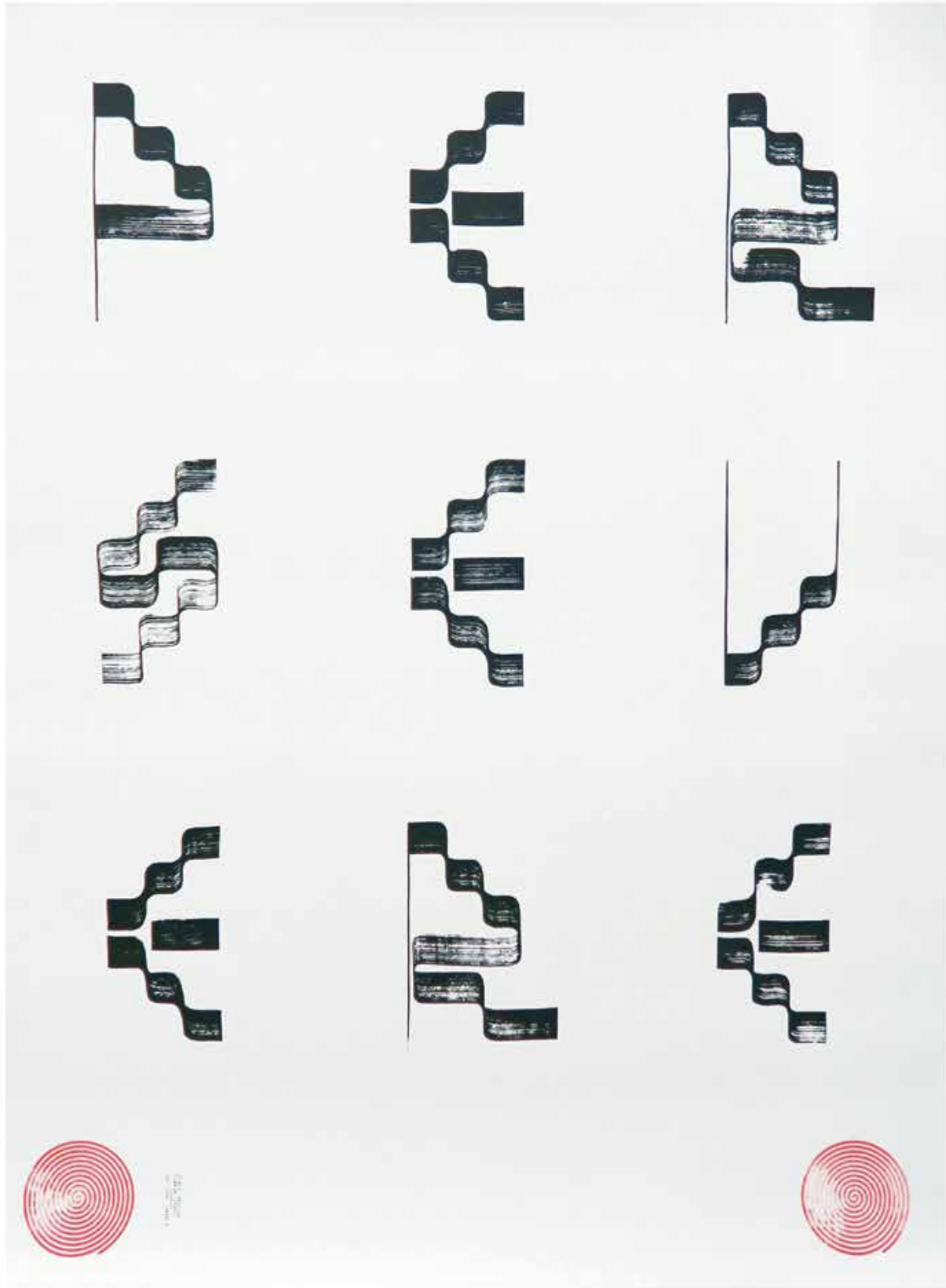
what's happening in the world, what's at stake, and what I'm willing to do about it. Maybe I've just needed something to do with my hands while I listen and think. Until now, my politics have shown up mostly in quotidian, domestic choices like being vegan, composting, and riding a bike. (Feel free to roll your eyes.) I support a few organizations. Big deal. I've always spoken my mind but probably too politely. Besides, all of these choices are luxuries, and none of them register as sacrifices because they actually make my life more enjoyable. Clearly, they are also not sufficient.

Historically, I've sought transformation through catharsis, through a firm or even forceful touch. I've preferred a painful massage to a light one, an intense sprint to a long jog. My belief system around force — as I conceived of it — was upended when I tried Qigong two years ago. It was so gentle, but it changed so much, not only in my body but in my being as a whole. It caused energy to move, spin, pulse, enter through my pores, radiate from my spine. I began to feel things I'd never felt before and taste flavors I'd never tasted. I used to conflate discipline with punishment, but this practice has shown me how generous and even buoyant it can be. Qigong resources power with sensitivity and patience. It is seemingly gentle but it is not at all faint.

Calligraphy and Qigong have several things in common, aside from offering a slow but bright burn. In both, I've found myself negotiating a sweet spot between speed and precision. Go too fast, and you deviate from the gesture. Go too slowly, and your movement gets sticky, losing its flow and sense of conviction. Both are exercises in tuning to various rhythms, initiating action at certain times from one's center and at other times from the periphery. Somehow, these principles seem to apply to the present moment.

I want to speak for the endurance race, to draw attention to the rhythm that lies beneath the ballistic pulse of the news cycle, of bills and bombings and even of elections. There is a more plodding, concurrent tempo at the scale of time in which plants manage to grow through concrete. There is power in this rhythm if we tend to it.

This is not an endorsement of gentleness in the sense I used to think of it, nor of passivity in any sense; it's for relentless steadiness, maintaining a

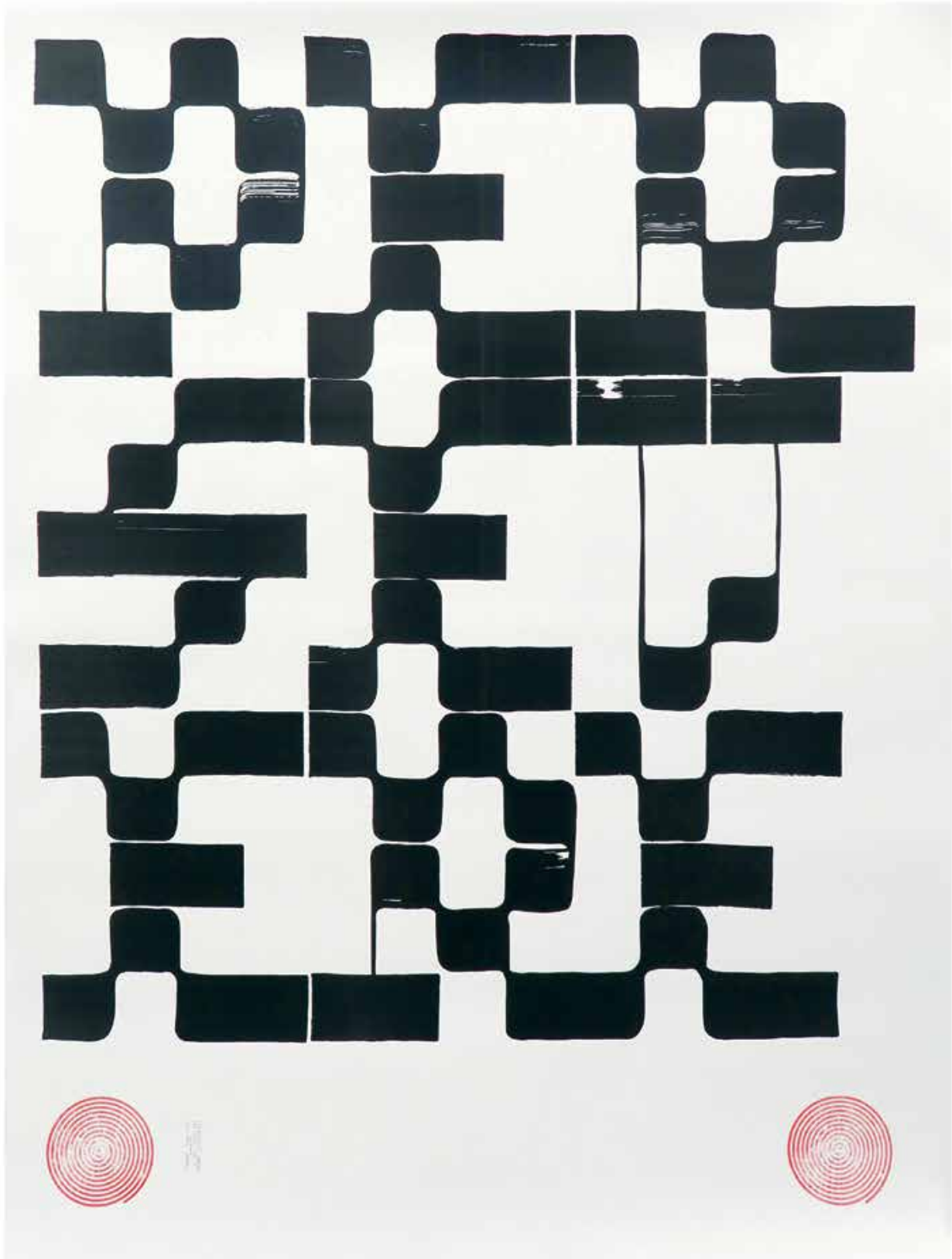


PERSEVERE III, Calligraphy poster to support CHINESE AMERICAN PLANNING COUNCIL

rhythm, for strength drawn from commitment rather than muscle.

I want to spend time in this less flashy realm, at least as much as in the realm of catharsis. Here, people seem to come up with responses rather than reactions and concern themselves with advancing a conversation more than winning an argument. They look inward and ask themselves hard questions. I want us to come at the present obstacles from all sides—top, bottom, and inside, not just the front. If you need evidence that this is a realm in which meaningful change can occur, I refer you not only to the plant but to my piles of quasi-calligraphy. The progress is obvious but also quite different from what I expected.

*



PERSEVERE IV, calligraphy poster to support PHILADELPHIA LAWYERS FOR SOCIAL EQUITY

liberal democracies, ubiquitous individual ability to produce information creates the potential for near-universal intake. It therefore portends significant, though not inevitable, changes in the structure of the public sphere from the commercial mass-media environment. These changes raise challenges for filtering. They underlie some of the critiques of the claims about the democratizing effect of the Internet that I explore later in this chapter. Fundamentally, however, they are the roots of possible change. Beginning with the cost of sending an e-mail to some number of friends or to a mailing list of people interested in a particular subject, to the cost of setting up a Web site or a blog, and through to the possibility of maintaining interactive conversations with large numbers of people through sites like Slashdot, the cost of being a speaker in a regional, national, or even international political conversation is several orders of magnitude lower than the cost of speaking in the mass-mediated environment. This, in turn, leads to several orders of magnitude more speakers and participants in conversation and, ultimately, in the public sphere.

The change is as much qualitative as it is quantitative. The qualitative change is represented in the experience of being a potential speaker, as opposed to simply a listener and voter. It relates to the self-perception of individuals in society and the culture of participation they can adopt. The easy possibility of communicating effectively into the public sphere allows individuals to reorient themselves from passive readers and listeners to potential speakers and participants in a conversation. The way we listen to what we hear changes because of this; as does, perhaps most fundamentally, the way we observe and process daily events in our lives. We no longer need to take these as merely private observations, but as potential subjects for public communication. This change affects the relative power of the media. It affects the structure of intake of observations and views. It affects the presentation of issues and observations for discourse. It affects the way issues are filtered, for whom and by whom. Finally, it affects the ways in which positions are crystallized and synthesized, sometimes still by being amplified to the point that the mass media take them as inputs and convert them into political positions, but occasionally by direct organization of opinion and action to the point of reaching a salience that drives the political process directly.

The basic case for the democratizing effect of the Internet, as seen from the perspective of the mid-1990s, was articulated in an opinion of the U.S. Supreme Court in *Reno v. ACLU*:

Chapter 7 Political Freedom Part 2: Emergence of the Networked Public Sphere

The fundamental elements of the difference between the networked information economy and the mass media are network architecture and the cost of becoming a speaker. The first element is the shift from a hub-and-spoke architecture with unidirectional links to the end points in the mass media, to distributed architecture with multidirectional connections among all nodes in the networked information environment. The second is the practical elimination of communications costs as a barrier to speaking across associational boundaries. Together, these characteristics have fundamentally altered the capacity of individuals, acting alone or with others, to be active participants in the public sphere as opposed to its passive readers, listeners, or viewers. For authoritarian countries, this means that it is harder and more costly, though not perhaps entirely impossible, to both be networked and maintain control over their public spheres. China seems to be doing too good a job of this in the middle of the first decade of this century for us to say much more than that it is harder to maintain control, and therefore that at least in some authoritarian regimes, control will be looser. In

The Web is thus comparable, from the readers' viewpoint, to both a vast library including millions of readily available and indexed publications and a sprawling mall offering goods and services. From the publishers' point of view, it constitutes a vast platform from which to address and hear from a world-wide audience of millions of readers, viewers, researchers, and buyers. Any person or organization with a computer connected to the Internet can "publish" information. Publishers include government agencies, educational institutions, commercial entities, advocacy groups, and individuals. . . .

Through the use of chat rooms, any person with a phone line can become a town crier with a voice that resonates farther than it could from any soapbox. Through the use of Web pages, mail exploders, and newsgroups, the same individual can become a pamphleteer. As the District Court found, "the content on the Internet is as diverse as human thought."¹

The observations of what is different and unique about this new medium relative to those that dominated the twentieth century are already present in the quotes from the Court. There are two distinct types of effects. The first, as the Court notes from "the readers' perspective," is the abundance and diversity of human expression available to anyone, anywhere, in a way that was not feasible in the mass-mediated environment. The second, and more fundamental, is that anyone can be a publisher, including individuals, educational institutions, and nongovernmental organizations (NGOs), alongside the traditional speakers of the mass-media environment—government and commercial entities.

Since the end of the 1990s there has been significant criticism of this early conception of the democratizing effects of the Internet. One line of critique includes variants of the Babel objection: the concern that information overload will lead to fragmentation of discourse, polarization, and the loss of political community. A different and descriptively contradictory line of critique suggests that the Internet is, in fact, exhibiting concentration: Both infrastructure and, more fundamentally, patterns of attention are much less distributed than we thought. As a consequence, the Internet diverts from the mass media much less than we thought in the 1990s and significantly less than we might hope.

I begin the chapter by offering a menu of the core technologies and usage patterns that can be said, as of the middle of the first decade of the twenty-first century, to represent the core Internet-based technologies of democratic discourse. I then use two case studies to describe the social and economic practices through which these tools are implemented to construct the public

sphere, and how these practices differ quite radically from the mass-media model. On the background of these stories, we are then able to consider the critiques that have been leveled against the claim that the Internet democratizes. Close examination of the application of networked information economy to the production of the public sphere suggests that the emerging networked public sphere offers significant improvements over one dominated by commercial mass media. Throughout the discussion, it is important to keep in mind that the relevant comparison is always between the public sphere that we in fact had throughout the twentieth century, the one dominated by mass media, that is the baseline for comparison, not the utopian image of the "everyone a pamphleteer" that animated the hopes of the 1990s for Internet democracy. Departures from the naïve utopia are not signs that the Internet does not democratize, after all. They are merely signs that the medium and its analysis are maturing.

BASIC TOOLS OF NETWORKED COMMUNICATION

Analyzing the effect of the networked information environment on public discourse by cataloging the currently popular tools for communication is, to some extent, self-defeating. These will undoubtedly be supplanted by new ones. Analyzing this effect without having a sense of what these tools are or how they are being used is, on the other hand, impossible. This leaves us with the need to catalog what is, while trying to abstract from what is being used to what relationships of information and communication are emerging, and from these to transpose to a theory of the networked information economy as a new platform for the public sphere.

E-mail is the most popular application on the Net. It is cheap and trivially easy to use. Basic e-mail, as currently used, is not ideal for public communications. While it provides a cheap and efficient means of communicating with large numbers of individuals who are not part of one's basic set of social associations, the presence of large amounts of commercial spam and the amount of mail flowing in and out of mailboxes make indiscriminate e-mail distributions a relatively poor mechanism for being heard. E-mails to smaller groups, preselected by the sender for having some interest in a subject or relationship to the sender, do, however, provide a rudimentary mechanism for communicating observations, ideas, and opinions to a significant circle, on an ad hoc basis. Mailing lists are more stable and self-selecting, and

therefore more significant as a basic tool for the networked public sphere. Some mailing lists are moderated or edited, and run by one or a small number of editors. Others are not edited in any significant way. What separates mailing lists from most Web-based uses is the fact that they push the information on them into the mailbox of subscribers. Because of their attention limits, individuals restrict their subscriptions, so posting on a mailing list tends to be done by and for people who have self-selected as having a heightened degree of common interest, substantive or contextual. It therefore enhances the degree to which one is heard by those already interested in a topic. It is not a communications model of one-to-many, or few-to-many as broadcast is to an open, undefined class of audience members. Instead, it allows one, or a few, or even a limited large group to communicate to a large but limited group, where the limit is self-selection as being interested or even immersed in a subject.

The World Wide Web is the other major platform for tools that individuals use to communicate in the networked public sphere. It enables a wide range of applications, from basic static Web pages, to, more recently, blogs and various social-software-mediated platforms for large-scale conversations of the type described in chapter 3—like Slashdot. Static Web pages are the individual's basic "broadcast" medium. They allow any individual or organization to present basic texts, sounds, and images pertaining to their position. They allow small NGOs to have a worldwide presence and visibility. They allow individuals to offer thoughts and commentaries. They allow the creation of a vast, searchable database of information, observations, and opinions, available at low cost for anyone, both to read and write into. This does not yet mean that all these statements are heard by the relevant others to whom they are addressed. Substantial analysis is devoted to that problem, but first let us complete the catalog of tools and information flow structures.

One Web-based tool and an emerging cultural practice around it that extends the basic characteristics of Web sites as media for the political public sphere are Web logs, or blogs. Blogs are a tool and an approach to using the Web that extends the use of Web pages in two significant ways. Technically, blogs are part of a broader category of innovations that make the web "writable." That is, they make Web pages easily capable of modification through a simple interface. They can be modified from anywhere with a networked computer, and the results of writing onto the Web page are immediately available to anyone who accesses the blog to read. This technical change resulted in two divergences from the cultural practice of Web sites

in the 1990s. First, they allowed the evolution of a journal-style Web page, where individual short posts are added to the Web site in short or large intervals. As practice has developed over the past few years, these posts are usually archived chronologically. For many users, this means that blogs have become a form of personal journal, updated daily or so, for their own use and perhaps for the use of a very small group of friends. What is significant about this characteristic from the perspective of the construction of the public sphere is that blogs enable individuals to write to their Web pages in journalism time—that is, hourly, daily, weekly—whereas Web page culture that preceded it tended to be slower moving, less an equivalent of reportage than of the essay. Today, one certainly finds individuals using blog software to maintain what are essentially static Web pages, to which they add essays or content occasionally, and Web sites that do not use blogging technology but are updated daily. The public sphere function is based on the content and cadence—that is, the use practice—not the technical platform.

The second critical innovation of the writable Web in general and of blogs in particular was the fact that in addition to the owner, readers/users could write to the blog. Blogging software allows the person who runs a blog to permit some, all, or none of the readers to post comments to the blog, with or without retaining power to edit or moderate the posts that go on, and those that do not. The result is therefore not only that many more people write finished statements and disseminate them widely, but also that the end product is a weighted conversation, rather than a finished good. It is a conversation because of the common practice of allowing and posting comments, as well as comments to these comments. Blog writers—bloggers—often post their own responses in the comment section or address comments in the primary section. Blog-based conversation is weighted, because the culture and technical affordances of blogging give the owner of the blog greater weight in deciding who gets to post or comment and who gets to decide these questions. Different blogs use these capabilities differently; some opt for broader-inake and discussion on the board, others for a more tightly edited blog. In all these cases, however, the communications model or information-flow structure that blogs facilitate is a weighted conversation that takes the form of one or a group of primary contributors/authors, together with some larger number, often many, secondary contributors, communicating to an unlimited number of many readers.

The writable Web also encompasses another set of practices that are distinct, but that are often pooled in the literature together with blogs. These

are the various larger-scale, collaborative-content production systems available on the Web, of the type described in chapter 3. Two basic characteristics make sites like Slashdot or Wikipedia different from blogs. First, they are intended for, and used by, very large groups, rather than intended to facilitate a conversation weighted toward one or a small number of primary speakers. Unlike blogs, they are not media for individual or small group expression with a conversation feature. They are intrinsically group communication media. They therefore incorporate social software solutions to avoid deterioration into chaos—peer review, structured posting privileges, reputation systems, and so on. Second, in the case of Wikis, the conversation platform is anchored by a common text. From the perspective of facilitating the synthesis of positions and opinions, the presence of collaborative authorship of texts offers an additional degree of viscosity to the conversation, so that views “stick” to each other, must jostle for space, and accommodate each other. In the process, the output is more easily recognizable as a collective output and a salient opinion or observation than where the form of the conversation is more free-flowing exchange of competing views.

Common to all these Web-based tools—both static and dynamic, individual and cooperative—are linking, quotation, and presentation. It is at the very core of the hypertext markup language (HTML) to make referencing easy. And it is at the very core of a radically distributed network to allow materials to be archived by whoever wants to archive them, and then to be accessible to whoever has the reference. Around these easy capabilities the cultural practice has emerged to reference through links for easy transition from your own page or post to the one you are referring to—whether as inspiration or in disagreement. This culture is fundamentally different from the mass-media culture, where sending a five-hundred-page report to millions of users is hard and expensive. In the mass media, therefore, instead of allowing readers to read the report alongside its review, all that is offered is the professional review in the context of a culture that trusts the reviewer. On the Web, linking to original materials and references is considered a core characteristic of communication. The culture is oriented toward “see for yourself.” Confidence in an observation comes from a combination of the reputation of the speaker as it has emerged over time, reading underlying sources you believe you have some competence to evaluate for yourself, and knowing that for any given referenced claim or source, there is some group of people out there, unaffiliated with the reviewer or speaker, who will have access to the source and the means for making their disagreement with the

speaker's views known. Linking and “see for yourself” represent a radically different, and more participatory model of accreditation than typified the mass media.

Another dimension that is less well developed in the United States than it is in Europe and East Asia is mobility, or the spatial and temporal ubiquity of basic tools for observing and commenting on the world we inhabit. Dan Gillmor is clearly right to include these basic characteristics in his book *We the Media*, adding to the core tools of what he describes as a transformation in journalism, short message service (SMS), and mobile connected cameras to mailing lists, Web logs, Wikis, and other tools. The United States has remained mostly a PC-based networked system, whereas in Europe and Asia, there has been more substantial growth in handheld devices, primarily mobile phones. In these domains, SMS—the “e-mail” of mobile phones—and camera phones have become critical sources of information, in real time. In some poor countries, where cell phone minutes remain very (even prohibitively) expensive for many users and where landlines may not exist, text messaging is becoming a central and ubiquitous communication tool. What these suggest to us is a transition, as the capabilities of both systems converge, to widespread availability of the ability to register and communicate observations in text, audio, and video, wherever we are and whenever we wish. Drazen Pantic tells of how listeners of Internet-based Radio B-92 in Belgrade reported events in their neighborhoods after the broadcast station had been shut down by the Milosevic regime. Howard Rheingold describes in *Smart Mobs* how citizens of the Philippines used SMS to organize real-time movements and action to overthrow their government. In a complex modern society, where things that matter can happen anywhere and at any time, the capacities of people armed with the means of recording, rendering, and communicating their observations change their relationship to the events that surround them. Whatever one sees and hears can be treated as input into public debate in ways that were impossible when capturing, rendering, and communicating were facilities reserved to a handful of organizations and a few thousands of their employees.

NETWORKED INFORMATION ECONOMY MEETS THE PUBLIC SPHERE

The networked public sphere is not made of tools, but of social production practices that these tools enable. The primary effect of the Internet on the

public sphere in liberal societies relies on the information and cultural production activity of emerging nonmarket actors: individuals working alone and cooperatively with others, more formal associations like NGOs, and their feedback effect on the mainstream media itself. These enable the networked public sphere to moderate the two major concerns with commercial mass media as a platform for the public sphere: (1) the excessive power it gives its owners, and (2) its tendency, when owners do not dedicate their media to exert power, to foster an inert polity. More fundamentally, the social practices of information and discourse allow a very large number of actors to see themselves as potential contributors to public discourse and as potential actors in political arenas, rather than mostly passive recipients of mediated information who occasionally can vote their preferences. In this section, I offer two detailed stories that highlight different aspects of the effects of the networked information economy on the construction of the public sphere. The first story focuses on how the networked public sphere allows individuals to monitor and disrupt the use of mass-media power, as well as organize for political action. The second emphasizes in particular how the networked public sphere allows individuals and groups of intense political engagement to report, comment, and generally play the role traditionally assigned to the press in observing, analyzing, and creating political salience for matters of public interest. The case studies provide a context both for seeing how the networked public sphere responds to the core failings of the commercial, mass-media-dominated public sphere and for considering the critiques of the Internet as a platform for a liberal public sphere.

Our first story concerns Sinclair Broadcasting and the 2004 U.S. presidential election. It highlights the opportunities that mass-media owners have to exert power over the public sphere, the variability within the media itself in how this power is used, and, most significant for our purposes here, the potential corrective effect of the networked information environment. At its core, it suggests that the existence of radically decentralized outlets for individuals and groups can provide a check on the excessive power that media owners were able to exercise in the industrial information economy.

Sinclair, which owns major television stations in a number of what were considered the most competitive and important states in the 2004 election—including Ohio, Florida, Wisconsin, and Iowa—informed its staff and stations that it planned to preempt the normal schedule of its sixty-two stations to air a documentary called *Stolen Honor: The Wounds That Never Heal*, as a news program, a week and a half before the elections.² The documentary

was reported to be a strident attack on Democratic candidate John Kerry's Vietnam War service. One reporter in Sinclair's Washington bureau, who objected to the program and described it as "blatant political propaganda," was promptly fired.³ The fact that Sinclair owns stations reaching one quarter of U.S. households, that it used its ownership to preempt local broadcast schedules, and that it fired a reporter who objected to its decision, make this a classic "Berlusconi effect" story, coupled with a poster-child case against media concentration and the ownership of more than a small number of outlets by any single owner. The story of Sinclair's plans broke on Saturday, October 9, 2004, in the *Los Angeles Times*. Over the weekend, "official" responses were beginning to emerge in the Democratic Party. The Kerry campaign raised questions about whether the program violated election laws as an undeclared "in-kind" contribution to the Bush campaign. By Tuesday, October 12, the Democratic National Committee announced that it was filing a complaint with the Federal Elections Commission (FEC), while seventeen Democratic senators wrote a letter to the chairman of the Federal Communications Commission (FCC), demanding that the commission investigate whether Sinclair was abusing the public trust in the airwaves. Neither the FEC nor the FCC, however, acted or intervened throughout the episode.

Alongside these standard avenues of response in the traditional public sphere of commercial mass media, their regulators, and established parties, a very different kind of response was brewing on the Net, in the blogosphere. On the morning of October 9, 2004, the *Los Angeles Times* story was blogged on a number of political blogs—Josh Marshall on talkingpointsmemo.com, Chris Bower on MyDD.com, and Markos Moulitsas on dailykos.com. By midday that Saturday, October 9, two efforts aimed at organizing opposition to Sinclair were posted in the dailykos and MyDD. A "boycott-Sinclair" site was set up by one individual, and was pointed to by these blogs. Chris Bowers on MyDD provided a complete list of Sinclair stations and urged people to call the stations and threaten to picket and boycott. By Sunday, October 10, the dailykos posted a list of national advertisers with Sinclair, urging readers to call them. On Monday, October 11, MyDD linked to that list, while another blog, theleftcoaster.com, posted a variety of action agenda items, from picketing affiliates of Sinclair to suggesting that readers oppose Sinclair license renewals, providing a link to the FCC site explaining the basic renewal process and listing public-interest organizations to work with. That same day, another individual, Nick Davis, started a Web site,

reported that Sinclair affiliates were threatening advertisers who cancelled advertisements with legal action, and called for volunteer lawyers to help respond. Within a brief period, he collected more than a dozen volunteers to help the advertisers. Later that day, another blogger at grassrootsnation.com had set up a utility that allowed users to send an e-mail to all advertisers in the BoycottSBG database. By the morning of Friday, October 15, Davis was reporting more than fifty advertisers pulling ads, and three or four mainstream media reports had picked up the boycott story and reported on it. That day, an analyst at Lehman Brothers issued a research report that downgraded the expected twelve-month outlook for the price of Sinclair stock, citing concerns about loss of advertiser revenue and risk of tighter regulation. Mainstream news reports over the weekend and the following week systematically placed that report in context of local advertisers pulling their ads from Sinclair. On Monday, October 18, the company's stock price dropped by 8 percent (while the S&P 500 rose by about half a percent). The following morning, the stock dropped a further 6 percent, before beginning to climb back, as Sinclair announced that it would not show *Stolen Honor*, but would provide a balanced program with only portions of the documentary and one that would include arguments on the other side. On that day, the company's stock price had reached its lowest point in three years. The day after the announced change in programming decision, the share price bounced back to where it had been on October 15. There were obviously multiple reasons for the stock price losses, and Sinclair stock had been losing ground for many months prior to these events. Nonetheless, as figure 7.1 demonstrates, the market responded quite sluggishly to the announcements of regulatory and political action by the Democratic establishment earlier in the week of October 12, by comparison to the precipitous decline and dramatic bounce-back surrounding the market projections that referred to advertising loss. While this does not prove that the Web-organized, blog-driven and -facilitated boycott was the determining factor, as compared to fears of formal regulatory action, the timing strongly suggests that the efficacy of the boycott played a very significant role.

The first lesson of the Sinclair *Stolen Honor* story is about commercial mass media themselves. The potential for the exercise of inordinate power by media owners is not an imaginary concern. Here was a publicly traded firm whose managers supported a political party and who planned to use their corporate control over stations reaching one quarter of U.S. households, many in swing states, to put a distinctly political message in front of this

BoycottSBG.com, on which he posted the basic idea that a concerted boycott of local advertisers was the way to go, while another site, stopsinclair.org, began pushing for a petition. In the meantime, TalkingPoints published a letter from Reed Hundt, former chairman of the FCC, to Sinclair, and continued finding tidbits about the film and its maker. Later on Monday, TalkingPoints posted a letter from a reader who suggested that stockholders of Sinclair could bring a derivative action. By 5:00 A.M. on the dawn of Tuesday, October 12, however, TalkingPoints began pointing toward Davis's database on BoycottSBG.com. By 10:00 that morning, Marshall posted on TalkingPoints a letter from an anonymous reader, which began by saying: "I've worked in the media business for 30 years and I guarantee you—that sales is what these local TV stations are all about. They don't care about license renewal or overwhelming public outrage. They care about sales only, so only local advertisers can affect their decisions." This reader then outlined a plan for how to watch and list all local advertisers, and then write to the sales managers—not general managers—of the local stations and tell them which advertisers you are going to call, and then call those. By 1:00 P.M. Marshall posted a story of his own experience with this strategy. He used Davis's database to identify an Ohio affiliate's local advertisers. He tried to call the sales manager of the station, but could not get through. He then called the advertisers. The post is a "how to" instruction manual, including admonitions to remember that the advertisers know nothing of this, the story must be explained, and accusatory tones avoided, and so on. Marshall then began to post letters from readers who explained with whom they had talked—a particular sales manager, for example—and who were then referred to national headquarters. He continued to emphasize that advertisers were the right addressees. By 5:00 P.M. that same Tuesday, Marshall was reporting more readers writing in about experiences, and continued to steer his readers to sites that helped them to identify their local affiliate's sales manager and their advertisers.⁴

By the morning of Wednesday, October 13, the boycott database already included eight hundred advertisers, and was providing sample letters for users to send to advertisers. Later that day, BoycottSBG reported that some participants in the boycott had received reply e-mails telling them that their unsolicited e-mail constituted illegal spam. Davis explained that the CAN-SPAM Act, the relevant federal statute, applied only to commercial spam, and pointed users to a law firm site that provided an overview of CAN-SPAM. By October 14, the boycott effort was clearly bearing fruit: Davis

quotations and references to get a sense of the broad range of proposals. Different people could coalesce on different modes of action—150,000 signed the petition on stopsindclair.org, while others began to work on the boycott. Setting up the mechanism was trivial, both technically and as a matter of cost—something a single committed individual could choose to do. Pointing and adoption provided the filtering, and feedback about the efficacy, again distributed through a system of cross-references, allowed for testing and accreditation of this course of action. High-visibility sites, like Talkingpointsmemo or the dailyKos, offered transmissions hubs that disseminated information about the various efforts and provided a platform for interest-group-wide tactical discussions. It remains ambiguous to what extent these dispersed loci of public debate still needed mass-media exposure to achieve broad political salience. BoycottSBG.com received more than three hundred thousand unique visitors during its first week of operations, and more than one million page views. It successfully coordinated a campaign that resulted in real effects on advertisers in a large number of geographically dispersed media markets. In this case, at least, mainstream media reports on these efforts were few, and the most immediate “transmission mechanism” of their effect was the analyst’s report from Lehman, not the media. It is harder to judge the extent to which those few mainstream media reports that did appear featured in the decision of the analyst to credit the success of the boycott efforts. The fact that mainstream media outlets may have played a role in increasing the salience of the boycott does not, however, take away from the basic role played by these new mechanisms of bringing information and experience to bear on a broad public conversation combined with a mechanism to organize political action across many different locations and social contexts.

Our second story focuses not on the new reactive capacity of the networked public sphere, but on its generative capacity. In this capacity, it begins to outline the qualitative change in the role of individuals as potential investigators and commentators, as active participants in defining the agenda and debating action in the public sphere. This story is about Diebold Election Systems (one of the leading manufacturers of electronic voting machines and a subsidiary of one of the foremost ATM manufacturers in the world, with more than \$2 billion a year in revenue), and the way that public criticism of its voting machines developed. It provides a series of observations about how the networked information economy operates, and how it allows large numbers of people to participate in a peer-production enterprise of

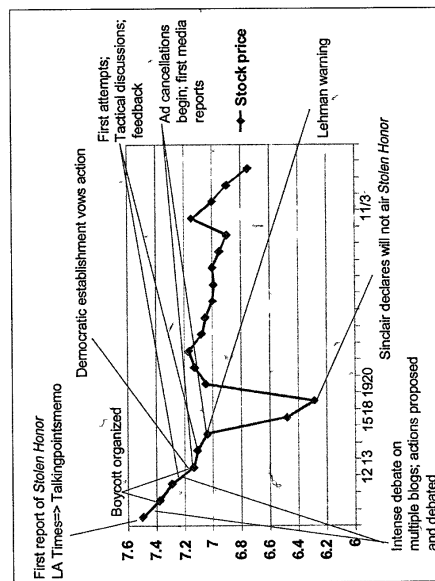


Figure 7.1: Sindclair Stock, October 8–November 5, 2004

large audience. We also learn, however, that in the absence of monopoly, such decisions do not determine what everyone sees or hears, and that other mass-media outlets will criticize each other under these conditions. This criticism alone, however, cannot stop a determined media owner from trying to exert its influence in the public sphere, and if placed as Sindclair was, in locations with significant political weight, such intervention could have substantial influence. Second, we learn that the new, network-based media can exert a significant counterforce. They offer a completely new and much more widely open intake basin for insight and commentary. The speed with which individuals were able to set up sites to stake out a position, to collect and make available information relevant to a specific matter of public concern, and to provide a platform for others to exchange views about the appropriate political strategy and tactics was completely different from anything that the economics and organizational structure of mass media make feasible. The third lesson is about the internal dynamics of the networked public sphere. Filtering and synthesis occurred through discussion, trial, and error. Multiple proposals for action surfaced, and the practice of linking allowed most anyone interested who connected to one of the nodes in the network to follow

news gathering, analysis, and distribution, applied to a quite unsettling set of claims. While the context of the story is a debate over electronic voting, that is not what makes it pertinent to democracy. The debate could have centered on any corporate and government practice that had highly unsettling implications, was difficult to investigate and parse, and was largely ignored by mainstream media. The point is that the networked public sphere did engage, and did successfully turn something that was not a matter of serious public discussion to a public discussion that led to public action.

Electronic voting machines were first used to a substantial degree in the United States in the November 2002 elections. Prior to, and immediately following that election, there was sparse mass-media coverage of electronic voting machines. The emphasis was mostly on the newness, occasional slips, and the availability of technical support staff to help at polls. An *Atlanta Journal-Constitution* story, entitled "Georgia Puts Trust in Electronic Voting, Critics Fret about Absence of Paper Trails,"³ is not atypical of coverage at the time, which generally reported criticism by computer engineers, but conveyed an overall soothing message about the efficacy of the machines and about efforts by officials and companies to make sure that all would be well. The *New York Times* report of the Georgia effort did not even mention the critics.⁴ The *Washington Post* reported on the fears of failure with the newness of the machines, but emphasized the extensive efforts that the manufacturer, Diebold, was making to train election officials and to have hundreds of technicians available to respond to failure.⁵ After the election, the *Atlanta Journal-Constitution* reported that the touch-screen machines were a hit, burying in the text any references to machines that highlighted the wrong candidates or the long lines at the booths, while the *Washington Post* highlighted long lines in one Maryland county, but smooth operation elsewhere. Later, the *Post* reported a University of Maryland study that surveyed users and stated that quite a few needed help from election officials, compromising voter privacy.⁶ Given the centrality of voting mechanisms for democracy, the deep concerns that voting irregularities determined the 2000 presidential elections, and the sense that voting machines would be a solution to the "hanging chads" problem (the imperfectly punctured paper ballots that came to symbolize the Florida fiasco during that election), mass-media reports were remarkably devoid of any serious inquiry into how secure and accurate voting machines were, and included a high quotient of soothing comments from election officials who bought the machines and executives of the manufacturers who sold them. No mass-media outlet sought to go

behind the claims of the manufacturers about their machines, to inquire into their security or the integrity of their tallying and transmission mechanisms against vote tampering. No doubt doing so would have been difficult. These systems were protected as trade secrets. State governments charged with certifying the systems were bound to treat what access they had to the inner workings as confidential. Analyzing these systems requires high degrees of expertise in computer security. Getting around these barriers is difficult. However, it turned out to be feasible for a collection of volunteers in various settings and contexts on the Net.

In late January 2003, Bev Harris, an activist focused on electronic voting machines, was doing research on Diebold, which has provided more than 75,000 voting machines in the United States and produced many of the machines used in Brazil's purely electronic voting system. Harris had set up a whistle-blower site as part of a Web site she ran at the time, *blackboxvoting.com*. Apparently working from a tip, Harris found out about an openly available site where Diebold stored more than forty thousand files about how its system works. These included specifications for, and the actual code of, Diebold's machines and vote-tallying system. In early February 2003, Harris published two initial journalistic accounts on an online journal in New Zealand, *Scoop.com*—whose business model includes providing an unedited platform for commentators who wish to use it as a platform to publish their materials. She also set up a space on her Web site for technically literate users to comment on the files she had retrieved. In early July of that year, she published an analysis of the results of the discussions on her site, which pointed out how access to the Diebold open site could have been used to affect the 2002 election results in Georgia (where there had been a tightly contested Senate race). In an editorial attached to the publication, entitled "Bigger than Watergate," the editors of *Scoop* claimed that what Harris had found was nothing short of a mechanism for capturing the U.S. elections process. They then inserted a number of lines that go to the very heart of how the networked information economy can use peer production to play the role of watchdog:

We can now reveal for the first time the location of a complete online copy of the original data set. As we anticipate attempts to prevent the distribution of this information we encourage supporters of democracy to make copies of these files and to make them available on websites and file sharing networks: <http://users.actrix.co.nz/dolly/>. As many of the files are zip password protected you may need some assistance in opening them, we have found that the utility available at

the following URL works well: <http://www.lostpassword.com>. Finally some of the zip files are partially damaged, but these too can be read by using the utility at <http://www.zip-repair.com/>. At this stage in this inquiry we do not believe that we have come even remotely close to investigating all aspects of this data; i.e., there is no reason to believe that the security flaws discovered so far are the only ones. Therefore we expect many more discoveries to be made. We want the assistance of the online computing community in this enterprise and we encourage you to file your findings at the forum [HERE](#) [providing link to forum].

A number of characteristics of this call to arms would have been simply infeasible in the mass-media environment. They represent a genuinely different mind-set about how news and analysis are produced and how censorship and power are circumvented. First, the ubiquity of storage and communications capacity means that public discourse can rely on "see for yourself" rather than on "trust me." The first move, then, is to make the raw materials available for all to see. Second, the editors anticipated that the company would try to suppress the information. Their response was not to use a counterweight of the economic and public muscle of a big media corporation to protect use of the materials. Instead, it was widespread distribution of information—about where the files could be found, and about where tools to crack the passwords and repair bad files could be found—matched with a call for action: get these files, copy them, and store them in many places so they cannot be squelched. Third, the editors did not rely on large sums of money flowing from being a big media organization to hire experts and interns to scour the files. Instead, they posed a challenge to whoever was interested—there are more scoops to be found, this is important for democracy good hunting! Finally, they offered a platform for integration of the insights on their own forum. This short paragraph outlines a mechanism for radically distributed storage, distribution, analysis, and reporting on the Diebold files.

As the story unfolded over the next few months, this basic model of peer production of investigation, reportage, analysis, and communication indeed worked. It resulted in the decertification of some of Diebold's systems in California, and contributed to a shift in the requirements of a number of states, which now require voting machines to produce a paper trail for recount purposes. The first analysis of the Diebold system based on the files Harris originally found was performed by a group of computer scientists at the Information Security Institute at Johns Hopkins University and released

as a working paper in late July 2003. The Hopkins Report, or Rubin Report as it was also named after one of its authors, Aviel Rubin, presented deep criticism of the Diebold system and its vulnerabilities on many dimensions. The academic credibility of its authors required a focused response from Diebold. The company published a line-by-line response. Other computer scientists joined in the debate. They showed the limitations and advantages of the Hopkins Report, but also, where the Diebold response was adequate and where it provided implicit admission of the presence of a number of the vulnerabilities identified in the report. The report and comments to it sparked two other major reports, commissioned by Maryland in the fall of 2003 and later in January 2004, as part of that state's efforts to decide whether to adopt electronic voting machines. Both studies found a wide range of flaws in the systems they examined and required modifications (see figure 7.2).

Meanwhile, trouble was brewing elsewhere for Diebold. In early August 2003, someone provided *Wired* magazine with a very large cache containing thousands of internal e-mails of Diebold. *Wired* reported that the e-mails were obtained by a hacker, emphasizing this as another example of the laxity of Diebold's security. However, the magazine provided neither an analysis of the e-mails nor access to them. Bev Harris, the activist who had originally found the Diebold materials, on the other hand, received the same cache, and posted the e-mails and memos on her site. Diebold's response was to threaten litigation. Claiming copyright in the e-mails, the company demanded from Harris, her Internet service provider, and a number of other sites where the materials had been posted, that the e-mails be removed. The e-mails were removed from these sites, but the strategy of widely distributed replication of data and its storage in many different topological and organizational settings made Diebold's efforts ultimately futile. The protagonists from this point on were college students. First, two students at Swarthmore College in Pennsylvania, and quickly students in a number of other universities in the United States, began storing the e-mails and scouring them for evidence of impropriety. In October 2003, Diebold proceeded to write to the universities whose students were hosting the materials. The company invoked provisions of the Digital Millennium Copyright Act that require Web-hosting companies to remove infringing materials when copyright owners notify them of the presence of these materials on their sites. The universities obliged, and required the students to remove the materials from their sites. The students, however, did not disappear quietly into the

Central from the perspective of understanding the dynamics of the networked public sphere is not, however, the court case—it was resolved almost a year later, after most of the important events had already unfolded—but the efficacy of the students' continued persistent publication in the teeth of the cease-and-desist letters and the willingness of the universities to comply. The strategy of replicating the files everywhere made it impracticable to keep the documents from the public eye. And the public eye, in turn, scrutinized. Among the things that began to surface as users read the files were internal e-mails recognizing problems with the voting system, with the security of the FTP site from which Harris had originally obtained the specifications of the voting systems, and e-mail that indicated that the machines implemented in California had been "patched" or updated after their certification. That is, the machines actually being deployed in California were at least somewhat different from the machines that had been tested and certified by the state. This turned out to have been a critical find.

California had a Voting Systems Panel within the office of the secretary of state that reviewed and certified voting machines. On November 3, 2003, two weeks after the students launched their electronic disobedience campaign, the agenda of the panel's meeting was to include a discussion of proposed modifications to one of Diebold's voting systems. Instead of discussing the agenda item, however, one of the panel members made a motion to table the item until the secretary of state had an opportunity to investigate, because "It has come to our attention that some very disconcerting information regarding this item [sic] and we are informed that this company, Diebold, may have installed uncertified software in at least one county before it was certified."¹⁰ The source of the information is left unclear in the minutes. A later report in *Wired* cited an unnamed source in the secretary of state's office as saying that somebody within the company had provided this information. The timing and context, however, suggest that it was the revelation and discussion of the e-mail memoranda online that played that role. Two of the members of the public who spoke on the record mention information from within the company. One specifically mentions the information gleaned from company e-mails. In the next committee meeting, on December 16, 2003, one member of the public who was in attendance specifically referred to the e-mails on the Internet, referencing in particular a January e-mail about upgrades and changes to the certified systems. By that December meeting, the independent investigation by the secretary of state had found systematic discrepancies between the systems actually installed

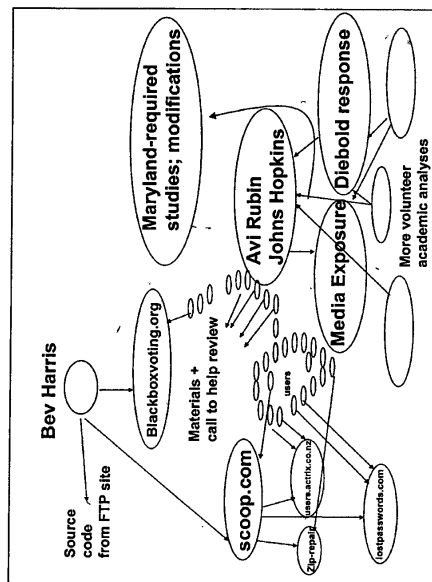


Figure 7.2: Analysis of the Diebold Source Code Materials

night. On October 21, 2003, they launched a multipronged campaign of what they described as "electronic civil disobedience." First, they kept moving the files from one student to another's machine, encouraging students around the country to resist the efforts to eliminate the material. Second, they injected the materials into FreeNet, the anticensorship peer-to-peer publication network, and into other peer-to-peer file-sharing systems, like eDonkey and BitTorrent. Third, supported by the Electronic Frontier Foundation, one of the primary civil-rights organizations concerned with Internet freedom, the students brought suit against Diebold, seeking a judicial declaration that their posting of the materials was privileged. They won both the insurgent campaign and the formal one. As a practical matter, the materials remained publicly available throughout this period. As a matter of law, the litigation went badly enough for Diebold that the company issued a letter promising not to sue the students. The court nonetheless awarded the students damages and attorneys' fees because it found that Diebold had "knowingly and materially misrepresented" that the publication of the e-mail archive was a copyright violation in its letters to the Internet service providers.⁹

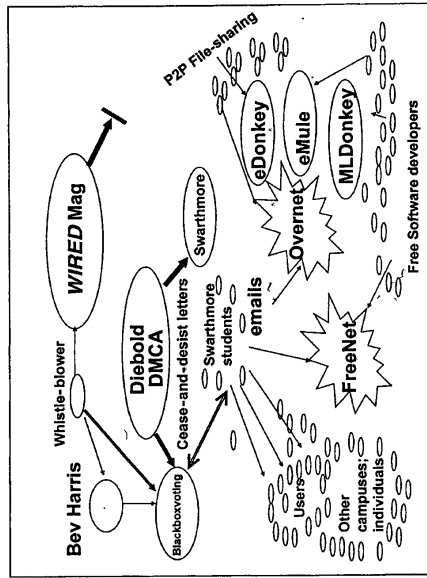


Figure 7.3a: Diebold Internal E-mail, Discovery and Distribution

the direct expression of the opinions of others, becomes a central part of the medium.

CRITIQUES OF THE CLAIMS THAT THE INTERNET HAS DEMOCRATIZING EFFECTS

It is common today to think of the 1990s, out of which came the Supreme Court's opinion in *Reno v. ACLU*, as a time of naïve optimism about the Internet, expressing in political optimism the same enthusiasm that drove the stock market bubble, with the same degree of justifiability. An ideal liberal public sphere did not, in fact, burst into being from the Internet; fully grown like Athena from the forehead of Zeus. The detailed criticisms of the early claims about the democratizing effects of the Internet can be characterized as variants of five basic claims:

1. *Information overload.* A basic problem created when everyone can speak is that there will be too many statements, or too much information. Too

and those tested and certified by the state. The following few months saw more studies, answers, debates, and the eventual decertification of many of the Diebold machines installed in California (see figures 7.3a and 7.3b).

The structure of public inquiry, debate, and collective action exemplified by this story is fundamentally different from the structure of public inquiry and debate in the mass-media-dominated public sphere of the twentieth century. The initial investigation and analysis was done by a committed activist, operating on a low budget and with no financing from a media company. The output of this initial inquiry was not a respectable analysis by a major player in the public debate. It was access to raw materials and initial observations about them, available to start a conversation. Analysis then emerged from a widely distributed process undertaken by Internet users of many different types and abilities. In this case, it included academics studying electronic voting systems, activists, computer systems practitioners, and mobilized students. When the pressure from a well-financed corporation mounted, it was not the prestige and money of a *Washington Post* or a *New York Times* that protected the integrity of the information and its availability for public scrutiny. It was the radically distributed cooperative efforts of students and peer-to-peer network users around the Internet. These efforts were, in turn, nested in other communities of cooperative production—like the free software community that developed some of the applications used to disseminate the e-mails after Swarthmore removed them from the students' own site. There was no single orchestrating power—neither party nor professional commercial-media outlet. There was instead a series of uncoordinated but mutually reinforcing actions by individuals in different settings and contexts, operating under diverse organizational restrictions and affordances, to expose, analyze, and distribute criticism and evidence for it. The networked public sphere here does not rely on advertising or capturing large audiences to focus its efforts. What became salient for the public agenda and shaped public discussion was what intensely engaged active participants, rather than what kept the moderate attention of large groups of passive viewers. Instead of the lowest-common-denominator focus typical of commercial mass media, each individual and group can—and, indeed, most likely will—focus precisely on what is most intensely interesting to its participants. Instead of iconic representation built on the scarcity of time slots and space on the air or on the page, we see the emergence of a “see for yourself” culture. Access to underlying documents and statements, and to

Individuals will view the world through millions of personally customized windows that will offer no common ground for political discourse or action, except among groups of highly similar individuals who customize their windows to see similar things.

Polarization. A descriptively related but analytically distinct critique of Sunstein's was that the fragmentation would lead to polarization. When information and opinions are shared only within groups of like-minded participants, he argued, they tend to reinforce each other's views and beliefs without engaging with alternative views or seeing the concerns and critiques of others. This makes each view more extreme in its own direction and increases the distance between positions taken by opposing camps.

2. *Centralization of the Internet.* A second-generation criticism of the democratizing effects of the Internet is that it turns out, in fact, not to be as egalitarian or distributed as the 1990s conception had suggested. First, there is concentration in the pipelines and basic tools of communications. Second, and more intractable to policy, even in an open network, a high degree of attention is concentrated on a few top sites—a tiny number of sites are read by the vast majority of readers, while many sites are never visited by anyone. In this context, the Internet is replicating the mass-media model, perhaps adding a few channels, but not genuinely changing anything structural.

Note that the concern with information overload is in direct tension with the second-generation concerns. To the extent that the concerns about Internet concentration are correct, they suggest that the information overload is not a deep problem. Sadly, from the perspective of democracy, it turns out that according to the concentration concern, there are few speakers to which most people listen, just as in the mass-media environment. While this means that the supposed benefits of the networked public sphere are illusory, it also means that the information overload concerns about what happens when there is no central set of speakers to whom most people listen are solved in much the same way that the mass-media model deals with the factual diversity of information, opinion, and observations in large societies—by consigning them to public oblivion. The response to both sets of concerns will therefore require combined consideration of a series of questions: To what extent are the claims of concentration correct? How do they solve the information over-

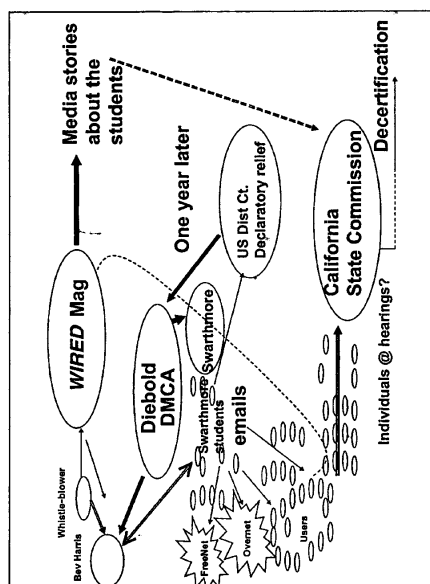


Figure 7.3b: Internal E-mails Translated to Political and Judicial Action

many observations and too many points of view make the problem of sifting through them extremely difficult, leading to an unmanageable din. This overall concern, a variant of the Babel objection, underlies three more specific arguments: that money will end up dominating anyway, that there will be fragmentation of discourse, and that fragmentation of discourse will lead to its polarization.

Money will end up dominating anyway. A point originally raised by Eli Noam is that in this explosively large universe, getting attention will be as difficult as getting your initial message out in the mass-media context, if not more so. The same means that dominated the capacity to speak in the mass-media environment—money—will dominate the capacity to be heard on the Internet, even if it no longer controls the capacity to speak.

Fragmentation of attention and discourse. A point raised most explicitly by Cass Sunstein in *Republic.com* is that the ubiquity of information and the absence of the mass media as condensation points will impoverish public discourse by fragmenting it. There will be no public sphere,

load problem? To what extent does the observed concentration replicate the mass-media model?

3. *Centrality of commercial mass media to the Fourth Estate function.* The importance of the press to the political process is nothing new. It earned the press the nickname "the Fourth Estate" (a reference to the three estates that made up the prerevolutionary French Estates-General, the clergy nobility, and townsmen), which has been in use for at least a hundred and fifty years. In American free speech theory, the press is often described as fulfilling "the watchdog function," deriving from the notion that the public representatives must be watched over to assure they do the public's business faithfully. In the context of the Internet, the concern, most clearly articulated by Neil Netanel, has been that in the modern complex societies in which we live, commercial mass media are critical for preserving the watchdog function of the media. Big, sophisticated, well-funded government and corporate market actors have enormous resources at their disposal to act as they please and to avoid scrutiny and democratic control. Only similarly big, powerful, independently funded media organizations, whose basic market roles are to observe and criticize other large organizations, can match these established elite organizational actors. Individuals and collections of volunteers talking to each other may be nice, but they cannot seriously replace well-funded, economically and politically powerful media.

4. *Authoritarian countries can use filtering and monitoring to squelch Internet use.* A distinct set of claims and their critiques have to do with the effects of the Internet on authoritarian countries. The critique is leveled at a basic belief supposedly, and perhaps actually, held by some cyber-libertarians, that with enough access to Internet tools freedom will burst out everywhere. The argument is that China, more than any other country, shows that it is possible to allow a population access to the Internet—it is now home to the second-largest national population of Internet users—and still control that use quite substantially.

5. *Digital divide.* While the Internet may increase the circle of participants in the public sphere, access to its tools is skewed in favor of those who already are well-off in society—in terms of wealth, race, and skills. I do not respond to this critique in this chapter. First, in the United States, this is less stark today than it was in the late 1990s. Computers and Internet connections are becoming cheaper and more widely available in public libraries and schools. As they become more central to life, they

seem to be reaching higher penetration rates, and growth rates among underrepresented groups are higher than the growth rate among the highly represented groups. The digital divide with regard to basic access within advanced economies is important as long as it persists, but seems to be a transitional problem. Moreover, it is important to recall that the democratizing effects of the Internet must be compared to democracy in the context of mass media, not in the context of an idealized utopia. Computer literacy and skills, while far from universal, are much more widely distributed than the skills and instruments of mass-media production. Second, I devote chapter 9 to the question of how and why the emergence specifically of nonmarket production provides new avenues for substantial improvements in equality of access to various desiderata that the market distributes unevenly, both within advanced economies and globally, where the maldistribution is much more acute. While the digital divide critique can therefore temper our enthusiasm for how radical the change represented by the networked information economy may be in terms of democracy, the networked information economy is itself an avenue for alleviating maldistribution.

The remainder of this chapter is devoted to responding to these critiques, providing a defense of the claim that the Internet can contribute to a more attractive liberal public sphere. As we work through these objections, we can develop a better understanding of how the networked information economy responds to or overcomes the particular systematic failures of mass media as platforms for the public sphere. Throughout this analysis, it is comparison of the attractiveness of the networked public sphere to that baseline—the mass-media-dominated public sphere—not comparison to a nonexistent ideal public sphere or to the utopia of "everyone a pamphleteer," that should matter most to our assessment of its democratic promise.

IS THE INTERNET TOO CHAOTIC, TOO CONCENTRATED, OR NEITHER?

The first-generation critique of the claims that the Internet democratizes focused heavily on three variants of the information overload or Babel objection. The basic descriptive proposition that animated the Supreme Court in *Reno v. ACLU* was taken as more or less descriptively accurate: Everyone would be equally able to speak on the Internet. However, this basic obser-

vation was then followed by a descriptive or normative explanation of why this development was a threat to democracy, or at least not much of a boon. The basic problem that is diagnosed by this line of critique is the problem of attention. When everyone can speak, the central point of failure becomes the capacity to be heard—who listens to whom, and how that question is decided. Speaking in a medium that no one will actually hear with any reasonable likelihood may be psychologically satisfying, but it is not a move in a political conversation. Noam's prediction was, therefore, that there would be a reconcentration of attention: money would reemerge in this environment as a major determinant of the capacity to be heard, certainly no less, and perhaps even more so, than it was in the mass-media environment.¹¹ Sunstein's theory was different. He accepted Nicholas Negroponte's prediction that people would be reading "The Daily Me," that is, that each of us would create highly customized windows on the information environment that would be narrowly tailored to our unique combination of interests. From this assumption about how people would be informed, he spun out two distinct but related critiques. The first was that discourse would be fragmented. With no six o'clock news to tell us what is on the public agenda, there would be no public agenda, just a fragmented multiplicity of private agendas that never coalesce into a platform for political discussion. The second was that, in a fragmented discourse, individuals would cluster into groups of self-reinforcing, self-referential discussion groups. These types of groups, he argued from social scientific evidence, tend to render their participants' views more extreme and less amenable to the conversation across political divides necessary to achieve reasoned democratic decisions.

Extensive empirical and theoretical studies of actual use patterns of the Internet over the past five to eight years has given rise to a second-generation critique of the claim that the Internet democratizes. According to this critique, attention is much more concentrated on the Internet than we thought a few years ago: a tiny number of sites are highly linked, the vast majority of "speakers" are not heard, and the democratic potential of the Internet is lost. If correct, these claims suggest that Internet use patterns solve the problem of discourse fragmentation that Sunstein was worried about. Rather than each user reading a customized and completely different "newspaper," the vast majority of users turn out to see the same sites. In a network with a small number of highly visible sites that practically everyone reads, the discourse fragmentation problem is resolved. Because they are seen by most people, the polarization problem too is solved—the highly visible sites are

not small-group interactions with homogeneous viewpoints. While resolving Sunstein's concerns, this pattern is certainly consistent with Noam's prediction that money would have to be paid to reach visibility, effectively replicating the mass-media model. While centralization would resolve the Babel objection, it would do so only at the expense of losing much of the democratic promise of the Net.

Therefore, we now turn to the question: Is the Internet in fact too chaotic or too concentrated to yield a more attractive democratic discourse than the mass media did? I suggest that neither is the case. At the risk of appearing a chimera of Goldilocks and Pangloss, I argue instead that the observed use of the network exhibits an order that is not too concentrated and not too chaotic, but rather, if not "just right," at least structures a networked public sphere more attractive than the mass-media-dominated public sphere.

There are two very distinct types of claims about Internet centralization. The first, and earlier, has the familiar ring of media concentration. It is the simpler of the two, and is tractable to policy. The second, concerned with the emergent patterns of attention and linking on an otherwise open network, is more difficult to explain and intractable to policy. I suggest, however, that it actually stabilizes and structures democratic discourse, providing a better answer to the fears of information overload than either the mass media or any efforts to regulate attention to matters of public concern.

The media-concentration type argument has been central to arguments about the necessity of open access to broadband platforms, made most forcefully over the past few years by Lawrence Lessig. The argument is that the basic instrumentalities of Internet communications are subject to concentrated markets. This market concentration in basic access becomes a potential point of concentration of the power to influence the discourse made possible by access. Eli Noam's recent work provides the most comprehensive study currently available of the degree of market concentration in media industries. It offers a bleak picture.¹² Noam looked at markets in basic infrastructure components of the Internet: Internet backbones, Internet service providers (ISPs), broadband providers, portals, search engines, browser software, media player software, and Internet telephony. Aggregating across all these sectors, he found that the Internet sector defined in terms of these components was, throughout most of the period from 1984 to 2002, concentrated according to traditional antitrust measures. Between 1992 and 1998, however, this sector was "highly concentrated" by the Justice Department's measure of market concentration for antitrust purposes. Moreover, the power

The critique of concentration in this form therefore does not undermine the claim that the networked information economy, if permitted to flourish, will improve the democratic public sphere. It underscores the threat of excessive monopoly in infrastructure to the sustainability of the networked public sphere. The combination of observations regarding market concentration and an understanding of the importance of a networked public sphere to democratic societies suggests that a policy intervention is possible and desirable. Chapter 11 explains why the relevant intervention is to permit substantial segments of the core common infrastructure—the basic physical transport layer of wireless or fiber and the software and standards that run communications—to be produced and provisioned by users and managed as a commons.

ON POWER LAW DISTRIBUTIONS, NETWORK TOPOLOGY, AND BEING HEARD

A much more intractable challenge to the claim that the networked information economy will democratize the public sphere emerges from observations of a set of phenomena that characterize the Internet, the Web, the blogosphere, and, indeed, most growing networks. In order to extract information out of the universe of statements and communications made possible by the Internet, users are freely adopting practices that lead to the emergence of a new hierarchy. Rather than succumb to the "information overload" problem, users are solving it by congregating in a small number of sites. This conclusion is based on a new but growing literature on the likelihood that a Web page will be linked to by others. The distribution of that probability turns out to be highly skewed. That is, there is a tiny probability that any given Web site will be linked to by a huge number of people, and a very large probability that for a given Web site only one other site, or even no site, will link to it. This fact is true of large numbers of very different networks described in physics, biology, and social science, as well as in communications networks. If true in this pure form about Web usage, this phenomenon presents a serious theoretical and empirical challenge to the claim that Internet communications of the sorts we have seen here meaningfully decentralize democratic discourse. It is not a problem that is tractable to policy. We cannot as a practical matter force people to read different things than what they choose to read; nor should we wish to. If users avoid information overload by focusing on a small subset of sites in an otherwise

of the top ten firms in each of these markets, and in aggregate for firms that had large market segments in a number of these markets, shows that an ever-smaller number of firms were capturing about 25 percent of the revenues in the Internet sector. A cruder, but consistent finding is the FCC's, showing that 96 percent of homes and small offices get their broadband access either from their incumbent cable operator or their incumbent local telephone carrier.¹³ It is important to recognize that these findings are suggesting potential points of failure for the networked information economy. They are not a critique of the democratic potential of the networked public sphere, but rather show us how we could fail to develop it by following the wrong policies.

The risk of concentration in broadband access services is that a small number of firms, sufficiently small to have economic power in the antitrust sense, will control the markets for the basic instrumentalities of Internet communications. Recall, however, that the low cost of computers and the open-ended architecture of the Internet protocol itself are the core enabling facts that have allowed us to transition from the mass-media model to the networked information model. As long as these basic instrumentalities are open and neutral as among users, and are relatively cheap, the basic economics of nonmarket production described in part I should not change. Under competitive conditions, as technology makes computation and communications cheaper, a well-functioning market should ensure that outcome. Under oligopolistic conditions, however, there is a threat that the network will become too expensive to be neutral as among market and nonmarket production. If basic upstream network connections, server space, and up-to-date reading and writing utilities become so expensive that one needs to adopt a commercial model to sustain them, then the basic economic characteristic that typifies the networked information economy—the relatively large role of nonproprietary, nonmarket production—will have been reversed. However, the risk is not focused solely or even primarily on explicit pricing. One of the primary remaining scarce resources in the networked environment is user time and attention. As chapter 5 explained, owners of communications facilities can extract value from their users in ways that are more subtle than increasing price. In particular, they can make some sites and statements easier to reach and see—more prominently displayed on the screen, faster to load—and sell that relative ease to those who are willing to pay.¹⁴ In that environment, nonmarket sites are systematically disadvantaged irrespective of the quality of their content.

open network that allows them to read more or less whatever they want and whatever anyone has written, policy interventions aimed to force a different pattern would be hard to justify from the perspective of liberal democratic theory.

The sustained study of the distribution of links on the Internet and the Web is relatively new—only a few years old. There is significant theoretical work in a field of mathematics called graph theory, or network topology, on power law distributions in networks, on skew distributions that are not pure power law, and on the mathematically related small-worlds phenomenon in networks. The basic intuition is that, if indeed a tiny minority of sites gets a large number of links, and the vast majority gets few or no links, it will be very difficult to be seen unless you are on the highly visible site. Attention patterns make the open network replicate mass media. While explaining this literature over the next few pages, I show that what is in fact emerging is very different from, and more attractive than, the mass-media-dominated public sphere.

While the Internet, the Web, and the blogosphere are indeed exhibiting much greater order than the freewheeling, “everyone a pamphleteer” image would suggest, this structure does not replicate a mass-media model. We are seeing a newly shaped information environment, where indeed few are read by many, but clusters of moderately read sites provide platforms for vastly greater numbers of speakers than were heard in the mass-media environment. Filtering, accreditation, synthesis, and salience are created through a system of peer review by information affinity groups, topical or interest based. These groups filter the observations and opinions of an enormous range of people, and transmit those that pass local peer review to broader groups and ultimately to the polity more broadly, without recourse to market-based points of control over the information flow. Intense interest and engagement by small groups that share common concerns, rather than lowest-common-denominator interest in wide groups that are largely alienated from each other, is what draws attention to statements and makes them more visible. This makes the emerging networked public sphere more responsive to intensely held concerns of a much wider swath of the population than the mass media were capable of seeing, and creates a communications process that is more resistant to corruption by money.

In what way, first, is attention concentrated on the Net? We are used to seeing probability distributions that describe social phenomena following a Gaussian distribution: where the mean and the median are the same and the

probabilities fall off symmetrically as we describe events that are farther from the median. This is the famous Bell Curve. Some phenomena, however, observed initially in Pareto's work on income distribution and Zipf's on the probability of the use of English words in text and in city populations, exhibit completely different probability distributions. These distributions have very long “tails”—that is, they are characterized by a very small number of very high-yield events (like the number of words that have an enormously high probability of appearing in a randomly chosen sentence, like “the” or “to”) and a very large number of events that have a very low probability of appearing (like the probability that the word “probability” or “blogosphere” will appear in a randomly chosen sentence). To grasp intuitively how un-intuitive such distributions are to us, we could think of radio humorist Garrison Keillor's description of the fictitious Lake Wobegon, where “all the children are above average.” That statement is amusing because we assume intelligence follows a normal distribution. If intelligence were distributed according to a power law, most children there would actually be below average—the median is well below the mean in such distributions (see figure 7.4). Later work by Herbert Simon in the 1950s, and by Derek de Solla Price in the 1960s, on cumulative advantage in scientific citations¹⁵ presaged an emergence at the end of the 1990s of intense interest in power law characterizations of degree distributions, or the number of connections any point in a network has to other points, in many kinds of networks—from networks of neurons and axons, to social networks and communications and information networks.

The Internet and the World Wide Web offered a testable setting, where large-scale investigation could be done automatically by studying link structure (who is linked-in to and by whom, who links out and to whom, how these are related, and so on), and where the practical applications of better understanding were easily articulated—such as the design of better search engines. In 1999, Albert-László Barabási and Reka Albert published a paper in *Science* showing that a variety of networked phenomena have a predictable topology: The distribution of links into and out of nodes on the network follows a power law. There is a very low probability that any vertex, or node, in the network will be very highly connected to many others, and a very large probability that a very large number of nodes will be connected only very loosely, or perhaps not at all. Intuitively, a lot of Web sites link to information that is located on Yahoo!, while very few link to any randomly selected individual's Web site. Barabási and Albert hypothesized a mechanism

mental factor that determines that the drop-off between the most linked-to site and the second most linked-to site, and the third, and so on, will be so dramatically rapid, and how rapid it is) for inlinks is roughly 2.1 and for outlinks 2.7.

If one assumes that most people read things by either following links, or by using a search engine, like Google, that heavily relies on counting inlinks to rank its results, then it is likely that the number of visitors to a Web page, and more recently, the number of readers of blogs, will follow a similarly highly skew distribution. The implication for democracy that comes most immediately to mind is dismal. While, as the Supreme Court noted with enthusiasm, on the Internet everyone can be a pamphleteer or have their own soapbox, the Internet does not, in fact, allow individuals to be heard in ways that are substantially more effective than standing on a soapbox in a city square. Many Web pages and blogs will simply go unread, and will not contribute to a more engaged polity. This argument was most clearly made in Barabási's popularization of his field, *Linked*: "The most intriguing result of our Web-mapping project was the complete absence of democracy, fairness, and egalitarian values on the Web. We learned that the topology of the Web prevents us from seeing anything but a mere handful of the billion documents out there."¹⁸

The stories offered in this chapter and throughout this book present a puzzle for this interpretation of the power law distribution of links in the network as re-creating a concentrated medium. The success of Nick Davis's site, Boycott3BG, would be a genuine fluke. The probability that such a site could be established on a Monday, and by Friday of the same week would have had three hundred thousand unique visitors and would have orchestrated a successful campaign, is so small as to be negligible. The probability that a completely different site, StopSindair.org, of equally network-obscure origins, would be established on the very same day and also successfully catch the attention of enough readers to collect 150,000 signatures on a petition to protest Sinclair's broadcast, rather than wallowing undetected in the mass of self-published angry commentary, is practically insignificant. And yet, intuitively, it seems unsurprising that a large population of individuals who are politically mobilized on the same side of the political map and share a political goal in the public sphere—using a network that makes it trivially simple to set up new points of information and coordination, tell each other about them, and reach and use them from anywhere—would, in fact, inform each other and gather to participate in a political demonstration. We saw

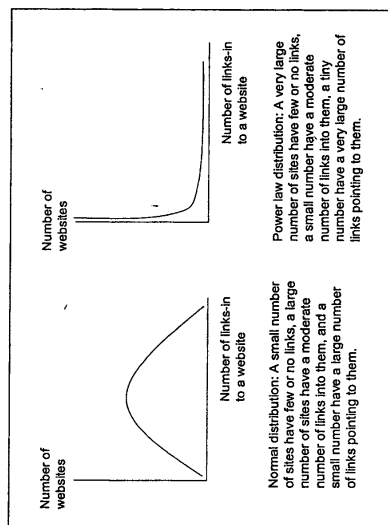


Figure 7.4: Illustration of How Normal Distribution and Power Law Distribution Would Differ in Describing How Many Web Sites Have Few or Many Links Pointing at Them

for this distribution to evolve, which they called "preferential attachment." That is, new nodes prefer to attach to already well-attached nodes. Any network that grows through the addition of new nodes, and in which nodes preferentially attach to nodes that are already well attached, will eventually exhibit this distribution.¹⁶ In other words, the rich get richer. At the same time, two computer scientists, Lada Adamic and Bernardo Huberman, published a study in *Nature* that identified the presence of power law distributions in the number of Web pages in a given site. They hypothesized not that new nodes preferentially attach to old ones, but that each site has an intrinsically different growth rate, and that new sites are formed at an exponential rate.¹⁷ The intrinsically different growth rates could be interpreted as quality, interest, or perhaps investment of money in site development and marketing. They showed that on these assumptions, a power law distribution would emerge. Since the publication of these articles we have seen an explosion of theoretical and empirical literature on graph theory, or the structure and growth of networks, and particularly on link structure in the World Wide Web. It has consistently shown that the number of links into and out of Web sites follows power laws and that the exponent (the expo-

required that they modify their equations to include something similar to what Huberman and Adamic had proposed—an intrinsic growth factor for each node, as well as the preferential connection of new nodes to established nodes.¹⁹ This modification is important because it means that not every new node is doomed to be unread relative to the old ones, only that on average they are much less likely to be read. It makes room for rapidly growing new nodes, but does not theorize what might determine the rate of growth. It is possible, for example, that money could determine growth rates: In order to be seen, new sites or statements would have to spend money to gain visibility and salience. As the BoycottSBG and Diebold stories suggest, however, as does the Lott story described later in this chapter, there are other ways of achieving immediate salience. In the case of BoycottSBG, it was providing a solution that resonated with the political beliefs of many people and was useful to them for their expression and mobilization. Moreover, the continued presence of preferential attachment suggests that noncommercial Web sites that are already highly connected because of the time they were introduced (like the Electronic Frontier Foundation), because of their internal attractiveness to large communities (like Slashdot), or because of their salience to the immediate interests of users (like BoycottSBG), will have persistent visibility even in the face of large infusions of money by commercial sites.

Developments in network topology theory and its relationship to the structure of the empirically mapped real Internet offer a map of the networked information environment that is indeed quite different from the naïve model of "everyone a pamphleteer." To the limited extent that these findings have been interpreted for political meaning, they have been seen as a disappointment—the real world, as it turns out, does not measure up to anything like that utopia. However, that is the wrong baseline. There never has been a complex, large modern democracy in which everyone could speak and be heard by everyone else. The correct baseline is the one-way structure of the commercial mass media. The normatively relevant descriptive questions are whether the networked public sphere provides broader intake, participatory filtering, and relatively incorruptible platforms for creating public salience. I suggest that it does. Four characteristics of network topology structure the Web and the blogosphere in an ordered, but nonetheless meaningfully participatory form. First, at a microlevel, sites cluster—in particular, topically and interest-related sites link much more heavily to each other than to other sites. Second, at a macrolevel, the Web and the blogosphere have

that the boycott technique that Davis had designed his Web site to facilitate was discussed on TalkingPoints—a site near the top of the power law distribution of political blogs—but that it was a proposal by an anonymous individual who claimed to know what makes local affiliates tick, not of TalkingPoints author Josh Marshall. By midweek, after initially stoking the fires of support for Davis's boycott, Marshall had stepped back, and Davis's site became the clearing point for reports, tactical conversations, and mobilization. Davis not only was visible, but rather than being drowned out by the high-powered transmitter, TalkingPoints, his relationship with the high-visibility site was part of his success. This story alone cannot, of course, "refute" the power law distribution of network links, nor is it offered as a refutation. It does, however, provide a context for looking more closely at the emerging understanding of the topology of the Web, and how it relates to the fears of concentration of the Internet, and the problems of information overload, discourse fragmentation, and the degree to which money will come to dominate such an unstructured and wide-open environment. It suggests a more complex story than simply "the rich get richer" and "you might speak, but no one will hear you." In this case, the topology of the network allowed rapid emergence of a position, its filtering and synthesis, and its rise to salience. Network topology helped facilitate all these components of the public sphere, rather than undermined them. We can go back to the mathematical and computer science literature to begin to see why.

Within two months of the publication of Barabási and Albert's article, Adamic and Huberman had published a letter arguing that, if Barabási and Albert were right about preferential attachment, then older sites should systematically be among those that are at the high end of the distribution, while new ones will wallow in obscurity. The older sites are already attached, so newer sites would preferentially attach to the older sites. This, in turn, would make them even more attractive when a new crop of Web sites emerged and had to decide which sites to link to. In fact, however, Adamic and Huberman showed that there is no such empirical correlation among Web sites. They argued that their mechanism—that nodes have intrinsic growth rates that are different—better describes the data. In their response, Barabási and Albert showed that on their data set, the older nodes are actually more connected in a way that follows a power law, but only on average—that is to say, the average number of connections of a class of older nodes related to the average number of links to a younger class of nodes follows a power law. This argued that their basic model was sound, but

the clustering coefficient of a network that exhibits power law distribution of connections or degrees—that is, its tendency to cluster—is related to the exponent of the distribution. At low exponents, below 2.333, the clustering coefficient becomes high. This explains analytically the empirically observed high level of clustering on the Web, whose exponent for inlinks has been empirically shown to be 2.1.²³

Second, at a macrolevel and in smaller subclusters, the power law distribution does not resolve into everyone being connected in a mass-media model relationship to a small number of major "backbone" sites. As early as 1999, Broder and others showed that a very large number of sites occupy what has been called a giant, strongly connected core.²⁴ That is, nodes within this core are heavily linked and interlinked, with multiple redundant paths among them. Empirically, as of 2001, this structure was comprised of about 28 percent of nodes. At the same time, about 22 percent of nodes had links into the core, but were not linked to from it—these may have been new sites, or relatively lower-interest sites. The same proportion of sites was linked to from the core, but did not link back to it—these might have been ultimate depositories of documents, or internal organizational sites. Finally, roughly the same proportion of sites occupied "tendrils" or "tubes" that cannot reach, or be reached from, the core. Tendrils can be reached from the group of sites that link into the strongly connected core or can reach into the group that can be connected to from the core. Tubes connect the inlinking sites to the outlinking sites without going through the core. About 10 percent of sites are entirely isolated. This structure has been called a "bow tie"—with a large core and equally sized in- and outflows to and from that core (see figure 7.5).

One way of interpreting this structure as counterdemocratic is to say: This means that half of all Web sites are not reachable from the other half—the "IN," "tendrils," and disconnected portions cannot be reached from any of the sites in SCC and OUT. This is indeed disappointing from the "everyone a pamphleteer" perspective. On the other hand, one could say that half of all Web pages, the SCC and OUT components, are reachable from IN and SCC. That is, hundreds of millions of pages are reachable from hundreds of millions of potential entry points. This represents a very different intake function and freedom to speak in a way that is potentially accessible to others than a five-hundred-channel, mass-media model. More significant yet, Dill and others showed that the bow tie structure appears not only at the level of the Web as a whole, but repeats itself within clusters. That is, the Web

giant, strongly connected cores—"areas" where 20–30 percent of all sites are highly and redundantly interlinked; that is, tens or hundreds of millions of sites, rather than ten, fifty, or even five hundred television stations. That pattern repeats itself in smaller subclusters as well. Third, as the cluster gets small enough, the obscurity of sites participating in the cluster diminishes, while the visibility of the superstars remains high, forming a filtering-and transmission backbone for universal intake and local filtering. Fourth and finally, the Web exhibits "small-world" phenomena, making most Web sites reachable through shallow paths from most other Web sites. I will explain each of these below, as well as how they interact to form a reasonably attractive image of the networked public sphere.

First, links are not smoothly distributed throughout the network. Sites cluster into densely linked "regions" or communities of interest. Computer scientists have looked at clustering from the perspective of what topical or other correlated characteristics describe these relatively high-density interconnected regions of nodes. What they found was perhaps entirely predictable from an intuitive perspective of the network users, but important as we try to understand the structure of information flow on the Web. Web sites cluster into topical and social/organizational clusters. Early work done in the IBM Almaden Research Center on how link structure could be used as a search technique showed that by mapping densely interlinked sites without looking at content, one could find communities of interest that identify very fine-grained topical connections, such as Australian fire brigades or Turkish students in the United States.²⁰ A later study out of the NEC Research Institute more formally defined the interlinking that would identify a "community" as one in which the nodes were more densely connected to each other than they were to nodes outside the cluster by some amount. The study also showed that topically connected sites meet this definition: For instance, sites related to molecular biology clustered with each other—in the sense of being more interlinked with each other than with off-topic sites—as did sites about physics and black holes.²¹ Lada Adamic and Natalie Glance recently showed that liberal political blogs and conservative political blogs densely interlink with each other, mostly pointing within each political leaning but with about 15 percent of links posted by the most visible sites also linking across the political divide.²² Physicists analyze clustering as the property of transitivity in networks: the increased probability that if node A is connected to node B, and node B is connected to node C, that node A also will be connected to node C, forming a triangle. Newman has shown that

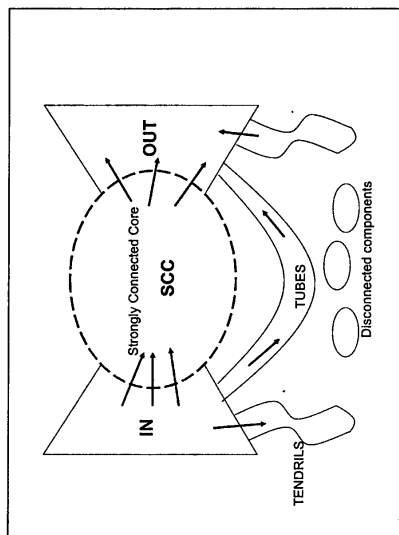


Figure 7.5: Bow Tie Structure of the Web

appears to show characteristics of self-similarity, up to a point—links within clusters also follow a power law distribution and cluster, and have a bow tie structure of similar proportions to that of the overall Web. Tying the two points about clustering and the presence of a strongly connected core, Dill and his coauthors showed that what they called “thematically unified clusters,” such as geographically or content-related groupings of Web sites, themselves exhibit these strongly connected cores that provided a thematically defined navigational backbone to the Web. It is not that one or two major sites were connected to by all thematically related sites; rather, as at the network level, on the order of 25–30 percent were highly interlinked, and another 25 percent were reachable from within the strongly connected core.²⁵ Moreover, when the data was pared down to treat only the home page, rather than each Web page within a single site as a distinct “node” (that is, everything that came under www.foo.com was treated as one node, as opposed to the usual method where [www.foo.com/nonsuch](http://www.foo.com), and www.foo.com/somethingelse are each treated as a separate node), fully 82 percent of the nodes were in the strongly connected core, and an additional 13 percent were reachable from the SCC as the OUT group.

Third, another finding of Web topology and critical adjustment to the

basic Barabási and Albert model is that when the topically or organizationally related clusters become small enough—on the order of hundreds or even low thousands of Web pages—they no longer follow a pure power law distribution. Instead, they follow a distribution that still has a very long tail—these smaller clusters still have a few genuine “superstars”—but the body of the distribution is substantially more moderate: beyond the few superstars, the shape of the link distribution looks a little more like a normal distribution. Instead of continuing to drop off exponentially, many sites exhibit a moderate degree of connectivity. Figure 7.6 illustrates how a hypothetical distribution of this sort would differ both from the normal and power law distributions illustrated in figure 7.4. David Pennock and others, in their paper describing these empirical findings, hypothesized a uniform component added to the purely exponential original Barabási and Albert model. This uniform component could be random (as they modeled it), but might also stand for quality of materials, or level of interest in the site by participants in the smaller cluster. At large numbers of nodes, the exponent dominates the uniform component, accounting for the pure power law distribution when looking at the Web as a whole, or even at broadly defined topics. In smaller clusters of sites, however, the uniform component begins to exert a stronger pull on the distribution. The exponent keeps the long tail intact, but the uniform component accounts for a much more moderate body. Many sites will have dozens, or even hundreds of links. The Pennock paper looked at sites whose number was reduced by looking only at sites of certain organizations—universities or public companies. Chakrabarti and others later confirmed this finding for topical clusters as well. That is, when they looked at small clusters of topically related sites, the distribution of links still has a long tail for a small number of highly connected sites in every topic, but the body of the distribution diverges from a power law distribution, and represents a substantial proportion of sites that are moderately linked.²⁶ Even more specifically, Daniel Drezner and Henry Farrell reported that the Pennock modification better describes distribution of links specifically to and among political blogs.²⁷

These findings are critical to the interpretation of the distribution of links as it relates to human attention and communication. There is a big difference between a situation where no one is looking at any of the sites on the low end of the distribution, because everyone is looking only at the superstars, and a situation where dozens or hundreds of sites at the low end are looking at each other, as well as at the superstars. The former leaves all but the very

sphere was simply exhibiting the power law characteristics common on the Web.²⁹ The emergence in 2003 of discussions of this sort in the blogosphere is, it turns out, hardly surprising. In a time-sensitive study also published in 2003, Kumar and others provided an analysis of the network topology of the blogosphere. They found that it was very similar to that of the Web as a whole—both at the macro- and microlevels. Interestingly, they found that the strongly connected core only developed after a certain threshold, in terms of total number of nodes, had been reached, and that it began to develop extensively only in 2001, reached about 20 percent of all blogs in 2002, and continued to grow rapidly. They also showed that what they called the “community” structure—the degree of clustering or mutual pointing within groups—was high, an order of magnitude more than a random graph with a similar power law exponent would have generated. Moreover, the degree to which a cluster is active or inactive, highly connected or not, changes over time. In addition to time-insensitive superstars, there are also flare-ups of connectivity for sites depending on the activity and relevance of their community of interest. This latter observation is consistent with what we saw happen for BoycottSBG.com. Kumar and his collaborators explained these phenomena by the not-too-surprising claim that bloggers link to each other based on topicality—that is, their judgment of the quality and relevance of the materials—not only on the basis of how well connected they are already.³⁰

This body of literature on network topology suggests a model for how order has emerged on the Internet, the World Wide Web, and the blogosphere. The networked public sphere allows hundreds of millions of people to publish whatever and whenever they please without disintegrating into an unusable cacophony, as the first-generation critics argued, and it filters and focuses attention without re-creating the highly concentrated model of the mass media that concerned the second-generation critique. We now know that the network at all its various layers follows a degree of order, where some sites are vastly more visible than most. This order is loose enough, however, and exhibits a sufficient number of redundant paths from an enormous number of sites to another enormous number, that the effect is fundamentally different from the small number of commercial professional editors of the mass media.

Individuals and individual organizations cluster around topical, organizational, or other common features. At a sufficiently fine-grained degree of clustering, a substantial proportion of the clustered sites are moderately con-

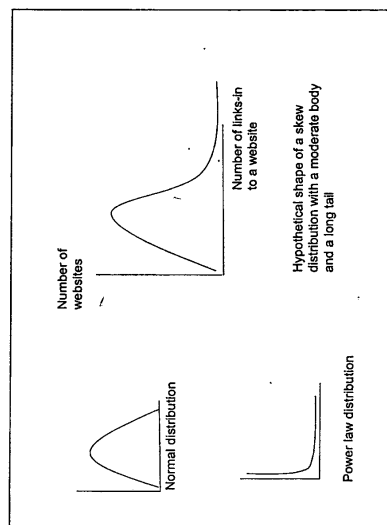


Figure 7.6: Illustration of a Skew Distribution That Does Not Follow a Power Law

few languishing in obscurity, with no one to look at them. The latter, as explained in more detail below, offers a mechanism for topically related and interest-based clusters to form a peer-reviewed system of filtering, accreditation, and salience generation. It gives the long tail on the low end of the distribution heft (and quite a bit of wag).

The fourth and last piece of mapping the network as a platform for the public sphere is called the “small-worlds effect.” Based on Stanley Milgram’s sociological experiment and on mathematical models later proposed by Duncan Watts and Steven Strogatz, both theoretical and empirical work has shown that the number of links that must be traversed from any point in the network to any other point is relatively small.²⁸ Fairly shallow “walks”—that is, clicking through three or four layers of links—allow a user to cover a large portion of the Web.

What is true of the Web as a whole turns out to be true of the blogosphere as well, and even of the specifically political blogosphere. Early 2003 saw increasing conversations in the blogosphere about the emergence of an “A-list,” a number of highly visible blogs that were beginning to seem more like mass media than like blogs. In two blog-based studies, Clay Shirky and then Jason Kotite published widely read explanations of how the blogo-

through a self-organizing principle, beginning with communities of interest on smallish scales, practices of mutual pointing, and the fact that, with freedom to choose what to see and who to link to, with some codependence among the choices of individuals as to whom to link, highly connected points emerge even at small scales, and continue to be replicated with ever-larger visibility as the clusters grow. Without forming or requiring a formal hierarchy, and without creating single points of control, each cluster generates a set of sites that offer points of initial filtering, in ways that are still congruent with the judgments of participants in the highly connected small cluster. The process is replicated at larger and more general clusters, to the point where positions that have been synthesized "locally" and "regionally" can reach Web-wide visibility and salience. It turns out that we are not intellectual lemmings. We do not use the freedom that the network has made possible to plunge into the abyss of incoherent babble. Instead, through iterative processes of cooperative filtering and "transmission" through the high visibility nodes, the low-end thin tail turns out to be a peer-produced filter and transmission medium for a vastly larger number of speakers than was imaginable in the mass-media model.

The effects of the topology of the network are reinforced by the cultural forms of linking, e-mail lists, and the writable Web. The network topology literature treats every page or site as a node. The emergence of the writable Web, however, allows each node to itself become a cluster of users and posters who, collectively, gain salience as a node. Slashdot is "a node" in the network as a whole, one that is highly linked and visible. Slashdot itself, however, is a highly distributed system for peer production of observations and opinions about matters that people who care about information technology and communications ought to care about. Some of the most visible blogs, like the dailyKos, are cooperative blogs with a number of authors. More important, the major blogs receive input—through posts or e-mails—from their users. Recall, for example, that the original discussion of a Sinclair boycott that would focus on local advertisers arrived on TalkingPoints through an e-mail comment from a reader. Talkingpoints regularly solicits and incorporates input from and research by its users. The cultural practice of writing to highly visible blogs with far greater ease than writing a letter to the editor and with looser constraints on what gets posted makes these nodes themselves platforms for the expression, filtering, and synthesis of observations and opinions. Moreover, as Drezner and Farrell have shown, blogs have developed cultural practices of mutual citation—when one blog-

nected, and each can therefore be a point of intake that will effectively transmit observations or opinions within and among the users of that topical or interest-based cluster. Because even in small clusters the distribution of links still has a long tail, these smaller clusters still include high-visibility nodes. These relatively high-visibility nodes can serve as points of transfer to larger clusters, acting as an attention backbone that transmits information among clusters. Subclusters within a general category—such as liberal and conservative blogs clustering within the broader cluster of political blogs—are also interlinked, though less densely than within-cluster connectivity. The higher level or larger clusters again exhibit a similar feature, where higher visibility nodes can serve as clearinghouses and connectivity points among clusters and across the Web. These are all highly connected with redundant links within a giant, strongly connected core—comprising more than a quarter of the nodes in any given level of cluster. The small-worlds phenomenon means that individual users who travel a small number of different links from similar starting points within a cluster cover large portions of the Web and can find diverse sites. By then linking to them on their own Web sites, or giving them to others by e-mail or blog post, sites provide multiple redundant paths open to many users to and from most statements on the Web. High-visibility nodes amplify and focus on given statements, and in this regard, have greater power in the information environment they occupy. However, there is sufficient redundancy of paths through high-visibility nodes that no single node or small collection of nodes can control the flow of information in the core and around the Web. This is true both at the level of the cluster and at the level of the Web as a whole.

The result is an ordered system of intake, filtering, and synthesis that can in theory emerge in networks generally, and empirically has been shown to have emerged on the Web. It does not depend on single points of control. It avoids the generation of a din through which no voice can be heard, as the fears of fragmentation predicted. And, while money may be useful in achieving visibility, the structure of the Web means that money is neither necessary nor sufficient to grab attention—because the networked information economy, unlike its industrial predecessor, does not offer simple points of dissemination and control for purchasing assured attention. What the network topology literature allows us to do, then, is to offer a richer, more detailed, and empirically supported picture of how the network can be a platform for the public sphere that is structured in a fundamentally different way than the mass-media model. The problem is approached

get finds a source by reading another, the practice is to link to the original blog, not only directly to the underlying source. Jack Balkin has argued that the culture of linking more generally and the "see for yourself" culture also significantly militate against fragmentation of discourse, because users link to materials they are commenting on, even in disagreement.

Our understanding of the emerging structure of the networked information environment, then, provides the basis for a response to the family of criticisms of the first generation claims that the Internet democratizes. Recall that these criticisms, rooted in the problem of information overload, or the Babel objection, revolved around three claims. The first claim was that the Internet would result in a fragmentation of public discourse. The clustering of topically related sites, such as politically oriented sites, and of communities of interest, the emergence of high-visibility sites that the majority of sites link to, and the practices of mutual linking show quantitatively and qualitatively what Internet users likely experience intuitively. While there is enormous diversity on the Internet, there are also mechanisms and practices that generate a common set of themes, concerns, and public knowledge around which a public sphere can emerge. Any given site is likely to be within a very small number of clicks away from a site that is visible from a very large number of other sites, and these form a backbone of common materials, observations, and concerns. All the findings of power law distribution of linking, clustering, and the presence of a strongly connected core, as well as the linking culture and "see for yourself," oppose the fragmentation prediction. Users self-organize to filter the universe of information that is generated in the network. This self-organization includes a number of highly salient sites that provide a core of common social and cultural experiences and knowledge that can provide the basis for a common public sphere, rather than a fragmented one.

The second claim was that fragmentation would cause polarization. Because like-minded people would talk only to each other, they would tend to amplify their differences and adopt more extreme versions of their positions. Given that the evidence demonstrates there is no fragmentation, in the sense of a lack of a common discourse, it would be surprising to find higher polarization because of the Internet. Moreover, as Balkin argued, the fact that the Internet allows widely dispersed people with extreme views to find each other and talk is not a failure for the liberal public sphere, though it may present new challenges for the liberal state in constraining extreme action. Only polarization of discourse in society as a whole can properly be

considered a challenge to the attractiveness of the networked public sphere. However, the practices of linking, "see for yourself," or quotation of the position one is criticizing, and the widespread practice of examining and criticizing the assumptions and assertions of one's interlocutors actually point the other way, militating against polarization. A potential counterargument, however, was created by the most extensive recent study of the political blogosphere. In that study, Adamic and Glance showed that only about 10 percent of the links on any randomly selected political blog linked to a site across the ideological divide. The number increased for the "A-list" political blogs, which linked across the political divide about 15 percent of the time. The picture that emerges is one of distinct "liberal" and "conservative" spheres of conversation, with very dense links within, and more sparse links between them. On one interpretation, then, although there are salient sites that provide a common subject matter for discourse, actual conversations occur in distinct and separate spheres—exactly the kind of setting that Sunstein argued would lead to polarization. Two of the study's findings, however, suggest a different interpretation. The first was that there was still a substantial amount of cross-divide linking. One out of every six or seven links in the top sites on each side of the divide linked to the other side in roughly equal proportions (although conservatives tended to link slightly more overall—both internally and across the divide). The second was, that in an effort to see whether the more closely interlinked conservative sites therefore showed greater convergence "on message," Adamic and Glance found that greater interlinking did not correlate with less diversity in external (outside of the blogosphere) reference points.³¹ Together, these findings suggest a different interpretation. Each cluster of more or less like-minded blogs tended to read each other and quote each other much more than they did the other side. This operated not so much as an echo chamber as a forum for working out of observations and interpretations internally, among like-minded people. Many of these initial statements or inquiries die because the community finds them uninteresting or fruitless. Some reach greater salience, and are distributed through the high-visibility sites throughout the community of interest. Issues that in this form reached political salience became topics of conversation and commentary across the divide. This is certainly consistent with both the BoycottSBG and Diebold stories, where we saw a significant early working out of strategies and observations before the criticism reached genuine political salience. There would have been no point for opponents to link to and criticize early ideas kicked around within the com-

munity, like opposing Sinclair station renewal applications. Only after a few days, when the boycott was crystallizing, would opponents have reason to point out the boycott effort and discuss it. This interpretation also well characterizes the way in which the Trent Lott story described later in this chapter began percolating on the liberal side of the blogosphere, but then migrated over to the center-right.

The third claim was that money would reemerge as the primary source of power brokerage because of the difficulty of getting attention on the Net. Descriptively, it shares a prediction with the second-generation claims: Namely, that the Internet will centralize discourse. It differs in the mechanism of concentration: it will not be the result of an emergent property of large-scale networks, but rather of an old, tried-and-true way of capturing the political arena—money. But the peer-production model of filtering and discussion suggests that the networked public sphere will be substantially less corruptible by money. In the interpretation that I propose, filtering for the network as a whole is done as a form of nested peer-review decisions, beginning with the speaker's closest information affinity group. Consistent with what we have been seeing in more structured peer-production projects like *Wikipedia*, *Slashdot*, or free software, communities of interest use clustering and mutual pointing to peer produce the basic filtering mechanism necessary for the public sphere to be effective and avoid being drowned in the din of the crowd. The nested structure of the Web, whereby subclusters form relatively dense higher-level clusters, which then again combine into even higher-level clusters, and in each case, have a number of high-end salient sites, allows for the statements that pass these filters to become globally salient in the relevant public sphere. This structure, which describes the analytic and empirical work on the Web as a whole, fits remarkably well as a description of the dynamics we saw in looking more closely at the success of the boycott on Sinclair, as well as the successful campaign to investigate and challenge Diebold's voting machines.

The peer-produced structure of the attention backbone suggests that money is neither necessary nor sufficient to attract attention in the networked public sphere (although nothing suggests that money has become irrelevant to political attention given the continued importance of mass media). It renders less surprising Howard Dean's strong campaign for the Democratic presidential primaries in 2003 and the much more stable success of MoveOn.org since the late 1990s. These suggest that attention on the network has more to do with mobilizing the judgments, links, and cooperation

of large bodies of small-scale contributors than with applying large sums of money. There is no obvious broadcast station that one can buy in order to assure salience. There are, of course, the highly visible sites, and they do offer a mechanism of getting your message to large numbers of people. However, the degree of engaged readership, interlinking, and clustering suggests that, in fact, being exposed to a certain message in one or a small number of highly visible places accounts for only a small part of the range of "reading" that gets done. More significantly, it suggests that reading, as opposed to having a conversation, is only part of what people do in the networked environment. In the networked public sphere, receiving information or getting out a finished message are only parts, and not necessarily the most important parts, of democratic discourse. The central desideratum of a political campaign that is rooted in the Internet is the capacity to engage users to the point that they become effective participants in a conversation and an effort; one that they have a genuine stake in and that is linked to a larger, society-wide debate. This engagement is not easily purchased, nor is it captured by the concept of a well-educated public that receives all the information it needs to be an informed citizenry. Instead, it is precisely the varied modes of participation in small-, medium-, and large-scale conversations, with varied but sustained degrees of efficacy, that make the public sphere of the networked environment different, and more attractive, than was the mass-media-based public sphere.

The networked public sphere is not only more resistant to control by money, but it is also less susceptible to the lowest-common-denominator orientation that the pursuit of money often leads mass media to adopt. Because communication in peer-produced media starts from an intrinsic motivation—writing or commenting about what one cares about—it begins with the opposite of lowest common denominator. It begins with what irks you, the contributing peer, individually, the most. This is, in the political world, analogous to Eric Raymond's claim that every free or open-source software project begins with programmers with an itch to scratch—something directly relevant to their lives and needs that they want to fix. The networked information economy, which makes it possible for individuals alone and in cooperation with others to scour the universe of politically relevant events, to point to them, and to comment and argue about them, follows a similar logic. This is why one freelance writer with lefty leanings, Russ Kick, is able to maintain a Web site, The Memory Hole, with documents that he gets by filing Freedom of Information Act requests. In April

2004, Kick was the first to obtain the U.S. military's photographs of the coffins of personnel killed in Iraq being flown home. No mainstream news organization had done so, but many published the photographs almost immediately after Kick had obtained them. Like free software, like Davis and the bloggers who participated in the debates over the Sinclair boycott, or the students who published the Diebold e-mails, the decision of what to publish does not start from a manager's or editor's judgment of what would be relevant and interesting to many people without being overly upsetting to too many others. It starts with the question: What do I care about most now?

To conclude, we need to consider the attractiveness of the networked public sphere not from the perspective of the mid-1990s utopianism, but from the perspective of how it compares to the actual media that have dominated the public sphere in all modern democracies. The networked public sphere provides an effective nonmarket alternative for intake, filtering, and synthesis outside the market-based mass media. This nonmarket alternative can attenuate the influence over the public sphere that can be achieved through control over, or purchase of control over, the mass media. It offers a substantially broader capture basin for intake of observations and opinions generated by anyone with a stake in the polity, anywhere. It appears to have developed a structure that allows for this enormous capture basin to be filtered, synthesized, and made part of a polity-wide discourse. This nested structure of clusters of communities of interest, typified by steadily increasing visibility of superstar nodes, allows for both the filtering and salience to climb up the hierarchy of clusters, but offers sufficient redundant paths and interlinking to avoid the creation of a small set of points of control where power can be either directly exercised or bought.

There is, in this story, an enormous degree of contingency and factual specificity. That is, my claims on behalf of the networked information economy as a platform for the public sphere are not based on general claims about human nature, the meaning of liberal discourse, context-independent efficiency, or the benevolent nature of the technology we happen to have stumbled across at the end of the twentieth century. They are instead based on, and depend on the continued accuracy of, a description of the economics of fabrication of computers and network connections, and a description of the dynamics of linking in a network of connected nodes. As such, my claim is not that the Internet inherently liberates. I do not claim that commons-based production of information, knowledge, and culture will win out by

some irresistible progressive force. That is what makes the study of the political economy of information, knowledge, and culture in the networked environment directly relevant to policy. The literature on network topology suggests that, as long as there are widely distributed capabilities to publish, link, and advise others about what to read and link to, networks enable intrinsic processes that allow substantial ordering of the information. The pattern of information flow in such a network is more resistant to the application of control or influence than was the mass-media model. But things can change. Google could become so powerful on the desktop, in the e-mail utility, and on the Web, that it will effectively become a supermode that will indeed raise the prospect of a reemergence of a mass-media model. Then the politics of search engines, as Lucas Introna and Helen Nissenbaum called it, become central. The zeal to curb peer-to-peer file sharing of movies and music could lead to a substantial redesign of computing equipment and networks, to a degree that would make it harder for end users to exchange information of their own making. Understanding what we will lose if such changes indeed warp the topology of the network, and through it the basic structure of the networked public sphere, is precisely the object of this book as a whole. For now, though, let us say that the networked information economy as it has developed to this date has a capacity to take in, filter, and synthesize observations and opinions from a population that is orders of magnitude larger than the population that was capable of being captured by the mass media. It has done so without re-creating identifiable and reliable points of control and manipulation that would replicate the core limitation of the mass-media model of the public sphere—its susceptibility to the exertion of control by its regulators, owners, or those who pay them.

WHO WILL PLAY THE WATCHDOG FUNCTION?

A distinct critique leveled at the networked public sphere as a platform for democratic politics is the concern for who will fill the role of watchdog. Neil Netanel made this argument most clearly. His concern was that, perhaps freedom of expression for all is a good thing, and perhaps we could even overcome information overflow problems, but we live in a complex world with powerful actors. Government and corporate power is large, and individuals, no matter how good their tools, cannot be a serious alternative to a well-funded, independent press that can pay investigative reporters, defend lawsuits, and generally act like the *New York Times* and the *Washington Post*.

journalistic potency was built on the back of then Senate majority leader Trent Lott. In 2002, Lott had the indiscretion of saying, at the one-hundredth-birthday party of Republican Senator Strom Thurmond, that if Thurmond had won his Dixiecrat presidential campaign, "we wouldn't have had all these problems over all these years." Thurmond had run on a segregationist campaign, splitting from the Democratic Party in opposition to Harry Truman's early civil rights efforts, as the post-World War II winds began blowing toward the eventual demise of formal, legal racial segregation in the United States. Few positions are taken to be more self-evident in the national public morality of early twenty-first-century America than that formal, state-imposed, racial discrimination is an abomination. And yet, the first few days after the birthday party at which Lott made his statement saw almost no reporting on the statement. ABC News and the *Washington Post* made small mention of it, but most media outlets reported merely on a congenial salute and farewell celebration of the Senate's oldest and longest-serving member. Things were different in the blogosphere. At first liberal past-racist statements by Lott, and to beat the drums calling for his censure or removal as Senate leader. Within about a week, the story surfaced in the mainstream media, became a major embarrassment, and led to Lott's resignation as Senate majority leader about a week later. A careful case study of this event leaves it unclear why the mainstream media initially ignored the story.³² It may have been that the largely social event drew the wrong sort of reporters. It may have been that reporters and editors who depend on major Washington, D.C., players were reluctant to challenge Lott. Perhaps they thought it rude to emphasize this indiscretion, or too upsetting to us all to think-of just how close to the surface thoughts that we deem abominable can lurk. There is little disagreement that the day after the party, the story was picked up and discussed by Marshall on TalkingPoints, as well as by another liberal blogger, Arios, who apparently got it from a post on Slate's "Chatterbox," which picked it up from ABC News's own *The Note*, a news summary made available on the television network's Web site. While the mass media largely ignored the story, and the two or three mainstream reporters who tried to write about it were getting little traction, bloggers were collecting more stories about prior instances where Lott's actions tended to suggest support for racist causes. Marshall, for example, found that Lott had filed a 1981 amicus curiae brief in support of Bob Jones University's effort to retain its tax-exempt status. The U.S. government had rescinded

when they published the Pentagon Papers in the teeth of the Nixon administration's resistance, providing some of the most damning evidence against the planning and continued prosecution of the war in Vietnam. Netanel is cognizant of the tensions between the need to capture large audiences and sell advertising, on the one hand, and the role of watchdog, on the other. He nonetheless emphasizes that the networked public sphere cannot investigate as deeply or create the public salience that the mass media can. These limitations make commercial mass media, for all their limitations, necessary for a liberal public sphere.

This diagnosis of the potential of the networked public sphere under-represents its productive capacity. The Diebold story provides in narrative form a detailed response to each of the concerns. The problem of voting machines has all the characteristics of an important, hard subject. It stirs deep fears that democracy is being stolen, and is therefore highly unsettling. It involves a difficult set of technical judgments about the functioning of voting machines. It required exposure and analysis of corporate-owned materials in the teeth of litigation threats and efforts to suppress and discredit the criticism. At each juncture in the process, the participants in the critique turned iteratively to peer production and radically distributed methods of investigation, analysis, distribution, and resistance to suppression: the initial observations of the whistle-blower or the hacker; the materials made available on a "see for yourself" and "come analyze this and share your insights" model; the distribution by students; and the fallback option when their server was shut down of replication around the network. At each stage, a peer-production solution was interposed in place of where a well-funded, high-end mass-media outlet would have traditionally applied funding in expectation of sales of copy. And it was only after the networked public sphere developed the analysis and debate that the mass media caught on, and then only gingerly.

The Diebold case was not an aberration, but merely a particularly-rich case study of a much broader phenomenon, most extensively-described in Dan Gilmore's *We the Media*. The basic production modalities that typify the networked information economy are now being applied to the problem of producing politically relevant information. In 2005, the most visible example of application of the networked information economy—both in its peer-production dimension and more generally by combining a wide range of nonproprietary production models—to the watchdog function of the media is the political blogosphere. The founding myth of the blogosphere's

that status because the university practiced racial discrimination—such as prohibiting interracial dating. By Monday of the following week, four days after the remarks, conservative bloggers like Glenn Reynolds on Instapundit, Andrew Sullivan, and others were calling for Lort's resignation. It is possible that, absent the blogosphere, the story would still have flared up. There were two or so mainstream reporters still looking into the story. Jesse Jackson had come out within four days of the comment and said Lort should resign as majority leader. Eventually, when the mass media did enter the fray, its coverage clearly dominated the public agenda and its reporters uncovered materials that helped speed Lort's exit. However, given the short news cycle, the lack of initial interest by the media, and the large time lag between the event itself and when the media actually took the subject up, it seems likely that without the intervention of the blogosphere, the story would have died. What happened instead is that the cluster of political blogs—starting on the Left but then moving across the Left-Right divide—took up the subject, investigated, wrote opinions, collected links and public interest, and eventually captured enough attention to make the comments a matter of public importance. Free from the need to appear neutral and not to offend readers, and free from the need to keep close working relationships with news subjects, bloggers were able to identify something that grated on their sensibilities, talk about it, dig deeper, and eventually generate a substantial intervention into the public sphere. That intervention still had to pass through the mass media, for we still live in a communications environment heavily based on those media. However, the new source of insight, debate, and eventual condensation of effective public opinion came from within the networked information environment.

The point is not to respond to the argument with a litany of anecdotes. The point is that the argument about the commercial media's role as watchdog turns out to be a familiar argument—it is the same argument that was made about software and supercomputers, encyclopedias and immersive entertainment scripts. The answer, too, is by now familiar. Just as the World Wide Web can offer a platform for the emergence of an enormous and effective almanac, just as free software can produce excellent software and peer production can produce a good encyclopedia, so too can peer production produce the public watchdog function. In doing so, clearly the unorganized collection of Internet users lacks some of the basic tools of the mass media: dedicated full-time reporters; contacts with politicians who need media to survive, and therefore cannot always afford to stonewall questions; or

public visibility and credibility to back their assertions. However, network-based peer production also avoids the inherent conflicts between investigative reporting and the bottom line—its cost, its risk of litigation, its risk of withdrawing readers. Building on the wide variation and diversity of knowledge, time, availability, insight, and experience, as well as the vast communications and information resources on hand for almost anyone in advanced economies, we are seeing that the watchdog function too is being peer produced in the networked information economy.

Note that while my focus in this chapter has been mostly the organization of public discourse, both the Sinclair and the Diebold case studies also identify characteristics of distributed political action. We see collective action emerging from the convergence of independent individual actions, with no hierarchical control like that of a political party or an organized campaign. There may be some coordination and condensation points—like BoycottSBG.com or blackboxvoting.org. Like other integration platforms in peer-production systems, these condensation points provide a critical function. They do not, however, control the process. One manifestation of distributed coordination for political action is something Howard Rheingold has called “smart mobs”—large collections of individuals who are able to coordinate real-world action through widely distributed information and communications technology. He tells of the “People Power II” revolution in Manila in 2001, where demonstrations to oust then president Estrada were coordinated spontaneously through extensive text messaging.³³ Few images in the early twenty-first century can convey this phenomenon more vividly than the demonstrations around the world on February 15, 2003. Between six and ten million protesters were reported to have gone to the streets of major cities in about sixty countries in opposition to the American-led invasion of Iraq. There had been no major media campaign leading up to the demonstrations—though there was much media attention to them later. There had been no organizing committee. Instead, there was a network of roughly concordant actions, none controlling the other, all loosely discussing what ought to be done and when. MoveOn.org in the United States provides an example of a coordination platform for a network of politically mobilized activities. It builds on e-mail and Web-based media to communicate opportunities for political action to those likely to be willing and able to take it. Radically distributed, network-based solutions to the problems of political mobilization rely on the same characteristics as networked information production

more generally: extensive communications leading to concordant and cooperative patterns of behavior without the introduction of hierarchy or the interposition of payment.

USING NETWORKED COMMUNICATION TO WORK AROUND AUTHORITARIAN CONTROL

The Internet and the networked public sphere offer a different set of potential benefits, and suffer a different set of threats, as a platform for liberation in authoritarian countries. State-controlled mass-media models are highly conducive to authoritarian control. Because they usually rely on a small number of technical and organizational points of control, mass media offer a relatively easy target for capture and control by governments. Successful control of such universally visible media then becomes an important tool of information manipulation, which, in turn, eases the problem of controlling the population. Not surprisingly, capture of the national television and radio stations is invariably an early target of coups and revolutions. The highly distributed networked architecture of the Internet makes it harder to control communications in this way.

The case of Radio B92 in Yugoslavia offers an example. B92 was founded in 1989, as an independent radio station. Over the course of the 1990s, it developed a significant independent newsroom broadcast over the station itself, and syndicated through thirty affiliated independent stations. B92 was banned twice after the NATO bombing of Belgrade, in an effort by the Milosevic regime to control information about the war. In each case, however, the station continued to produce programming, and distributed it over the Internet from a server based in Amsterdam. The point is a simple one. Shutting down a broadcast station is simple. There is one transmitter with one antenna, and police can find and hold it. It is much harder to shut down all connections from all reporters to a server and from the server back into the country wherever a computer exists.

This is not to say that the Internet will of necessity in the long term lead all authoritarian regimes to collapse. One option open to such regimes is simply to resist Internet use. In 2003, Burma, or Myanmar, had 28,000 Internet users out of a population of more than 42 million, or one in fifteen hundred, as compared, for example, to 6 million out of 65 million in neighboring Thailand, or roughly one in eleven. Most countries are not, however, willing to forgo the benefits of connectivity to maintain their control. Iran's

population of 69 million includes 4.3 million Internet users, while China has about 80 million users, second only to the United States in absolute terms, out of a population of 1.3 billion. That is, both China and Iran have a density of Internet users of about one in sixteen.³⁴ Burma's negligible level of Internet availability is a compound effect of low gross domestic product (GDP) per capita and government policies. Some countries with similar GDP levels still have levels of Internet users in the population that are two orders of magnitude higher: Cameroon (1 Internet user for every 27 residents), Moldova (1 in 30), and Mongolia (1 in 55). Even very large poor countries have several times more users per population than Myanmar: like Pakistan (1 in 100), Mauritania (1 in 300), and Bangladesh (1 in 580). Lawrence Solum and Minn Chung outline how Myanmar achieves its high degree of control and low degree of use.³⁵ Myanmar has only one Internet service provider (ISP), owned by the government. The government must authorize anyone who wants to use the Internet or create a Web page within the country. Some of the licensees, like foreign businesses, are apparently permitted and enabled only to send e-mail, while using the Web is limited to security officials who monitor it. With this level of draconian regulation, Myanmar can avoid the liberating effects of the Internet altogether, at the cost of losing all its economic benefits. Few regimes are willing to pay that price.

Introducing Internet communications into a society does not, however, immediately and automatically mean that an open, liberal public sphere emerges. The Internet is technically harder to control than mass media. It increases the cost and decreases the efficacy of information control. However, a regime willing and able to spend enough money and engineering power, and to limit its population's access to the Internet sufficiently, can have substantial success in controlling the flow of information into and out of its country. Solum and Chung describe in detail one of the most extensive and successful of these efforts, the one that has been conducted by China—home to the second-largest population of Internet users in the world, whose policies controlled use of the Internet by two out of every fifteen Internet users in the world in 2003. In China, the government holds a monopoly over all Internet connections going into and out of the country. It either provides or licenses the four national backbones that carry traffic throughout China and connect it to the global network. ISPs that hang off these backbones are licensed, and must provide information about the location and workings of their facilities, as well as comply with a code of conduct. In-

dividual users must register and provide information about their machines, and the many Internet cafes are required to install filtering software that will filter out subversive sites. There have been crackdowns on Internet cafes to enforce these requirements. This set of regulations has replicated one aspect of the mass-medium model for the Internet—it has created a potential point of concentration or centralization of information flow that would make it easier to control Internet use. The highly distributed production capabilities of the networked information economy, however, as opposed merely to the distributed carriage capability of the Internet, mean that more must be done at this bottleneck to squelch the flow of information and opinion than would have to be done with mass media. That "more" in China has consisted of an effort to employ automatic filters—some at the level of the cyberspace or the local ISP, some at the level of the national backbone networks. The variability of these loci and their effects is reflected in partial efficacy and variable performance for these mechanisms. The most extensive study of the efficacy of these strategies for controlling information flows over the Internet to China was conducted by Jonathan Zittrain and Ben Edelman. From servers within China, they sampled about two hundred thousand Web sites and found that about fifty thousand were unavailable at least once, and close to nineteen thousand were unavailable on two distinct occasions. The blocking patterns seemed to follow mass-media logic—BBC News was consistently unavailable, as CNN and other major news sites often were; the U.S. court system official site was unavailable. However, Web sites that provided similar information—like those that offered access to all court cases but were outside the official system—were available. The core Web sites of human rights organizations or of Taiwan and Tibet-related organizations were blocked, and about sixty of the top one hundred results for "Tibet" on Google were blocked. What is also apparent from their study, however, and confirmed by Amnesty International's reports on Internet censorship in China, is that while censorship is significant, it is only partially effective.³⁶ The Amnesty report noted that Chinese users were able to use a variety of techniques to avoid the filtering, such as the use of proxy servers, but even Zittrain and Edelman, apparently testing for filtering as experienced by unsophisticated or compliant Internet users in China, could access many sites that would, on their face, seem potentially destabilizing.

This level of censorship may indeed be effective enough for a government negotiating economic and trade expansion with political stability and control. It suggests, however, limits of the ability of even a highly dedicated

government to control the capacity of Internet communications to route around censorship and to make it much easier for determined users to find information they care about, and to disseminate their own information to others. Iran's experience, with a similar level of Internet penetration, emphasizes the difficulty of maintaining control of Internet publication.³⁷ Iran's network emerged from 1993 onward from the university system, quite rapidly complemented by commercial ISPs. Because deployment and use of the Internet preceded its regulation by the government, its architecture is less amenable to centralized filtering and control than China's. Internet access through university accounts and cybercafes appears to be substantial, and until the past three or four years, had operated free of the crackdowns and prison terms suffered by opposition print publications and reporters. The conservative branches of the regime seem to have taken a greater interest in suppressing Internet communications since the publication of imprisoned Ayatollah Montazeri's critique of the foundations of the Islamic state on the Web in December 2000. While the original Web site, montazeri.com, seems to have been eliminated, the site persists as montazeri.ws, using a Western Samoan domain name, as do a number of other Iranian publications. There are now dozens of chat rooms, blogs, and Web sites, and e-mail also seems to be playing an increasing role in the education and organization of an opposition. While the conservative branches of the Iranian state have been clamping down on these forms, and some bloggers and Web site operators have found themselves subject to the same mistreatment as journalists, the efficacy of these efforts to shut down opposition seems to be limited and uneven.

Media other than static Web sites present substantially deeper problems for regimes like those of China and Iran. Scanning the text of e-mail messages of millions of users who can encrypt their communications with widely available tools creates a much more complex problem. Ephemeral media like chat rooms and writable Web tools allow the content of an Internet communication or Web site to be changed easily and dynamically, so that blocking sites becomes harder, while coordinating moves to new sites to route around blocking becomes easier. At one degree of complexity deeper, the widely distributed architecture of the Net also allows users to build censorship-resistant networks by pooling their own resources. The pioneering example of this approach is Freenet, initially developed in 1999–2000 by Ian Clarke, an Irish programmer fresh out of a degree in computer science and artificial intelligence at Edinburgh University. Now a broader free-software project, Freenet

is a peer-to-peer application specifically designed to be censorship resistant. Unlike the more famous peer-to-peer network developed at the time—Napster—Freenet was not intended to store music files on the hard drives of users. Instead, it stores bits and pieces of publications, and then uses sophisticated algorithms to deliver the documents to whoever seeks them, in encrypted form. This design trades off easy availability for a series of security measures that prevent even the owners of the hard drives on which the data resides—or government agents that search their computers—from knowing what is on their hard drive or from controlling it. As a practical matter, if someone in a country that prohibits certain content but enables Internet connections wants to publish content—say, a Web site or blog—safely, they can inject it into the Freenet system. The content will be encrypted and divided into little bits and pieces that are stored in many different hard drives of participants in the network. No single computer will have all the information, and shutting down any given computer will not make the information unavailable. It will continue to be accessible to anyone running the Freenet client. Freenet indeed appears to be used in China, although the precise scope is hard to determine, as the network is intended to mask the identity and location of both readers and publishers in this system. The point to focus on is not the specifics of Freenet, but the feasibility of constructing user-based censorship-resistant storage and retrieval systems that would be practically impossible for a national censorship system to identify and block subversive content.

To conclude, in authoritarian countries, the introduction of Internet communications makes it harder and more costly for governments to control the public sphere. If these governments are willing to forgo the benefits of Internet connectivity, they can avoid this problem. If they are not, they find themselves with less control over the public sphere. There are, obviously, other means of more direct repression. However, control over the mass media was, throughout most of the twentieth century, a core tool of repressive governments. It allowed them to manipulate what the masses of their populations knew and believed, and thus limited the portion of the population that the government needed to physically repress to a small and often geographically localized group. The efficacy of these techniques of repression is blunted by adoption of the Internet and the emergence of a networked information economy. Low-cost communications, distributed technical and organizational structure, and ubiquitous presence of dynamic authorship

tools make control over the public sphere difficult, and practically never perfect.

TOWARD A NETWORKED PUBLIC SPHERE

The first generation of statements that the Internet democratizes was correct but imprecise. The Internet does restructure public discourse in ways that give individuals a greater say in their governance than the mass media made possible. The Internet does provide avenues of discourse around the bottlenecks of older media, whether these are held by authoritarian governments or by media owners. But the mechanisms for this change are more complex than those articulated in the past. And these more complex mechanisms respond to the basic critiques that have been raised against the notion that the Internet enhances democracy.

Part of what has changed with the Internet is technical infrastructure. Network communications do not offer themselves up as easily for single points of control as did the mass media. While it is possible for authoritarian regimes to try to retain bottlenecks in the Internet, the cost is higher and the efficacy lower than in mass-media-dominated systems. While this does not mean that introduction of the Internet will automatically result in global democratization, it does make the work of authoritarian regimes harder. In liberal democracies, the primary effect of the Internet runs through the emergence of the networked information economy. We are seeing the emergence to much greater significance of nonmarket, individual, and cooperative peer-production efforts to produce universal intake of observations and opinions about the state of the world and what might and ought to be done about it. We are seeing the emergence of filtering, accreditation, and synthesis mechanisms as part of network behavior. These rely on clustering of communities of interest and association and highlighting of certain sites, but offer tremendous redundancy of paths for expression and accreditation. These practices leave no single point of failure for discourse: no single point where observations can be squelched or attention commanded—by fiat or with the application of money. Because of these emerging systems, the networked information economy is solving the information overload and discourse fragmentation concerns without reintroducing the distortions of the mass-media model. Peer production, both long-term and organized, as in the case of Slashdot, and ad hoc and dynamically formed, as in the case of blogging or

the Sinclair or Diebold cases, is providing some of the most important functionalities of the media. These efforts provide a watchdog, a source of salient observations regarding matters of public concern, and a platform for discussing the alternatives open to a polity.

In the networked information environment, everyone is free to observe, report, question, and debate, not only in principle, but in actual capability. They can do this, if not through their own widely read blog, then through a cycle of mailing lists, collective Web-based media like Slashdot, comments on blogs, or even merely through e-mails to friends who, in turn, have meaningful visibility in a smallish-scale cluster of sites or lists. We are witnessing a fundamental change in how individuals can interact with their democracy and experience their role as citizens. Ideal citizens need not be seen purely as trying to inform themselves about what others have found, so that they can vote intelligently. They need not be limited to reading the opinions of opinion makers and judging them in private conversations. They are no longer constrained to occupy the role of mere readers, viewers, and listeners. They can be, instead, participants in a conversation. Practices that begin to take advantage of these new capabilities shift the locus of content creation from the few professional journalists trolling society for issues and observations, to the people who make up that society. They begin to free the public agenda setting from dependence on the judgments of managers, whose job it is to assure that the maximum number of readers, viewers, and listeners are sold in the market for eyeballs. The agenda thus can be rooted in the life and experience of individual participants in society—in their observations, experiences, and obsessions. The network allows all citizens to change their relationship to the public sphere. They no longer need be consumers and passive spectators. They can become creators and primary subjects. It is in this sense that the Internet democratizes.

Franco "Bifo" Berardi

The Uprising

On Poetry and Finance

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POETRY AND FINANCE

EMANCIPATION OF THE SIGN: POETRY AND FINANCE IN THE TWENTIETH CENTURY

Money and language have something in common: they are nothing and they move everything. They are nothing but symbols, conventions, *flatus vocis*, but they have the power of persuading human beings to act, to work, to transform physical things.

Money makes things happen. It is the source of action in the world and perhaps the only power we invest in. Perhaps in every other respect, in every other value, bankruptcy has been declared, giving money the power of some sacred deity, demanding to be recognized. Economics no longer persuades money to behave. Numbers cannot make the beast lie down and be quiet or sit up and do tricks. Thus, as we suspected all along, economics falsely imitates science. At best, economics is a neurosis of money, a symptom

contrived to hold the beast in abeyance [...]
Thus economics shares the language of psychopathology, inflation, depression, lows and heights, slumps and peaks, investments and losses, and the economy remains caught in manipulations of acting stimulated or depressed, drawing attention to itself, egotistically unaware of its own soul. Economists, brokers, accountants, financiers, all assisted by lawyers, are the priests of the cult of money, reciting their prayers to make the power of money work without imagination.
(Sardello 1983, 1–2)

Financial capitalism is based on the autonomization of the dynamics of money, but more deeply on the autonomization of value production from the physical interaction of things.

The passage from the industrial abstraction of work to the digital abstraction of world implies an immaterialization of the labor process.

Jean Baudrillard has proposed a general semiology of simulation based on the premise of the end of referentiality, in the economic as well as in the linguistic field. In *The Mirror of Production*, Baudrillard writes: "need, use value, and the referent 'do not exist.' They are only concepts produced and projected into a generic dimension by the development of the very system of exchange value." (Baudrillard 1975, 30)

The process of the autonomization of money is a particular level of this general trend, but it also has a long history, according to Marc Shell in *Money, Language, and Thought*.

Between the electrum money of ancient Lydia and the electric money of contemporary America there occurred a historically momentous change. The exchange value of the earliest coins derived wholly from the material substance (electrum) of the ingots of which the coins were made and not from the inscriptions stamped into these ingots. The eventual development of coins whose politically authorized inscriptions were inadequate to the weights and purities of the ingots into which the inscriptions were stamped precipitated awareness of quantities about the relationship between face value (intellectual currency) and substantial value (material currency). This difference between inscription and thing grew greater with the introduction of paper moneys. Paper, the material substance on which the inscriptions were printed, was supposed to make no difference in exchange, and metal or electrum, the material substance to which the inscriptions referred, was connected with those inscriptions in increasingly abstract ways. With the advent of electronic fund-transfers the link between inscription and

substance was broken. The matter of electric money does not matter. (Shell 1982, 1)

As I've already said, the dephysicalization of money is part of the general process of abstraction which is the all-encompassing tendency of capitalism.

Marx's theory of value is based on the concept of abstract work: because it is the source and the measure of value, work has to sever its relation to the concrete usefulness of its activity and product. Concrete usefulness does not matter from the point of view of valorization. Baudrillard speaks of the relation between signification and language in the same vein. The abstraction process at the core of the capitalist capture (subsumption) of work implies abstraction from the need for the concreteness of products: the referent is erased.

The rational, referential, historical and functional machines of consciousness correspond to industrial machines. The aleatory, nonreferential, trans-ferential, indeterminate and floating machines of the unconscious respond to the aleatory machines of the code [...] The systemic strategy is merely to invoke a number of floating values in this hyper-reality. This is true of the unconscious as it is of money and theories. Value rules according to the indiscernible order of generation by means of

models, according to the infinite chains of simulation. (Baudrillard 1993, 3)

The crucial point of Baudrillard's critique is that referentiality and the (in)determination of value has come to an end. In the sphere of the market, things are not considered from the point of view of their concrete usefulness, but from that of their exchangeability and exchange value. Similarly, in the sphere of communication, language is traded and valued as something that is performed. Effectiveness, not truth value, is the rule of language in the sphere of communication. Pragmatics, not hermeneutics, is the methodology for understanding social communication, particularly in the age of new media.

Retracing the process of dereferentialization in both semiotics and economics, Baudrillard speaks of the emancipation of the sign.

A revolution has put an end to this "classical" economics of value, a revolution of value itself, which carries value beyond its commodity form into its radical form.

This revolution consists in the dislocation of the two aspects of the law of value, which were thought to be coherent and eternally bound as if by a natural law. *Referential value is annihilated, giving the structural play of value the upper hand.*

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The structural dimension becomes autonomous by excluding the referential dimension, and is instituted upon the death of reference [...] from now on, signs are exchanged against each other rather than against the real (it is not that they just happen to be exchanged with each other, they do so *on condition* that they are no longer exchanged against the real). The emancipation of the sign. (Baudrillard, 1993, 6-7)

The emancipation of the sign from the referential function may be seen as the general trend of late Modernity, the prevailing tendency in literature and art as in science and in politics.

In the following pages I want to retrace the evolution of poetry in the passage from romantic realism to symbolist transrealism.

Symbolism opened a new space for poetic praxis, starting from the emancipation of the word from its referential task.

The emancipation of money—the financial sign—from the industrial production of things follows the same semiotic procedure, from referential to nonreferential signification.

But the analogy between economy and language should not mislead us: although money and language have something in common, their destinies do not coincide, as language exceeds economic exchange. Poetry is the language of nonexchangeability, the

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return of infinite hermeneutics, and the return of the sensuous body of language.

I'm talking about poetry here as an excess of language, a hidden resource which enables us to shift from one paradigm to another.

A PLACE WE DO NOT KNOW

Angel, if there were a place we do not know, and there
On some ineffable carpet, the lovers, who never
Could achieve fulfillment here, could show
Their bold lofty figures of heart-swings,
Their towers of ecstasy, their pyramid
That long since, where there was no standing-ground,
Were tremblingly propped together—could succeed
Before the spectators around them, the innumerable
silent dead:

Would not these then throw their last, ever-hoarded,
Ever-hidden, unknown to us, eternally
Valid coins of happiness
Before their pair with the finally genuine smile
On the assuaged carpet?

—Rainer Maria Rilke, "Fifth Elegy"
(Translated by C.F. MacIntyre)

The reactivation of the social body is the precondition for the full deployment of the general intellect.

Since 2001 we have witnessed a dismantling of the general intellect that started after the dot-com crash in the spring of 2000. During the first decade of the new century, cognitive labor was disempowered and subjected to precarization.

The social and affective body of the cognitive workers has been separated from their daily activity of production. The new alienation is based on this separation, on the virtualization of social relations. The new alienation takes the form of psychic suffering, panic, depression, and a suicidal tide. This is the affective character of the first generation of people who have learned more words from a machine than from the mother.

The insurrection against financial capitalism is aimed to recompose the social and affective body. The student struggles that have exploded in Europe since the fall of 2010 should not be seen as sudden outbursts of rage, but as the beginnings of a long-lasting process that will encompass the next decade: a cognitarian insurrection of sorts. Insurrection means a rising up, and also implies the full deployment of the potencies of the actor. The actor that is appearing on the historical scene today is the general intellect in its process of subjectivation. The potencies of this actor are the potencies of collective intelligence in the network, the potencies of knowledge, reduced to the narrow dogmatic utilization that the capitalist economy is forcing on them.

informational process. The activation of the potency of this connected intelligence, autonomously from its capitalist use, is the lesson Wikileaks has to offer. And the new generation of rebels will find in this lesson a way to the autonomization and self-organization of the general intellect.

In street demonstrations, the social and erotic body of the cognitarions is finding rhythm and empathy. The main stake of street actions is the reactivation of the body of the general intellect. Bodily sensibility, blurred and stressed by precarity and competition, are finding new modes of expression, so that desire may begin flowing again.

Connection and Sensibility

Sensibility is the ability to understand what cannot be verbalized, and it has been a victim of the precarization and fractalization of time. In order to reactivate sensibility, art and therapy and political action have to all be gathered.

In the sphere of precarious work, time has been fragmented and depersonalized. Social time is transformed into a sprawl of fractals, compatible fragments that can be recombined by the networked machine: this is why I speak of the fractalization of time.

Aesthetic perception—here properly conceived of as the realm of sensibility and aesthesia—is

The full deployment of the general intellect falls beyond the sphere of capitalism.

When general intellect will be able to reconstitute its social and erotic body, capitalist rule will become obsolete. This is the new consciousness that comes from the explosion of the last months of 2010, from the reclamation of knowledge's autonomy.

In the same period of the student revolt, the Wikileaks event has exposed the other face of cognitarian subjectivation. What is its meaning, beyond the remarkable effect that Wikileaks has had in the field of diplomacy and politics and war, and obviously in the field of information?

Wikileaks has displayed the infinite potency of the collective networked intelligence. The unleashing of the creative force of the general intellect is the momentous event that Julian Assange has been able to orchestrate. I don't think that we really needed to know the contents of all those cables and e-mails that Wikileaks disclosed. Actually, we already knew that diplomats are paid to lie, and that soldiers are paid for killing civilians.

Many interesting things have come out from the disclosures, but this is not my focus here. What is more important concerning this event is the activation of solidarity, complicity, and independent collaboration between cognitarions that it represents: between programmers, hardware technicians, journalists, and artists who all take part in an

be grasped and internalized thanks to refrains that we have in our minds, in our sensitive and sensible brains.

In his book *Chaosmosis*, Guattari speaks of the "aesthetic paradigm." This concept redefines the historical and social perspective, and it is fully integrated into the vision of ecosophy. An environmental consciousness adequate to the technological complexity of hypermodernity, ecosophy is based on the acknowledgment of the crucial role of aesthetics in the prospect of ecology.

Actually, aesthetics is the science dedicated to the study of the contact between the derma (the skin, the sensitive surface of our body-mind) and different chemical, physical, electromagnetic, electronic, and informational flows. Therefore, aesthetics has much to do with the modern psychopathology of contact, with the pathological effects of the acceleration of the info-flow and the precarization of social existence. Guattari views the universe as a continuum of diverse and interrelated entities in bodily contact with each other. It is both an organic and inorganic continuum, animal and machinic, mental and electronic, and the concatenation is made possible by *ritournelles*, semiotic markers of rhythm. Rhythm is the common substance of signs (word, music, vision) and the brain. The mind hooks onto the other (the other mind, nature, artificial, or social world) thanks to rhythmic concatenation.

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directly involved in the technological transformation of communication and work: in its attempt to efficiently interface with the connective environment, the conscious organism appears to increasingly inhibit what we call sensibility. By sensibility, I mean the faculty that enables human beings to interpret signs that are not verbal nor can be made so, the ability to understand what cannot be expressed in forms that have a finite syntax. This faculty reveals itself to be useless and even damaging in an integrated connective system, because sensibility tends to slow down the processes of interpretation, making them ambiguous and downgrading the competitive efficiency of the semiotic agent.

Sensibility is in time, and we need time to understand the hypercomplex communication of the body. Due to the acceleration of the info-rhythm, precarious workers are obliged to detect and interpret signs at an ever-accelerating pace, and their sensibility is disturbed. This is why therapy is increasingly involved in the political field of reactivating the social body and recomposing work in a process of subjectivation.

If we want to think through the relation between art and (schizo)therapy, we have to think in terms of the refrain. Guattari says that the refrain is a semiotic concatenation (*agencement*) that is able to latch onto the environment. Cosmic, terrestrial, social, and affective environments can

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In the past century, the century that trusted in the future, art was essentially involved in the business of acceleration. Futurism defined the relation between art, the social mind, and social life. The cult of energy marked the artistic zeitgeist, up to the saturation of collective perception and the paralysis of empathy. Futurist rhythm was the rhythm of info-acceleration, of violence and war.

Now we need refrains that disentangle singular existence from the social game of competition and productivity: refrains of psychic and sensitive autonomization, refrains of the singularization and sensibilization of breathing, once unchained from the congested pace of the immaterial assembly line of semio-capitalist production.

Once upon a time, pleasure was repressed by power. Now it is advertised and promised, and simultaneously postponed and deceived. This is the pornographic feature of semio-production in the sphere of the market.

The eye has taken the central place of human sensory life, but this ocular domination is a domination of merchandise, of promises that are never fulfilled and always postponed. In the current conditions of capitalist competition, acceleration is the trigger for panic, and panic is the premise to depression. Singularity is forgotten, erased, and cancelled in the erotic domain of semio-capitalism. The singularity of the voice and the singularity of

words are subjected to the homogenization of exchange and valorization.

Social communication is submitted to technological interfaces: in order to exchange meaning in the sphere of connectivity, conscious organisms have to adapt to the digital environment.

In order to accelerate the circulation of value, meaning is reduced to information, and technological devices act as the communicative matrix. The matrix takes the place of the mother in the process of generating language.

But language and information do not overlap, and language cannot be resolved in exchangeability. In Ferdinand de Saussure's parlance, we may say that the infinity of the *parole* exceeds the recombining logic of the *langue*, such that language can escape from the matrix and reinvent a social sphere of singular vibrations intermingling and projecting a new space for sharing, producing, and living.

Poetry opens the doors of perception to singularity.

Poetry is language's excess: poetry is what in language cannot be reduced to information, and is not exchangeable, but gives way to a new common ground of understanding, of shared meaning: the creation of a new world.

Poetry is a singular vibration of the voice. This vibration can create resonances, and resonances may produce common space, the place where:

lovers, who never
Could achieve fulfillment here, could show
Their bold lofty figures of heart-swings,
Their towers of ecstasy.

Vagrants

But tell me, who are these vagrants, these even a little
More transitory than we, these from the start
Violently wrung (and for whose sake?)
By a never-appeasable will? But it wrings them,
Bends them, slings them and swings them,
Throws them and catches them; as if from an oily,
More slippery air they come down
On the carpet worn thinner by their eternal leaping,
This carpet lost in the universe.
Stuck there like a plaster, as if the sky
Of the suburb had hurt the earth.
—Rilke: "Fifth Elegy," verses 1–11

These verses can be read simultaneously as a metaphor for the condition of precarity, and as an announcement of a place that we don't know, that we have never experienced: a place of the city, a square, a street, an apartment where suddenly lovers, who here (in the kingdom of valorization and exchange) never "could achieve fulfillment," toss their last ever-hoarded, ever hidden, unknown—to us—eternally valid coins of happiness.

There is no secret meaning in these words, but we can read in these verses a description of the frail architectures of collective happiness: "Their towers of ecstasy, their pyramid that long since, where there was no standing-ground were tremblingly propped together."

This place we don't know is the place we are looking for, in a social environment that has been impoverished by social precariousness, in a landscape that has been deserted. It is the place that will be able to warm the sensible sphere that has been deprived of the joy of singularity. It is the place of occupation, where movements are gathering: Tahrir square in Cairo, Plaza do Sol in Madrid, and Zuccotti Park in New York City.

We call poetry the semiotic concatenation that exceeds the sphere of exchange and the codified correspondence of the signifier and signified; it is the semiotic concatenation that creates new pathways of signification and opens the way to a reactivation of the relation between sensibility and time, as sensibility is the faculty that makes possible the singularity of the enunciation and the singularity of the understanding of a noncodified enunciation.

Viktor Shklovsky, the Russian formalist theorist, says that the specificity of literary language lies in the ability to treat words according to an unrepeatable singular procedure, that in Russian he calls *priem*: an artificial treatment of verbal matter generating

effects of meaning never seen and codified before. Poetical procedure is a form of enstrangement (*ostranenie*, in Russian) that carries the word far and away from its common use.

"Art is not chaos," say Deleuze and Guattari in *What Is Philosophy?*, "but a composition of chaos that yields the vision or sensation, so that it constitutes, as Joyce says, a chaosmos" (Deleuze and Guattari 1994, 204–205). The relation between the organism and the environment is disturbed by the acceleration of info-stimula in the infosphere, by semiotic inflation, and by the saturation of attention and the conscious sensitive sphere of subjectivity. Art is recording and detecting this dissonance, as it simultaneously creates the aesthetic conditions for the perception and expression of new modes of becoming.

Relative to schizoanalysis, art is acting differently in two ways: it represents a diagnostic of the infospheric pollution of the psychosphere, but also a therapy treating the disturbed organism.

The refrain is the sensitive niche where we can create cosmos elaborating chaos.

Social movements can be described as a form of refrain: movements are the refrain of singularization, as they act to create spheres of singularity at the aesthetic and existential levels.

In the process of singularization that the movement makes possible, production, need, and con-

sumption can be semiotized again, according to a new system of world expectations.

Changing the order of expectations is one of the main social transformations that a movement can produce: this change implies a cultural transformation but also a change in sensitivity, in the opening of the organism to the world and to the others.

Insurrection is a refrain helping to withdraw the psychic energies of society from the standardized rhythm of compulsory competition-consumerism, and helping to create an autonomous collective sphere. Poetry is the language of the movement as it tries to deploy a new refrain.

The Limits of the World

In the chapter of *Chaosmosis* that is dedicated to the aesthetic paradigm, Guattari speaks of the new modes of the submission and standardization of subjectivity produced by network technologies and by neoliberal globalization. Simultaneously, he tries to find new pathways to autonomous subjectivation.

As far as concerns the first side of the problem, he writes:

Subjectivity is standardized through a communication which evacuates as much as possible trans-semiotic and amodal enunciative compositions. Thus it slips towards the progressive

effacement of polysemy, prosody, gesture, mimicry and posture, to the profit of a language rigorously subjected to scriptural machines and their mass media avatars. In its extreme contemporary forms it amounts to an exchange of information tokens calculable as bits and reproducible on computers.

In this type of deterritorialised assemblage, the capitalist Signifier, a simulacrum of the imaginary of power, has the job of overcoding all the other Universes of value. (Guattari 1995, 104-5)

Digital technology is canceling the singular enunciative composition of polysemy, gesture, and voice, and tends to produce a language that is subjected to the linguistic machinery. While analyzing the standardization of language, Guattari simultaneously looks for a line of escape from the informational submission (*assujettissement*).

An initial chaotic folding consists in making the powers of chaos co-exist with those of the highest complexity. It is by a continuous coming-and-going at an infinite speed that the multiplicities of entities differentiate into ontologically heterogeneous complexions and become chaoticised in abolishing their figural diversity and by homogenising themselves within the same being-non-being. In a way, they never stop diving into an umbilical chaotic zone where they lose their

extrinsic references and coordinates, but from where they re-emerge invested with new charges of complexity. It is during this chaotic folding that an interface is installed—an interface between the sensible finitude of existential Territories and the trans-sensible infinitude of the Universe of reference bound to them. Thus one oscillates, on the one hand, between a finite world of reduced speed, where limits always loom up behind limits, constraints behind constraints, systems of coordinates behind other systems of coordinates, without ever arriving at the ultimate tangent of a being-matter which recedes everywhere and, on the other hand, Universes of infinite speed where being can't be denied anymore, where it gives itself in its intrinsic differences, in its heterogeneous qualities. The machine, every species of machine, is always at the junction of the finite and infinite, at this point of negotiation between complexity and chaos. (Guattari 1995, 110-111)

Guattari here questions the relation between the finite and infinite in the sphere of language. He is mapping the territory of the informational rhizome, that was not yet completely discovered when *Chaosmosis* was written. The ambiguity of the info-rhizomatic territory is crystal clear: info-technology is standardizing subjectivity and

language, inscribing techno-linguistic interfaces which automatize enunciation.

We are tracing here the dynamic of a disaster, the disaster that capitalism is inserting into hyper-modern subjectivity, the disaster of acceleration and panic. But simultaneously we have to look for a rhythm which may open a further landscape, a landscape beyond panic and beyond the precarious affects of loneliness and despair.

In the chapter on aesthetic paradigm in *Chaosmosis*, Guattari rethinks the question of singularity in terms of sensitive finitude and the possible infinity of language.

The conscious and sensitive organism, the living individuality walking towards extinction, is finite. But the creation of possible universes of meaning is infinite. Desire is the field of this tendency of the finite towards a becoming-infinite.

To produce new infinities from a submersion in sensible finitude, infinities not only charged with virtuality but with potentialities actualisable in given situations, circumventing or dissociating oneself from the Universals itemised by traditional arts, philosophy, and psychoanalysis [...] a new love of the unknown... (Guattari 1995, 161)

The finitude of the conscious and sensitive organism is the place where we imagine projections of

infinity which are not only virtual, but also a potentiality of life, and that can be actualized in situations.

We are on the threshold of a deterritorialized and rhizomatic world, realizing the antioedipal, schizoid form dream. But this dream is becoming true in the form of a global nightmare of financial derealization. On this threshold we have to imagine a politics and an ethics of singularity, breaking our ties with expectations of infinite growth, infinite consumption, and infinite expansion of the self.

In the preface to his *Tractatus Logico-Philosophicus*, Wittgenstein writes: "in order to draw a limit to thinking we should have to be able to think both sides of this limit (we should therefore have to be able to think what cannot be thought)." (Wittgenstein 1922, 27)

And he also writes:

The limits of my language mean the limits of my world. Logic pervades the world: the limits of the world are also its limits. So we cannot say in logic, "The world has this in it, and this, but not that." For that would appear to presuppose that we were excluding certain possibilities, and this cannot be the case, since it would require that logic should go beyond the limits of the world; for only in that way could it view those limits from the other side as well. We cannot think

what we cannot think; so what we cannot think we cannot say either. (Wittgenstein 1922, 68)

And finally, he writes: "The subject does not belong to the world: rather, it is a limit of the world."

When Wittgenstein says that the limits of language are the limits of the world, he is saying something that should be read in two different ways. First, he is saying: what we cannot say we cannot do, we cannot experience, we cannot live, because only in the sphere of language can we interact with the reality of Being. But he is also saying that, because the world is what resides within the limits of our language, what therefore lies beyond the limits of language will only be able to be lived and experienced once our language is able to elaborate that sphere of Being that lies beyond the present limit.

In fact, the philosopher writes: "the subject does not belong to the world, rather it is a limit of the world."

The potency and extension of language depends on the consistency of the subject, on his or her vision, on his or her situation. And the extension of my world depends on the potency of my language.

Guattari calls "chaosmosis" the process of going beyond the limits of the world, and he calls this going beyond resemiotization: i.e., a redefinition

of the semiotic limit, which is also the limit of the experimentability of the world.

Scientists call this effect of autopoietic morphogenesis "emergence": a new form emerges and takes shape when logical linguistic conditions make it possible to see it and to name it. Let's try to understand our present situation from this point of view.

Digital financial capitalism has created a closed reality which cannot be overcome with the techniques of politics, of conscious organized voluntary action, and of government.

Only an act of language can give us the ability to see and to create a new human condition, where we now only see barbarianism and violence.

Only an act of language escaping the technical automatisms of financial capitalism will make possible the emergence of a new life form. The new form of life will be the social and instinctual body of the general intellect, the social and instinctual body that the general intellect is deprived of inside the present conditions of financial dictatorship.

Only the reactivation of the body of the general intellect—the organic, existential, historical finitude that embodies the potency of the general intellect—will be able to imagine new infinities.

In the intersection of the finite and infinite, in the point of negotiation between complexity and chaos, it will be possible to generate a degree of complexity

A social movement, at the end of the day, should use irony as semiotic insolvency, as a mechanism of disentangling language, behavior, and action from the limits of the symbolic debt.

IRONY AND CYNICISM

Mass Zynismus

In his book *The Courage of Truth*, a transcription of lectures delivered at the College de France in 1984, Michel Foucault speaks of Diogenes and the other ancient philosophers known as cynics, and defines their thought as a practice of telling the truth (*parrhesia*). Twenty-five years later, the word cynicism has acquired a totally different meaning, almost the opposite: the cynic is someone who routinely lies to everyone, especially to him or herself. An intimate lie, the contradiction between speech and belief, lies at the core of contemporary cynicism. Still, there remains a kind of consistency between the ancient notion of cynicism—rigorous truthfulness, individualism, ascetic behavior, and disdain for power—and our own, which consists largely of lip service, moral unreliability, and conformist subjugation to those in power. This consistency lies in an awareness of the ambiguous nature of language, and an ability to suspend the

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greater than the degree of complexity that financial capitalism is able to manage and elaborate.

Language has an infinite potency, but the exercise of language happens in finite conditions of history and existence. Thanks to the establishment of a limit, the world comes into existence as a world of language. Grammar, logic, and ethics are based on the institution of a limit. But infinity remains unmeasurable.

Poetry is the reopening of the indefinite, the ironic act of exceeding the established meaning of words.

In every sphere of human action, grammar is the establishment of limits defining a space of communication. Today the economy is the universal grammar traversing the different levels of human activity. Language is defined and limited by its economic exchangeability: this effects a reduction of language to information, an incorporation of technological automatisms into the social circulation of language.

Nevertheless, while social communication is a limited process, language is boundless: its potentiality is not limited to the limits of the signified. Poetry is language's excess, the signifier disentangled from the limits of the signified.

Irony, the ethical form of the excessive power of language, is the infinite game that words play to create and to skip and to shuffle meaning.

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Calm Tech, Then and Now

re:form interviews John Seely Brown on
the paradox of information overload and
designing for the periphery

This interview is a revised version of "[Calm Tech, Then and Now](#)," originally published by re:form on Medium and presented by BMW on August 11, 2014. It has been edited for clarity and more detail by Capri Mali LaRocca. Photos by Talia Herman.

"In the twenty-first century the technology revolution will move into the everyday, the small and the invisible. The impact of technology will increase ten-fold as it is imbedded in the fabric of everyday life. As technology becomes more imbedded and invisible, it calms our lives by removing annoyances while keeping us connected with what is truly important. This imbedding, this invisibility, this radical ease-of-use requires radical innovations in our connectivity infrastructure."

—Mark Weiser

More than twenty years ago, then-Xerox PARC chief technologist Mark Weiser began articulating a prescient vision of the next wave of digital technology. His concept of Ubiquitous Computing, or Ubicomp, anticipated the arrival of tiny networked sensors and the Internet of Things. More radically, he saw the resulting explosion of information leading to a new "calm" design movement as an antidote to the far more common experience of tech rage brought on by poor user experiences and data overload.

Weiser died of cancer in 1999 at the age of 46, but his ideas seem more relevant than ever. *re:form* sat down with Weiser's PARC colleague John Seely Brown (JSB) to revisit the origins of calm technology design, and its subsequent arc. We're also republishing by permission a joint paper by Weiser and Seely Brown, "The Coming Age of Calm Technology."

re:form To kick things off I just want to mention this interview is the result of some research we're doing for a new design collection that we started on Medium. It's called *re:form* and is sponsored by BMW. We came across your paper with Mark Weiser at Xerox PARC from 1996 titled *The Coming Age of Calm Technology* and we thought, wow, that's very prescient, yet seems to be discussed very little these days despite increasing information overload and tech rage. Maybe it's time to bring those ideas back into the design conversation.

JSB: Glad to be here. It's actually quite ironic that this is sponsored by BMW because when Mark and I first spoke about calm technology, we were talking about the BMW motorcycles we both used to drive. I happen to be a motorcycle fanatic and the amount that has influenced my personal thinking on this topic is astronomical.

The reason motorcycles were so important is twofold. The first has to do with ABS brakes. They are the most beautiful example of calm computing because they anticipate your needs and automatically assist you when you need help, yet you're completely unaware they're there. It's an interesting anticipatory context, where micro sensors notice when things are about to go wrong and make subtle adjustments without interrupting the driver.

ABS brakes seamlessly move in from the periphery to the center, help you, and then back out again. The beauty is that it's a tremendous technology that is dramatically enhancing your ability to drive in a wide variety of conditions, but you're completely unaware of it. That brings a sense of calm and that was one origin of designing technology for calmness.

The second origin of calmness also comes from motorcycles. I often drove along Skyline Drive on my motorcycle and one day I realized—because we tend to drive down that twisty stretch very fast—that I was processing so much more information riding a motorcycle down Skyline Drive than any time spent sitting in front of one, two, three, or four screens.

Yet, I never felt any information overload. Why? I began to realize that I could behold if you are still alive and a motorcyclist that you are doing a very good job processing the periphery, as well as the center. Suddenly I began to realize that the way you cognitively process the center has to do with the standard ontology of objects and predicates.

Due to the way our brains process the periphery, we're subconsciously aware of properties that are independent of objects. We notice properties like the color, shape or speed of an object in the periphery, but the object itself does not come into direct interpretation. For example, you might see something move quickly in your peripheral vision. You can't put a name to it – and maybe it's the case that you don't care what it is – but what's important is that your brain takes a weak signal in the periphery and alerts it to the center. It says, "You've got to be prepared to pay attention." It lets you shift seamlessly to bring that part of the periphery into the center of your attention and helps you quickly shift to a different context.



A good motorcyclist is processing huge amounts of peripheral information and much of that is being processed subconsciously. There is a tremendous sense of calm in streaming through the hillside at one hundred miles an hour or more, depending where the curves are. It's a state of flow as the periphery is flying by, and the cyclist is completely in sync. They don't have to pay attention to every bit of information, yet they're in the moment and so focused, looking straight ahead. It's that occasional sense of harmony with the world. But the instant something unusual happens in the periphery that doesn't make sense one way or another, it alerts your conscious mind to shift focus and pay attention. Most people don't realize that's what's going on.

People used to push back. They'd come up to us and they'd say, "I don't want calm. I want exciting." I'd say, "Calm and exciting can go hand in hand. What you don't want is to be overwhelmed with information or bogged down with

nonsense.” Solving that is what we’re interested in.

So, the thing that initially brought Mark and me together was phenomenology. Take a blind man and give him a cane, preferably his cane. Sitting in a chair, he can tell you everything about the handle on the cane. As soon as he gets up and starts walking however, that handle completely disappears and becomes much more like a wrist. Very few of us can truly explain the feelings and protocols that happen at this junction here [points at his wrist]. We focus on what we’re touching with our hand, not what’s happening with our wrist. It completely disappears.

With that in mind, we were interested in what enables technology to profoundly disappear and let you look through the information or look through the interface onto the domain – just like how the blind man’s eyes are now touching the concrete, so to speak. The technology disappears in the same way that the cane disappears. So we were exploring how we might design technology that lets us look *through* the screen instead of *at* the screen and then play with the information as if there’s no screen there at all.

The more we started thinking about this, the more we were led to a counter-intuitive idea. Mark said we will always feel information overload unless we increase the amount of information that we have to process by a factor of at least ten. If you go by a factor of ten, then you stop thinking about putting more information on screens. It becomes more like driving down Skyline Drive; you can’t process all of the information in front of you, but through a synergistic relationship between the center and the periphery, you can reach through the information and on to the world with a sense of calm. You start thinking in a different way and that’s what got us focusing on how we process the total context.

It led to our fascination with the “Dangling String” that we describe in *Designing Calm Technology*. The string is an eight-foot piece of spaghetti-like plastic that hangs from a small electric motor mounted in the ceiling. The motor is electrically connected to a nearby Ethernet cable, so that each bit of information that goes past causes a tiny twitch of the motor. A very busy network causes a madly whirling string, the string whipping through the air

producing a characteristic whirring noise that changes octaves depending on the speed. A quiet network causes only a small set of twitches every few seconds. Placed in an unused corner of a hallway, the dangling string is visible and audible from many offices without being obtrusive. It’s continuous noise and movement in the background communicates information without you having to focus on it, thereby expanding your peripheral vision. In a sense, you are attuned to it without having to attend to it. You can hear when it’s twirling faster and the frequency shifts – that’s the peripheral cue. You’re not meant to look at the string; you just know this weak signal has changed.

Only when your flow gets interrupted by your machine slowing down do you become more attuned to what’s happening around you. You enter a state of confusion and begin to look around for cues. It’s clear whether or not the network is the problem based on whether or not the dangling string is spinning rapidly. A madly spinning string indicates an overloaded Ethernet is causing the problem. A slowly spinning string indicates the problem is elsewhere. Then you can attend to the issue and the string fades back into the periphery.

It’s the same way that you might be hard at work at a conference, but notice when it’s approaching lunchtime because suddenly you’re aware of...

rf People getting up and moving?

JSB: Yes, people moving and getting restless. You become aware that the noise and movement are signaling a change...and you start processing differently. So it’s the sense – phenomenologically speaking – of how do you become attuned to information on the periphery? Attending and attunement are slightly different. We can attune to the periphery without having to consciously interpret and attend to it, and that ability is essential for maintaining calm in a world of information overload.

In computer science, user interface people often talk about making things user “centric.” Most user-centric design focuses on understanding how people interpret information on the graphical user interface (GUI) and how to display information to make it most intuitively graspable. Similar to how an artist

will know how to draw your eyes to the center – to what's important to pay attention to – user experience experts know how to design interfaces that draw your eye to the important information.

r:f So, how is this device [points at iPhone] user centric? Do you imagine it as basically a PC in your pocket?

JSB: Yes, and we did. In fact, I think it was 1998 and Comdex, the Computer Dealers' Exhibition, showed the material that Roy Want had done with Mark and myself. We embedded all kinds of MEMS accelerometers – devices that measure acceleration – into a PDA. We actually showed a digital Rolodex on the PDA that...

r:f That flipped the page.

JSB: Well actually one where the pages flipped when the PDA was tilted. You never had to touch the interface for that to happen. Similar to newer systems today where you can shake a device to erase things, the PDA was picking up gestures directly. When you tilted it, the pages of the Rolodex fell as if influenced by gravity. It was the most natural thing – you tilt it and the pages start to turn. Great user centric design makes you almost unaware that there's an actual interface. It's more like having a gestural conversation.

Today you can see Amazon taking it much further than any of us ever thought possible with the Dynamic Perspective sensor system on the Fire phone. They have taken the whole notion of gestural conversations to the extreme with devices that respond to subtle hand tilts and head movements. Map displays are partially 3D and change perspective based on your movement. Immersed in a game you can turn your head to look around virtual corners and obstacles. Depending on which direction you tilt the phone, specific content like menus or photo carousels are revealed. Phenomenologically speaking, you extend your social practices onto the device and the device becomes an extension of you. And that transforms into a whole new world.

r:f So how far do you think we've come in terms of designers understanding and working on the problems of calm technology? Would you consider a



device like Google Glass a step in the direction of calm, as you described it earlier, in the sense of seeing through the information and past the screen?

JSB: There are a lot of reasons Google Glass is interesting. Why I consider it interesting relative to this conversation is something I've never talked about much and it's how Google Glass leverages Google Now. That's to say Google Now is gathering so much information about you – if you've been using it all the time in Gmail and all the other Google services – that it's capable of anticipating what you need.

It's the beginnings of an anticipatory system. The way Google Glass works you don't need to give it instructions. It anticipates what you need and that anticipation is a kind of context awareness. By codifying your context, actions and your propensity for that context, it knows what you've done, where you are and where you likely want to go next. Combined with a pretty simple

stroke interface and limited speech recognition instead of a keyboard, the interface starts to disappear and you and the device become one.

In that sense, Google Now understands the context very much like we do when processing the periphery. However, it's using a completely different set of cognitive mechanisms, I think, than what we're used to in terms of how processing the periphery actually works. Still, it strikes me as the first attempt that Google Now is making – for the purpose of Google Glass – to build and amplify an anticipatory system. It is a huge step, one that can completely transform our experience of interacting with the world.

r:f At the same time it feels like Google Glass is an enraging technology for many people when they are on the other side of that screen. Is attempting to address how devices can be enraging part of your concept for designing calm technology? For example, how parents can get angry when their children are constantly absorbed in their phones?

JSB: No, we were looking more at how to build anticipatory contexts over our systems, but part of examining how technologies engage our attention involves addressing why some are enraging while others are encalming.

In fact, it could be very interesting to build an anticipatory system like Glass without the camera lens. There are a lot of things we can do to mitigate the fact that people think they're being photographed. You could put in only a fundamentally defocusing lens so it would pick up qualities, not objects and predicates. It's a random new idea, but I mean it's interesting. We may be able to have devices that don't intrude. You'd be surprised what you might be able to do ...

r:f So what areas of design do you see calm technology being most actively developed right now? What is not being developed where it ought to be?

JSB: Well let me go back to your field here. My first book was called *The Social Life of Information* and it discusses how books are social artifacts. Well-designed books have all kinds of affordances and cues to them that help you read the book; you know how to open a book and turn the pages. Usually when

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you think about a book you think about the content, not the structure. A lot of attention went into the cover, the spacing, the typography, the chapter layout and so on. This is because all of the affordances that the physical artifact provides are almost all subliminal and you don't necessarily think about them directly.

The design of that artifact achieves an amazing sense of communication and – in some sense to a lot of us – a calming factor. In contrast, I have a hard time getting used to electronic books and the fact that many of the cues that I subconsciously enjoy just aren't there.

I see electronic book readers trying to keep up sometimes by creating fundamentally new forms to help compensate for the lack of cues – such as turning a page – that those of us that love physical books look for. To do this successfully requires taking the broader field of affordances around us more



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seriously. How do we design the affordances in the new medium to provide some of the cues that the old medium provided in terms of reading context, not content. We tend to overlook the generative dance between context and content.

r:f That's interesting. It reminds me of calm reading and the calm reading movement where people are taking web pages, stripping them down, and removing a lot of the clutter to really focus on a much cleaner space for reading. It's a reading context that is much more conducive to engagement and focus. Medium pages are designed that way.

JSB: Yes, I think Medium knows more about design than many other publishers today. There are a lot of other factors that go into the subliminal affordances that you can also look at. The actual page layout matters and how that page gets read. Think about the page layout of a newspaper. How do you decide what story should be adjacent to another? How do you orchestrate serendipity?

Well-designed newspapers—which we don't have much of anymore – have front-page designers that understand what's happening above the fold versus below the fold. They understand how adjacent articles might capture your eye, even if you didn't necessarily think you wanted to know about the topic. They're capturing enough to make you say, "Oh." These newspapers actually orchestrate serendipity for you. But to orchestrate serendipity, you have to be a darn good designer.

Ubiquitous computing makes orchestrating serendipity even easier. It reminds me of back at PARC in the early nineties when we put the coffee pot on the Ethernet. It was the Internet of Things before the Internet of Things! The coffee machine would announce on the Ethernet when a fresh pot of coffee was ready, prompting people to get up and go where they were bound to interact with other coffee-hungry employees. That's orchestrating serendipity. What's more is that we had a floor to ceiling whiteboard next to the coffee pot where people could write down ideas so that the whole discussion would be rendered or given enough context for others to quickly enter the conversation. A digital camera was there to take a snapshot of what was on the whiteboard

so that people could take it back to their own office and continue working on it if they wanted; it helped scaffold the serendipitous conversations for later expansion. A lot of thought went into making it an inviting space where if you chose to participate you could get up to speed quickly. The space was transformed by putting the coffee pot online into a nano creation space where context was captured, rendered and designed to foster emergence. The technology fades into the woodwork and people are able to focus on the ideas and interactions with each other. Ubiquitous computing really amplifies what you can do.

r:f I hear you have a new book. What's it about?

JSB: It's called *Design Unbound: Designing for Emergence in a White Water World* by Ann Pendleton-Jullian and myself. It presents new tools, skills and methodologies for addressing today's most complex issues and by complex we don't mean just complicated, we mean issues that don't lend themselves to fixed solutions at all: education, overpopulation, water shortages, climate change...to work in and on these problems requires more than working on things in contexts. It requires that we work on the contexts themselves.

So the book starts with an operational construct about how to have agency in the twenty-first century. We then present a series of toolsets that are strongly influenced by architectural methodologies – landscape design, urban design – but supercharged for this specific type of work. The types of problems we're addressing are unique to the twenty-first century where technology-fueled change is happening at an exponential rate. I'm fond of saying that we're now living in a "white water world," where in order to be successful we must be more like the white water kayaker – skillfully reading the currents and disruptions of the context around us. We must respond in real time and to novel problems for which there is no guidebook to reference. Innovation arises – most often – in action. Therefore *Design Unbound* also presents a series of case studies from fifteen years of practice – both Ann and myself – on projects in the field that have not been able to be approached with the old toolset and from others who have brought about major change in difficult, highly intractable environments and on highly trans-disciplinary, radically contingent – otherwise called wicked – problems. The methodologies we discuss go beyond the content of these issues to address and design contexts specifically.

Calm technology is very much related in that it also elevates context to a first class item for consideration.

r:f When you talk about designing calm technology, it sounds like a prescription for using technology to solve the problems of technology. Would you say that's fair? Some people might say it is a cultural shift that's required to get control of our devices and our information obsession, and not so much a problem of more and better design engineering.

JSB: I wouldn't say calm technology is going to solve all the problems associated technology. We never viewed technology as solving the problem. We often viewed technology as a complicating factor since the design was rarely informed, and that's the whole thrust of this new book. It's really re-thinking the design game and up-leveling our relationship with technology through the kind of aesthetics that architects have where the interplay between context and content or landscape architecture and building architecture work hand in hand. So, as the world gets more and more complicated, I think that the need for designing context increases exponentially. And sometimes you've got to really break the paradigm and think about design in brand new ways.

As We May Think

VANNEVAR BUSH

JULY 1945 ISSUE | TECHNOLOGY

As Director of the Office of Scientific Research and Development, Dr. Vannevar Bush has coordinated the activities of some six thousand leading American scientists in the application of science to warfare. In this significant article he holds up an incentive for scientists when the fighting has ceased. He urges that men of science should then turn to the massive task of making more accessible our bewildering store of knowledge. For years inventions have extended man's physical powers rather than the powers of his mind. Trip hammers that multiply the fists, microscopes that sharpen the eye, and engines of destruction and detection are new results, but not the end results, of modern science. Now, says Dr. Bush, instruments are at hand which, if properly developed, will give man access to and command over the inherited knowledge of the ages. The perfection of these pacific instruments should be the first objective of our scientists as they emerge from their war work. Like Emerson's famous address of 1837 on "The American Scholar," this paper by Dr. Bush calls for a new relationship between thinking man and the sum of our knowledge. —THE EDITOR

This has not been a scientist's war; it has been a war in which all have had a part. The scientists, burying their old professional competition in the demand of a common cause, have shared greatly and learned much. It has been exhilarating to work in effective partnership. Now, for many, this appears to be approaching an end. What are the scientists to do next?

For the biologists, and particularly for the medical scientists, there can be little indecision, for their war has hardly required them to leave the old paths. Many indeed have been able to carry on their war research in their familiar peacetime laboratories. Their objectives remain much the same.

It is the physicists who have been thrown most violently off stride, who have left academic pursuits for the making of strange destructive gadgets, who have had to devise new methods for their unanticipated assignments. They have done their part on the devices that made it possible to turn back the enemy, have worked in combined effort with the physicists of our allies. They have felt within themselves the stir of achievement. They have been part of a great team. Now, as peace approaches, one asks where they will find objectives worthy of their best.

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Of what lasting benefit has been man's use of science and of the new instruments which his research brought into existence? First, they have increased his control of his material environment. They have improved his food, his clothing, his shelter; they have increased his security and released him partly from the bondage of bare existence. They have given him increased knowledge of his own biological processes so that he has had a progressive freedom from disease and an increased span of life. They are illuminating the interactions of his physiological and psychological functions, giving the promise of an improved mental health.

Science has provided the swiftest communication between individuals; it has provided a record of ideas and has enabled man to manipulate and to make extracts from that record so that knowledge evolves and endures throughout the life of a race rather than that of an individual.

There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less to remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial.

Professionally our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose. If the aggregate time spent in writing scholarly works and in reading them could be

evaluated, the ratio between these amounts of time might well be startling. Those who conscientiously attempt to keep abreast of current thought, even in restricted fields, by close and continuous reading might well shy away from an examination calculated to show how much of the previous month's efforts could be produced on call. Mendel's concept of the laws of genetics was lost to the world for a generation because his publication did not reach the few who were capable of grasping and extending it; and this sort of catastrophe is undoubtedly being repeated all about us, as truly significant attainments become lost in the mass of the inconsequential.

The difficulty seems to be, not so much that we publish unduly in view of the extent and variety of present day interests, but rather that publication has been extended far beyond our present ability to make real use of the record. 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.

But there are signs of a change as new and powerful instrumentalities come into use. Photocells capable of seeing things in a physical sense, advanced photography which can record what is seen or even what is not, thermionic tubes capable of controlling potent forces under the guidance of less power than a mosquito uses to vibrate his wings, cathode ray tubes rendering visible an occurrence so brief that by comparison a microsecond is a long time, relay combinations which will carry out involved sequences of movements more reliably than any human operator and thousands of times as fast—there are plenty of mechanical aids with which to effect a transformation in scientific records.

Two centuries ago Leibnitz invented a calculating machine which embodied most of the essential features of recent keyboard devices, but it could not then come into use. The economics of the situation were against it: the labor involved in constructing it, before the days of mass production, exceeded the labor to be saved by its use, since all it could accomplish could be duplicated by sufficient use of pencil and paper. Moreover, it would have been subject to frequent breakdown, so

that it could not have been depended upon; for at that time and long after, complexity and unreliability were synonymous.

Babbage, even with remarkably generous support for his time, could not produce his great arithmetical machine. His idea was sound enough, but construction and maintenance costs were then too heavy. Had a Pharaoh been given detailed and explicit designs of an automobile, and had he understood them completely, it would have taxed the resources of his kingdom to have fashioned the thousands of parts for a single car, and that car would have broken down on the first trip to Giza.

Machines with interchangeable parts can now be constructed with great economy of effort. In spite of much complexity, they perform reliably. Witness the humble typewriter, or the movie camera, or the automobile. Electrical contacts have ceased to stick when thoroughly understood. Note the automatic telephone exchange, which has hundreds of thousands of such contacts, and yet is reliable. A spider web of metal, sealed in a thin glass container, a wire heated to brilliant glow, in short, the thermionic tube of radio sets, is made by the hundred million, tossed about in packages, plugged into sockets—and it works! Its gossamer parts, the precise location and alignment involved in its construction, would have occupied a master craftsman of the guild for months; now it is built for thirty cents. The world has arrived at an age of cheap complex devices of great reliability; and something is bound to come of it.

2

A record if it is to be useful to science, must be continuously extended, it must be stored, and above all it must be consulted. Today we make the record conventionally by writing and photography, followed by printing; but we also record on film, on wax disks, and on magnetic wires. Even if utterly new recording procedures do not appear, these present ones are certainly in the process of modification and extension.

Certainly progress in photography is not going to stop. Faster material and lenses, more automatic cameras, finer-grained sensitive compounds to allow an extension

of the minicamera idea, are all imminent. Let us project this trend ahead to a logical, if not inevitable, outcome. The camera hound of the future wears on his forehead a lump a little larger than a walnut. It takes pictures 3 millimeters square, later to be projected or enlarged, which after all involves only a factor of 10 beyond present practice. The lens is of universal focus, down to any distance accommodated by the unaided eye, simply because it is of short focal length. There is a built-in photocell on the walnut such as we now have on at least one camera, which automatically adjusts exposure for a wide range of illumination. There is film in the walnut for a hundred exposures, and the spring for operating its shutter and shifting its film is wound once for all when the film clip is inserted. It produces its result in full color. It may well be stereoscopic, and record with two spaced glass eyes, for striking improvements in stereoscopic technique are just around the corner.

The cord which trips its shutter may reach down a man's sleeve within easy reach of his fingers. A quick squeeze, and the picture is taken. On a pair of ordinary glasses is a square of fine lines near the top of one lens, where it is out of the way of ordinary vision. When an object appears in that square, it is lined up for its picture. As the scientist of the future moves about the laboratory or the field, every time he looks at something worthy of the record, he trips the shutter and in it goes, without even an audible click. Is this all fantastic? The only fantastic thing about it is the idea of making as many pictures as would result from its use.

Will there be dry photography? It is already here in two forms. When Brady made his Civil War pictures, the plate had to be wet at the time of exposure. Now it has to be wet during development instead. In the future perhaps it need not be wetted at all. There have long been films impregnated with diazo dyes which form a picture without development, so that it is already there as soon as the camera has been operated. An exposure to ammonia gas destroys the unexposed dye, and the picture can then be taken out into the light and examined. The process is now slow, but someone may speed it up, and it has no grain difficulties such as now keep photographic researchers busy. Often it would be advantageous to be able to snap the camera and to look at the picture immediately.

Another process now in use is also slow, and more or less clumsy. For fifty years impregnated papers have been used which turn dark at every point where an electrical contact touches them, by reason of the chemical change thus produced in an iodine compound included in the paper. They have been used to make records, for a pointer moving across them can leave a trail behind. If the electrical potential on the pointer is varied as it moves, the line becomes light or dark in accordance with the potential.

This scheme is now used in facsimile transmission. The pointer draws a set of closely spaced lines across the paper one after another. As it moves, its potential is varied in accordance with a varying current received over wires from a distant station, where these variations are produced by a photocell which is similarly scanning a picture. At every instant the darkness of the line being drawn is made equal to the darkness of the point on the picture being observed by the photocell. Thus, when the whole picture has been covered, a replica appears at the receiving end.

A scene itself can be just as well looked over line by line by the photocell in this way as can a photograph of the scene. This whole apparatus constitutes a camera, with the added feature, which can be dispensed with if desired, of making its picture at a distance. It is slow, and the picture is poor in detail. Still, it does give another process of dry photography, in which the picture is finished as soon as it is taken.

It would be a brave man who would predict that such a process will always remain clumsy, slow, and faulty in detail. Television equipment today transmits sixteen reasonably good pictures a second, and it involves only two essential differences from the process described above. For one, the record is made by a moving beam of electrons rather than a moving pointer, for the reason that an electron beam can sweep across the picture very rapidly indeed. The other difference involves merely the use of a screen which glows momentarily when the electrons hit, rather than a chemically treated paper or film which is permanently altered. This speed is necessary in television, for motion pictures rather than stills are the object.

Use chemically treated film in place of the glowing screen, allow the apparatus to transmit one picture only rather than a succession, and a rapid camera for dry photography results. The treated film needs to be far faster in action than present examples, but it probably could be. More serious is the objection that this scheme would involve putting the film inside a vacuum chamber, for electron beams behave normally only in such a rarefied environment. This difficulty could be avoided by allowing the electron beam to play on one side of a partition, and by pressing the film against the other side, if this partition were such as to allow the electrons to go through perpendicular to its surface, and to prevent them from spreading out sideways. Such partitions, in crude form, could certainly be constructed, and they will hardly hold up the general development.

Like dry photography, microphotography still has a long way to go. The basic scheme of reducing the size of the record, and examining it by projection rather than directly, has possibilities too great to be ignored. The combination of optical projection and photographic reduction is already producing some results in microfilm for scholarly purposes, and the potentialities are highly suggestive. Today, with microfilm, reductions by a linear factor of 20 can be employed and still produce full clarity when the material is re-enlarged for examination. The limits are set by the graininess of the film, the excellence of the optical system, and the efficiency of the light sources employed. All of these are rapidly improving.

Assume a linear ratio of 100 for future use. Consider film of the same thickness as paper, although thinner film will certainly be usable. Even under these conditions there would be a total factor of 10,000 between the bulk of the ordinary record on books, and its microfilm replica. The *Encyclopaedia Britannica* could be reduced to the volume of a matchbox. A library of a million volumes could be compressed into one end of a desk. If the human race has produced since the invention of movable type a total record, in the form of magazines, newspapers, books, tracts, advertising blurbs, correspondence, having a volume corresponding to a billion books, the whole affair, assembled and compressed, could be lugged off in a moving van. Mere compression, of course, is not enough; one needs not only to make and store a

record but also be able to consult it, and this aspect of the matter comes later. Even the modern great library is not generally consulted; it is nibbled at by a few.

Compression is important, however, when it comes to costs. The material for the microfilm *Britannica* would cost a nickel, and it could be mailed anywhere for a cent. What would it cost to print a million copies? To print a sheet of newspaper, in a large edition, costs a small fraction of a cent. The entire material of the *Britannica* in reduced microfilm form would go on a sheet eight and one-half by eleven inches. Once it is available, with the photographic reproduction methods of the future, duplicates in large quantities could probably be turned out for a cent apiece beyond the cost of materials. The preparation of the original copy? That introduces the next aspect of the subject.

3

To make the record, we now push a pencil or tap a typewriter. Then comes the process of digestion and correction, followed by an intricate process of typesetting, printing, and distribution. To consider the first stage of the procedure, will the author of the future cease writing by hand or typewriter and talk directly to the record? He does so indirectly, by talking to a stenographer or a wax cylinder; but the elements are all present if he wishes to have his talk directly produce a typed record. All he needs to do is to take advantage of existing mechanisms and to alter his language.

At a recent World Fair a machine called a Voder was shown. A girl stroked its keys and it emitted recognizable speech. No human vocal chords entered into the procedure at any point; the keys simply combined some electrically produced vibrations and passed these on to a loud-speaker. In the Bell Laboratories there is the converse of this machine, called a Vocoder. The loudspeaker is replaced by a microphone, which picks up sound. Speak to it, and the corresponding keys move. This may be one element of the postulated system.

The other element is found in the stenotype, that somewhat disconcerting device encountered usually at public meetings. A girl strokes its keys languidly and looks

about the room and sometimes at the speaker with a disquieting gaze. From it emerges a typed strip which records in a phonetically simplified language a record of what the speaker is supposed to have said. Later this strip is retyped into ordinary language, for in its nascent form it is intelligible only to the initiated. Combine these two elements, let the Vocoder run the stenotype, and the result is a machine which types when talked to.

Our present languages are not especially adapted to this sort of mechanization, it is true. It is strange that the inventors of universal languages have not seized upon the idea of producing one which better fitted the technique for transmitting and recording speech. Mechanization may yet force the issue, especially in the scientific field; whereupon scientific jargon would become still less intelligible to the layman.

One can now picture a future investigator in his laboratory. His hands are free, and he is not anchored. As he moves about and observes, he photographs and comments. Time is automatically recorded to tie the two records together. If he goes into the field, he may be connected by radio to his recorder. As he ponders over his notes in the evening, he again talks his comments into the record. His typed record, as well as his photographs, may both be in miniature, so that he projects them for examination.

Much needs to occur, however, between the collection of data and observations, the extraction of parallel material from the existing record, and the final insertion of new material into the general body of the common record. For mature thought there is no mechanical substitute. But creative thought and essentially repetitive thought are very different things. For the latter there are, and may be, powerful mechanical aids.

Adding a column of figures is a repetitive thought process, and it was long ago properly relegated to the machine. True, the machine is sometimes controlled by a keyboard, and thought of a sort enters in reading the figures and poking the corresponding keys, but even this is avoidable. Machines have been made which will read typed figures by photocells and then depress the corresponding keys; these are combinations of photocells for scanning the type, electric circuits for sorting the

consequent variations, and relay circuits for interpreting the result into the action of solenoids to pull the keys down.

All this complication is needed because of the clumsy way in which we have learned to write figures. If we recorded them positionally, simply by the configuration of a set of dots on a card, the automatic reading mechanism would become comparatively simple. In fact if the dots are holes, we have the punched-card machine long ago produced by Hollorith for the purposes of the census, and now used throughout business. Some types of complex businesses could hardly operate without these machines.

Adding is only one operation. To perform arithmetical computation involves also subtraction, multiplication, and division, and in addition some method for temporary storage of results, removal from storage for further manipulation, and recording of final results by printing. Machines for these purposes are now of two types: keyboard machines for accounting and the like, manually controlled for the insertion of data, and usually automatically controlled as far as the sequence of operations is concerned; and punched-card machines in which separate operations are usually delegated to a series of machines, and the cards then transferred bodily from one to another. Both forms are very useful; but as far as complex computations are concerned, both are still in embryo.

Rapid electrical counting appeared soon after the physicists found it desirable to count cosmic rays. For their own purposes the physicists promptly constructed thermionic-tube equipment capable of counting electrical impulses at the rate of 100,000 a second. The advanced arithmetical machines of the future will be electrical in nature, and they will perform at 100 times present speeds, or more.

Moreover, they will be far more versatile than present commercial machines, so that they may readily be adapted for a wide variety of operations. They will be controlled by a control card or film, they will select their own data and manipulate it in accordance with the instructions thus inserted, they will perform complex arithmetical computations at exceedingly high speeds, and they will record results in such form as to be readily available for distribution or for later further

manipulation. Such machines will have enormous appetites. One of them will take instructions and data from a whole roomful of girls armed with simple key board punches, and will deliver sheets of computed results every few minutes. There will always be plenty of things to compute in the detailed affairs of millions of people doing complicated things.

4

The repetitive processes of thought are not confined however, to matters of arithmetic and statistics. In fact, every time one combines and records facts in accordance with established logical processes, the creative aspect of thinking is concerned only with the selection of the data and the process to be employed and the manipulation thereafter is repetitive in nature and hence a fit matter to be relegated to the machine. Not so much has been done along these lines, beyond the bounds of arithmetic, as might be done, primarily because of the economics of the situation. The needs of business and the extensive market obviously waiting, assured the advent of mass-produced arithmetical machines just as soon as production methods were sufficiently advanced.

With machines for advanced analysis no such situation existed; for there was and is no extensive market; the users of advanced methods of manipulating data are a very small part of the population. There are, however, machines for solving differential equations—and functional and integral equations, for that matter. There are many special machines, such as the harmonic synthesizer which predicts the tides. There will be many more, appearing certainly first in the hands of the scientist and in small numbers.

If scientific reasoning were limited to the logical processes of arithmetic, we should not get far in our understanding of the physical world. One might as well attempt to grasp the game of poker entirely by the use of the mathematics of probability. The abacus, with its beads strung on parallel wires, led the Arabs to positional numeration and the concept of zero many centuries before the rest of the world; and it was a useful tool—so useful that it still exists.

It is a far cry from the abacus to the modern keyboard accounting machine. It will be an equal step to the arithmetical machine of the future. But even this new machine will not take the scientist where he needs to go. Relief must be secured from laborious detailed manipulation of higher mathematics as well, if the users of it are to free their brains for something more than repetitive detailed transformations in accordance with established rules. A mathematician is not a man who can readily manipulate figures; often he cannot. He is not even a man who can readily perform the transformations of equations by the use of calculus. He is primarily an individual who is skilled in the use of symbolic logic on a high plane, and especially he is a man of intuitive judgment in the choice of the manipulative processes he employs.

All else he should be able to turn over to his mechanism, just as confidently as he turns over the propelling of his car to the intricate mechanism under the hood. Only then will mathematics be practically effective in bringing the growing knowledge of atomistics to the useful solution of the advanced problems of chemistry, metallurgy, and biology. For this reason there still come more machines to handle advanced mathematics for the scientist. Some of them will be sufficiently bizarre to suit the most fastidious connoisseur of the present artifacts of civilization.

5

The scientist, however, is not the only person who manipulates data and examines the world about him by the use of logical processes, although he sometimes preserves this appearance by adopting into the fold anyone who becomes logical, much in the manner in which a British labor leader is elevated to knighthood. Whenever logical processes of thought are employed—that is, whenever thought for a time runs along an accepted groove—there is an opportunity for the machine. Formal logic used to be a keen instrument in the hands of the teacher in his trying of students' souls. It is readily possible to construct a machine which will manipulate premises in accordance with formal logic, simply by the clever use of relay circuits. Put a set of premises into such a device and turn the crank, and it will readily pass

out conclusion after conclusion, all in accordance with logical law, and with no more slips than would be expected of a keyboard adding machine.

Logic can become enormously difficult, and it would undoubtedly be well to produce more assurance in its use. The machines for higher analysis have usually been equation solvers. Ideas are beginning to appear for equation transformers, which will rearrange the relationship expressed by an equation in accordance with strict and rather advanced logic. Progress is inhibited by the exceedingly crude way in which mathematicians express their relationships. They employ a symbolism which grew like Topsy and has little consistency; a strange fact in that most logical field.

A new symbolism, probably positional, must apparently precede the reduction of mathematical transformations to machine processes. Then, on beyond the strict logic of the mathematician, lies the application of logic in everyday affairs. We may some day click off arguments on a machine with the same assurance that we now enter sales on a cash register. But the machine of logic will not look like a cash register, even of the streamlined model.

So much for the manipulation of ideas and their insertion into the record. Thus far we seem to be worse off than before—for we can enormously extend the record; yet even in its present bulk we can hardly consult it. This is a much larger matter than merely the extraction of data for the purposes of scientific research; it involves the entire process by which man profits by his inheritance of acquired knowledge. The prime action of use is selection, and here we are halting indeed. There may be millions of fine thoughts, and the account of the experience on which they are based, all encased within stone walls of acceptable architectural form; but if the scholar can get at only one a week by diligent search, his syntheses are not likely to keep up with the current scene.

Selection, in this broad sense, is a stone adze in the hands of a cabinetmaker. Yet, in a narrow sense and in other areas, something has already been done mechanically on selection. The personnel officer of a factory drops a stack of a few thousand employee cards into a selecting machine, sets a code in accordance with an

established convention, and produces in a short time a list of all employees who live in Trenton and know Spanish. Even such devices are much too slow when it comes, for example, to matching a set of fingerprints with one of five million on file. Selection devices of this sort will soon be speeded up from their present rate of reviewing data at a few hundred a minute. By the use of photocells and microfilm they will survey items at the rate of a thousand a second, and will print out duplicates of those selected.

This process, however, is simple selection: it proceeds by examining in turn every one of a large set of items, and by picking out those which have certain specified characteristics. There is another form of selection best illustrated by the automatic telephone exchange. You dial a number and the machine selects and connects just one of a million possible stations. It does not run over them all. It pays attention only to a class given by a first digit, then only to a subclass of this given by the second digit, and so on; and thus proceeds rapidly and almost unerringly to the selected station. It requires a few seconds to make the selection, although the process could be speeded up if increased speed were economically warranted. If necessary, it could be made extremely fast by substituting thermionic-tube switching for mechanical switching, so that the full selection could be made in one one-hundredth of a second. No one would wish to spend the money necessary to make this change in the telephone system, but the general idea is applicable elsewhere.

Take the prosaic problem of the great department store. Every time a charge sale is made, there are a number of things to be done. The inventory needs to be revised, the salesman needs to be given credit for the sale, the general accounts need an entry, and, most important, the customer needs to be charged. A central records device has been developed in which much of this work is done conveniently. The salesman places on a stand the customer's identification card, his own card, and the card taken from the article sold—all punched cards. When he pulls a lever, contacts are made through the holes, machinery at a central point makes the necessary computations and entries, and the proper receipt is printed for the salesman to pass to the customer.

But there may be ten thousand charge customers doing business with the store, and before the full operation can be completed someone has to select the right card and insert it at the central office. Now rapid selection can slide just the proper card into position in an instant or two, and return it afterward. Another difficulty occurs, however. Someone must read a total on the card, so that the machine can add its computed item to it. Conceivably the cards might be of the dry photography type I have described. Existing totals could then be read by photocell, and the new total entered by an electron beam.

The cards may be in miniature, so that they occupy little space. They must move quickly. They need not be transferred far, but merely into position so that the photocell and recorder can operate on them. Positional dots can enter the data. At the end of the month a machine can readily be made to read these and to print an ordinary bill. With tube selection, in which no mechanical parts are involved in the switches, little time need be occupied in bringing the correct card into use—a second should suffice for the entire operation. The whole record on the card may be made by magnetic dots on a steel sheet if desired, instead of dots to be observed optically, following the scheme by which Poulsen long ago put speech on a magnetic wire. This method has the advantage of simplicity and ease of erasure. By using photography, however one can arrange to project the record in enlarged form and at a distance by using the process common in television equipment.

One can consider rapid selection of this form, and distant projection for other purposes. To be able to key one sheet of a million before an operator in a second or two, with the possibility of then adding notes thereto, is suggestive in many ways. It might even be of use in libraries, but that is another story. At any rate, there are now some interesting combinations possible. One might, for example, speak to a microphone, in the manner described in connection with the speech controlled typewriter, and thus make his selections. It would certainly beat the usual file clerk.

6

The real heart of the matter of selection, however, goes deeper than a lag in the adoption of mechanisms by libraries, or a lack of development of devices for their

use. Our ineptitude in getting at the record is largely caused by the artificiality of systems of indexing. When data of any sort are placed in storage, they are filed alphabetically or numerically, and information is found (when it is) by tracing it down from subclass to subclass. It can be in only one place, unless duplicates are used; one has to have rules as to which path will locate it, and the rules are cumbersome. Having found one item, moreover, one has to emerge from the system and re-enter on a new path.

The human mind does not work that way. It operates by association. With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain. It has other characteristics, of course; trails that are not frequently followed are prone to fade, items are not fully permanent, memory is transitory. Yet the speed of action, the intricacy of trails, the detail of mental pictures, is awe-inspiring beyond all else in nature.

Man cannot hope fully to duplicate this mental process artificially, but he certainly ought to be able to learn from it. In minor ways he may even improve, for his records have relative permanency. The first idea, however, to be drawn from the analogy concerns selection. Selection by association, rather than indexing, may yet be mechanized. One cannot hope thus to equal the speed and flexibility with which the mind follows an associative trail, but it should be possible to beat the mind decisively in regard to the permanence and clarity of the items resurrected from storage.

Consider a future device for individual use, which is a sort of mechanized private file and library. It needs a name, and, to coin one at random, "memex" will do. A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory.

It consists of a desk, and while it can presumably be operated from a distance, it is primarily the piece of furniture at which he 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. On the top of the memex is a transparent platen. On this are placed longhand notes, photographs, memoranda, all sorts of things. When one is in place, the depression of a lever causes it to be photographed onto the next blank space in a section of the memex film, dry photography being employed.

There is, of course, provision for consultation of the record by the usual scheme of indexing. If the user wishes to consult a certain book, he taps its code on the keyboard, and the title page of the book promptly appears before him, projected onto one of his viewing positions. Frequently-used codes are mnemonic, so that he seldom consults his code book; but when he does, a single tap of a key projects it for his use. Moreover, he has supplemental levers. On deflecting one of these levers to the right he runs through the book before him, each page in turn being projected at a speed which just allows a recognizing glance at each. If he deflects it further to the right, he steps through the book 10 pages at a time; still further at 100 pages at a time. Deflection to the left gives him the same control backwards.

A special button transfers him immediately to the first page of the index. Any given book of his library can thus be called up and consulted with far greater facility than if it were taken from a shelf. As he has several projection positions, he can leave one item in position while he calls up another. He can add marginal notes and comments, taking advantage of one possible type of dry photography, and it could

even be arranged so that he can do this by a stylus scheme, such as is now employed in the telautograph seen in railroad waiting rooms, just as though he had the physical page before him.

7

All this is conventional, except for the projection forward of present-day mechanisms and gadgetry. It affords an immediate step, however, to associative indexing, the basic idea of which is a provision whereby any item may be caused at will to select immediately and automatically another. This is the essential feature of the memex. The process of tying two items together is the important thing.

When the user is building a trail, he names it, inserts the name in his code book, and taps it out on his keyboard. Before him are the two items to be joined, projected onto adjacent viewing positions. At the bottom of each there are a number of blank code spaces, and a pointer is set to indicate one of these on each item. The user taps a single key, and the items are permanently joined. In each code space appears the code word. Out of view, but also in the code space, is inserted a set of dots for photocell viewing; and on each item these dots by their positions designate the index number of the other item.

Thereafter, at any time, when one of these items is in view, the other can be instantly recalled merely by tapping a button below the corresponding code space. Moreover, when numerous items have been thus joined together to form a trail, they can be reviewed in turn, rapidly or slowly, by deflecting a lever like that used for turning the pages of a book. It is exactly as though the physical items had been gathered together from widely separated sources and bound together to form a new book. It is more than this, for any item can be joined into numerous trails.

The owner of the memex, let us say, is interested in the origin and properties of the bow and arrow. Specifically he is studying why the short Turkish bow was apparently superior to the English long bow in the skirmishes of the Crusades. 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.

And his trails do not fade. Several years later, his talk with a friend turns to the queer ways in which a people resist innovations, even of vital interest. He has an example, in the fact that the outraged Europeans still failed to adopt the Turkish bow. In fact he has a trail on it. A touch brings up the code book. Tapping a few keys projects the head of the trail. A lever runs through it at will, stopping at interesting items, going off on side excursions. It is an interesting trail, pertinent to the discussion. So he sets a reproducer in action, photographs the whole trail out, and passes it to his friend for insertion in his own memex, there to be linked into the more general trail.

8

Wholly new forms of encyclopedias will appear, ready made with a mesh of associative trails running through them, ready to be dropped into the memex and there amplified. The lawyer has at his touch the associated opinions and decisions of his whole experience, and of the experience of friends and authorities. 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 a 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 historian, with a vast chronological account of a people, parallels it with a skip trail which stops only on the salient items, and can follow at any time contemporary trails which lead him all over civilization at a particular epoch. There is a new profession of trail blazers, those who find delight in the task of establishing useful trails through the enormous mass of the common record. The inheritance from the master becomes, not only his additions to the world's record, but for his disciples the entire scaffolding by which they were erected.

Thus science may implement the ways in which man produces, stores, and consults the record of the race. It might be striking to outline the instrumentalities of the future more spectacularly, rather than to stick closely to methods and elements now known and undergoing rapid development, as has been done here. Technical difficulties of all sorts have been ignored, certainly, but also ignored are means as yet unknown which may come any day to accelerate technical progress as violently as did the advent of the thermionic tube. In order that the picture may not be too commonplace, by reason of sticking to present-day patterns, it may be well to mention one such possibility, not to prophesy but merely to suggest, for prophecy based on extension of the known has substance, while prophecy founded on the unknown is only a doubly involved guess.

All our steps in creating or absorbing material of the record proceed through one of the senses—the tactile when we touch keys, the oral when we speak or listen, the visual when we read. Is it not possible that some day the path may be established more directly?

We know that when the eye sees, all the consequent information is transmitted to the brain by means of electrical vibrations in the channel of the optic nerve. This is an exact analogy with the electrical vibrations which occur in the cable of a television set: they convey the picture from the photocells which see it to the radio transmitter from which it is broadcast. We know further that if we can approach that cable with the proper instruments, we do not need to touch it; we can pick up those vibrations by electrical induction and thus discover and reproduce the scene which is being transmitted, just as a telephone wire may be tapped for its message.

The impulses which flow in the arm nerves of a typist convey to her fingers the translated information which reaches her eye or ear, in order that the fingers may be caused to strike the proper keys. Might not these currents be intercepted, either in the original form in which information is conveyed to the brain, or in the marvelously metamorphosed form in which they then proceed to the hand?

By bone conduction we already introduce sounds: into the nerve channels of the deaf in order that they may hear. Is it not possible that we may learn to introduce them without the present cumbersomeness of first transforming electrical vibrations to mechanical ones, which the human mechanism promptly transforms back to the electrical form? With a couple of electrodes on the skull the encephalograph now produces pen-and-ink traces which bear some relation to the electrical phenomena going on in the brain itself. True, the record is unintelligible, except as it points out certain gross malfunctioning of the cerebral mechanism; but who would now place bounds on where such a thing may lead?

In the outside world, all forms of intelligence whether of sound or sight, have been reduced to the form of varying currents in an electric circuit in order that they may be transmitted. Inside the human frame exactly the same sort of process occurs. Must we always transform to mechanical movements in order to proceed from one electrical phenomenon to another? It is a suggestive thought, but it hardly warrants prediction without losing touch with reality and immediateness.

Presumably man's spirit should be elevated if he can better review his shady past and analyze more completely and objectively his present problems. He has built a civilization so complex that he needs to mechanize his records more fully if he is to push his experiment to its logical conclusion and not merely become bogged down part way there by overtaxing his limited memory. His excursions may be more enjoyable if he can reacquire the privilege of forgetting the manifold things he does not need to have immediately at hand, with some assurance that he can find them again if they prove important.

The applications of science have built man a well-supplied house, and are teaching him to live healthily therein. They have enabled him to throw masses of people

against one another with cruel weapons. They may yet allow him truly to encompass the great record and to grow in the wisdom of race experience. He may perish in conflict before he learns to wield that record for his true good. Yet, in the application of science to the needs and desires of man, it would seem to be a singularly unfortunate stage at which to terminate the process, or to lose hope as to the outcome.

Calvino, Italo. *Six Memos for the Next Millennium*.
New York: Vintage Books, 1993.

2

QUICKNESS

I will start by telling you an ancient legend.

Late in life the emperor Charlemagne fell in love with a German girl. The barons at his court were extremely worried when they saw that the sovereign, wholly taken up with his amorous passion and unmindful of his regal dignity, was neglecting the affairs of state. When the girl suddenly died, the courtiers were greatly relieved—but not for long, because Charlemagne's love did not die with her. The emperor had the embalmed body carried to his bedchamber, where he refused to be parted from it. The Archbishop Turpin, alarmed by this macabre passion, suspected an enchantment and insisted on examining the corpse. Hidden under the girl's dead tongue he found a ring with a precious stone set in it. As soon as the ring was in Turpin's hands, Charlemagne fell passionately in love with the archbishop and hurriedly had the girl buried. In order to escape the embarrassing situation, Turpin flung the ring into Lake Constance. Charlemagne thereupon fell in love with the lake and would not leave its shores.

This legend, "taken from a book on magic," is set down even more concisely than I have recorded it in a book of unpublished notes by the French Romantic writer Jules Barbey d'Aurevilly (you can find it in the notes to the *Pléiade* edition of Barbey d'Aurevilly's works, I.1315). Ever since I read it, the legend has

kept coming back into my mind as if the spell of the ring were continuing to act through the medium of the story.

Let me try to explain why such a story can be so fascinating to us. What we have is a series of totally abnormal events linked together: the love of an old man for a young girl, a necrophiliac obsession and a homosexual impulse, while in the end everything subsides into melancholy contemplation, with the old king starting in rapture at the lake. "Charlemagne, la vue attachée sur son lac de Constance, amoureux de l'abîme caché" (Charlemagne, his eyes fixed on Lake Constance, in love with the hidden abyss), writes Barbey d'Aurevilly in the passage in his novel (*Une vieille maîtresse*, p. 221) which he annotates by relating the legend.

To hold this chain of events together, there is a verbal link, the word "love" or "passion," which establishes a continuity between different forms of attraction. There is also a narrative link, the magic ring that establishes a logical relationship of cause and effect between the various episodes. The drive of desire toward a thing that does not exist, a lack or absence symbolized by the empty circle of the ring, is expressed more by the rhythm of the story than by the events narrated. In the same way, the whole story is shot through with a sense of death, against which Charlemagne appears to be struggling feverishly by clinging to the last remnants of life; a fever that then subsides in the contemplation of the lake.

The real protagonist of the story, however, is the magic ring, because it is the movements of the ring that determine those of the characters and because it is the ring that establishes the relationships between them. Around the magic object there forms a kind of force field that is in fact the territory of the story itself. We might say that the magic object is an outward and visible sign that reveals the connection between people or between events. It has a narrative function, whose history we may trace in the

Norse sagas and the chivalric romances—a function that continues to surface in Italian poems of the Renaissance. In Ariosto's *Orlando furioso* we find an endless series of exchanges of swords, shields, helmets, and horses, each one endowed with particular qualities. In this way the plot can be described in terms of the changes of ownership of a certain number of objects, each one endowed with certain powers that determine the relationships between certain characters.

In realistic narrative, Mambrino's helmet becomes a barber's bowl, but it does not lose importance or meaning. In the same way, enormous weight is attached to all the objects that Robinson Crusoe saves from the wrecked ship or makes with his own hands. I would say that the moment an object appears in a narrative, it is charged with a special force and becomes like the pole of a magnetic field, a knot in the network of invisible relationships. The symbolism of an object may be more or less explicit, but it is always there. We might even say that in a narrative any object is always magic.

Returning to the Charlemagne legend, we find it has a literary tradition in Italian. In his *Lettere famigliari* (I.4) Petrarca tells us that he had heard this "not unpleasant tale" (*fabella non inamena*)—which he says he doesn't believe—while visiting Charlemagne's tomb at Aix-la-Chapelle. In Petrarca's Latin, the story is much richer in moral comment, and also in detail and feeling (the bishop of Cologne, in obedience to a miraculous voice from heaven, gropes with his finger beneath the cold, rigid tongue of the corpse: *sub gelida rigentique lingua*). But speaking for myself, I greatly prefer the bare résumé, in which everything is left to the imagination and the speed with which events follow one another conveys a feeling of the ineluctable.

The legend reappears in the flowery language of sixteenth-century Italy in various versions, in which the necrophiliac aspect

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acquires the most emphasis. Sebastiano Erizzo, a Venetian writer of novellas, puts into the mouth of Charlemagne—while he is in bed with the corpse—a lamentation several pages in length. On the other hand, the homosexual aspect of the emperor's passion for the archbishop is hardly ever alluded to, or even expunged altogether, as in one of the most famous sixteenth-century treatises on love (that of Giuseppe Bettussi) in which the story ends with the finding of the ring. As for the ending, in Petrararch and his Italian followers, Lake Constance is not mentioned because the entire action takes place at Aix-la-Chapelle, since the legend was supposed to be an explanation of the origins of the palace and the church the emperor had built there. The ring is thrown into a marsh, whose muddy stench the emperor breathes in as if it were perfume, while "he takes delight in using its waters." Here there is a link with other local legends on the origins of the thermal springs, details that put even more emphasis on the mortuary quality of the whole affair.

Even earlier than this were the German medieval traditions studied by Gaston Paris. These deal with Charlemagne's love for a dead woman with variants that make it a very different story. Now the beloved is the emperor's legal wife, who uses the magic ring to ensure his fidelity; at other times she is a fairy or nymph who dies when the ring is taken from her; sometimes she is a woman who seems to be alive but is discovered to be a corpse once the ring is removed. At the bottom of all this there may well be a Scandinavian saga: Harald, king of Norway, slept with his dead wife who was wrapped in a magic cloak that gave her the appearance of being alive.

In a word, in the medieval versions collected by Gaston Paris, what is lacking is the chain of events; in the literary versions of Petrararch and the Renaissance writers, what is missing is speed. So I still prefer the version given by Barbey d'Aurevilly, in spite

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of its rather patched-up crudity. The secret of the story lies in its economy: the events, however long they last, become punctiform, connected by rectilinear segments, in a zigzag pattern that suggests incessant motion.

I do not wish to say that quickness is a value in itself. Narrative time can also be delaying, cyclic, or motionless. In any case, a story is an operation carried out on the length of time involved, an enchantment that acts on the passing of time, either contracting or dilating it. Sicilian storytellers use the formula "lu cuntun nun metti tempu" (time takes no time in a story) when they want to leave out links or indicate gaps of months or even years. The technique of oral narration in the popular tradition follows functional criteria. It leaves out unnecessary details but stresses repetition: for example, when the tale consists of a series of the same obstacles to be overcome by different people. A child's pleasure in listening to stories lies partly in waiting for things he expects to be repeated: situations, phrases, formulas. Just as in poems and songs the rhymes help to create the rhythm, so in prose narrative there are events that rhyme. The Charlemagne legend is highly effective narrative because it is a series of events that echo each other as rhymes do in a poem.

If during a certain period of my career as a writer I was attracted by folktales and fairytales, this was not the result of loyalty to an ethnic tradition (seeing that my roots are planted in an entirely modern and cosmopolitan Italy), nor the result of nostalgia for things I read as a child (in my family, a child could read only educational books, particularly those with some scientific basis). It was rather because of my interest in style and structure, in the economy, rhythm, and hard logic with which they are told. In working on my transcription of Italian folktales as recorded by

scholars of the last century, I found most enjoyment when the original text was extremely laconic. This I tried to convey, respecting the conciseness and at the same time trying to obtain the greatest possible narrative force. See, for instance, number 57 in *Italian Folktales* (*Fiabe italiane*):

Un Re s'ammalò. Vennero i medici e gli dissero: "Senta, Maestà, se vuol guarire, bisogna che lei prenda una penna dell'Orco. E' un rimedio difficile, perchè l'Orco tutti i cristiani che vede se li mangia."

Il Re lo disse a tutti ma nessuno ci voleva andare. Lo chiese a un suo sottoposto, molto fedele e coraggioso, e questi disse: "Andrò."

Gli insegnarono la strada: "In cima a un monte, ci sono sette buche: in una delle sette, ci sta l'Orco."

L'uomo andò e lo prese il buio per la strada. Si fermò in una locanda . . .

A king fell ill and was told by his doctors, "Majesty, if you want to get well, you'll have to obtain one of the ogre's feathers. That will not be easy, since the ogre eats every human he sees."

The king passed the word on to everybody, but no one was willing to go to the ogre. Then he asked one of his most loyal and courageous attendants, who said, "I will go."

The man was shown the road and told, "On a mountain-top are seven caves, in one of which lives the ogre."

The man set out and walked until dark, when he stopped at an inn . . . *

Not a word is said about what illness the king was suffering from, or why on earth an ogre should have feathers, or what

*"The Feathered Ogre," translated by George Martin, from *Italian Folktales* (New York: Harcourt Brace Jovanovich, 1956, 1980).

those caves were like. But everything mentioned has a necessary function in the plot. The very first characteristic of a folktale is economy of expression. The most outlandish adventures are recounted with an eye fixed on the bare essentials. There is always a battle against time, against the obstacles that prevent or delay the fulfillment of a desire or the repossession of something cherished but lost. Or time can stop altogether, as in the castle of Sleeping Beauty. To bring this about, Charles Perrault has only to write: "Les brochures mêmes qui étaient au feu toutes pleines de perdrix et de faisans s'endormirent, et le feu aussi. Tout cela se fit en un moment; les Fées n'étaient pas longues à leur besogne" (Even the spits on the fire, all laden with partridges and pheasants, went to sleep, and the fire along with them. All this happened in a moment: the fairs were not long at their work).

The relativity of time is the subject of a folktale known almost everywhere: a journey to another world is made by someone who thinks it has lasted only a few hours, though when he returns, his village is unrecognizable because years and years have gone by. In early American literature, of course, this was the theme of Washington Irving's "Rip Van Winkle," which acquired the status of a foundation myth for your ever-changing society.

This motif can also be interpreted as an allegory of narrative time and the way in which it cannot be measured against real time. And the same significance can be seen in the reverse operation, in the expanding of time by the internal proliferations from one story to another, which is a feature of oriental storytelling. Scheherazade tells a story in which someone tells a story in which someone tells a story, and so forth. The art that enables Scheherazade to save her life every night consists of knowing how to join one story to another, breaking off at just the right moment—two ways of manipulating the continuity and discontinuity of time. It is a secret of rhythm, a way of capturing time that we can recognize from the very beginning: in the epic by means

of the metrical effects of the verse, in prose narrative by those effects that make us eager to know what comes next.

Everybody knows the discomfort felt when someone sets out to tell a joke without being good at it and gets everything wrong, by which I mean, above all, the links and the rhythms. This feeling is evoked in one of Boccaccio's novellas (VI.1), which is in fact devoted to the art of storytelling.

A jovial company of ladies and gentlemen, guests of a Florentine lady in her country house, go for an after-lunch outing to another pleasant place in the neighborhood. To cheer them on their way, one of the men offers to tell a story.

"Madonna Oretta, quando voi vogliate, io vi porterò, gran parte della via che a andare abbiamo, a cavallo con una delle belle novelle del mondo."

Al quale la donna rispuose: "Messere, anzi ve ne priego io molto, e sarammi carissimo."

Messer lo cavaliere, al quale forse non stava meglio la spada allato che 'l novellar nella lingua, udito questo, cominciò una sua novella, la quale nel vero da sé era bellissima, ma egli or tre e quatro e sei volte replicando una medesima parola e ora indietro tornando e talvolta dicendo: "Io non dissi bene" e spesso ne' nomi errando, un per un altro ponendone, fieramente la guastava: senza che egli pessimamente, secondo le qualità delle persone e gli atti che accadevano, profereva.

Di che a madonna Oretta, udendolo, spesso volte veniva un sudore e uno sfinimento di cuore, come se inferna fosse stata per terminare; la qual cosa poi che più sofferir non poté, conoscendo che il cavaliere era entrato nel pecoreccio né era per riuscirne, piacevolmente disse: "Messere, questo vostro cavallo ha troppo duro trotto, per che io vi priego che vi piaccia di pormi a piè."

"Mistress Oretta, if you please, I shall carry you a great part of the way we have to go on horseback, with one of the best stories in the world." "Sir," she replied, "I pray you to do so; that will be most agreeable." Hearing this, master cavalier, who perhaps fared no better with sword at side than with tale on tongue, began his story, which was indeed a very fine one. But what with his repeating of the same word three or four or six times over, his recapitulations, his "I didn't say that right," his erring in putting one name for another, he spoiled it dreadfully. Also his delivery was very poor, quite out of keeping with the circumstances and the quality of his persons. Mistress Oretta, hearing him, was many times taken with a sweat and a sinking of the heart, as if she were sick and about to die. At last, unable to endure the torment any longer and seeing that the gentleman was entangled in a maze of his own making, she said pleasantly: "Sir, this horse of yours has too hard a trot, and I pray you to set me on my feet again."

The novella is a horse, a means of transport with its own pace, a trot or a gallop according to the distance and the ground it has to travel over; but the speed Boccaccio is talking about is a mental speed. The listed defects of the clumsy storyteller are above all offenses against rhythm, as well as being defects of style, because he does not use the expressions appropriate either to the characters or to the events. In other words, even correctness of style is a question of quick adjustment, of agility of both thought and expression.

The horse as an emblem of speed, even speed of the mind, runs through the whole history of literature, heralding the entire problematics of our own technological viewpoint. The age of

speed, in transport as in information, opens with one of the finest essays in English literature, Thomas De Quincey's "The English Mail-Coach." In 1849 he already understood everything we now know about the motorized highway world, including death-dealing high-speed crashes.

In the section called "The Vision of Sudden Death," De Quincey describes a night journey on the box of an express mail coach with a gigantic coachman who is fast asleep. The technical perfection of the vehicle, and the transformation of the driver into a blind inanimate object, puts the traveler at the mercy of the mechanical inexorability of a machine. In the clarity of perception brought on by a dose of laudanum, De Quincey becomes aware that the horses are running uncontrollably at thirteen miles an hour on the wrong side of the road. This means certain disaster, not for the swift, sturdy mail coach but for the first unfortunate carriage to come along that road in the opposite direction. In fact, at the end of the straight, tree-lined avenue, which looks like a "Gothic aisle," he sees a "frail reedy gig" in which a young couple are approaching at one mile an hour. "Between them and eternity, to all human calculation, there is but a minute and a-half." De Quincey gives a shout: "Mine had been the first step; the second was for the young man; the third was for God." The account of these few seconds has not been bettered even in an age in which the experience of high speeds has become a basic fact of life.

Glance of eye, thought of man, wing of angel, which of these had speed enough to sweep between the question and the answer, and divide the one from the other? Light does not tread upon the steps of light more indivisibly than did our all-conquering arrival upon the escaping efforts of the gig.

De Quincey succeeds in conveying a sense of an extremely short period of time that nonetheless contains both the calculation of the technical inevitability of the crash and the imponderable—God's part in the matter—in virtue of which the two vehicles do not collide.

The motif that interests us here is not physical speed, but the relationship between physical speed and speed of mind. This was also interesting to a great Italian poet of De Quincey's generation. Giacomo Leopardi, whose youth was as sedentary as one can imagine, struck a rare joyful moment when he wrote in his diary, the *Zibaldone di pensieri* (Casual Thoughts):

La velocità, per esempio, de' cavalli o veduta, o sperimentata, cioè quando essi vi trasportano . . . è piacevolissima per se sola, cioè per la vivacità, l'energia, la forza, la vita di tal sensazione. Essa desta realmente una quasi idea dell'infinito, sublima l'anima, la fortifica . . . (27 Ottobre 1821).

Speed, for example, of horses, whether seen or experienced, that is, when they are carrying you . . . is most pleasurable in itself; that is, for the vivacity, the energy, the strength, the sheer life of such a feeling. Indeed it almost gives you an idea of the infinite—elevates the soul, fortifies it.

In his notes in the *Zibaldone* over the following few months, Leopardi develops his reflections on the subject of speed, and at a certain point starts to speak about literary style:

La rapidità e la concisione dello stile, piace perchè presenta all'anima una folla d'idee simultanee, o così rapidamente succedentisi, che paiono simultanee, e fanno ondeggiar l'anima in una tale abbondanza di pensieri, o d'immagini e sensazioni spirituali, ch'ella o non è capace di abbracciarle

If discoursing on a difficult problem were like carrying weights, when many horses can carry more sacks of grain than a single horse, I would agree that many discourses would do more than a single one; but discoursing is like coursing, not like carrying, and one Barbary courser can go faster than a hundred Frieslands.

"Discoursing," or "discourse," for Galileo means reasoning, and very often deductive reasoning. "Discoursing is like coursing": this statement could be Galileo's declaration of faith—style as a method of thought and as literary taste. For him, good thinking means quickness, agility in reasoning, economy in argument, but also the use of imaginative examples.

There is also a certain predilection for the horse in Galileo's metaphors and *Gedanken-Experimenten*. In a study I once made on metaphor in Galileo, I counted at least eleven significant examples in which he talks of horses—as an image of motion, and therefore as an instrument in kinetic experiments; as a form of nature in all its complexity and also in all its beauty; as a form that sparks off the imagination in the hypothetical situation of horses subjected to the most unlikely trials or growing to gigantic proportions—and all this apart from the comparison of reasoning with racing: "Discoursing is like coursing."

In the *Dialogo dei massimi sistemi* (Dialogue Concerning the Two Chief World Systems), speed of thought is personified by Sagredo, a character who intervenes in the discussion between the Ptolemaic Simplicio and the Copernican Salviati. Salviati and Sagredo represent two different facets of Galileo's temperament. Salviati is the rigorously methodical reasoner, who proceeds slowly and with prudence; Sagredo, with his "swift manner of speech" and more imaginative way of seeing things, draws conclusions that have not been demonstrated and pushes every idea

tutte, e pienamente ciascuna, o non ha tempo di restare in ozio, e priva di sensazioni. La forza dello stile poetico, che in gran parte è tutt'uno colla rapidità, non è piacevole per altro che per questi effetti, e non consiste in altro. L'eccitamento d'idee simultanee, può derivare e da ciascuna parola isolata, o propria o metaforica, e dalla loro collocazione, e dal giro della frase, e dalla soppressione stessa di altre parole o frasi ec. (3 Novembre 1821).

Speed and conciseness of style please us because they present the mind with a rush of ideas that are simultaneous, or that follow each other so quickly they seem simultaneous, and set the mind afloat on such an abundance of thoughts or images or spiritual feelings that either it cannot embrace them all, each one fully, or it has no time to be idle and empty of feelings. The power of poetic style, which is largely the same thing as rapidity, is pleasing for these effects alone and consists in nothing else. The excitement of simultaneous ideas may arise either from each isolated word, whether literal or metaphorical, from their arrangement, from the turn of a phrase, or even from the suppression of other words and phrases.

The metaphor of the horse for the speed of thought was, I think, first used by Galileo Galilei. In the *Saggiatore* (The Tester), arguing with an adversary who propped up his own theories with a vast number of classical quotations, he wrote:

Se il discorrere circa un problema difficile fosse come il portar pesi, dove molti cavalli porteranno più sacca di grano che un caval solo, io acconsentirei che i molti discorsi facesser più che un solo; ma il discorrere è come il correre, e non come il portare, ed un caval barbero solo correrà più che cento frisoni. (45)

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to its extreme consequences. It is Sagredo who makes hypotheses on how life might be on the moon or what would happen if the earth stopped turning. But it is Salviati who defines the scale of values in which Galileo places quickness of mind. Instantaneous reasoning without *passaggi* (transitions) is the reasoning of God's mind, infinitely superior to the mind of man, which however should not be despised or considered nothing, insofar as it was created by God, and in the course of time has investigated and understood and achieved wonderful things. At this point Sagredo breaks in with an encomium on the greatest human invention, the alphabet:

Ma sopra tutte le invenzioni stupende, qual eminenza di mente fu quella di colui che s'immaginò di trovar modo di comunicare i suoi più reconditi pensieri a qualsivoglia altra persona, benchè distante per lunghissimo intervallo di luogo e di tempo? parlare con quelli che son nell'Indie, parlare a que li che non sono ancora nati né saranno se non di qua a mille e dieci mila anni? e con qual facilità? con i vari accozzamenti di venti caratteruzzi sopra una carta.
(End of the first day)

But above all stupendous inventions, what eminence of mind was his who dreamed of finding means to communicate his deepest thoughts to any other person, no matter how far distant in place and time? Of speaking with those who are in India, of speaking with those who are not yet born and will not be born for a thousand or ten thousand years? And with what facility? All by using the various arrangements of twenty little characters on a page!

In my last talk, on lightness, I quoted Lucretius, who in the combinatoria of the alphabet saw a model of the impalpable

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atomic structure of matter. Now I quote Galileo who, in the combinatoria of the alphabet ("the various arrangements of twenty little characters on a page"), saw the ultimate instrument of communication. Communication with people distant in place and time, says Galileo; but we should also add the immediate connection that writing establishes between everything existent or possible.

Since in each of my lectures I have set myself the task of recommending to the next millennium a particular value close to my heart, the value I want to recommend today is precisely this: In an age when other fantastically speedy, widespread media are triumphing, and running the risk of flattening all communication onto a single, homogeneous surface, the function of literature is communication between things that are different simply because they are different, not blunting but even sharpening the differences between them, following the true bent of written language.

The motor age has forced speed on us as a measurable quantity, the records of which are milestones in the history of the progress of both men and machines. But mental speed cannot be measured and does not allow comparisons or competitions; nor can it display its results in a historical perspective. Mental speed is valuable for its own sake, for the pleasure it gives to anyone who is sensitive to such a thing, and not for the practical use that can be made of it. A swift piece of reasoning is not necessarily better than a long-pondered one. Far from it. But it communicates something special that is derived simply from its very swiftness.

I said at the beginning that each value or virtue I chose as the subject for my lectures does not exclude its opposite. Implicit in

my tribute to lightness was my respect for weight, and so this apology for quickness does not presume to deny the pleasures of lingering. Literature has worked out various techniques for slowing down the course of time. I have already mentioned repetition, and now I will say a word about digression.

In practical life, time is a form of wealth with which we are stingy. In literature, time is a form of wealth to be spent at leisure and with detachment. We do not have to be first past a predetermined finish line. On the contrary, saving time is a good thing because the more time we save, the more we can afford to lose. Quickness of style and thought means above all agility, mobility, and ease, all qualities that go with writing where it is natural to digress, to jump from one subject to another, to lose the thread a hundred times and find it again after a hundred more twists and turns.

Laurence Sterne's great invention was the novel that is completely composed of digressions, an example followed by Diderot. The digression is a strategy for putting off the ending, a multiplying of time within the work, a perpetual evasion or flight. Flight from what? From death, of course, says Carlo Levi, in an introduction he wrote to an Italian edition of *Tristram Shandy*. Few people would imagine Levi to be an admirer of Sterne, but actually his own secret lay precisely in bringing a spirit of digression and a feeling of unlimited time even to the observation of social problems. Levi writes:

L'orologio è il primo simbolo di Shandy. Sotto il suo influsso egli viene generato, ed iniziano le sue disgrazie, che sono tutt'uno con questo segno del tempo. La morte sta nascosta negli orologi, come diceva il Belli; e l'infelicità della vita individuale, di questo frammento, di questa cosa scissa e disgregata, e priva di totalità: la morte, che è il tempo, il

tempo della individuazione, della separazione, l'astratto tempo che rotola verso la sua fine. Tristram Shandy non vuol nascere, perché non vuol morire. Tutti i mezzi, tutte le armi sono buone per salvarsi dalla morte e dal tempo. Se la linea retta è la più breve fra due punti fatali e inevitabili, le digressioni la allungheranno: e se queste digressioni diventeranno così complesse, aggrovigliate, tortuose, così rapide da far perdere le proprie tracce, chissà che la morte non ci trovi più, che il tempo si smarrisca, e che possiamo restare celati nei mutevoli nascondigli.

The clock is Shandy's first symbol. Under its influence he is conceived and his misfortunes begin, which are one and the same with this emblem of time. Death is hidden in clocks, as Belli said; and the unhappiness of individual life, of this fragment, of this divided, disunited thing, devoid of wholeness: death, which is time, the time of individuation, of separation, the abstract time that rolls toward its end. Tristram Shandy does not want to be born, because he does not want to die. Every means and every weapon is valid to save oneself from death and time. If a straight line is the shortest distance between two fated and inevitable points, digressions will lengthen it; and if these digressions become so complex, so tangled and tortuous, so rapid as to hide their own tracks, who knows—perhaps death may not find us, perhaps time will lose its way, and perhaps we ourselves can remain concealed in our shifting hiding places.

Words, words that make me think. Because I am not devoted to aimless wandering, I'd rather say that I prefer to entrust myself to the straight line, in the hope that the line will continue into infinity, making me unreachable. I prefer to calculate at length the trajectory of my flight, expecting that I will be able to launch

myself like an arrow and disappear over the horizon. Or else, if too many obstacles bar my way, to calculate the series of rectilinear segments that will lead me out of the labyrinth as quickly as possible.

From my youth on, my personal motto has been the old Latin tag, *Festina lente*, hurry slowly. Perhaps what attracted me, even more than the words and the idea, was the suggestiveness of its emblems. You may recall that the great Venetian humanist publisher, Aldus Manutius, on all his title pages symbolized the motto *Festina lente* by a dolphin in a sinuous curve around an anchor. The intensity and constancy of intellectual work are represented in that elegant graphic trademark, which Erasmus of Rotterdam commented on in some memorable pages. But both dolphin and anchor belong to the same world of marine emblems, and I have always preferred emblems that throw together incongruous and enigmatic figures, as in a rebus. Such are the butterfly and crab that illustrate *Festina lente* in the sixteenth-century collection of emblems by Paolo Giovio. Butterfly and crab are both bizarre, both symmetrical in shape, and between them establish an unexpected kind of harmony.

My work as a writer has from the beginning aimed at tracing the lightning flashes of the mental circuits that capture and link points distant from each other in space and time. In my love of adventure stories and fairytales, I have always searched for the equivalent of some inner energy, some motion of the mind. I have always aimed at the image and the motion that arises naturally from the image, while still being aware that one cannot speak of a literary result until this stream of imagination has been turned into words. Just as for the poet writing verse, so it is for the prose writer: success consists in felicity of verbal expression, which every so often may result from a quick flash of inspiration but as a rule involves a patient search for the *mot juste*, for the

sentence in which every word is unalterable, the most effective marriage of sounds and concepts. I am convinced that writing prose should not be any different from writing poetry. In both cases it is a question of looking for the unique expression, one that is concise, concentrated, and memorable.

It is hard to keep up tension of this kind in very long works. However, by temperament I feel myself more at ease in short pieces: much of my work consists of short stories. For example, the sort of thing I tried out in *Cosmocomics* (*Le cosmicomiche*) and *t zero* (*T con zero*)—giving narrative form to abstract ideas of space and time—could not be brought off except within the brief span of a short story. But I have experimented with even shorter compositions, with narrative on a smaller scale, something between a fable and a *petit poème en prose*, in my book *Invisible Cities* (*Le città invisibili*) and more recently in my descriptions in *Palomar*. Of course the length or brevity of a text is an external criterion, but I am speaking of a particular density that, even if it can be attained in narratives of broader scope, nevertheless finds its proper dimension in the single page.

In this preference for short literary forms I am only following the true vocation of Italian literature, which is poor in novelists but rich in poets, who even when they write in prose give of their best in texts where the highest degree of invention and thought is contained in a few pages. This is the case with a book unparalleled in other literatures: Leopardi's *Operette morali* (Essays and Dialogues). American literature has a glorious and thriving tradition of short stories, and indeed I would say that its most precious gems are to be found there. But the rigid distinction made by publishers—either short story or novel—excludes other possible short forms (which still may be found in the prose works of the great American poets, from Walt Whitman's *Specimen Days* to many pages of William Carlos Williams). The demands of the

publishing business are a fetish that must not be allowed to keep us from trying out new forms. I should like at this point to break a lance on the field for the richness of short literary forms, with all they imply in terms of style and concentration of content. I am thinking of the Paul Valéry of *Monsieur Teste* and many of his essays, of the prose poems that Francis Ponge wrote about objects, of Michel Leiris' explorations of himself and his own language, of Henri Michaux's mysterious and hallucinatory humor in the very brief stories in *Plume*.

The last great invention of a new literary genre in our time was achieved by a master of the short form, Jorge Luis Borges. It was the invention of himself as narrator, that "Columbus' egg," which enabled him to get over the mental block that until nearly forty years of age prevented him from moving beyond essays to fiction. The idea that came to Borges was to pretend that the book he wanted to write had already been written by someone else, some unknown hypothetical author—an author in a different language, of a different culture—and that his task was to describe and review this invented book. Part of the Borges legend is the anecdote that when the first extraordinary story written according to this formula, "El acercamiento a Almotásim" (The Approach to Al'Mutásim), appeared in the magazine *Sur* in 1940, it was in fact believed to be a review of a book by an Indian author. In the same way, critics of Borges feel bound to observe that each of his texts doubles or multiplies its own space through the medium of other books belonging to a real or imaginary library, whether they be classical, erudite, or merely invented.

What I particularly wish to stress is how Borges achieves his approaches to the infinite without the least congestion, in the most crystalline, sober, and airy style. In the same way, his syn-

thetic, sidelong manner of narration brings with it a language that is everywhere concrete and precise, whose inventiveness is shown in the variety of rhythms, the syntactic movements, the unflinching surprising and unexpected adjectives. Borges has created a literature raised to the second power and, at the same time, a literature that is like the extraction of the square root of itself. It is a "potential literature," to use a term applied later on in France. The first signs of this may be found in *Ficciones*, in the little hints and formulas of what might have become the works of a hypothetical author called Herbert Quain.

Conciseness is only one aspect of the subject I want to deal with, and I will confine myself to telling you that I dream of immense cosmologies, sagas, and epics all reduced to the dimensions of an epigram. In the even more congested times that await us, literature must aim at the maximum concentration of poetry and of thought.

Borges and Bioy Casares put together an anthology of short extraordinary tales (*Cuentos breves y extraordinarios*, 1955). I would like to edit a collection of tales consisting of one sentence only, or even a single line. But so far I haven't found any to match the one by the Guatemalan writer Augusto Monterroso: "Cuando despertó, el dinosaurio todavía estaba allí" (When I woke up, the dinosaur was still there).

I realize that this talk, based as it is on invisible connections, has wandered off in many directions and is risking dispersion. But all the subjects I have dealt with this evening, and perhaps those from last time, might indeed be united in that they are all under the sign of an Olympian god whom I particularly honor: Hermes-Mercury, god of communication and mediation, who under the name of Thoth was the inventor of writing and who—according to C. G. Jung in his studies on alchemical symbolism—in the guise of "spirit Mercury" also represents the *principium*

individuationis. Mercury with his winged feet, light and airborne, astute, agile, adaptable, free and easy, established the relationships of the gods among themselves and those between the gods and men, between universal laws and individual destinies, between the forces of nature and the forms of culture, between the objects of the world and all thinking subjects. What better patron could I possibly choose to support my proposals for literature?

For the ancients, who saw microcosm and macrocosm mirrored in the correspondences between psychology and astrology, between humours, temperaments, planets, and constellations, Mercury's nature was the most indefinite and variable. But, in the more widespread view, the temperament influenced by Mercury, inclined toward exchanges and commerce and dexterity, was contrasted with the temperament influenced by Saturn, seen as melancholy, contemplative, and solitary. Ever since antiquity it has been thought that the saturnine temperament is the one proper to artists, poets, and thinkers, and that seems true enough. Certainly literature would never have existed if some human beings had not been strongly inclined to introversion, discontented with the world as it is, inclined to forget themselves for hours and days on end and to fix their gaze on the immobility of silent words. Certainly my own character corresponds to the traditional features of the guild to which I belong. I too have always been saturnine, whatever other masks I have attempted to wear. My cult of Mercury is perhaps merely an aspiration, what I would like to be. I am a Saturn who dreams of being a Mercury, and everything I write reflects these two impulses.

But if Saturn-Chronos does exercise some power over me, it is also true that he is not one of my favorite divinities. I have never nourished any feeling for him other than a timorous respect. There is, however, another god with family ties to Saturn for whom I feel much affection. He is a god who does not enjoy

too much astrological and therefore psychological prestige, since his name was not given to one of the seven planets in the skies of the ancients, but still he has been well treated in literature from Homer on. I am speaking of Vulcan-Hephaestus, a god who does not roam the heavens but lurks at the bottom of craters, shut up in his smithy, where he tirelessly forges objects that are the last word in refinement: jewels and ornaments for the gods and goddesses, weapons, shields, nets, traps. To Mercury's aerial flight, Vulcan replies with his limping gait and the rhythmic beat of his hammer.

Here too I have to refer to some occasional reading of mine—from time to time enlightening ideas emerge from reading odd books that are hard to classify from a rigorously academic point of view. The book in question, which I read while studying the symbolism of the tarot, is André Virel's *Histoire de notre image* (1965). According to the author—a student of the collective imagination in what I take to be the school of Jung—Mercury and Vulcan represent the two inseparable and complementary functions of life: Mercury represents *syntony*, or participation in the world around us; Vulcan, *focalization* or constructive concentration. Mercury and Vulcan are both sons of Jupiter, whose realm is that of the consciousness, individual and social. But on his mother's side Mercury is a descendant of Uranus, whose kingdom was that of the "cyclophrenic" age of undifferentiated continuity. And Vulcan is descended from Saturn, whose realm was that of the "schizophrenic" era of egocentric isolation. Saturn dethroned Uranus, and Jupiter dethroned Saturn. In the end, in the well-balanced, luminous realm of Jupiter, both Mercury and Vulcan carry with them the memory of some dark primordial realm, changing what had been a destructive malady into something positive: syntony and focalization.

Even since I read Virel's explanation of how Mercury and Vul-

can be both contrasting and complementary, I have begun to understand something that I had only a rather vague idea of before—something about myself, about how I am and how I would like to be; about how I write and how I might be able to write. Vulcan's concentration and craftsmanship are needed to record Mercury's adventures and metamorphoses. Mercury's swiftness and mobility are needed to make Vulcan's endless labors become bearers of meaning. And from the formless mineral matrix, the gods' symbols of office acquire their forms: lyres or tridents, spears or diadems.

A writer's work has to take account of many rhythms: Vulcan's and Mercury's, a message of urgency obtained by dint of patient and meticulous adjustments and an intuition so instantaneous that, when formulated, it acquires the finality of something that could never have been otherwise. But it is also the rhythm of time that passes with no other aim than to let feelings and thoughts settle down, mature, and shed all impatience or ephemeral contingency.

I began this lecture by telling a story. Let me end it with another story, this time Chinese: Among Chuang-tzu's many skills, he was an expert draftsman. The king asked him to draw a crab. Chuang-tzu replied that he needed five years, a country house, and twelve servants. Five years later the drawing was still not begun. "I need another five years," said Chuang-tzu. The king granted them. At the end of these ten years, Chuang-tzu took up his brush and, in an instant, with a single stroke, he drew a crab, the most perfect crab ever seen.

3

EXACTITUDE

For the ancient Egyptians, exactitude was symbolized by a feather that served as a weight on scales used for the weighing of souls. This light feather was called Maat, goddess of the scales. The hieroglyph for Maat also stood for a unit of length—the 33 centimeters of the standard brick—and for the fundamental note of the flute.

This information comes from a lecture by Giorgio de Santillana on the precision of the ancients in observing astronomical phenomena, a lecture I heard in Italy in 1963 which had a profound influence on me. These days I have often thought of Santillana, who acted as my guide in Massachusetts during my first visit to the United States in 1960. In memory of his friendship, I have started this talk on exactitude in literature with the name of Maat, goddess of the scales—all the more because Libra is my sign of the Zodiac.

First I shall try to define my subject. To my mind exactitude means three things above all:

- (1) a well-defined and well-calculated plan for the work in question;
- (2) an evocation of clear, incisive, memorable visual images; in Italian we have an adjective that doesn't exist in English, "icastico," from the Greek εἰκαστικός;



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January 22, 2018

Hard Questions: What Effect Does Social Media Have on Democracy?

Hard Questions: Social Media an...
Posted by Facebook
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By *Samidh Chakrabarti, Product Manager, Civic Engagement*
This post is part of a series on social media and democracy.

Around the world, social media is making it easier for people to have a voice in government — to discuss issues, organize around causes, and hold leaders accountable. As recently as 2011, when social media played a critical role in the Arab Spring in places like Tunisia, it was heralded as a technology for liberation.

A lot has changed since then. The 2016 US presidential election brought to the fore the risks of foreign meddling, “fake news” and political polarization. The effect of social media on politics has never been so crucial to examine.

All of this raises an important question: what effect does social media have on democracy?

As the product manager in charge of civic engagement on Facebook, I live and breathe these issues. And while I’m an optimist at heart, I’m not blind to the damage that the internet can do to even a well-functioning democracy.

That’s why I’m dedicated to understanding these risks and ensuring the good far overshadows the bad.

With each passing year, this challenge becomes more urgent. Facebook was originally designed to connect friends and family — and it has excelled at that. But as unprecedented numbers of people channel their political energy through this medium, it’s being used in unforeseen ways with societal repercussions that were never anticipated.

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In 2016, we at Facebook were far too slow to recognize how bad actors were abusing our platform. We're working diligently to neutralize these risks now.

We can't do this alone, which is why we want to initiate an open conversation on the hard questions this work raises. In this post, I'll share how we are thinking about confronting the most consequential downsides of social media on democracy, and also discuss how we're working to amplify the positive ways it can strengthen democracy, too.

Foreign Interference

Let's start with the elephant in the room. Around the US 2016 election, Russian entities set up and promoted fake Pages on Facebook to influence public sentiment — essentially using social media as an [information weapon](#).

Although we didn't know it at the time, we [discovered](#) that these Russian actors created 80,000 posts that reached around 126 million people in the US over a two-year period. This kind of activity goes against everything we stand for. It's abhorrent to us that a nation-state used our platform to wage a cyberwar intended to divide society. This was a new kind of threat that we couldn't easily predict, but we should have done better.

Now we're making up for lost time. The Russian interference worked in part by promoting inauthentic Pages, so we're working to make politics on Facebook more transparent. We're making it possible to visit an advertiser's Page and see the ads they're currently running. We'll soon also require organizations running election-related ads to confirm their identities so we can show viewers of their ads who exactly paid for

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them. Finally, we'll archive electoral ads and make them searchable to enhance accountability.

As critical as this plan is, it poses challenges. How, for example, do we avoid putting legitimate activity at risk? Many human rights organizations commonly use Facebook to spread educational messages around the world. The wrong kind of transparency could put these activists in real danger in many countries.

But we're committed to this issue of transparency because it goes beyond Russia. Without transparency, it can be hard to hold politicians accountable for their own words. Micro-targeting can enable dishonest campaigns to spread toxic discourse without much consequence. Democracy then suffers because we don't get the full picture of what our leaders are promising us. This is an even more pernicious problem than foreign interference. But we hope that by setting a new bar for transparency, we can tackle both of these challenges simultaneously.

False News

But foreign interference isn't the only means of corrupting a democracy. We recognize that the same tools that give people more voice can sometimes be used, by anyone, to spread hoaxes and misinformation. There is active debate about how much of our information diet is tainted by false news — and how much it influences people's behavior. But even a handful of deliberately misleading stories can have dangerous consequences.

To take just one example, in Australia a false news story claimed that the first Muslim woman to be a Member of Parliament had refused to

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lay a wreath on a national day of remembrance. This led people to flood her Facebook Page with abusive comments.

In the public debate over false news, many believe Facebook should use its own judgment to filter out misinformation. We've chosen not to do that because we don't want to be the arbiters of truth, nor do we imagine this is a role the world would want for us.

Instead, we've made it easier to [report](#) false news and have taken steps in partnership with third-party fact checkers to rank these stories lower in News Feed. Once our fact checking partners label a story as false, we're able to reduce future impressions of the story on Facebook by 80%. We're also working to make it harder for bad actors to profit from false news, eliminating their incentive to create this content in the first place.

Finally, since the best deterrent will ultimately be a discerning public, we've started sharing [more context](#) about the news sources people see on Facebook. By helping people sharpen their social media literacy, we can help society be more resilient to misleading stories.

Even with all these countermeasures, the battle will never end. Misinformation campaigns are not amateur operations. They are professionalized and constantly try to game the system. We will always have more work to do.

Echo Chambers

One of the most common criticisms of social media is that it creates echo chambers where people only see viewpoints they agree with — further driving us apart.

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That's a legitimate issue but it's more complex than how it is sometimes portrayed. Compared with the media landscape of the past, social media exposes us to a more diverse range of views. A recent [Reuters Institute Digital News Report](#) found that 44% of people in the US who use social media for news end up seeing sources from both the left and the right — more than twice the rate of people who don't use social media.

The deeper question is how people respond when they encounter these differing opinions — do they listen to them, ignore them, or even block them?

Think about how our minds work. It's natural to seek out information that confirms what we already believe — a phenomenon social scientists call “confirmation bias.” Walter Quattrociocchi, Antonio Scala and Cass Sunstein found evidence last year that social media users are drawn to information that [strengthens their preferred narratives](#) and reject information that undermines it.

That makes bursting these bubbles hard because it requires pushing against deeply ingrained human instincts. Research shows that some obvious ideas — like showing people an article from an opposing perspective — could actually make us dig in even more.

A better approach might be to show people many views, not just the opposing side. We recently started testing this idea with a feature called [Related Articles](#) that shows people articles with a range of perspectives on the news they're already reading about. We'll see if it helps, and we're eager to share our findings.

Political Harassment

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While we want Facebook to be a safe place for people to express themselves politically, we need to make sure no one is bullied or threatened for their views.

To make matters more complex, governments themselves sometimes engage in such harassment. In one country we recently visited, a citizen reported that after he had posted a video critical of the authorities, the police paid him a visit to inspect his tax compliance. As more countries write laws that attempt to criminalize online discourse, the risk grows that states use their power to intimidate their critics. That could have a chilling effect on speech.

Even in more open societies, we're seeing cases where government officials write hateful posts that make enforcing our [Community Standards](#) challenging. So far, we've kept such posts up on our platform since we view them as newsworthy information that citizens deserve to know. We've also found these posts often become important magnets for counter-speech, but we recognize reasonable people may disagree with this policy.

Our concerns with political hate speech aren't limited to the online sphere — we also need to be vigilant that social media doesn't facilitate offline violence.

Policing this content at a global scale is an open research problem since it is hard for machines to understand the cultural nuances of political intimidation. And while we are hiring over 10,000 more people this year to work on safety and security, this is likely to remain a challenge.

Unequal Participation

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While foreign meddling, misinformation, echo chambers and hate speech get the headlines, what worries me most is how social media can distort policymakers' perception of public opinion. People on Facebook tend to represent every walk of life, but not everyone is using their voice equally. Take women. They represent a majority of the population, yet are [under-represented in public political dialogue](#) on Facebook.

If politicians mistake the views of a few with the views of many, that can make for bad public policy. Vulnerable populations could end up ignored, and fringe groups could appear mainstream.

We're trying to move the needle on this by studying, for example, why women participate less in political discourse online. In some of our civic features, we've incorporated these lessons and pioneered [new privacy models](#) that help to increase women's participation. They still aren't on par with men, but we're getting closer. This is proof in my eyes that research-driven design can make social media a better medium for democracy.

Giving Voice

Clearly, there is no shortage of challenges at the convergence of social media and democracy. But there are also many bright spots that keep me coming to work every day.

First, social media has enormous power to keep people informed. According to the Pew Research Center, [two-thirds](#) of US adults consume at least some of their news on social media. Since many people are happening upon news they weren't explicitly seeking out, social media is often expanding the audience for news.

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More importantly, people aren't just reading news — they're actively discussing it. The implications for civic engagement are profound. It has long been observed that when people discuss the news, they're more likely to be involved in their community, whether by volunteering or reaching out to elected officials. There is growing evidence that this is also true for social media — especially among [young people](#).

Social media platforms are driving people not just to learn about issues but to take action. During the 2016 US election alone, we estimate our voter registration efforts on Facebook led more than 2 million people to register to vote.

Even more encouraging is that we're seeing how social media can help people be more knowledgeable voters. During the last US election, we created [Voting Plan](#), a tool to preview your local ballot and discuss it with friends. Millions of people did so. On average this [increased people's knowledge of their ballot](#) by over 6%. That's equivalent to raising the average ballot knowledge of the entire US Facebook community by a few grade levels.

But perhaps what inspires me most of all is that with social media, people can have a voice in their government everyday, not just on election day. Some 87% of governments around the world have a presence on Facebook. And they're listening — and responding — to what they hear.

In Iceland, for example, when someone moves to a new neighborhood, the first thing they often do is join their community's Facebook group. They tag their representatives in posts and push for the issues they want taken to Parliament. Conversations like these are quietly reinvigorating local governance around the world.

To bring this experience to more people, in 2016 we built [a feature](#) that makes it simple to follow all your elected representatives on Facebook with a single click. When we launched it in the US, it doubled the number of connections between people and their government. We've since seen a similar level of impact in other places like Germany and Japan.

This means that for the first time in history, people can keep up with their government as easily as they keep up with their friends. This is unlocking new waves of latent civic energy and putting power into more hands.

So, What Effect Does Social Media Have on Democracy?

If there's one fundamental truth about social media's impact on democracy it's that it [amplifies human intent](#) — both good and bad. At its best, it allows us to express ourselves and take action. At its worst, it allows people to spread misinformation and corrode democracy.

I wish I could guarantee that the positives are destined to outweigh the negatives, but I can't. That's why we have a moral duty to understand how these technologies are being used and what can be done to make communities like Facebook as representative, civil and trustworthy as possible.

This is a new frontier and we don't pretend to have all the answers. But I promise you that my team and many more here are dedicated to this pursuit. We'll share what we learn and collaborate with you to find the answers.

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What gives me hope is that the same ingenuity that helped make social media an incredible way to connect with friends can also be applied to making it an effective way to connect with the public square.

In the end, that's why I believe that a more connected world can be a more democratic one.

Samidh Chakrabarti is a product manager at Facebook, where he is responsible for politics and elections products globally. Before coming to Facebook, he was the product lead for Google's civic engagement initiative. His background is in both technology and public policy, and he's spent his career working to combine them in service of the common good.

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Deep Neural Networks for YouTube Recommendations

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ABSTRACT

YouTube represents one of the largest scale and most sophisticated industrial recommendation systems in existence. In this paper, we describe the system at a high level and focus on the dramatic performance improvements brought by deep learning. The paper is split according to the classic two-stage information retrieval dichotomy: first, we detail a deep candidate generation model and then describe a separate deep ranking model. We also provide practical lessons and insights derived from designing, iterating and maintaining a massive recommendation system with enormous user-facing impact.

Keywords

recommender system; deep learning; scalability

1. INTRODUCTION

YouTube is the world’s largest platform for creating, sharing and discovering video content. YouTube recommendations are responsible for helping more than a billion users discover personalized content from an ever-growing corpus of videos. In this paper we will focus on the immense impact deep learning has recently had on the YouTube video recommendations system. Figure 1 illustrates the recommendations on the YouTube mobile app home.

Recommending YouTube videos is extremely challenging from three major perspectives:

- *Scale*: Many existing recommendation algorithms proven to work well on small problems fail to operate on our scale. Highly specialized distributed learning algorithms and efficient serving systems are essential for handling YouTube’s massive user base and corpus.
- *Freshness*: YouTube has a very dynamic corpus with many hours of video are uploaded per second. The recommendation system should be responsive enough to model newly uploaded content as well as the latest actions taken by the user. Balancing new content

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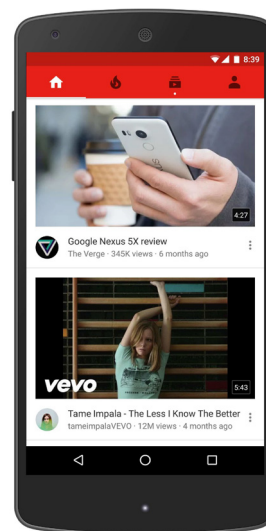


Figure 1: Recommendations displayed on YouTube mobile app home.

with well-established videos can be understood from an exploration/exploitation perspective.

- *Noise*: Historical user behavior on YouTube is inherently difficult to predict due to sparsity and a variety of unobservable external factors. We rarely obtain the ground truth of user satisfaction and instead model noisy implicit feedback signals. Furthermore, metadata associated with content is poorly structured without a well defined ontology. Our algorithms need to be robust to these particular characteristics of our training data.

In conjugation with other product areas across Google, YouTube has undergone a fundamental paradigm shift towards using deep learning as a general-purpose solution for nearly all learning problems. Our system is built on Google Brain [4] which was recently open sourced as TensorFlow [1]. TensorFlow provides a flexible framework for experimenting with various deep neural network architectures using large-scale distributed training. Our models learn approximately one billion parameters and are trained on hundreds of billions of examples.

In contrast to vast amount of research in matrix factoriza-

tion methods [19], there is relatively little work using deep neural networks for recommendation systems. Neural networks are used for recommending news in [17], citations in [8] and review ratings in [20]. Collaborative filtering is formulated as a deep neural network in [22] and autoencoders in [18]. Elkahky *et al.* used deep learning for cross domain user modeling [5]. In a content-based setting, Burges *et al.* used deep neural networks for music recommendation [21].

The paper is organized as follows: A brief system overview is presented in Section 2. Section 3 describes the candidate generation model in more detail, including how it is trained and used to serve recommendations. Experimental results will show how the model benefits from deep layers of hidden units and additional heterogeneous signals. Section 4 details the ranking model, including how classic logistic regression is modified to train a model predicting expected watch time (rather than click probability). Experimental results will show that hidden layer depth is helpful as well in this situation. Finally, Section 5 presents our conclusions and lessons learned.

2. SYSTEM OVERVIEW

The overall structure of our recommendation system is illustrated in Figure 2. The system is comprised of two neural networks: one for *candidate generation* and one for *ranking*.

The candidate generation network takes events from the user’s YouTube activity history as input and retrieves a small subset (hundreds) of videos from a large corpus. These candidates are intended to be generally relevant to the user with high precision. The candidate generation network only provides broad personalization via collaborative filtering. The similarity between users is expressed in terms of coarse features such as IDs of video watches, search query tokens and demographics.

Presenting a few “best” recommendations in a list requires a fine-level representation to distinguish relative importance among candidates with high recall. The ranking network accomplishes this task by assigning a score to each video according to a desired objective function using a rich set of features describing the video and user. The highest scoring videos are presented to the user, ranked by their score.

The two-stage approach to recommendation allows us to make recommendations from a very large corpus (millions) of videos while still being certain that the small number of videos appearing on the device are personalized and engaging for the user. Furthermore, this design enables blending candidates generated by other sources, such as those described in an earlier work [3].

During development, we make extensive use of offline metrics (precision, recall, ranking loss, etc.) to guide iterative improvements to our system. However for the final determination of the effectiveness of an algorithm or model, we rely on A/B testing via live experiments. In a live experiment, we can measure subtle changes in click-through rate, watch time, and many other metrics that measure user engagement. This is important because live A/B results are not always correlated with offline experiments.

3. CANDIDATE GENERATION

During candidate generation, the enormous YouTube corpus is winnowed down to hundreds of videos that may be relevant to the user. The predecessor to the recommender

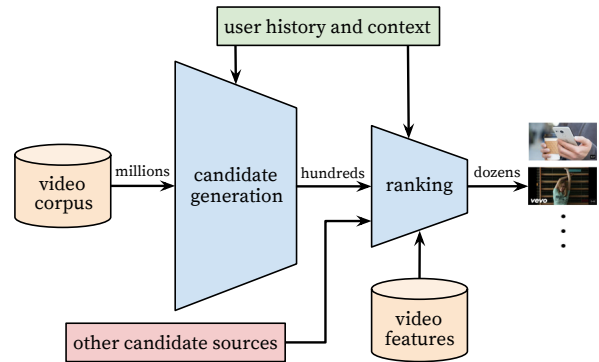


Figure 2: Recommendation system architecture demonstrating the “funnel” where candidate videos are retrieved and ranked before presenting only a few to the user.

described here was a matrix factorization approach trained under rank loss [23]. Early iterations of our neural network model mimicked this factorization behavior with shallow networks that only embedded the user’s previous watches. From this perspective, our approach can be viewed as a non-linear generalization of factorization techniques.

3.1 Recommendation as Classification

We pose recommendation as extreme multiclass classification where the prediction problem becomes accurately classifying a specific video watch w_t at time t among millions of videos i (classes) from a corpus V based on a user U and context C ,

$$P(w_t = i | U, C) = \frac{e^{v_i u}}{\sum_{j \in V} e^{v_j u}}$$

where $u \in \mathbb{R}^N$ represents a high-dimensional “embedding” of the user, context pair and the $v_j \in \mathbb{R}^N$ represent embeddings of each candidate video. In this setting, an embedding is simply a mapping of sparse entities (individual videos, users etc.) into a dense vector in \mathbb{R}^N . The task of the deep neural network is to learn user embeddings u as a function of the user’s history and context that are useful for discriminating among videos with a softmax classifier.

Although explicit feedback mechanisms exist on YouTube (thumbs up/down, in-product surveys, etc.) we use the implicit feedback [16] of watches to train the model, where a user completing a video is a positive example. This choice is based on the orders of magnitude more implicit user history available, allowing us to produce recommendations deep in the tail where explicit feedback is extremely sparse.

Efficient Extreme Multiclass

To efficiently train such a model with millions of classes, we rely on a technique to sample negative classes from the background distribution (“candidate sampling”) and then correct for this sampling via importance weighting [10]. For each example the cross-entropy loss is minimized for the true label and the sampled negative classes. In practice several thousand negatives are sampled, corresponding to more than 100 times speedup over traditional softmax. A popular alternative approach is hierarchical softmax [15], but we weren’t

able to achieve comparable accuracy. In hierarchical softmax, traversing each node in the tree involves discriminating between sets of classes that are often unrelated, making the classification problem much more difficult and degrading performance.

At serving time we need to compute the most likely N classes (videos) in order to choose the top N to present to the user. Scoring millions of items under a strict serving latency of tens of milliseconds requires an approximate scoring scheme sublinear in the number of classes. Previous systems at YouTube relied on hashing [24] and the classifier described here uses a similar approach. Since calibrated likelihoods from the softmax output layer are not needed at serving time, the scoring problem reduces to a nearest neighbor search in the dot product space for which general purpose libraries can be used [12]. We found that A/B results were not particularly sensitive to the choice of nearest neighbor search algorithm.

3.2 Model Architecture

Inspired by continuous bag of words language models [14], we learn high dimensional embeddings for each video in a fixed vocabulary and feed these embeddings into a feedforward neural network. A user’s watch history is represented by a variable-length sequence of sparse video IDs which is mapped to a dense vector representation via the embeddings. The network requires fixed-sized dense inputs and simply averaging the embeddings performed best among several strategies (sum, component-wise max, etc.). Importantly, the embeddings are learned jointly with all other model parameters through normal gradient descent back-propagation updates. Features are concatenated into a wide first layer, followed by several layers of fully connected Rectified Linear Units (ReLU) [6]. Figure 3 shows the general network architecture with additional non-video watch features described below.

3.3 Heterogeneous Signals

A key advantage of using deep neural networks as a generalization of matrix factorization is that arbitrary continuous and categorical features can be easily added to the model. Search history is treated similarly to watch history - each query is tokenized into unigrams and bigrams and each token is embedded. Once averaged, the user’s tokenized, embedded queries represent a summarized dense search history. Demographic features are important for providing priors so that the recommendations behave reasonably for new users. The user’s geographic region and device are embedded and concatenated. Simple binary and continuous features such as the user’s gender, logged-in state and age are input directly into the network as real values normalized to $[0, 1]$.

“Example Age” Feature

Many hours worth of videos are uploaded each second to YouTube. Recommending this recently uploaded (“fresh”) content is extremely important for YouTube as a product. We consistently observe that users prefer fresh content, though not at the expense of relevance. In addition to the first-order effect of simply recommending new videos that users want to watch, there is a critical secondary phenomenon of bootstrapping and propagating viral content [11].

Machine learning systems often exhibit an implicit bias towards the past because they are trained to predict future

behavior from historical examples. The distribution of video popularity is highly non-stationary but the multinomial distribution over the corpus produced by our recommender will reflect the average watch likelihood in the training window of several weeks. To correct for this, *we feed the age of the training example as a feature during training*. At serving time, this feature is set to zero (or slightly negative) to reflect that the model is making predictions at the very end of the training window.

Figure 4 demonstrates the efficacy of this approach on an arbitrarily chosen video [26].

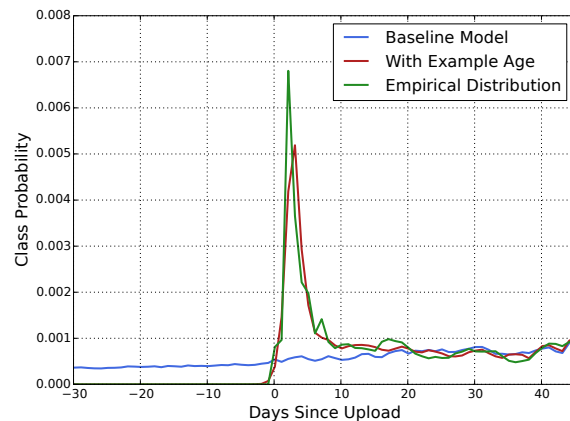


Figure 4: For a given video [26], the model trained with example age as a feature is able to accurately represent the upload time and time-dependant popularity observed in the data. Without the feature, the model would predict approximately the average likelihood over the training window.

3.4 Label and Context Selection

It is important to emphasize that recommendation often involves solving a *surrogate problem* and transferring the result to a particular context. A classic example is the assumption that accurately predicting ratings leads to effective movie recommendations [2]. We have found that the choice of this surrogate learning problem has an outsized importance on performance in A/B testing but is very difficult to measure with offline experiments.

Training examples are generated from all YouTube watches (even those embedded on other sites) rather than just watches on the recommendations we produce. Otherwise, it would be very difficult for new content to surface and the recommender would be overly biased towards exploitation. If users are discovering videos through means other than our recommendations, we want to be able to quickly propagate this discovery to others via collaborative filtering. Another key insight that improved live metrics was to generate a fixed number of training examples per user, effectively weighting our users equally in the loss function. This prevented a small cohort of highly active users from dominating the loss.

Somewhat counter-intuitively, great care must be taken to *withhold information from the classifier* in order to prevent the model from exploiting the structure of the site and overfitting the surrogate problem. Consider as an example a

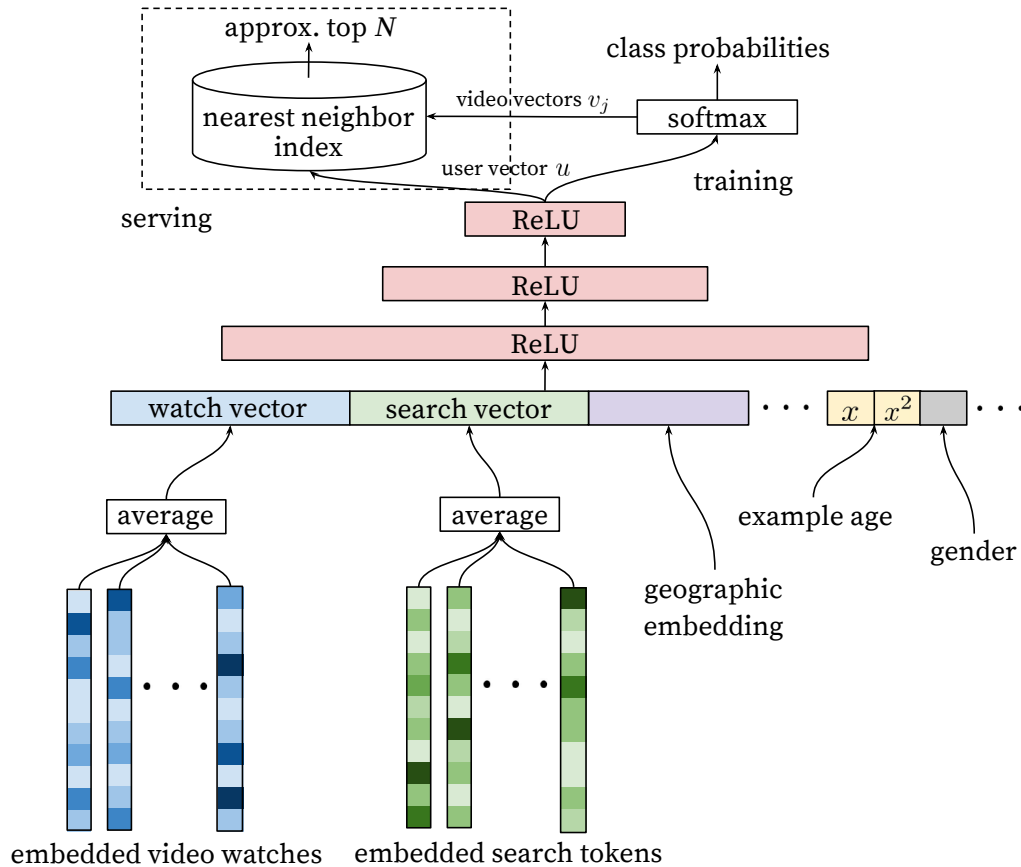


Figure 3: Deep candidate generation model architecture showing embedded sparse features concatenated with dense features. Embeddings are averaged before concatenation to transform variable sized bags of sparse IDs into fixed-width vectors suitable for input to the hidden layers. All hidden layers are fully connected. In training, a cross-entropy loss is minimized with gradient descent on the output of the sampled softmax. At serving, an approximate nearest neighbor lookup is performed to generate hundreds of candidate video recommendations.

case in which the user has just issued a search query for “taylor swift”. Since our problem is posed as predicting the next watched video, a classifier given this information will predict that the most likely videos to be watched are those which appear on the corresponding search results page for “taylor swift”. Unsurprisingly, reproducing the user’s last search page as homepage recommendations performs very poorly. By discarding sequence information and representing search queries with an unordered bag of tokens, the classifier is no longer directly aware of the origin of the label.

Natural consumption patterns of videos typically lead to very asymmetric co-watch probabilities. Episodic series are usually watched sequentially and users often discover artists in a genre beginning with the most broadly popular before focusing on smaller niches. We therefore found much better performance predicting the user’s next watch, rather than predicting a randomly held-out watch (Figure 5). Many collaborative filtering systems implicitly choose the labels and context by holding out a random item and predicting it from other items in the user’s history (5a). This leaks future infor-

mation and ignores any asymmetric consumption patterns. In contrast, we “rollback” a user’s history by choosing a random watch and only input actions the user took before the held-out label watch (5b).

3.5 Experiments with Features and Depth

Adding features and depth significantly improves precision on holdout data as shown in Figure 6. In these experiments, a vocabulary of 1M videos and 1M search tokens were embedded with 256 floats each in a maximum bag size of 50 recent watches and 50 recent searches. The softmax layer outputs a multinomial distribution over the same 1M video classes with a dimension of 256 (which can be thought of as a separate output video embedding). These models were trained until convergence over all YouTube users, corresponding to several epochs over the data. Network structure followed a common “tower” pattern in which the bottom of the network is widest and each successive hidden layer halves the number of units (similar to Figure 3). The depth zero network is effectively a linear factorization scheme which

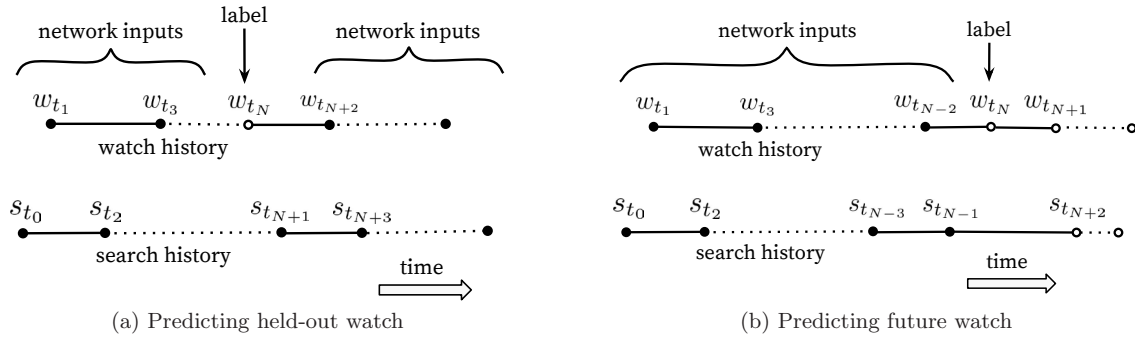


Figure 5: Choosing labels and input context to the model is challenging to evaluate offline but has a large impact on live performance. Here, solid events \bullet are input features to the network while hollow events \circ are excluded. We found predicting a future watch (5b) performed better in A/B testing. In (5b), the example age is expressed as $t_{\max} - t_N$ where t_{\max} is the maximum observed time in the training data.

performed very similarly to the predecessor system. Width and depth were added until the incremental benefit diminished and convergence became difficult:

- Depth 0: A linear layer simply transforms the concatenation layer to match the softmax dimension of 256
- Depth 1: 256 ReLU
- Depth 2: 512 ReLU \rightarrow 256 ReLU
- Depth 3: 1024 ReLU \rightarrow 512 ReLU \rightarrow 256 ReLU
- Depth 4: 2048 ReLU \rightarrow 1024 ReLU \rightarrow 512 ReLU \rightarrow 256 ReLU

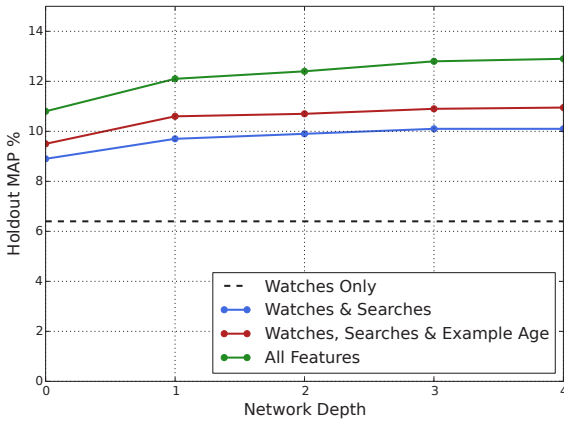


Figure 6: Features beyond video embeddings improve holdout Mean Average Precision (MAP) and layers of depth add expressiveness so that the model can effectively use these additional features by modeling their interaction.

4. RANKING

The primary role of ranking is to use impression data to specialize and calibrate candidate predictions for the particular user interface. For example, a user may watch a given

video with high probability generally but is unlikely to click on the specific homepage impression due to the choice of thumbnail image. During ranking, we have access to many more features describing the video and the user’s relationship to the video because only a few hundred videos are being scored rather than the millions scored in candidate generation. Ranking is also crucial for ensembling different candidate sources whose scores are not directly comparable.

We use a deep neural network with similar architecture as candidate generation to assign an independent score to each video impression using logistic regression (Figure 7). The list of videos is then sorted by this score and returned to the user. Our final ranking objective is constantly being tuned based on live A/B testing results but is generally a simple function of expected watch time per impression. Ranking by click-through rate often promotes deceptive videos that the user does not complete (“clickbait”) whereas watch time better captures engagement [13, 25].

4.1 Feature Representation

Our features are segregated with the traditional taxonomy of categorical and continuous/ordinal features. The categorical features we use vary widely in their cardinality - some are binary (e.g. whether the user is logged-in) while others have millions of possible values (e.g. the user’s last search query). Features are further split according to whether they contribute only a single value (“univalent”) or a set of values (“multivalent”). An example of a univalent categorical feature is the video ID of the impression being scored, while a corresponding multivalent feature might be a bag of the last N video IDs the user has watched. We also classify features according to whether they describe properties of the item (“impression”) or properties of the user/context (“query”). Query features are computed once per request while impression features are computed for each item scored.

Feature Engineering

We typically use hundreds of features in our ranking models, roughly split evenly between categorical and continuous. Despite the promise of deep learning to alleviate the burden of engineering features by hand, the nature of our raw data does not easily lend itself to be input directly into feedforward neural networks. We still expend considerable

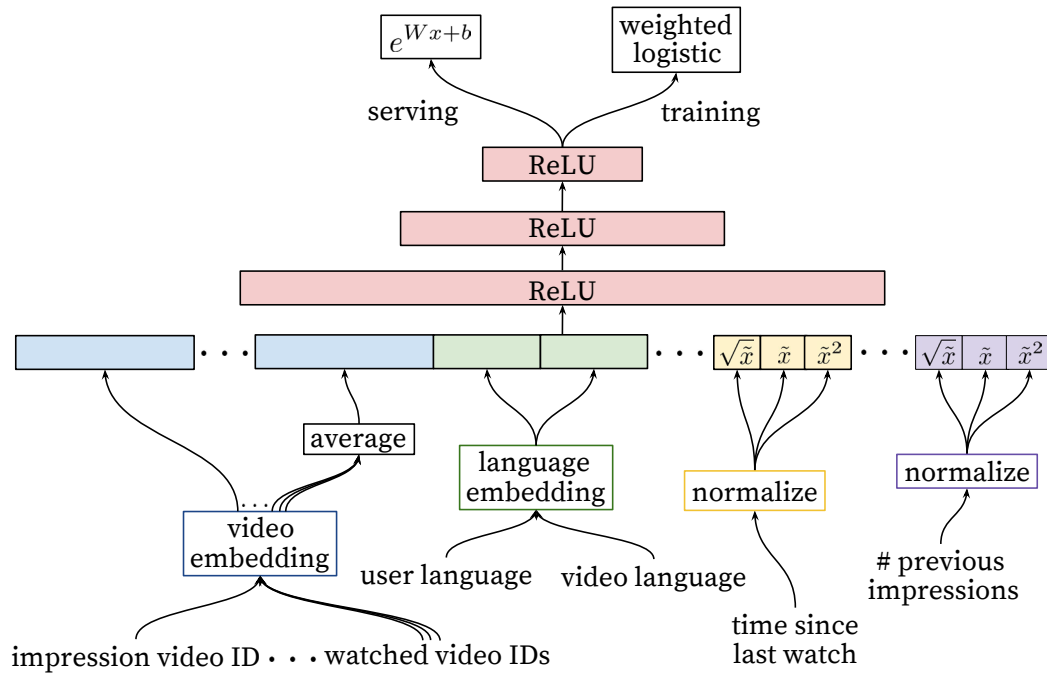


Figure 7: Deep ranking network architecture depicting embedded categorical features (both univalent and multivalent) with shared embeddings and powers of normalized continuous features. All layers are fully connected. In practice, hundreds of features are fed into the network.

engineering resources transforming user and video data into useful features. The main challenge is in representing a temporal sequence of user actions and how these actions relate to the video impression being scored.

We observe that the most important signals are those that describe a user’s previous interaction with the item itself and other similar items, matching others’ experience in ranking ads [7]. As an example, consider the user’s past history with the channel that uploaded the video being scored - how many videos has the user watched from this channel? When was the last time the user watched a video on this topic? These continuous features describing past user actions on related items are particularly powerful because they generalize well across disparate items. We have also found it crucial to propagate information from candidate generation into ranking in the form of features, e.g. which sources nominated this video candidate? What scores did they assign?

Features describing the frequency of past video impressions are also critical for introducing “churn” in recommendations (successive requests do not return identical lists). If a user was recently recommended a video but did not watch it then the model will naturally demote this impression on the next page load. Serving up-to-the-second impression and watch history is an engineering feat onto itself outside the scope of this paper, but is vital for producing responsive recommendations.

Embedding Categorical Features

Similar to candidate generation, we use embeddings to map sparse categorical features to dense representations suitable for neural networks. Each unique ID space (“vocabulary”)

has a separate learned embedding with dimension that increases approximately proportional to the logarithm of the number of unique values. These vocabularies are simple look-up tables built by passing over the data once before training. Very large cardinality ID spaces (e.g. video IDs or search query terms) are truncated by including only the top N after sorting based on their frequency in clicked impressions. Out-of-vocabulary values are simply mapped to the zero embedding. As in candidate generation, multivalent categorical feature embeddings are averaged before being fed in to the network.

Importantly, categorical features in the same ID space also share underlying embeddings. For example, there exists a single global embedding of video IDs that many distinct features use (video ID of the impression, last video ID watched by the user, video ID that “seeded” the recommendation, etc.). Despite the shared embedding, each feature is fed separately into the network so that the layers above can learn specialized representations per feature. Sharing embeddings is important for improving generalization, speeding up training and reducing memory requirements. The overwhelming majority of model parameters are in these high-cardinality embedding spaces - for example, one million IDs embedded in a 32 dimensional space have 7 times more parameters than fully connected layers 2048 units wide.

Normalizing Continuous Features

Neural networks are notoriously sensitive to the scaling and distribution of their inputs [9] whereas alternative approaches such as ensembles of decision trees are invariant to scaling of individual features. We found that proper normalization

of continuous features was critical for convergence. A continuous feature x with distribution f is transformed to \tilde{x} by scaling the values such that the feature is equally distributed in $[0, 1]$ using the cumulative distribution, $\tilde{x} = \int_{-\infty}^x df$. This integral is approximated with linear interpolation on the quantiles of the feature values computed in a single pass over the data before training begins.

In addition to the raw normalized feature \tilde{x} , we also input powers \tilde{x}^2 and $\sqrt{\tilde{x}}$, giving the network more expressive power by allowing it to easily form super- and sub-linear functions of the feature. Feeding powers of continuous features was found to improve offline accuracy.

4.2 Modeling Expected Watch Time

Our goal is to predict expected watch time given training examples that are either positive (the video impression was clicked) or negative (the impression was not clicked). Positive examples are annotated with the amount of time the user spent watching the video. To predict expected watch time we use the technique of weighted logistic regression, which was developed for this purpose.

The model is trained with logistic regression under cross-entropy loss (Figure 7). However, the positive (clicked) impressions are weighted by the observed watch time on the video. Negative (unclicked) impressions all receive unit weight. In this way, the odds learned by the logistic regression are $\frac{\sum T_i}{N-k}$ where N is the number of training examples, k is the number of positive impressions, and T_i is the watch time of the i th impression. Assuming the fraction of positive impressions is small (which is true in our case), the learned odds are approximately $E[T](1+P)$, where P is the click probability and $E[T]$ is the expected watch time of the impression. Since P is small, this product is close to $E[T]$. For inference we use the exponential function e^x as the final activation function to produce these odds that closely estimate expected watch time.

4.3 Experiments with Hidden Layers

Table 1 shows the results we obtained on next-day holdout data with different hidden layer configurations. The value shown for each configuration (“weighted, per-user loss”) was obtained by considering both positive (clicked) and negative (unclicked) impressions shown to a user on a single page. We first score these two impressions with our model. If the negative impression receives a higher score than the positive impression, then we consider the positive impression’s watch time to be *mispredicted watch time*. Weighted, per-user loss is then the total amount mispredicted watch time as a fraction of total watch time over heldout impression pairs.

These results show that increasing the width of hidden layers improves results, as does increasing their depth. The trade-off, however, is server CPU time needed for inference. The configuration of a 1024-wide ReLU followed by a 512-wide ReLU followed by a 256-wide ReLU gave us the best results while enabling us to stay within our serving CPU budget.

For the 1024 \rightarrow 512 \rightarrow 256 model we tried only feeding the normalized continuous features without their powers, which increased loss by 0.2%. With the same hidden layer configuration, we also trained a model where positive and negative examples are weighted equally. Unsurprisingly, this increased the watch time-weighted loss by a dramatic 4.1%.

Hidden layers	weighted, per-user loss
None	41.6%
256 ReLU	36.9%
512 ReLU	36.7%
1024 ReLU	35.8%
512 ReLU \rightarrow 256 ReLU	35.2%
1024 ReLU \rightarrow 512 ReLU	34.7%
1024 ReLU \rightarrow 512 ReLU \rightarrow 256 ReLU	34.6%

Table 1: Effects of wider and deeper hidden ReLU layers on watch time-weighted pairwise loss computed on next-day holdout data.

5. CONCLUSIONS

We have described our deep neural network architecture for recommending YouTube videos, split into two distinct problems: candidate generation and ranking.

Our deep collaborative filtering model is able to effectively assimilate many signals and model their interaction with layers of depth, outperforming previous matrix factorization approaches used at YouTube [23]. There is more art than science in selecting the surrogate problem for recommendations and we found classifying a future watch to perform well on live metrics by capturing asymmetric co-watch behavior and preventing leakage of future information. Withholding discriminative signals from the classifier was also essential to achieving good results - otherwise the model would overfit the surrogate problem and not transfer well to the homepage.

We demonstrated that using the age of the training example as an input feature removes an inherent bias towards the past and allows the model to represent the time-dependent behavior of popular of videos. This improved offline holdout precision results and increased the watch time dramatically on recently uploaded videos in A/B testing.

Ranking is a more classical machine learning problem yet our deep learning approach outperformed previous linear and tree-based methods for watch time prediction. Recommendation systems in particular benefit from specialized features describing past user behavior with items. Deep neural networks require special representations of categorical and continuous features which we transform with embeddings and quantile normalization, respectively. Layers of depth were shown to effectively model non-linear interactions between hundreds of features.

Logistic regression was modified by weighting training examples with watch time for positive examples and unity for negative examples, allowing us to learn odds that closely model expected watch time. This approach performed much better on watch-time weighted ranking evaluation metrics compared to predicting click-through rate directly.

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Texts

[T]here are still many tricks that electronic technology is quite incapable of performing; still many structural, practical, and interpretative problems embedded in the new systems; still many radical and continuing limitations on the supposed electronic management of knowledge.

—Ian Donaldson, “The Destruction of the Book”

Books, the centuries-old foundation of textuality, can now be seen as overshadowed by a metatextuality that extends progressively to the whole complex of modes of representing the world, to all the different media, while continuing, nevertheless, to function as a referent. It is for this reason that the difficulty of perfecting and framing the methods for leafing through “pages” on screen witnesses both an effort to reconfirm the book as a nonbook, and at the same time the book’s permanence.

—Patrick Bazin, “Toward Metareading”

If, as I argued in the preceding chapters, peer review in a digitally networked environment might most productively become a process of peer-to-peer review, and if online authoring will require us to think differently about the relationships among individual authors, we might expect that moving the machinery of publishing online would similarly demand or result in some greater connectivity in the forms that our published texts assume. To some extent, this goes without saying: the very essence of the web lies in the hyperlink, and texts on the web seem destined to be connected via links of one form or another. In this chapter, however, I press a bit harder on what those connections might mean and how they might affect the kinds of texts we produce, the ways we distribute them, and the ways that they are, finally, read. In exploring those connections, I want to think less about the technology of the link per se than about what D. F. McKenzie (1999) has called “the sociology of texts,” which is to say the ways that texts of all varieties inter-

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Part III

Course readings for ‘Networks and Transactions’ and ‘Interaction Design and the Internet’

act, both with one another and with their readers. In thinking through the sociology of texts, we need to consider “the human motives and interactions which texts involve at every stage of their production, transmission, and consumption” (15). Because the dominant print-based forms of today’s scholarly communication have been with us for so long, many of those motives and interactions have become invisible to us; texts simply are the way they are, or, when we do consider them more deeply, they are the ways that print requires them to be.

In what follows I will explore the kinds of interactions fostered by the current forms of scholarship—which have developed in concert with print’s technologies of production, distribution, and use, but which aren’t in any inescapable sense determined by those technologies—and how network-based communication might inspire new kinds of interactivity in our scholarship. When I talk about “interactivity” in this sense, however, I don’t mean the kinds often associated with computer-based texts, which are imagined to be digital forms of the “choose your own adventure” text. Lev Manovich (2001, 55) has compellingly debunked what he refers to as “the myth of interactivity” in new media, pointing out that the term as used in this sense is tautological, “stating the most basic fact about computers.” Instead, I’m interested in a more communicative sense of interaction across texts, between texts and readers, and among readers. These forms of interaction exist even in what seems like the static, discrete textual forms made possible by print, but the affordances of network-based communication present the potential for heightening and highlighting them in ways that could prove extremely powerful for the future of scholarship.

Although this chapter explores the new kinds of textual structures that network-based publishing might inspire, it doesn’t attempt to take on *all* such structures. Most notably, I’m not primarily focused on the kinds of multimodal scholarship that I discussed at the end of the previous chapter, though I think that such new forms, especially as they’re being pioneered in venues such as the online journals *Kairos* and *Vectors*, could have an enormous impact on the ways that we produce and support scholarly arguments. Multimodal texts, which make rich use of images, audio, video, and other forms of computer-processed data, enable authors to interact in new ways with their objects of study, and to create rich models of complex processes and ideas. In this chapter, however, I focus most of my attention on the kinds of scholarly texts that are primarily composed of *text*, in no small part because the new digital form that we’re seeking might continue the work that the book has done for us for the last five centuries. What I hope to explore in

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the pages that follow are the possibilities for a new digital form that's as comfortable, engaging, information-rich, flexible, and inviting as the book itself has been—but that extends beyond the covers of the individual text to take advantage of the interactive possibilities that the network presents.

In order to begin exploring that new textual structure, it would be useful first to think carefully about what exactly the book has been, how its affordances have affected the organization of knowledge, and how our interactions with it have shaped our assumptions about the relationships between author, text, and reader that it mediates. During the December 2006 Modern Language Association convention in Philadelphia, Peter Stallybrass presented a paper whose title indicated that it would focus on the relationship between textual studies—or the application of material culture approaches to the study of textual production—and the book.¹ At the very outset of his presentation, however, Stallybrass overturned several basic assumptions about that form's production often unconsciously held by both literary scholars and textual critics. In asking who, exactly, it is that produces the thing we know as the book, he made a somewhat startling claim: *Authors do not write books, he argued, but rather sentences or, on a larger scale, texts. Similarly, printers do not produce books, but rather pages.* The primary argument that Stallybrass's paper sought to make was about the need for textual studies scholars to think in terms of pages, both bound and unbound, in order to escape what he called "the tyranny of the book."² While any such escape from tyranny in criticism is undoubtedly a good thing, our attention in *this* project needs to remain on the book, as it is the endangered form that we must either save or replace.

In setting up his argument about the need for textual scholars to focus on the page, however, Stallybrass suggested, almost as an aside, that the book is a production, finally, of the binder. This is a point I'd like to dwell on a bit, as it suggests that the bookness of the book derives less from its material composition—ink-on-paper—than from its organization, which in the case of print takes the form of sequenced, bound, and cut leaves. As Stallybrass (2002, 42) notes, conventional wisdom holds that the development of that form—specifically, the shift from the scroll to the codex—enabled "the capacity for random access," allowing a reader to turn immediately to any particular point in a text, thus facilitating the reader's active engagement in and manipulation of the textual object. Turning our material focus from print to binding as the source of bookness holds significant implications for scholars working on new, electronic modes of textuality, and in particular, on the future of the book. For if this is the case—that the formal properties of the book that have the greatest impact on our reading experience are derived not from print, but

rather from the codex—researchers working on new ways of transforming ink-on-paper to pixels-on-screens may be addressing the wrong problem, or at least the wrong aspect of a knottier problem than it has at times appeared. As Johanna Drucker (2008, 217) has suggested, it's all too easy for the problem of the digital future of the book to get caught up in how the book *looks* rather than how it *works*; in order to imagine a new digital form for the book, we need to focus on what, and how, it communicates.

The task, in other words, is on some level to forget about the arrangement of pixels on the screen and instead focus on our experience of larger-scale structural or organizational matters. This is not to say that interface design isn't important; as scholars including Stan Ruecker and Alan Galey (2009) have recently argued, design is itself a hermeneutic process, always presenting an interpretation of the ways digital projects communicate. It's also evident that the absence of careful design can interfere with the reader's ability to engage with digital text. Stallybrass (2002) notes the irony, for instance, in what appears to be the computer's regression from the kinds of manipulation that the codex made possible, as many digital texts reimpose the limitations of the scroll on our reading practices. Despite having greater capacities for random access to texts via searching and other modes of linking, the web's reliance on scrolling text too often fails to take account of the ways that cognitive practices of reading are spatially organized. See, for instance, Geoffrey Nunberg's footnoted observation in "The Places of Books in the Age of Electronic Reproduction": "One ancillary effect of this homogenization of the appearance of electronic documents is to blur the sense of provenance that we ordinarily register subconsciously when we are reading. As a colleague said to me not long ago, 'Where did I see something about that the other day? I have a clear mental picture of a UNIX window'" (1993, 37n31). Stallybrass similarly notes the dislocation that results from the inability to stick one's finger between the pages of an electronic text to mark one's place. None of this is meant to imply that digital publishing ought to mimic the spatial arrangement of bound pages; if anything, too much current thinking about the design of digital texts is predicated on the structure of the book rather than any natively networked structure. Rather, I suggest that those of us working on the future of publishing online need to think in terms that are not just about page design, but rather about larger-scale textual structures, and about readers' interactions with and through those structures.

In what follows, I will explore a few projects focused on stretching the boundaries of textual structures in digital scholarship, exploring the ways these projects conceive of the possibilities for a web-native replacement for

the codex form. An early draft of a portion of this chapter was posted for comment and discussion using one of these technologies, CommentPress. I later revised the article based upon the comments I received and republished it in CommentPress on MediaCommons, as well as in a more traditionally linear format in the *Journal of Electronic Publishing*.³ This experiment allowed me, in some sense, to practice what I am preaching, but it also permitted some insight into the limitations of current web-based publishing technologies, as well as into some of the issues that publishing organizations face in the deployment of these technologies. None of the projects I discuss in this chapter should thus be imagined as a conclusion to the issues I'm exploring, but instead as various modes of exploration, ways of approaching the issues involved in electronic publishing from a broader structural perspective. At stake is not the success or failure of any particular technology, but rather our ability to produce a reading experience that provides net-native principles of organization as compelling as those of the codex, but with the extraordinary flexibility and multiplicity of the digital. Only in significantly broadening our sense of the text beyond the structures that have developed in print, I argue, will we be able to forge a new form for scholarship that will thrive electronically.

Documents, E-books, Pages

As I've suggested, much recent research on new systems of digital textuality has fallen into the trap of attempting all too literally to reproduce the printed page on digital screens through innovations in hardware or software—whether through various “e-book” readers such as Amazon's Kindle or computer-based document types such as the PDF (Portable Document Format) originated by Adobe. Many of these technologies have been reasonably successful, perhaps most notably the PDF, which has made possible the widespread distribution online of materials that either were originally in print or that are intended to wind up in print once again. Except for their mode of distribution, however, there's almost never anything particularly “net-native” about PDF-based texts, with little in their form that makes use of the digital environment in which they exist. These documents are, until printed, like paper under glass: mostly unmarkable, resisting interaction with an active reader or with other such documents in the network. More recent iterations of PDF software do allow users to annotate documents, but even so, such annotations remain superficial—the ability to add “sticky notes” or to mark in the margins of a static document is useful, but no deeper interaction with the text, its author, or its other readers is possible. Various modes

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of e-book hardware and software, ranging from the Expanded Books of the early 1990s Voyager Company through today's platforms such as the Kindle, have focused on becoming more genuinely digital in mode by providing readers with a set of tools that can be brought to bear on the text, including bookmarking, annotation, hyperlinking, and the like, all of which are simultaneously aimed at allowing the reader to traverse the text in ways that would be difficult, if not impossible, in print, while also providing the ability to mark the text so lamented by bibliophiles in contemplating on-screen reading.⁴ Thus far, however, no e-book format, whether, in Clifford Lynch's (2001) terms, device-based or text-based, has been terribly successful at luring readers away from pages and toward screens.⁵

One of the problems with both the e-book reader and the portable document format—as well as, for that matter, the more generic HTTP/HTML-based web technologies that have produced billions upon billions of web pages—is visible in their very vocabulary: despite whatever innovations exist in “pages,” “documents,” or “e-books,” we remain tied to thinking about electronic texts in terms of print-based, or, more specifically, codex-based, models. As Drucker notes, “Such nomenclature seems charged by a need to acknowledge the historical priority of books and to invoke a link between their established cultural identity and the new electronic surrogates” (2008, 216). The book and other forms of print have been critically important to the development of Western culture over the last six hundred years; they are so deeply ingrained in the ways we think that it becomes hard to imagine alternatives to them.⁶ However, simply translating texts from paper to screen misses the point. There's a reason, after all, why so many of my students print the PDFs that I teach in my classes before they read them, and why the response of many readers to e-book formats is to talk about the smell of paper, the use of a pencil, or the comfort of reading in bed; each of these e-book forms loses many of the benefits of print in the process of trying to retain them.⁷ While these technologies have demonstrated that the format of ink-on-paper can successfully be translated into pixels-on-screens, they've done so at the cost of remaining trapped in what Paul Levinson (1997: 126), following Marshall McLuhan, has referred to as “rear-view mirrorism,” the difficulty we have defining new technologies except in terms of older ones. Take, for instance the example of the car: the first major insight of its inventors was the flash that one might produce a carriage that was able to move without the horse; had the thinking about such an invention remained at the phase of the “horseless carriage,” however, many of the later developments in automotive design would have been impossible.⁸

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the same because the new formal mechanisms that deliver it to the reader modify the conditions of its reception and its comprehension. (Chartier 1993, 48–49)

Those conditions of reception and comprehension, and the intellectual technologies that will be put to use in the production of further, future texts, are the true stakes of imagining new structures within which new kinds of digital texts can be published.

Hypertext is one of the few modes of radical experiment in textual form to which the digital has thus far given birth. This networked data structure, the invention of which is generally credited to Ted Nelson and Douglas Engelbart, created the possibility of dramatically reorganizing text in networked ways, delinearizing and interlinking the text both within its own boundaries and in relation to other such texts. Numerous literary authors and critics saw the future in early hypertext publishing, envisioning a means of creating a new, more active relationship between the reader and the text. On the one hand, such thinkers pointed out the ways that hypertext's technologies succeeded in making manifest what had always been latent in the reader's encounter with print: "Hypertext only more consciously than other texts implicates the reader in writing at least its sequences by her choices" (Joyce 2000, 131).¹⁰ In this, hypertext became the fulfillment of the ideal form of the codex. On the other hand, hypertext also promised a radical restructuring of worldview, of "intellectual technologies," as Chartier suggests, by lending its readers a new set of metaphors through which to build a whole new epistemology. Thus, J. David Bolter suggested early on that hypertext's structure might affect not just the ways we understand texts, but the ways we understand the world in its entirety:

There is nothing in an electronic book that quite corresponds to the printed table of contents. . . . In this sense, the electronic book reflects a different natural world, in which relationships are multiple and evolving: there is no great chain of being in an electronic world-book. For that very reason, an electronic book is a better analogy for contemporary views of nature, since nature today is often not regarded as a hierarchy, but rather as a network of interdependent species and systems. (Bolter 1991, 105)

In leaving behind the codex, in eliminating the "great chain of being" enforced by the book, such critics suggested, hypertext would enable a new enlightenment to dawn, resulting in, among other things, the leveling of the

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In the same fashion, many of our attempts to produce a new form of electronic textuality have yet been unable to escape the structures of thought associated with the printed book, resulting, as Drucker (2008, 216) points out, in forms that "often mimic the most kitsch elements of book iconography while for the longest time the newer features of electronic functionality seemed not to have found their place in the interface at all."⁹ These elements of the book mimicked in the e-book of course have their own histories; print-based features such as the title page, for instance, or the table of contents, or running page headers, or even something as simple as page numbers, took decades to coalesce, and as Kindle users are discovering, they don't translate easily to new environments. Worse, attempting to make those translations in any direct sense may prevent us from really seeing the ways the new format might best function; we are being distracted by our attempts to simulate "the way a book looks" from the more crucial problem of "extending the ways a book works" (p. 217). Once we've genuinely managed to make that turn, developing wholly new textual structures, today's concept of the "e-book" will no doubt sound naïve, a remnant of our tenuous toe-dipping into digital publishing.

Hypertext

Some part of that naïveté arises from the term's very indication that we have not yet found the net-native structure that will be as flexible and inviting to individual readers as the codex has been. The absence that the "e-book" highlights is not the means of moving from imprinting ink on paper to arranging pixels on screens, but the means of organizing and presenting digital texts in a structural sense, in a way that produces the greatest possible readability and writerly engagement, that enables both the intensive development of an idea within the bounds of the electronic text and the extensive situation of that idea within a network of other such ideas and texts. Developing this format is of vital importance, not simply because the pleasure it can produce for readers will facilitate its adoption, but because it promises to have a dramatic impact on a wide range of our interactions with texts. As Roger Chartier has argued,

If texts are emancipated from the form that has conveyed them since the first centuries of the Christian era—the codex, the book composed of signatures from which all printed objects with which we are familiar derive—the same token all intellectual technologies and all operations working to produce meaning become similarly modified. . . . When it passes from the codex to the monitor screen the "same" text is no longer truly

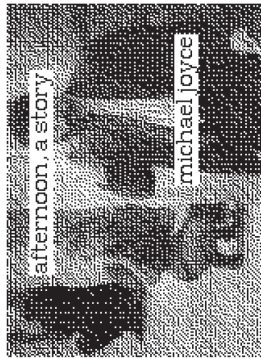
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out, the disorientation produced by hypertext's apparent immateriality can have powerful physical and metaphysical effects: "Hypertexts refigure our perception of ourselves as closed systems: sitting before the computer monitor, mouse in hand, and index finger twitching on the command button, we are engaged in a border experience, a moving back and forth across the lines which divide the human and the machine, culture and nature." This "back and forth" cannot be experienced neutrally, as it suggests a profound dislocation of the self in the encounter with the machinic other.

The negative response to hypertext among contemporary students often gets dismissed as a kind of reactionary technophobia resulting from tradition-bound understandings of textuality, and not without reason; we've taught them, and they've learned well, to value the organizational strategies of the book. Students of mine, in fact, who've been willing to rough it through the confusions of a text like Thomas Pynchon's *Gravity's Rainbow* have felt stymied by Michael Joyce's *Afternoon*, unable to discern from the text the most basic rules for its comprehension. But I'm unconvinced that the problem that this generation of students has with hypertext is entirely a retrograde one; one of the other issues that they point to, in their complaints about the hypertext form, is feeling manipulated. Hypertext isn't really interactive, they argue; it only gives the *illusion* of reader involvement—and certainly only the illusion that the hierarchy of author and reader has been leveled: *clicking*, they insist, is not the same as *writing*. In fact, hypertext caters not to the navigational and compositional desires of the reader, but to the thought processes of the author. Hypertext, after all, was originally imagined in Vannevar Bush's classic 1945 essay "As We May Think," not as a technology through which readers would encounter a single text, but as a means for researchers to organize their thoughts about multiple texts and share those thoughts with other researchers. Similarly, Nelson (1965, 84) describes "the original idea" of his Xanadu project as having been the production of "a file for writers and scientists." The "we" doing the thinking in both Bush's and Nelson's visions was the author and his descendants, not average readers. Insofar as hypertext attempts in its form to more accurately replicate the structures and processes of human thought, it is the processes of the *author's* thought that are represented, often leaving the reader with the task of determining what the author was thinking—thus effectively reinscribing the author-reader hierarchy at an even higher level.

Such a focus on authorial desire wasn't a necessary element of early interactive texts; in addition to the Storyspace-style hypertexts such as *Afternoon*, the personal computing environments of the late 1970s and early 1980s gave

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for directions click yes (y)-- to start press Return
©1987 Michael Joyce
The Eastgate Press Edition 1990
PO Box 1307
Cambridge, MA 02238

Fig. 3.1. Opening screen, Michael Joyce's *Afternoon* (screenshot from the author's collection)

previously hierarchical relationship between author and reader, elevating the reader to full participation in the production of the text's meaning.

But—and this is one of the dirty little secrets of electronic textuality, one that doesn't get spoken terribly often—hypertext can often be difficult to read. And to teach: the vast majority of my students have visceral reactions against hypertext every time I introduce them to it. Some of what they hate, of course, may be attributed to the general appearance of datedness that most of the classic hypertexts now have, given that the most crucial Storyspace-composed texts haven't been ported to OS X-native formats, thus requiring that they be run in "Classic" mode, a mode no longer available since the release of OS 10.5 and one that was clunky even when it was available under OS 10.4 (see fig. 3.1).¹ But when pressed to think beyond the slowness, the small window, the pixelated fonts, what my students most often voice is their sense of disorientation, their lostness within the world of the text. They stab randomly at it, trying to find their way somewhere; they wander aimlessly, trying to make sense of their paths; they finally give up, not at all sure how much of the text they've actually read, or what they should have taken from it. As critics including Christopher Keep (1999, 165) have pointed

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rise to a number of "interactive fiction" titles such as *Adventure* and *Zork*. These texts, part narrative and part game, provided an often dungeon-like space that users explored, solving puzzles, fighting battles, and unlocking new parts of the textual world for further exploration. Such interactive fiction relied on a parser that took textual inputs from a user, read them for comprehensible commands (such as "go north," "open window," or "take rock"), and selected the appropriate outputs. While a text like *Zork* arguably bore less in common with narrative in any traditional sense than it did with games, particularly of the Dungeons & Dragons role-playing variety, the mode of interactivity that it relied upon was far closer to the hypertextual ideal of reader-as-coauthor than that of hypertext itself.

Given the original publication dates and platforms of *Zork* and *Adventure*, they should be equally difficult to access today as are *Afternoon* and the other Eastgate-published hypertexts. However, as Dennis Jerz pointed out (2009), Infocom, the primary publisher of interactive fiction in the early 1980s, designed a virtual machine through which those titles run; all that is required to operate the virtual machine on any new platform is a new interpreter for that platform, and the fans of interactive fiction, many of them technologists, have over the years produced the new interpreters that have kept *Zork* and *Adventure* alive even on today's newest operating systems and devices. Had early hypertext such as *Afternoon* run in such a virtualized, interpretable environment, its user base might have been able to help the publisher keep the texts alive. But it's also worth suggesting that the deeper level of interactivity of the writing user of interactive fiction, as opposed to the clicking reader of hypertext, might have contributed to the creation of that actively invested user base in the first place.¹²

Experiments in hypertext thus may have pointed in the general direction of a digital publishing future, but were finally hampered by difficulties in readerly engagement, as well as, I would argue, by having awakened in readers a desire for fuller participation that hypertext could not itself satisfy. For this reason, I suggest that if we are going to make any real headway in bridging the gap between our evident abilities with respect to arranging pixels on screens and the difficulties that remain with organizing texts in digital environments—in moving away from thinking about electronic publishing as a problem revolving around the future of *print* and instead thinking of it as a problem related to the future of the *codex*—we need to think differently about the networked relationships among our texts, and among the readers who interact with them. Enormous amounts of research have been done on the means of situating text within a digital network—on making text transmissible, comfortably readable

onscreen, and so forth. All of this is necessary, of course, and no doubt a precursor to the problems on which several contemporary projects are focused: the need to situate text within a network that is not just digital but interactive, fostering communication that is not just one-way, from author to reader, but multi-directional, from reader back to author, among readers, among authors, across texts. This network is fundamentally social in its orientation: as John Seely Brown and Paul Duguid (2000, 18) have convincingly argued, the ends of information are always human ends, and thus the communication of that information must always follow social purposes; similarly, Drucker (2008, 221) reminds us that the book is not, and has never been, separable from the interactions we have with it. In building the scholarly communication network of the future, a network that can foster the discursive exchange and development of ideas among peers that is ostensibly the purpose of all scholarship, we need to create structures that foreground those social interactions that we have with and through texts.

Database-Driven Scholarship

One key element in building such a network will be a shift in our understanding of the relationship between the individual text and the many other texts to which it might potentially connect. Lev Manovich has convincingly argued in *The Language of New Media* (2001) that the constitutive features of computerized media forms include the modularity of the media elements they involve, the automated processes that can be used to bring them together, and the variable nature of the texts that such processes create. If this is so, it stands to reason that digital publishing structures designed to facilitate work within the database logic of new media, in which textual and media objects can be created, combined, remixed, and reused, might help scholars to produce exciting new projects of the kind that I discussed near the end of the last chapter. Such a platform, for instance, might fruitfully allow authors to create complex publications by drawing together multiple preexisting texts along with original commentary, thus giving authors access to the remix tools that can help foster curation as a sophisticated digital scholarly practice. Curated texts produced in such a platform might resemble edited volumes, whether by single or multiple authors, or they might take as yet unimagined forms, but they would allow users to access and manipulate a multiplicity of objects contained in a variable, extensible database, which could then be processed in a wide range of ways, as well as allowing users the ability to add to the database and to create their own texts from its materials.

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Numerous such databases exist, of course; extensive digital projects focused on the creation of archives and repositories have developed since the early days of popular computing. The oldest and most famous such archive may be Project Gutenberg, founded by Michael Hart in 1971. Hart's philosophy in beginning the production of this archive was that "anything that can be entered into a computer can be reproduced indefinitely" (Hart 1992); perhaps more importantly, anything so entered can also be processed in a wide variety of ways. The potential value of creating a full archive, in "Plain Vanilla ASCII," of the wealth of texts available in the public domain is evident: these texts can not only be read on a wide variety of platforms, but also repurposed in a range of other projects. The scholarly value of Project Gutenberg, however, may be open to question; as Hart has noted, "Project Gutenberg has avoided requests, demands, and pressures to create 'authoritative editions.' We do not write for the reader who cares whether a certain phrase in Shakespeare has a ' or a ' ; between its clauses. We put our sights on a goal to release texts that are 99.9% accurate in the eyes of the general reader" (ibid.). Scholars, however, do care about the authoritativeness of the objects with which they work, and therefore a range of authoritative digital archives of work by and about a number of authors has been created, including *The William Blake Archive*, *The Walt Whitman Archive*, *The Swinburne Project*, and so on. These projects are grounded in the large-scale digitization of published and unpublished texts, images, and other materials related to the work and lives of these authors, creating extensive searchable databases of digital objects that potentially can be reused in a wide range of scholarly projects.

The problem in developing such new forms of publication as these databases, however, is what Jerome McGann (2005, 112) has referred to as one of the crises facing the digital humanities: such "scholarship—even the best of it—is all more or less atomized"; the various digital texts and collections that have been created are "idiosyncratically designed and so can't talk to each other," and there are no authoritative, systemic, searchable bibliographies of these projects that enable scholars to find the digital objects they'd like to reuse.¹⁵ In response to these problems, McGann and the Applied Research in Patacriticism group at the University of Virginia began developing NINES, the Networked Infrastructure for Nineteenth-century Electronic Scholarship, as "a three-year undertaking initiated in 2003 . . . to establish an online environment for publishing peer-reviewed research in nineteenth-century British and American studies" (p. 116). NINES has since become an aggregator for peer-reviewed digital objects published in a range of venues. This project, which has received significant funding from the Mellon Foundation, was established as a means of averting atomization in the digital humanities,

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bringing separate projects into dialogue with one another. The NINES goals, as described on the site ("What Is NINES?"), are:

- to serve as a peer-reviewing body for digital work in the long 19th-century (1770–1920), British and American;
- to support scholars' priorities and best practices in the creation of digital research materials;
- to develop software tools for new and traditional forms of research and critical analysis.

Among the tools that NINES has developed are Juxta, a system for online textual collation and analysis, and Collex, which forms the core of the NINES site today. Collex is an aggregator tool that searches multiple scholarly databases and archives, with fifty-eight federated sites represented, including library and special collection catalogs, repositories, journals, and other projects; Collex allows a user to find objects in a wide range of such locations and then to "collect" and tag such items, structuring them into exhibits (see fig. 3.2).

Collex's tagging function serves to add user-generated metadata to expert-created data within the various collections and archives that NINES draws together, but the key aspect of this "folksonomy" arises when the user then reshapes the tagged objects; as Kim Knight (2006) has argued, "Collex's folksonomical characteristics only take on interpretive importance as the community of users develops and collections and exhibits are shared." As NINES/Collex developer Bethany Nowviskie has noted (2007, 1), however, one of the project's primary focuses is on precisely such an "expansion of interpretive methods in digital humanities," through the connection and juxtaposition of digital objects and the production of commentary on and around them. The potential impact of such curatorial work could be enormous, as scholars find new ways to discover, manipulate, connect, and comment upon digital research objects. One problem facing the system, however, is that, as Madeleine Clare Elish and Whitney Trettien (2009, 6) point out, "in reality, the information that NINES aggregates is quite shallow, most of it only metadata, or information about information." Most of the "objects" that NINES is currently able to retrieve in a search are simply citations or catalog entries rather than the objects themselves. However, as access to primary objects alongside this metadata is increased, Collex's usefulness as a research and publishing tool will no doubt grow.

Other such collection- and exhibit-building projects are in production as well. Most notably, the Center for History and New Media is developing Omeka, a simple but extensible open-source platform that, once installed,

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above, a wide range of tools is being developed to support what has been called “data-driven scholarship” in the humanities; these include SEASR (Software Environment for the Advancement of Scholarly Research), which allows scholars to perform sophisticated forms of textual analysis, process the results of that analysis, and create engaging visualizations of the data that the analysis returns. Other tools such as Pliny allow scholars to create rich annotations for the objects they are studying and then organize those annotations in ways that highlight the relationships among the objects. Annotation, organization, analysis, and visualization represent new, computer-native modes of academic work, all of which permit scholars to find and analyze patterns at a scale previously impossible. One problem tools such as these face, however, is uptake; as a report from a meeting titled “Tools for Data-Driven Scholarship: Past, Present, Future” notes, “the vast majority of scholars who are not directly involved with the creation of digital tools and collections are not adopting these new applications and resources in the number one might anticipate this far into the digital revolution” (Cohen et al. 2009). To some extent, the report indicates, failures in uptake have to do with lapses in communication; scholars are too often unaware that such tools exist.¹⁴ Even when traditional scholars do find these tools, there’s often lingering uncertainty about what exactly one might do with them and why—what they’ll accomplish, what the resulting project will look like, what it will tell us that we haven’t yet seen. Those questions can be answered only when digital humanists engage and experiment with such computational tools, and thereby give rise to new kinds of scholarly questions.

Each of the projects discussed above is focused on the interactions among texts that the modularity, automatization, and variability of computer-based media might enable. What hasn’t yet been fully realized in many of these projects, however, is the key aspect of interaction between the reader and the text; despite all of the wonderful work being done on NINES, through Omeka, and in a range of other exciting digital tools, that work remains largely author-centric. Given the discursive purposes of scholarship, it might be useful to explore the ways that, long before the development of the digital network, the circulation of texts operated within and was driven by the social networks of their readers.

Reading and the Communications Circuit

Scholars working on areas of material culture studies such as the history of the book, as well as those literary critics focused on reader reception, have long included among their interests the social networks formed by readers and their effects on the dissemination and the reception of texts. Leah



Fig. 3.2. Introduction to a NINES exhibit (nines.org)

enables the creation, organization, and publication of archival materials in a wide range of formats, producing sophisticated narratives by combining digital objects with text about them. Omeka's ease of use and granular publishing structure resemble that of a blog engine, leading Dan Cohen (2008) to describe the project as “WordPress for your exhibits and collections.” Like Collex, Omeka is developing means of accessing and ingesting materials from existing repositories of digital texts and objects, thus potentially enabling scholars to repurpose those objects in engaging ways. While the “exhibit” has not been a standard mode of scholarly production in fields outside art history, we might consider the new kinds of scholarly inquiry such a mode of curation could inspire. As more of our work within the humanities comes to engage with mediated primary materials such as visual representations and digital archives, the more we might fruitfully create new forms of networked arguments driven by the juxtaposition of digital objects and their analysis.

Furthermore, the availability of digital objects is producing new kinds of research questions. In addition to the collection and exhibit software discussed

Price (2004, 309–10), in an essay reviewing the vast number of approaches to the study of reading as a cultural activity, notes that some scholars trace an historical trajectory from “the open spaces of antiquity (gardens, porticoes, squares, streets) to the closed sites of the Middle Ages (churches, monks’ cells, refectories, courts),” while the act of reading also “carved out privacy within communal institutions such as the coffee shop, the public library, and the railway carriage,” both trends suggesting an increasing privatization of the act of reading. However, Price also notes that even at its most solitary, reading has always had communal aspects. These social aspects of reading have been explored by scholars ranging from Robert Darnton (1982), who focuses on books’ circulation as a manifestation of a “communications circuit,” to Elizabeth Long (1993), who argues that, in Price’s words, “readers need others to set an example, to provide a sounding board for reactions to texts, to recommend and criticize and exchange books” (Price 2004, 306), to Stanley Fish (1980), who has argued most famously for the role of “interpretive communities” in shaping readers’ potential responses to texts.

Texts have thus never operated in isolation from their readers, and readers have never been fully isolated from one another, but different kinds of textual structures have given rise to and interacted within different kinds of communications circuits. Newspapers and pamphlets, as most famously studied by Jürgen Habermas (1989) and Benedict Anderson (1991), developed their influence in close concert with the rise of a coffee-house culture in which the events and polemics of the day were discussed and debated, giving birth not simply to a Habermasian sense of the “public sphere,” but to a sense of the public inhabiting that sphere, the “imagined community” of the nation.¹⁵ Books, similarly, moved within a set of social and communal structures that greatly affected their reception and comprehension, including libraries and reading groups, which not only assisted readers in the selection of texts but also provided space for their discussion. That said, the technology of the book, which fostered the notion of the text as the discrete, unique, authentic product of an individual author—what Joseph Esposito (2003) has referred to as “the myth of the primal book”—similarly fostered a sense of the discrete reader with whom it interacted, shifting the predominant mode of reading from a communal reading-aloud to a more individualized, isolated, and silent mode of consumption.¹⁶

This isolated mode of reading overwhelmingly dominates our understanding of book-consumption today, and particularly the form done by scholars. The library model of textual circulation, once understood to be a communal enterprise, now comes to seem profoundly individualistic: books

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are checked out and read by one person at a time, in retreat from interaction with the world. Indeed, when we imagine scholarly interactions with the bulk of printed texts today, particularly within the humanities, the primary images that arise are of isolation: individual scholars hunched over separately bound texts, each working individually, whether in their separate offices or in the silent reading rooms of the major research libraries. Of course scholars need to read and reflect in relative silence and retreat in order to understand and process the texts with which they work, as well as to produce more texts from those understandings. But the isolated aspect of this mode of reading has come to dominate our sense of the practice of reading as a whole, and in so doing the scholar has come to partake of the myth of individual genius, in which the great man produces noble ideas wholly from his own intellectual resources.¹⁷ As Walter Ong has suggested,

Writing is a solipsistic operation. I am writing a book which I hope will be read by hundreds of thousands of people, so I must be isolated from everyone. While writing the present book, I have left word that I am “out” for hours and days—so that no one, including persons who will presumably read the book, can interrupt my solitude. (Ong 2002, 100)

Such an understanding of the operation of scholarship ignores the ways that the communal lingers in the circuit, if only in submerged ways; the scholar alone in his or her office with a book is never wholly alone, but is always in conversation with that book’s author,¹⁸ and the products of this scholar’s readings are likewise intended to contribute to an ongoing conversation with other thinkers in the field. This conversation takes place at an often glacial pace, as years elapse between thought and utterance, in the form of the book’s publication, and between utterance and response, in the form of reviews of or responses to that book, but it is a conversation nonetheless.

This perspective on the practices of scholarly discourse is meant to suggest that, in attempting to reproduce the book form electronically, technologists have for too long focused on the isolated practices of reading—the individual reader, alone with a screen—rather than the communal engagement in discussion and debate to which those practices are, on some level, meant to give rise. Scholars operate in a range of conversations, from classroom interactions with students to conference discussions with colleagues; they need to have available to them not simply the library model of texts circulating among individual readers, but also the coffee-house model of public reading and debate. This interconnection of individual nodes into a collective fabric

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is the strength of the network, which not only physically binds individual machines, but also can bring together the users of those machines, at their separate workstations, into a communal whole.

There's nothing particularly revolutionary in this insight; "The network can create virtual connections among otherwise isolated individuals" is little more than the kind of utopian thinking that's colored Internet studies since Howard Rheingold's *The Virtual Community* was first published in 1993. My interest in thinking about the relationship between the social network and the structure of online texts should not be read as suggesting that such wired community will solve all of the problems of contemporary scholarly publishing. I do argue, however, that understanding the ways that texts circulate within and give rise to communities will be a necessary component of any successful electronic publishing venture. Given that the strength of the network with respect to the circulation of text is precisely its orientation toward the commons—that many readers can interact with the same text at the same time—developers of textual technologies would do well to think about ways to situate those texts within a community, and to promote communal discussion and debate within those texts' frames. Developers of new textual technologies and publishing systems must recognize that, on the one hand, simply publishing texts online, finding ways to reproduce the structures of the book in digital form, is insufficient, because the network cannot, and should not, replicate the codex; and that, on the other hand, simply moving toward a more internally networked form of publishing will likewise not revolutionize the circulation of texts, as the emphasis remains on the individual text, the individual author, the individual mind. The processed book, as Esposito (2003) has argued, cannot remain isolated from other texts: "By being placed within a network, where it is pointed to and pointed from, where it is analyzed and measured and processed and redistributed, a book reveals its connections to all other books." And, as Richard Lanham (1992, 203) noted in an early review essay on studies of electronic textuality, these connections have the potential to alter "the whole idea of scholarly originality, research, and production and publication"—but such transformations can only succeed if the medium's interactivity and nonauthoritative structures are fully mobilized in our new textual forms.¹⁹ It's no paradox that my students resist hyper-text while embracing Facebook; the generation celebrated by *Time* magazine as the "Person of the Year" in late 2006—"you" (Grossman 2006)—expects that the reader will likewise be allowed to write.

The speedy rise to popularity of academic blogging, and in particular in the success of a range of scholarly group blogs such as *The Valve* in liter-

ary studies (Holbo et al.), *Crooked Timber* in political philosophy (Bertram et al.), *Clippatria* in history (Bady et al.), and *Language Log* in linguistics (Lieberman et al.), indicates that scholars, and not just students, desire such interaction. Many scholars feel over-isolated, longing for new modes of collaboration and discussion, and such blogs have enabled a kind of conference-without-walls in which new ideas and texts can be discussed in something closer to real time. Moreover, contrary to the sense of some more curmudgeonly folks that the kinds of casual writing done on scholarly blogs can only detract from one's ability to produce "serious" work by stealing time and focus or by encouraging speed at the cost of deliberativeness, in fact, many academic bloggers argue that their blogging and the discussions on various other blogs have helped them produce more substantive work. By revitalizing discourse among peers, blogs have helped revive the coffee-house model of textual circulation.

But this coffee-house model still largely revolves around the contemporary equivalent of newspaper and pamphlet publishing, rather than the longer, more deliberative form of the book. One question that remains is whether the library model of the circulation of single-author, long-form texts meant to be consumed in relative isolation over longer periods of time might similarly benefit from the kinds of interaction that blogs produce, and if so, how. The library in such a model would become not simply a repository, but instead fully part of a communications circuit that facilitates discourse rather than enforcing silence. Many libraries are already seeking ways to create more interaction within their walls; my institution's library, for instance, hosts a number of lecture series and has a weekly "game night," each designed to help some group of its users interact not simply with the library's holdings, but with one another. Games may seem a frivolous example of the contemporary academy's drive to cater to the younger generation's relatively non-intellectual interests, but it is in fact hoped that patrons who use the library in such a fashion will not only be more likely to use it in traditional ways—more likely, for instance, to feel comfortable approaching a research librarian for help with a project—but also more empowered to collaborate with one another, breaking the library's stereotypical hush.

Libraries are interested in establishing themselves as part of a scholarly discursive network, and for that reason emphasizing the development of electronic publishing technologies based on an individualist sense of book circulation—on the retreat into isolation that accompanies our stereotypical imaginings of the library—threatens to miss the point entirely, ignoring the ways that the book itself has always served as an object of discussion,

and thus overlooking the real benefits of liberating the book's content from the codex form. Network interactions and connections of the types provided by blog engines can revitalize academic discourse not just in its pamphlet/coffee-house mode, but also in its book/library mode, by facilitating active reader engagement with texts, promoting discussion within the text's own frame, and manifesting the ways that each individual text is, and has always been, in dialogue with numerous texts that have preceded it, as well as others yet to come.

CommentPress

A number of projects underway attempt to reimagine reading as a socially situated process. Among the most significant of these is CommentPress, a blog-based publishing engine developed by the Institute for the Future of the Book, which seeks to promote dialogue within and around long-form texts in two primary ways: first, by structuring those texts around chunks that can be interlinked in linear and non-linear fashions, and that can take advantage of the ability to link to (and receive links from) other such texts in the network; and second, by allowing those chunks of texts to be commented on and discussed at various levels of granularity, from the whole document to the individual paragraph. The goal of CommentPress stems from the desire

to see whether a popular net-native publishing form, the blog, which, most would agree, is very good at covering the present moment in pithy, conversational bursts but lousy at handling larger, slow-developing works requiring more than chronological organization—whether this form might be refashioned to enable social interaction around long-form texts. (“About CommentPress” 2007)

Such interconnections and discussions are possible in large part because CommentPress builds upon a popular blogging engine, WordPress. As I noted in the last chapter, blogs are arguably the first successful web-native mode of electronic publishing, and their rapid spread and relative robustness suggest that their tools might be applicable to a range of other potential digital publishing modes. The conventional structure of a blog privileges immediacy—the newest posts appear first on the screen, and older posts quickly lose currency, moving down the blog's front page and eventually falling off it entirely, relegated to the archives. This emphasis on the present works at cross purposes with much long-form scholarship, which needs stability and

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longevity in order to make its points. But, as I've argued elsewhere, such scholarship might adopt from blogs their community-oriented structure, in which posts are generally made to elicit comment, and in which responses from other authors produce links on the original posts to which they refer (see Fitzpatrick 2007a). CommentPress allows commenting technologies to be usefully appropriated to a number of forms of scholarly publishing, ranging from the article to the long-form monograph, making manifest the recognition that readers of scholarly texts are nearly always themselves authors in other venues.

I have worked with the Institute for the Future of the Book for the last several years, most notably on MediaCommons, an electronic scholarly network focused on media studies that hopes to regroup the purposes of scholarly publishing in the desire for communication among a group of peers. The Institute has conducted a number of experiments focused on new textual structures, seeking to devise ways to publish long texts online in engaging, readable formats. These experiments, by and large, have sought to enable conversation in and around digitally published texts. As Bob Stein suggested to a reporter from *The Chronicle of Higher Education*, the electronic text can powerfully overcome the codex's isolation: “[B]est of all would be if readers could talk to each other, and if readers could talk to the author, because the reason for a book is to afford conversation across space and time, and so why shouldn't some of that conversation take place literally within the book itself?” (Young 2006) CommentPress is one of the primary tools through which the Institute hopes to facilitate some of that conversation.

The deep origins of CommentPress lie in a project with McKenzie Wark who, in preparing the manuscript for his 2007 book *Gamer Theory*, was persuaded to collaborate with the Institute in putting a draft of the text online. Because of the text's structure, the online version (titled *GAM3R 7H30RY* so that Wark could distinguish Google hits mentioning the online text from those mentioning the print book) easily adapted itself to publication through a blogging engine. However, Wark and the Institute early expressed an interest in subverting one of the basic structures of the blogging hierarchy: rather than keeping each chunk of the “original” text up top, with comments relegated to a spot further down the screen, Wark and the Institute's developers collaborated on a design (see fig. 3.3) that placed the text and the comments side-by-side, emphasizing the conversational principle that they hoped the publication would foster.³⁰ *GAM3R 7H30RY* lent itself to being published in this fashion in part because the text was already “chunked,” written in a rigidly algorithmic structure, with 9 alphabetically sequential chapters, each

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text's whole and pay close attention to its individual parts. In the design for "Holy of Holies," the Institute gave each paragraph its own comment stream, allowing the comment area to the right of Stephens's text to become dynamic, changing as the user selects the comment icon next to each paragraph (see fig. 3-4). Each section of the text likewise allows for more general comments, which can be found by selecting the comment icon next to the section title; all comments that have been made on any section can be read by clicking on the "All Comments" tab above the comment window. Moreover, clicking on the small icon to the right of a commenter's name highlights the paragraph to which the comment is attached. The 104 comments Stephens received on the paper were by and large substantive, and they included a number of technical comments that allowed the Institute to continue developing the templates for publications with this kind of fine-grained commenting ability.

The Institute's next such venture was in certain ways the most ambitious, and in others, the most traditional: the Institute teamed up with Lewis Lapham of *Lapham's Quarterly* to publish a commentable version of the *Iraq Study Group Report*. This version of the CommentPress templates carried over from "Holy of Holies" the ability of readers to discuss full sections of the text as well as comment at the more fine-grained paragraph level, but added two important innovations: first, a space for general comments about the report as a whole, and second, and more importantly, the ability to read comments organized not just by section but also by commenter, enabling a reader interested in the responses of another particular reader to see those comments as a group. The Institute followed this with a treatment of President Bush's televised address to the nation responding to the report, interweaving the transcribed text of the address with streaming video of the speech, opening both the content and the delivery to discussion.

Interestingly, the entire *Iraq Study Group Report* received a total of 92 comments, fewer than did Mitchell Stephens's much shorter—and arguably much less pressing—paper. The reasons in no small part have to do with the structure of the two social networks into which the texts were released: Stephens put his paper into CommentPress as a means of presenting it to a working group at the Center for Religion and Media at New York University, a group organized around the discussion of texts like Stephens's, so the technology to some degree facilitated the interactions and exchanges members of the paper were not affiliated with the working group but had been following Stephens's blog, hosted by the Institute, on which he had for some months been thinking out loud about the process and progress of his research. These read-

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Fig. 3.3. McKenzie Wark, *GAM3R 7H30RY* (futureofthebook.org/gamrtheory)

containing 25 paragraphs, with a strict 250-word limit per paragraph; as the paragraphs themselves were often aphoristic, many of them stood alone well, and reader comments thus could be closely associated with each paragraph of the text. However, the translation of what was originally intended to be a traditional codex book into this non-linear structure nonetheless created some complications: each paragraph looked a bit more free-standing than it really was; a reader couldn't simply enter and exit the text at any random point; readers often left questions or comments on early chunks about issues that were addressed in later parts of the text. Moreover, publishing Warf's online was extraordinarily labor-intensive, as the interface required too much manual tweaking to be readily adaptable for more general publishing purposes.

The next phase in the Institute's development of CommentPress was its publication of Mitchell Stephens's article "Holy of Holies: On the Constituents of Emptiness" (2006) as what they termed a "networked working paper," reimagining this paper, as their blog entry announcing its publication suggested, as "small steps toward an n-dimensional reading/writing space" (Verzhbovshchou 2006b). This new experiment was in part designed to help develop means for publishing texts that aren't as quite so self-chunking as War's manuscript was, so that a reader could simultaneously have sense of the

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1. "Empty": An Introduction

Pompey's incursion was made upon what the Jews called their second temple. The original version of the first temple was supposed to have been a magnificent structure in Jerusalem constructed by Judah's King Solomon on land purchased by his father, King David. No archaeological evidence – not one brick – has been found of anything remotely on that scale existing in what appears to have been at the time, the tenth century BCE, a tiny, sleepy kingdom. But by the reign of King Josiah, in the seventh century BCE, a central temple clearly existed in Jerusalem. It was destroyed by King Nebuchadnezzar II of Babylon in 586 BCE. Destruction on a new temple began with the return from exile in Babylon in 537 BCE.

That was the second temple. The sacrifices and purity rituals that were at the center of the Jewish religion were performed in and around such a temple in Jerusalem for more than half a millennium. (Herod, beginning in 19 BCE, built a version that may truly have qualified as magnificent.)

members not only were interested in the same subject matter as Stephens—as were the members of the working group, many of whom resisted online discussion—but were ready to use the technologies to facilitate that conversation.

By contrast, Lapham's project brought together what the site referred to as "a quorum of informed sources (historians, generals, politicians both foreign and domestic)," as well as a number of writers and reporters, all of whom had a vested interest in the material, but most of whom were unaccustomed to working in such a mediated or interactive vein. (In fact, more than a third of the comments on the report came from one participant, novelist and political writer Kevin Baker, who maintains an extensive web presence.) Other mitigating factors have to be considered, of course; for one thing, the *Iraq Study Group Report* had, at least initially, a closed commenter base, as opposed to Stephens's paper, which was open to community input. Moreover, the timing of the report's release by the study group—December 6, 2006—meant that the Institut's commentable version went online precariously close to the holidays. And even worse, by the time the commentable version was released, the Bush administration had already dismissed the report, making discussion of its proposals a significantly less compelling exercise. I would hold, however, that the readiness for online interaction is the most compelling reason for the relative quiet on the Iraq report's discussion channel; Ste-

phen's commenters were, by and large, not just attuned to the issues he presented, but actively engaged in other online reading and writing practices, which prepared them to be active contributors.²¹

All this is to say that no technology, whether CommentPress or another system, will be a panacea; even the most ingenious new structures for publishing a text online will not automatically get any randomly selected group talking. Technologies like these can, however, facilitate discussions among readers who are both motivated and prepared to have them.

And academics, unsurprisingly, often want to talk. After their first successful experiments with this new format for discussion-oriented publishing, the Institute began receiving numerous requests from academics and other authors hoping to use the template to publish their papers. They agreed in a few cases, helping Cathy Davidson and David Theo Goldberg (2007) publish a HASTAC (Humanities, Arts, Science, and Technology Advanced Collaboratory) working paper, as well as using a modification of the template as the engine behind the first release of MediaCommons's ongoing video discussion feature, *In Media Res*. This growing demand spurred the Institute to compile the various hacks and templates that, to this point, they had been tweaking manually into a releasable, documented, open-source theme easily installable and usable with any WordPress installation. CommentPress 0.9, a development release, was first made available to testers on July 21, 2007. The following day, I used my web hosting provider's one-click install function to load a new installation of WordPress, installed and set up the CommentPress theme, loaded in the text, and did a bit of tinkering with formatting and the like, taking a draft of the article on which this chapter is based from a Word document to "published" (including, arguably, founding the publisher) in under three hours (see fig. 3.5).

The original releases of CommentPress provided two “skins” from which users could select: one more traditionally blog-like, in which excerpts from posts appeared in reverse-chronological order on the site’s front page, but full post pages provided paragraph-level commenting parallel to the original text; and one for “documents,” which presented a table of contents on the front page linked to each of the document’s sections. In either skin, comments were readable in multiple modes: clicking on a small dialogue bubble to the right of a paragraph revealed comments on that paragraph, while a combination page/bubble icon to the right of a page’s title showed comments on the whole page. Readers could also browse all comments, organized either by commenter or by section of the text; browsing in this way provided links back to the portion of the original text on which the com-

ers. The kinds of feedback that I received helped me clarify that article’s argument as it continued to develop into this text.²²

In my experience, then, CommentPress became a useful tool not just for quickly and engagingly publishing a text, and for seeking feedback while a text is in draft form, but for facilitating an open mode of review. As I discussed briefly in chapter 1, Noah Wardrip-Fruin similarly used a CommentPress-derived tool to facilitate the blog-based review of the manuscript for his book, *Expressive Processing*; his reflections on the process not only pointed out that “the blog commentaries will have been through a social process that, in some ways, will probably make me trust them more” than the traditional blind peer reviews he also received (Wardrip-Fruin 2008), but also that the blog-based review uncovered one of the manuscript’s weaknesses in an unexpected way. One of the reviewers, Ian Bogost, noted on his own blog that he had trouble following the manuscript’s argument through the series of posts that comprised it, attributing that difficulty to the blog form’s serialized structure (Bogost 2008).²³ As it turns out, however, the traditional peer reviewers noted issues in following the argument across the text as well: “What had seemed like a confirmation of one of our early fears about this form of review—the possibility of losing the argument’s thread—was actually a successful identification, by the blog-based reviewers, of a problem with the manuscript also seen by the anonymous reviewers” (Wardrip-Fruin 2009a). In the end, the blog-based review provided Wardrip-Fruin with more feedback, and with feedback that he trusted more, based upon the community out of which it arose.

Wardrip-Fruin also notes, however, that the preexistence of the community was an absolute necessity for this project; while the Institute for the Future of the Book “sought to build new communities from scratch, via widespread publicity, for their projects” such as *GAM3R 7H30RY*, he argued, “this cannot be done for every scholarly publication—and a number of fields already have existing online communities that function well, connecting thinkers from universities, industry, nonprofits, and the general public” (Wardrip-Fruin 2009a). Making use of such an already existing community was necessary for the richness of discussion that *Expressive Processing* received. Similarly, a commenter on the revised version of my article noted that “in order to get the ‘liveliness of conversation and interaction’ required, some kind of community has to exist. Maybe in the form of an established scholarly web site, journal portal, or blog” (Hillesund 2007). Without such a community available and willing to discuss published texts, interaction will inevitably lag; one of the key tasks in building such technologically net-

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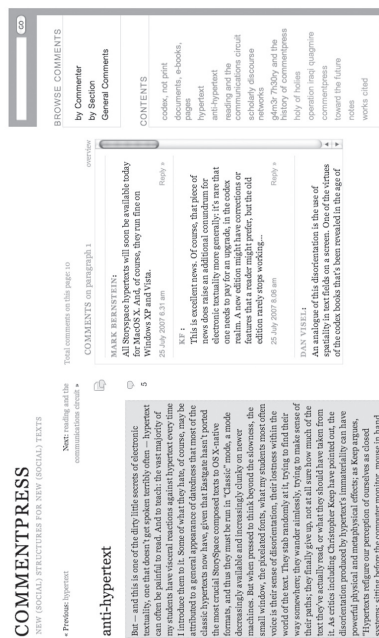


Fig. 3.5: Kathleen Fitzpatrick, “CommentPress” (screenshot from the author’s collection)

ments were made. In the months following the beta release of CommentPress, the Institute updated and advanced the software to release 1.4, adding features such as a widget-ready theme that allowed users to customize the sidebar of a text quickly and easily. Moreover, because CommentPress was released as an open-source project, users were able both to get the tool quickly into use—it was adopted, for instance, for a web-based version of the Ithaka Report, “University Publishing in a Digital Age” (Brown, Griffiths, and Rascoff 2007)—and to repurpose and redistribute it in ways that could enrich the possibilities the project presents for electronic publishing.

My experience of using CommentPress left me quite enthusiastic about the form; I was able to get the kinds of feedback on my article draft that I required, as well as to have a record of the responses the draft produced. The draft received a total of fifty-nine comments, just over a third of which were my own responses to issues raised by other readers. Those issues ranged from the factual to the interpretative, and in every case pressed my thinking about the article forward. In fact, though the *Journal of Electronic Publishing*, which published a revised version of the article (Fitzpatrick 2007d), offered to have it peer reviewed, I felt strongly enough about the reviews the article had already received to stick with the open process; rather than send the finished version to blind reviewers, I republished it in CommentPress as well, receiving another twenty-five or so comments from a second group of read-

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worked publishing environments will be maintaining the social networks they are meant to connect.

CommentPress ran into a series of problems early in its life, however, due in part to its dependence on the stability of the WordPress software on which it was based, as well as its reliance on the particular developer who originally wrote the plugin. The October 2007 release of WordPress 2.3, which heavily revised some key aspects of the codebase, effectively broke CommentPress; current CommentPress users were required to refrain from updating their WordPress software, and new users were obliged to find an older release in order to create CommentPress sites. In the meantime, however, the developer of CommentPress had moved on to another project. The Institute was finally able to release a WordPress 2.3-compatible update for CommentPress in January 2008, but the project's momentum had been severely compromised in the interim. Since that time, however, CommentPress has undergone two parallel development paths: the original developer has updated the code, re-releasing it as "digress.it," while the Institute has, following another successful project, overhauled the code as well, and in late 2009 released CommentPress 3.1 (see "digress.it").

In its most recent experiment, the Institute published the entire text of Doris Lessing's 1962 novel *The Golden Notebook* online, engaging seven women to read and discuss the text in the margin (see fig. 3.6). This project produced robust discussion not just among the seven primary readers, but also among a wide range of other readers who participated in the connected forum. This division between readers who could comment in the margins and those who could only discuss in the forums became one of the most heated topics under consideration; as the project announced on its front page,

How come only the seven women can comment in the margins?

Good conversations are messy, non-linear and complicated. The comment area, a chronological scrolling field[,] just isn't robust enough to follow a conversation among an infinite number of participants. Seven may even be too many. (Lessing 2008)

As one commenter noted in the forum, she understood why the "two-tiered structure" was necessary to "prevent chaos," but was unhappy with the disfunction that resulted: "Grad school all over again I guess" (marthaquest 2008). The Internet hates walled gardens, and thus one of the clear challenges faced by a conversational publishing system like CommentPress is precisely that of managing the potential for chaos in large-scale open discus-

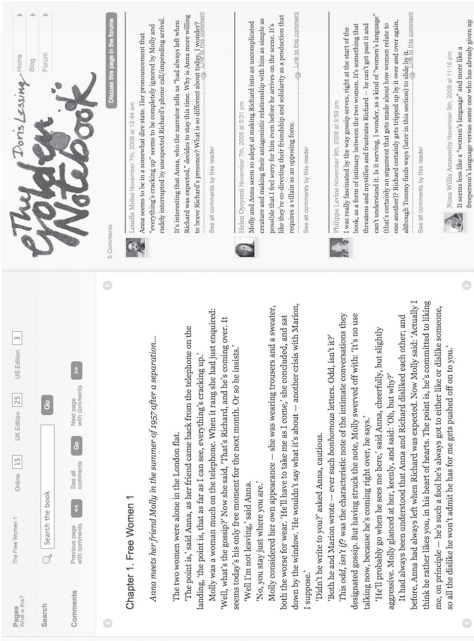


Fig. 3.6. Page from the Institute for the Future of the Book's publication of Doris Lessing's *The Golden Notebook* (thegoldennotebook.org)

sions. And while CommentPress has gone some distance toward imagining social interaction within and around texts, the fact that it still relies upon scrolling text windows suggests that, though we're beginning to solve the larger-scale structural problems of native digital textuality, we still have miles to go before our interactions with the screen have the ease of our interactions with the book.²⁴

The new kinds of interactions we need to develop affect authors as much as readers. Authors who publish via CommentPress need to develop the hosting skills required for such a conversational publishing strategy to succeed; as their texts are under discussion, they need to be present without being omnipresent, responding as called upon to reader comments, but without dominating and therefore closing down the discussion. As Wardrip-Fruin (2009a) notes, "[T]he flow of blog conversation is mercilessly driven by time. While it is possible to try to pick up threads of conversation after they have been quiet for a few days, the results are generally much less successful than when one responds within a day or, better yet, an hour." Authors will therefore be required to manage the labor involved not simply in producing the text, but

also in publishing it and in engaging with its audience, and our expectations with respect to faculty workload will have to reflect that labor: "[G]enerally pursuing blog-based review with time for full conversational engagement would require a shift in thinking around universities. It isn't uncommon for authors to request release time for book writing and revisions, yet it has almost never been requested in order to participate more fully in community peer review. I hope that will change in the future" (ibid.). As authors begin increasingly to publish in networked environments, we won't be quite so able to walk away from a text in manuscript form and leave its dissemination and discussion to others; we'll need to commit to being present in a text, for a time, and to engaging with the publishing process. This mode of participation is only one of the ongoing challenges involved in maintaining new digital publishing systems once they're built; new forms such as CommentPress will require significant investments of labor, not just in the development, installation, and implementation of the technologies themselves or in the design and release of texts through them, but in the post-publication maintenance of the texts. Publishing systems like CommentPress thus won't relieve institutions of the infrastructural demands posed by current analog press and library systems; if anything, as I discuss in the next chapter, they'll produce new kinds of requirements for preservation of the texts published through them.

That said, CommentPress demonstrates the fruitfulness of reimagining the technologies of electronic publishing in service to the social interconnections of authors and readers. The success of the electronic publishing ventures of the future will likely hinge on the liveliness of the conversations and interactions they produce, as well as the new writing that those interactions inspire. CommentPress grows out of an understanding that the chief problem in creating the future of the book is not simply placing the words on the screen, but structuring their delivery in an engaging manner; the issue of engagement, moreover, is not simply about locating the text within the technological network, but also, and primarily, about locating it within the social work. The publishing platform of the future might bring together the modes of interaction between readers and texts that CommentPress fosters with the modes of interaction among texts that are produced by the database-driven scholarship of projects such as NINES. Such a platform would allow not only for ease of reading and for engaging discussion, but also for the curation and remix of existing texts and digital objects into more new, exciting kinds of texts, finally resulting in a digital mode of publishing that doesn't just rival but indeed outdoes the codex. This new publishing structure would invite the reader in, acknowledge that the reader's engagement with the text is a mode

of social interaction, and recognize that the reader is, in many cases, a writer too. This publishing structure would also demonstrate an understanding that all publication is part of an ongoing series of public conversations, conducted in multiple time registers, across multiple texts. Making those conversations as accessible and inviting as possible should be the goal in imagining the textual communications circuit of the future.

For Daria

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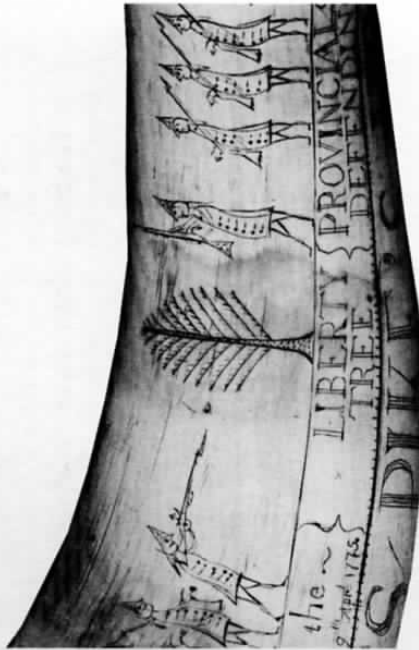
The Birth of American Freedom

American freedom was born in revolution. During the struggle for independence inherited ideas of liberty were transformed, new ones emerged, and the definition of those entitled to enjoy what the Constitution called "the blessings of liberty" was challenged and extended. The Revolution bequeathed to future generations an enduring yet contradictory legacy. Its vision of the new nation as an asylum for freedom in a world overrun by oppression resonates in the political culture to this day. Yet the United States, a nation conceived in liberty, harbored a rapidly growing slave population, belying the founders' confident affirmation of freedom as a universal human birthright.

The Freeborn Englishman

"Liberty," of course, did not suddenly enter the American vocabulary in 1776; indeed, few words were as ubiquitous in the trans-Atlantic political discourse of the eighteenth century. Colonial America was heir to many understandings of liberty, some as old as the city-states of ancient Greece, others as new as the Enlightenment. Some laid the foundations for modern conceptions of freedom; others are quite unfamiliar today.

One common definition in British North America defined freedom less as a political or social status than as a spiritual condition. In the ancient world, lack of self-control was understood as a form of slav-



In March 1776, James Pike, a soldier in the Massachusetts militia, carved this scene on his powder horn to commemorate the battles of Lexington and Concord eleven months earlier. Pike identified British troops as "aggressors." At the center stands the liberty tree. (Chicago Historical Society)

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religious revivals of the late colonial era, known to historians as the Great Awakening, reinforced this understanding of freedom. On the eve of independence, ministers like Jonathan Boucher were insisting that "true liberty" meant "a liberty to do every thing that is right, and being restrained from doing any thing that is wrong," not "a right to do every thing that we please."³

This equation of liberty with moral action flourished as well in a secularized form in the Atlantic world of the eighteenth century. If religious liberty meant obedience to God, "civil liberty" rested on obedience to law. As far back as the ancient world, Aristotle had cautioned men not to "think it slavery to live according to the rule of the constitution." The law was liberty's "salvation," not its adversary. Modern philosophers of liberty also distinguished sharply between "unrestrained freedom" and "a life lived under the rule of law." Liberty, wrote John Locke, meant not leaving every person free to do as he desired, but "having a standing rule to live by, common to every one of that society, and made by the legislative power." As Locke's formulation suggests, liberty in its civil form depended on obedience to the law, so long as statutes were promulgated by elected representatives and did not operate in an arbitrary manner. Here lay the essence of the idea of British liberty, a central element of social and political thought on both sides of the Atlantic. Until the 1770s, most colonists believed themselves part of the freest political system mankind had ever known.⁴

By the eighteenth century, the "invented tradition" of the freeborn Englishman had become a central feature of Anglo-American political culture and a major building block in the sense of nationhood then being consolidated in Britain. By self-definition, the British nation was a community of free individuals and its past a "history of liberty." Belief in freedom as the common heritage of all Britons and the British empire as the world's sole repository of liberty had helped to legitimize the colonization of North America in the first place. Subsequently, it served to cast imperial wars against Catholic France and Spain as struggles between liberty and tyranny, a definition widely disseminated in the colonies as well as the mother country. British freedom celebrated the rule of law, the right to live under legislation to which one's community had consented, restraints on the arbitrary exercise of political authority, and rights like trial by jury enshrined in the common law. It was closely identified with the Protestant religion and was invoked most stridently to contrast Britons with the "servile" subjects of Catholic countries.⁵

Of course, the idea of freedom as the natural condition of mankind was hardly unknown in a nation that had produced the writings of John Milton and John Locke. But British freedom was anything but universal. Nationalist, often

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ery, the antithesis of the free life. "Show me a man who isn't a slave," wrote Seneca. "One is a slave to sex, another to money, another to ambition." This understanding of freedom as submission to a moral code was central to the Christian cosmology that suffused the world view of the early colonists. Wherever it flourished, Christianity enshrined the idea of liberation, but as a spiritual condition rather than a worldly one. Since the Fall, man had been prone to succumb to his lusts and passions. Freedom meant abandoning this life of sin to embrace the teachings of Christ. "Where the Spirit of the Lord is," declares the New Testament, "there is liberty." In this definition, servitude and freedom were mutually reinforcing, not contradictory states, since those who accepted the teachings of Christ simultaneously became "free from sin" and "servants to God."¹

The Puritan settlers of colonial Massachusetts, who believed their colony the embodiment of true Christianity, planted this spiritual definition of freedom on American soil. In a 1645 speech to the Massachusetts legislature that epitomized Puritan conceptions of freedom, John Winthrop, the colony's governor, distinguished sharply between "natural liberty," which suggested "a liberty to evil," and "moral liberty . . . a liberty to do only what is good." This definition of freedom as flowing from self-denial and moral choice was quite compatible with severe restraints on freedom of speech, religion, movement, and personal behavior. Individual desires must give way to the needs of the community, and "Christian liberty" meant submission not only to the will of God but to secular authority as well, to a well-understood set of interconnected responsibilities and duties, a submission no less complete for being voluntary. The most common civil offense in the courts of colonial New England was "contempt of authority." The unrestrained individual enjoying natural rights, whom later generations would imagine as the embodiment of freedom, struck these Puritan settlers as the incarnation of anarchy, the antithesis of liberty. "When each man hath liberty to follow his own imagination," declared the Puritan minister Thomas Hooker, disaster inevitably resulted, for "all prejudice the public good."²

Communal authority was always weaker in the more secular colonies to the south of the Puritan commonwealth. Even in New England, as jeremiads of the early eighteenth century vigorously lamented, willingness to accept community regimentation in the name of liberty soon waned. By the 1750s, the idea of New England's special place in God's plan for humanity had been subsumed in the more general celebration of the entire Anglo-American Protestant world as a bulwark against tyranny and popery. Yet the Christian understanding of liberty as spiritual salvation survived to the Revolution and, indeed, our own time. The

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xenophobic, it viewed nearly every other nation on earth as "enslaved"—to popery, tyranny, or barbarism. "Freedom . . . in no other land will thrive," wrote the poet John Dryden; "Freedom an English subject's sole prerogative." Britons saw no contradiction between proclaiming themselves citizens of a land of freedom precisely when British ships were transporting millions of Africans to bondage in the New World. "Britons never, never, never will be slaves," ran the popular song, "Rule, Britannia." It did not say that Britons could not own slaves, since for most of the eighteenth century, almost no one seemed to consider Africans entitled to the rights of Englishmen.⁶

Nor was British liberty incompatible with wide gradations in personal freedom at home—a hierarchical, aristocratic society with a restricted "political nation" (those entitled to vote and hold office). The common law's protections applied to everyone, but property qualifications and other restrictions limited the eighteenth-century electorate to less than 5 percent of the adult male population. (The "right of magistracy," wrote Joseph Priestley in his *Essay on the First Principles of Government* [1768], was not essential to British freedom. Men "may enjoy civil liberty, but not political liberty.") Nor did British law view laborers as wholly free. Vagrancy statutes punished those without visible means of support, "master and servant" laws required strict obedience of employees, and breaches of labor contracts carried criminal penalties. The very navy whose domination of the high seas secured the nation's freedom from foreign domination was manned by sailors seized by press gangs from the streets of London and Liverpool. In this sense, British freedom was the lineal descendant of an understanding of liberty derived from the Middle Ages, when "liberties" meant formal privileges such as self-government or exemption from taxation granted to particular groups by contract, charter, or royal decree. Only those who enjoyed the "freedom of the city," for example, could engage in certain economic activities. This medieval understanding of liberty assumed a hierarchical world in which individual rights in a modern sense barely existed, and political and economic entitlements were enjoyed by some social classes and denied to others. Echoes of this old, restricted idea of liberty survived in early America—for example, in New York City's rule limiting the right to work in certain trades to those who held the legal status of "freeman."⁷

Whatever its limitations and exclusions, it would be impossible, as the historian Gordon Wood writes, "to overemphasize the degree to which eighteenth-century Englishmen reveled in their worldwide reputation for freedom," an observation as applicable to the American colonies as to the mother country. One could, if one desired, subdivide British liberty into its component parts, as many writers of the era were prone to do. Political liberty meant the right

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to participate in public affairs; civil liberty protection of one's person and property against encroachment by government; personal liberty freedom of conscience and movement; religious liberty the right of Protestants to worship as they chose. But the whole exceeded the sum of these parts. British liberty was simultaneously a collection of specific rights, a national characteristic, and a state of mind. So ubiquitous and protean was the concept that what would later seem inconsistent elements managed happily to coexist.⁸

British freedom, for example, incorporated contradictory attitudes about political power. On the one hand, the idea's historical development was inseparable from the rise of the nation-state, and reached its apotheosis precisely when Britain emerged as the world's leading imperial power. At the same time, restraints on the exercise of political authority were central to British freedom. Power and liberty were widely believed to be natural antagonists, and in their balanced constitution and the principle that no man, even the king, is above the law, Britons claimed to have devised the best means of preventing political absolutism. These ideas sank deep roots not only within the political nation but far more broadly in British society. Laborers, sailors, and artisans spoke the language of common law rights and British freedom as insistently as pamphleteers and Parliamentarians. By the eighteenth century, the category of free person had become not simply a legal status, as in medieval times, but a powerful element of popular ideology. On both sides of the Atlantic, liberty emerged as "the battle cry of the rebellious." Frequent crowd actions protesting infringements on traditional rights gave concrete expression to the definition of liberty as resistance to tyranny. "We are *Free-men*—British subjects—Not Born Slaves," was a rallying cry of the Regulators, who protested the underrepresentation of western settlements in the South Carolina legislature during the 1760s.⁹

This tension between freedom as the power to participate in public affairs and freedom as a collection of individual rights requiring protection against governmental interference helps define the difference between two political languages that flourished in the Anglo-American world. One, termed by scholars "republicanism" (although few in eighteenth-century England used the word, which conjured up memories of the time when Charles I was beheaded), celebrated active participation in public life as the essence of liberty. Tracing its lineage back to Renaissance Florence and beyond that to the ancient world, republicanism held that as a social being, man reached his highest fulfillment in setting aside self-interest to pursue the common good. Republican freedom could be expansive and democratic, as when it spoke of the common rights of the entire community. It also had an exclusive, class-based dimension, in its assumption that only property-owning citizens possessed the quality known as

"virtue"—understood in the eighteenth century not simply as a personal, moral quality but as a willingness to subordinate private passions and desires to the public good. "Only a virtuous people are capable of freedom," wrote Benjamin Franklin.¹⁰

If republican liberty was a civic and social quality, which could only be enjoyed by citizens of a "free state" (one ruled in accordance with the consent of the governed), the freedom celebrated by eighteenth-century liberalism was essentially individual and private. According to John Locke, the founding father of modern liberalism, government is established to offer security to the "life, liberties, and estates" that are the natural rights of all mankind, and essentially should be limited to this task. Liberty, for Locke and his eighteenth-century disciples, meant not civic involvement but personal autonomy—"not to be subject to the inconstant, uncertain, unknown Arbitrary Will of another Man." Protecting freedom required shielding a realm of private life and personal concerns—including family relations, religious preferences, and economic activity—from interference by the state. The public good was less an ideal to be consciously pursued by government than the outcome of free individuals' pursuit of their myriad private ambitions.¹¹

Liberalism, as the historian Pierre Manent puts it, severed the "citizen" from the "man," the political realm of life from the social. Critics condemned it as an excuse for selfishness and lack of civic-mindedness. "The freedom . . . that I love," declared Edmund Burke, "is not solitary, unconnected, individual, selfish Liberty. As if every Man was to regulate the whole of his conduct by his own will. The Liberty I mean is *social* liberty." Yet it is easy to understand liberalism's appeal in the hierarchical Atlantic world of the eighteenth century. It called into question all the legal privileges and governmental arrangements that impeded individual advancement, from the economic prerogatives of chartered corporations to legalized religious intolerance. And in its starting point, that mankind possessed natural rights no government could violate, liberalism opened the door to the disenfranchised, women, and even slaves, to challenge limitations on their own freedom.¹²

Eventually, liberalism and republicanism would come to be seen as alternative and contradictory understandings of freedom. In the eighteenth century, however, these languages overlapped and often reinforced one another. Many leaders of the Revolution seem to the modern eye simultaneously republican (in their concern for the public good and citizens' obligations to the polity) and liberal (in their preoccupation with individual rights). Both political ideologies could inspire a commitment to constitutional government, freedom of speech and religion, and restraints on arbitrary power. Both emphasized the security

of property as a foundation of freedom. The pervasive influence of Protestant morality, moreover, tempered what later would come to be seen as liberalism's amorality.

Certainly, in the colonial era, "liberty" stood as a meeting point between liberal and republican understandings of government and society. There seemed no necessary contradiction between the personal freedom central to liberalism and the public liberty of the republican tradition. Moreover, whether liberal, republican, or some combination of the two, most eighteenth-century commentators assumed that only certain kinds of persons were fully capable of enjoying the benefits and exercising the rights of freedom. On both sides of the Atlantic, it was an axiom of political thought that dependents lacked a will of their own and thus were incapable of participating in public affairs. Liberty, wrote the influential political theorist Richard Price, rested on "one general idea . . . the idea of *self-direction* or *self-government*." Those who did not control their own lives ought not to have a voice in governing the state. Political freedom required economic independence.¹³

Property, therefore, was "interwoven" with eighteenth-century understandings of freedom, as the New York publisher John Peter Zenger put it in 1735. The independence entailed by property was an indispensable basis of liberty. Dr. Samuel Johnson's dictionary defined "independence" as "freedom," and Thomas Jefferson insisted that dependence "begets subservience and venality, suffocates the germ of virtue, and prepares fit tools for the designs of ambition." Hence the ubiquity of property qualifications for voting in Britain and the colonies. The "true reason" for such requirements, Sir William Blackstone explained in his *Commentaries on the Laws of England* (1765–69), was that men without property would inevitably fall "under the immediate domination of others." Lacking a will of their own, their votes would threaten the "general liberty." Not only personal dependence, as in the case of a domestic servant, but working for wages was widely viewed as disreputable. In seventeenth- and eighteenth-century England, wage labor was associated with servility and loss of liberty; only those who controlled their own labor could be regarded as fully free. British popular ballads and folk tales romanticized vagabonds, gypsies, highwaymen, even beggars as more free than those who worked for wages. Many years would pass before the idea that wage labor was compatible with genuine freedom gained broad public acceptance.¹⁴

Those who drew up plans to colonize British North America expected to reproduce the hierarchical social structure of the mother country. But from the earliest days of settlement, migrants from Britain and the Continent held the promise of the New World to be liberation from the economic inequalities and

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widespread economic dependence of the Old. John Smith had barely landed at Jamestown in 1607 when he observed that in America, "every man may be master and owner of his owne labour and land." During the whole of the colonial era, most free immigrants expected to achieve economic autonomy, an anticipation encouraged by promotional literature that lured settlers by publicizing the notion of the New World as a place of exceptional opportunity for the acquisition of property. The visions of liberty that emigrants brought to colonial America always included the promise of economic independence and the ability to pass a freehold on to one's children.¹⁵

Defining freedom in terms of economic independence drew a sharp line between those classes capable of fully enjoying its benefits and those who were not. In the eighteenth century, economic autonomy was far beyond the reach of most Britons. Even in colonial America, most of the population was not, by this standard, truly free. Lacking a hereditary aristocracy like that of England, colonists prided themselves on having "no rank above that of freeman." But there were many ranks below. The half million slaves who labored in the mainland colonies on the eve of independence obviously stood outside the circle of free persons. For free women, whose civic identity was subsumed within that of their fathers and husbands, and who had no legal claim to their own labor, opportunities for economic autonomy barely existed. Women, moreover, were deemed by men deficient in rationality, courage, and the broad capacity for self-determination—the qualities necessary in the public-spirited citizen. Indeed, the ideal of independence was partly defined by gender; whether in the economy or polity, autonomy was a masculine trait, dependence the normal lot of women.¹⁶

Even among the white male population, it is sometimes forgotten, many varieties of partial freedom coexisted in colonial America, including indentured servants, apprentices, domestic laborers, transported convicts, and sailors impressed into service in the Royal Navy. Freedom in colonial America existed along a continuum from the slave, stripped of all rights, to the independent property owner, and during a lifetime an individual might well occupy more than one place on this spectrum. Indentured servants, who voluntarily surrendered their freedom for a specified time, comprised a major part of the non-slave labor force throughout the colonial era. As late as the early 1770s, nearly half the immigrants who arrived in America from England and Scotland had entered into contracts for a fixed period of labor in exchange for passage. Indentured servants often worked in the fields alongside slaves. Like slaves, servants could be bought and sold, were subject to corporal punishment, and their obligation to fulfill their duties ("specific performance," in legal terms)

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was enforced by the courts. "Many Negroes are better used," complained one female indentured servant in 1756; she went on to describe being forced to work "day and night . . . then tied up and whipped." But, of course, unlike slaves, servants could look forward to freedom from their servitude. Assuming they survived their period of labor (and many in the early years did not), servants would be released from dependency and receive "freedom dues." Servants, a Pennsylvania judge remarked in 1793, occupied "a middle rank between slaves and freemen."¹⁷

The prevalence of so many less than free workers underpinned the widespread reality of economic independence, and therefore freedom, for propertied male heads of households. This was most obvious in the case of slaveholding planters, who already equated freedom with mastership, but also true of the countless artisans in northern cities who owned a slave or two and employed indentured servants and apprentices. (In New York City and Philadelphia, artisans and tradesmen, who prided themselves on their own independence, dominated the ranks of slaveholders.) And the vaunted independence of the yeoman farmer depended in considerable measure on the labor of dependent women. The popular adage, "Women's work is never done," was literally true; the cooking, cleaning, sewing, and assistance in agricultural chores by farmers' wives and daughters often spelled the difference between self-sufficiency and economic dependence. In the household-based economy of colonial America, autonomy rested on command over others. "Freedom and dependence," wrote the Pennsylvania jurist James Wilson in 1774, were "opposite and irreconcilable terms." Wilson failed to note that since the free man was, by definition, master of a household, freedom and dependence were also inextricably connected.¹⁸

The eighteenth century witnessed an increase in social stratification in colonial America and the rise of a wealthy gentry exercising more and more dominance over civil, religious, and economic institutions, and demanding deference from their social inferiors. Nonetheless, by the time of the Revolution, the majority of the non-slave male population were farmers who owned their own land. With the household still the center of economic production, the propertyless were a far smaller proportion of the population than in Britain and wage labor far less prevalent. Among the free population, property was more widely distributed than anywhere in Europe. In colonial America, writes one historian, lived "thousands of the freest individuals the Western world had ever known."¹⁹

Thus, an abhorrence of personal dependence and the equation of freedom with autonomy sank deep roots in British North America not simply as part of an ideological inheritance, but because these beliefs accorded with social re-

ality—a wide distribution of productive property that made a modicum of economic independence part of the lived experience of large numbers of colonists. What the French essayist Hector St. John Crèvecoeur identified in 1782 as the hallmark of American society—its “pleasing uniformity of decent competence”—would form the material basis for the later definition of the United States as a “producer’s republic,” as well as its corollary, that widespread ownership of property was the social precondition of freedom.²⁰

Democratizing Freedom

With its wide distribution of property (and therefore a broadly participatory political life), weak aristocratic power, and an established church far less powerful than in Britain, colonial America was a society with deep democratic potential. But it took the struggle for independence to transform this society not only into a republican polity without a king but into a nation that enshrined equality and opportunity as its *raison d'être* and proudly proclaimed itself an asylum for liberty for all mankind. The Revolution unleashed public debates and political and social struggles that democratized the concept of freedom.

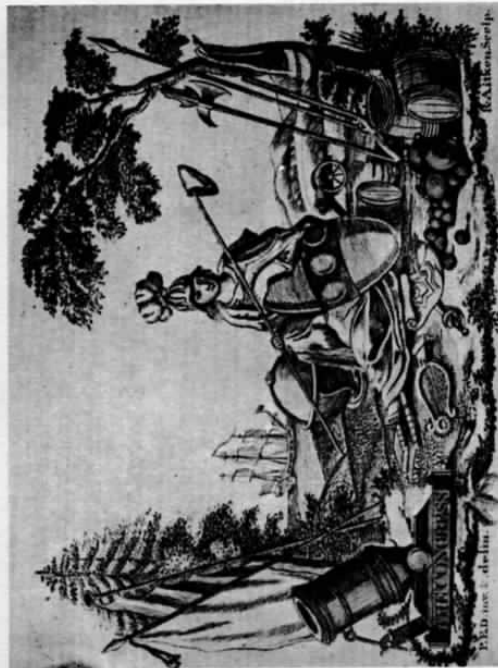
The American Revolution was fought in the name of liberty. On the road to independence, no word was more frequently invoked, although it rarely received precise definition. There were liberty trees, liberty poles, Sons and Daughters of Liberty, and an endless parade of pamphlets with titles like *A Chariot of Liberty* and *Oration on the Beauties of Liberty* (the latter, a sermon delivered in Boston by Joseph Allen in 1772, became the most popular public address of the years before independence). Throughout the colonies, British measures like the Stamp Act of 1765 were greeted by mock funerals of liberty, carefully choreographed spectacles in which a coffin was carried to a burial ground only to have the occupant miraculously revived at the last moment (whereupon the assembled multitude repaired to a tavern to celebrate). Liberty was more than an idea for those resisting British authority; it was a passion. Sober men spoke longingly of the “sweets of liberty.” All sorts of hopes and expectations came to be embodied in the idea of freedom. Commented a British emigrant who arrived in Maryland early in 1775: “They are all liberty mad.”²¹

Americans during the age of revolution did not start out to transform the rights of Englishmen into the rights of man. The very first colonial charter—Virginia’s, in 1606—had granted settlers the same “Liberties, Franchises, and Immunities” as if they resided “in our Realm of *England*.” And a century and a

half later, American colonists shared in the intensification of British nationalism, reaffirming their loyalty to king and constitution. Resistance to British revenue measures of the 1760s began by invoking Americans’ “rights as British subjects” within the framework established by the British constitution, “the best that ever existed among men.” At the outset, opposition to imperial policies invoked time-honored British principles (no taxation without representation, trial by jury) and employed modes of resistance long familiar in the mother country, from petitions and pamphlets to crowd activity. British measures of the 1760s like the Stamp Act, Quartering Act, and Townshend Duties were sometimes assailed in terms of natural rights, but far more frequently in the name of the “rights and privileges of freeborn Englishmen,” especially freedom from arbitrary government, security of property, and the right to live in a political community to whose laws a people, through their representatives, had given consent. As late as 1774, appeals to natural law were often combined with a hodgepodge of other claims to liberty, as in the “ancient, constitutional, and chartered Rights” invoked by Virginians. In the same year, the first Continental Congress defended its actions by appealing to the “principles of the English constitution” and the “liberties . . . of free and natural-born subjects, within the realm of England.”²²

As the conflict deepened, however, colonial leaders came to interpret metropolitan policies as part and parcel of an immense conspiracy to destroy the liberty of America, and their own resistance not merely as a struggle over specific legislation but as an episode in a global conflict between freedom and despotism. The Intolerable Acts of 1774, which suspended the Massachusetts legislature and closed the port of Boston, represented the final stage in this British design “for enslaving the colonies.” Now, the right to resist arbitrary authority and the identification of liberty with the cause of God, so deeply ingrained by the imperial struggles of the eighteenth century, were invoked against Britain itself.²³

The coming of independence rendered the rights of freeborn Englishmen irrelevant in America. As late as March 1775, Edmund Burke assured the British Parliament that the colonists were devoted not to “abstract liberty,” but to “liberty according to English ideas, and on English principles.” But the deepening crisis inevitably pushed Americans to ground their claims in the more abstract language of natural rights and universal liberty. In a merging of the evangelical belief in the New World as the future seat of “perfect freedom” with the secular vision of the Old as sunk in debauchery and arbitrary rule, the idea of British liberty was transformed into a set of universal rights, with America



On both sides of the Atlantic, the liberty cap symbolized the right of self-government and, more broadly, individual freedom. In a 1770 engraving from the *Boston Gazette* by Paul Revere (top), Britannia sits with the cap and national shield, reflecting the identification of liberty with the tradition of the "free-born Englishman." Five years later, on the cover of the *Pennsylvania Magazine*, liberty has been Americanized. The shield displays the colony's coat of arms and the female figure is surrounded by weaponry (including a carriage box marked "liberty" hanging from the tree) of the patriotic struggle. (Chicago Historical Society; American Antiquarian Society)

a sanctuary of freedom for humanity. Ironically, it took an emigrant from the lower classes of England, who only arrived in America in 1774, fully to grasp this breathtaking vision of the meaning of independence. As Thomas Paine proclaimed in January 1776 in the most widely read pamphlet of the era, *Common Sense*:

O! ye that love mankind . . . stand forth! Every spot of the old world is overrun with oppression. Freedom hath been hunted round the globe. Asia and Africa have long expelled her. Europe regards her as a stranger, and England hath given her warning to depart. O! receive the fugitive, and prepare in time an asylum for mankind.²⁴

Written, as Paine later observed, to help men "to be free," *Common Sense* announced a prophecy from which would spring the nineteenth-century idea of the United States as an "empire of liberty." Unburdened by the institutions—monarchy, aristocracy, hereditary privilege—that oppressed the peoples of the Old World, America, and America alone, was the place where the principle of universal freedom could take root. Six months later, the Declaration of Independence would legitimate American rebellion not merely by invoking British efforts to establish "absolute tyranny" over the colonies but by referring to the natural, unalienable rights of mankind, among which liberty was second only to life itself. In the Declaration, "the Laws of Nature and Nature's God," not the British constitution or the heritage of the freeborn Englishman, justified independence. The idea of liberty as a natural right became a revolutionary rallying cry, a standard by which to judge existing institutions and a justification for their overthrow. No longer a set of specific rights, no longer a privilege to be enjoyed by a corporate body or people in specific social circumstances, liberty had become a universal, open-ended entitlement. And the contradiction between the ideal of universal liberty and the reality of a society beset with inequalities would bedevil American public life during the Revolution and long thereafter.²⁵

Thus, if the roots of American freedom lay in the traditions of Christian liberty and of the freeborn Englishman, its emergence as a new and distinct ideology grew out of the struggle for independence and the creation of a nation-state that defined itself, in James Madison's words, as the "workshop of liberty to the Civilized World." In this "republic of the mind," to borrow a phrase from Rousseau, a newly invented national history and a putative national destiny both revolved around the idea of freedom. "Our forefathers," Jefferson wrote in 1775, "left their native land to seek on these shores a residence for civil

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and religious freedom," an inspiring if somewhat limited account of the numerous motives that had brought colonists to America. As for the future, Paine's stirring remark in *Common Sense*, "we have it in our power to begin the world over again," epitomized a sense that the American Revolution was an event of transcendent historical importance, an idea reiterated in countless sermons, political tracts, and newspaper articles of the time. From the beginning, devotion to freedom formed the essence of American nationalism.²⁶

A stunning repudiation of imperial authority, the Revolution also unleashed challenges to inherited structures of power at home. The real revolution, Paine would write, was intellectual: "We see with other eyes; we hear with other ears; and think with other thoughts, than those we formerly used." In rejecting the crown, as well as the principle of hereditary aristocracy, many Americans also rejected the very idea of human inequality and the society of privilege, patronage, and fixed status that these venerable traditions embodied. Jefferson's seemingly matter-of-fact assertion in the Declaration—"all men are created equal"—announced a truly radical principle, whose full implications no one could anticipate. In British North America, a well-ordered society was thought to depend on obedience to authority—the power of rulers over their subjects, husbands over wives, parents over children, masters over servants and apprentices, slaveholders over slaves. Inequality had been fundamental to the colonial social order; the Revolution in many ways made it illegitimate. Henceforth, American freedom would be inextricably linked with the idea of equality (at least for those within the circle of free citizens): equality before the law, equality in political rights, equality of economic opportunity, and, for some, equality of condition. "Whenever I use the words *freedom or rights*," Paine explained, "I desire to be understood to mean a perfect equality of them. . . . The floor of Freedom is as level as water."²⁷

In the egalitarian atmosphere of revolutionary America, long-accepted relations of dependency and forms of unfreedom suddenly appeared illegitimate. Abigail Adams's plea to her husband to "remember the ladies," her reminder that women, no less than men, ought not to be "bound by any laws in which we have no voice or representation," is widely remembered today. Less familiar is John Adams's response, which illuminated the crumbling of all sorts of inherited ideas of deference:

We have been told that our struggle has loosened the bonds of government everywhere; that children and apprentices were disobedient; that schools and colleges were grown turbulent; that Indians slighted their guardians, and negroes grew insolent to their masters.

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To John Adams, this egalitarian upheaval, including his wife's claim to political freedom, was an affront to the natural order of things.²⁸

In the end, the Revolution did not undo the obedience to which male heads of household were entitled from their wives, children, employees, and slaves. For free men, however, the democratization of freedom was dramatic, and nowhere more so than in challenges to the traditional limitation of political participation to those who owned property. "We are all, from the cobbler up to the senator, become politicians," declared a Boston letterwriter in 1774. Throughout the colonies, election campaigns became free-wheeling debates on the fundamentals of government, in which annual elections, universal manhood suffrage, religious toleration, even the abolition of slavery, were debated not only by the educated elite but by artisans, small farmers, and laborers, now emerging as a self-conscious element in politics. The militia, composed largely of members of the "lower orders," including servants and apprentices, became a "school of political democracy." Its members demanded the right to elect all their officers and insisted on the enfranchisement of all soldiers, whether or not they met age and property qualifications. They thereby established a long-lasting tradition whereby service in the army enabled excluded groups to stake a claim to full citizenship.

Those who during the Revolution demanded annual elections and an expansion of the right to vote envisioned not simply severing the link between property and suffrage but a redefinition of "property" itself. By the end of the revolutionary era, the concept of property had expanded to include rights and liberties as well as physical possessions. "A man," Madison declared at the Constitutional Convention of 1787, "has property in his opinions and the free communication of them, he has property in . . . the safety and liberty of his person." A few years later, he would speak of government's obligation to protect both the right to hold property and a citizen's "property" in his rights. Rather than property serving as a requirement to qualify for freedom, in other words, freedom could be imagined as a form of property.²⁹

The idea that property included ownership of one's self helped to democratize the political nation. If all persons had a property in their rights, then there was no logical reason why all should not participate in government. Before independence, the right to vote had been subject to complex restrictions, which varied from colony to colony. Everywhere, property qualifications, while less exclusionary than in England because of the wide distribution of ownership, barred those deemed incapable of independent judgment—journeymen, servants, apprentices, and the poor. Women were generally excluded from voting (although occasionally propertied females, usually widows, did cast ballots);

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residents of Lenox, Massachusetts, in 1778, "when he has not a voice allowed him" in elections? Henceforth, political freedom—the right to self-government—would mean not only, as in the past, a people's right to be ruled by their chosen representatives, but an individual's right to political participation.³²

In economic as well as political affairs, the Revolution redrew the boundary between the free and the unfree. In colonial America, slavery was one less-than-free system of labor among many. In the generation after independence, with the rapid decline of indentured servitude and apprenticeship, and the transformation of paid domestic service into an occupation for blacks and white females, the halfway houses between slavery and freedom disappeared (at least for white men). The demise of these forms of labor, well before they ceased to be widespread in Britain, had many causes, including the growing availability of wage workers and the actions of considerable numbers of servants and apprentices who took advantage of the turmoil of the Revolution to abscond from their masters. But the democratization of freedom played an important part. There could be no such thing as "partial liberty," and servitude increasingly came to be seen as incompatible with republican citizenship. In 1784, a group of "respectable" New Yorkers released a newly arrived shipload of indentured servants on the grounds that their status was "contrary to . . . the idea of liberty this country has so happily established."

By 1800, indentured servitude had all but disappeared from the United States, and apprenticeship was on the wane, developments that sharpened the dichotomy between freedom and slavery and between a northern economy relying on what would come to be called "free labor" and a South ever more heavily bound to the labor of slaves. In the process, the very meaning of the words "master" and "servant" were transformed. In the North, where they were deemed an affront to personal liberty, they fell into disuse. Wage laborers now referred to their employer as the "boss" rather than the "master," and domestic servants were now called "help." In the South, "master" meant slaveowner and "servant" became a euphemism for slave.³³

Buffered by unexpected events, Americans of the revolutionary era probed not only the definition of freedom but the means for its preservation. Preoccupied with the social conditions of freedom, they worried about whether a republic could survive with a sizable dependent class of citizens. Virginia's influential Declaration of Rights of June 1776, written by the planter and political leader George Mason, spoke of citizens as "equally free and independent," suggesting a connection between the qualities of freedom, independence, and equality. "A general and tolerably equal distribution of landed property,"

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and many colonies also imposed religious qualifications of one kind or another. The struggle for independence galvanized participation by hundreds of thousands of those outside the political nation. "Every poor man," claimed a Maryland writer, "has a life, a personal liberty, and a right to his earnings." Hence, voting was a universal entitlement, not a privilege: the "inherent right of free suffrage" was "the grandest right of a freeman." "The suffrage," declared a 1776 petition of disenfranchised North Carolinians, was "a right essential to and inseparable from freedom."³⁰

Conservative patriots struggled valiantly to reassert the rationale for the old restrictions. Property, and property alone, John Adams insisted, meant independence; those without it had no "judgment of their own. They talk and vote as they are directed by some man of property." The removal of property qualifications, Adams feared, would "confound and destroy all distinctions, and prostrate all ranks to one common level." This was precisely the aim, however, of the era's radical democrats. Yet, while moving much of the way toward the idea of voting as an entitlement rather than a privilege, they generally stopped short of universal suffrage, even for free men. The most democratic new state constitutions, such as Pennsylvania's, eliminated property qualifications, but substituted a taxpaying requirement, enfranchising nearly all of the state's free male population but leaving a small number, mainly paupers and domestic servants, still barred from voting. Even Paine, who considered the right to political participation "to be inseparable from the man as man," believed it could be forfeited for a time by those who chose to work as servants in homes and therefore voluntarily surrendered their autonomy. Paine still assumed that "freedom is destroyed by dependence." Nonetheless, since paying taxes did not make a man economically independent, the taxpaying requirement for voting represented a dramatic departure from colonial practice. It elevated "personal liberty," in the words of one Maryland essayist, to a position more important than property ownership in defining the boundaries of the political nation.³¹

Overall, the Revolution witnessed a great expansion of the right to vote, through the substitution of taxpaying for property requirements in some states, the substantial reduction of the freehold qualification in others, and the widespread enfranchisement of soldiers. The debate over the suffrage would, of course, continue for many decades. For white men, the process of democratization did not run its course until the Age of Jackson; for women and nonwhites, it would take much longer. But even during the Revolution, the process had a profound effect on prevailing definitions of freedom. In the popular language of politics, if not in law, freedom and the suffrage had become interchangeable. "How can a Man be said to [be] free and independent," asked

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more than "an opportunity for temptation," a threat to the spirit of self-sacrifice and communal loyalty essential to Christian liberty. But despite such fears, disestablishment did not end the influence of religion on American society; quite the reverse. Thanks to religious freedom, the post-revolutionary era witnessed an amazing proliferation of religious denominations. Today, even as debates continue over the proper relationship between spiritual and political concerns, more than one thousand three hundred religions are practiced in the United States.⁴⁹

"Yield to the mighty current of American freedom." So a member of the South Carolina legislature implored his colleagues in 1777.⁵⁰ And the current of freedom swept away not only British authority but also the principle of hereditary rule, the established churches, long-standing habits of deference and hierarchy, and old limits on the political nation. Yet in one crucial area, the tide of freedom encountered an obstacle that did not yield to its powerful flow. For freedom's antithesis—slavery—emerged from the Revolution more firmly entrenched than ever in American life.

2 To Call It Freedom

Slavery and the Republic

APART FROM "liberty," the word most frequently invoked in the legal and political literature of the eighteenth century was its opposite, "slavery." The institution of slavery is as old as civilization and its metaphorical meanings go back to ancient times. Virtually every form of oppression has at one time or another been described as a form of slavery. In the eighteenth century, freedom and slavery were frequently juxtaposed as "the two extremes of happiness and misery in society."

The condition of the slave was widely considered odious. "When an Englishman would paint the greatest curse that can befall him," commented Boston merchant Nathan Appleton, "it is to be no better off than an African slave." Yet in the era's political discourse, slavery was primarily a political category, shorthand for the denial of one's personal and political rights by arbitrary government. Those who lacked a voice in public affairs, declared a 1769 petition demanding an expansion of the British franchise, were "enslaved." In the years preceding independence, slavery assumed a central place in the language of colonial resistance. Many Americans came to describe their relationship to the mother country as a form of enslavement.¹

Occasionally, colonial writers of the 1760s made a direct connection between slavery as a reality and slavery as a metaphor. Few were as forthright as James Otis of Massachusetts, whose pamphlets did much to popularize the idea that Parliament lacked the authority to tax the

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proclaimed Noah Webster, "is the whole basis of national freedom." "Equality," he added, was "the very soul of a republic," outstripping in importance liberty of the press, trial by jury, and other "palladia of freedom." Even a conservative like John Adams, who distrusted the era's democratic pretensions, still believed that "equal liberty" required enabling "every member of society" to acquire land, "so that the multitude may be possessed of small estates." The goal was less real equality of condition than widespread household independence, and the elimination of social conditions such as extensive poverty deemed to make autonomy impossible.³⁴

When Jefferson substituted "the pursuit of happiness" for "property" in the familiar Lockean triad that opened the Declaration of Independence, he tied the new nation's star to an open-ended, democratic process whereby individuals develop their own potential and seek to realize their own life goals. Individual self-fulfillment, unimpeded by government, would become a central element of American freedom. If taken seriously as a goal, equality of opportunity can have results nearly as disruptive of traditional institutions and hierarchies as demands for equality of condition. Certainly, many leaders of the Revolution assumed that in the new republic, equality of opportunity would lead to a rough equality of condition. With hereditary privileges and mercantilist monopolies dismantled, with access to wealth thrown open to all men of talent, "perfect liberty" of trade and freedom for laborers to seek desirable employment would allow all industrious citizens to acquire property. Especially in the exceptional circumstances of the New World, with its vast areas of available land and large population of independent farmers and artisans, there seemed no contradiction between a *laissez-faire* economy and widespread economic autonomy. In the absence of government favoritism, the natural workings of society would produce justice, liberty, and equality. Jefferson argued that, given the rapid growth of international demand for American grain, freedom of commerce would benefit ordinary Americans, creating the material conditions for an industrious, property-owning citizenry. A limited government would allow citizens both to achieve economic independence and to become virtuous, thus reconciling order and freedom, equality and liberty.³⁵

The reinforced equation of autonomy and liberty inevitably raised the question of the social preconditions of freedom. If economic dependence created political subservience, should not the citizens of a republic be guaranteed access to productive property? The linkage of property ownership and liberty, previously employed to draw the political nation's boundary so as to exclude those without property, could be transformed into a political entitlement by those seeking land. From conflict over access to western lands not only with

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Britain but with creditors, landlords, and Indians, for example, settlers on the frontier forged their own distinctive language of freedom. When a group of Ohioans petitioned Congress in 1785 assailing landlords and speculators who engrossed available acreage, their motto was "Grant us Liberty." Settlers' claims for preferential access to land rested on the idea that possession of property, as a North Carolina congressman put it, was "a situation incident to freedom and desired by all."

Others sought different ways for the government to ensure economic autonomy—and therefore freedom—to those who did not possess it. At the Revolution's radical edge, the cry of equality led to demands for government to ensure that all Americans enjoyed equally "the blessings and benefits" arising from national independence. The democratization of state government after independence unleashed a flood of enactments aimed at bolstering economic autonomy: debtor relief, more equitable taxation, and direct grants of land to those who did not possess it. In the name of liberty, demands were even raised for limits on the amount of property any individual could accumulate. Whatever the wisdom of individual measures (and taken together, they so alarmed proponents of prudent fiscal and economic policy that they inspired the movement for a stronger national government that culminated in the writing of the U.S. Constitution), the debate itself suggested that the Revolution had thrust to the forefront of politics the question of the economic conditions of freedom.³⁶

Like many other Americans of his generation, Thomas Jefferson believed that to lack economic resources was to lack freedom. Jefferson favored a limited state, but simultaneously believed government could help create freedom's institutional framework. Among his proudest achievements were the Virginia laws abolishing entail (the limitation of inheritance to a specified line of heirs to keep an estate within a family) and primogeniture (a law providing for the passing of a family's land entirely to the eldest son), so as to prevent the rise of a "future aristocracy" and lay the foundation for "a government truly republican." To the same end, Jefferson proposed to award fifty acres of land to "every person of full age" who did not already possess it, another way government could enhance the liberty of its subjects.³⁷

Jefferson's lifelong friend and colleague, James Madison, agreed that the small, independent farmer constituted "the best basis of public liberty." Legislation in a republic, Madison wrote, should aim to "reduce extreme wealth toward a state of mediocrity, and to raise extreme indigence toward a state of comfort." But lacking Jefferson's congenial optimism, Madison was obsessed by fear that conditions of relative economic equality would prove temporary.

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Economic development, he warned the Constitutional Convention, would inevitably produce a society with a non-propertied majority and class conflict between rich and poor. How could government resting on the popular will survive when a democratic majority, resenting its propertyless status, might seek to despoil the rich? For Madison, the answer was to structure government so as to prevent any single economic interest from achieving power. With its elaborate system of checks and balances and divided sovereignty, the Constitution was designed, in part, to enable republican government to survive the rise of economic inequality (and to render unequal concentrations of property immune from governmental interference). But Madison and Jefferson also believed that the new nation's unique circumstances could long delay the rise of economic inequalities on the scale of Great Britain and Europe. Westward expansion, an option obviously not available to the Old World, would underpin the "regime of liberty" in the New. Here, indeed, was a powerful and enduring American dream—a society of free individuals made equal by the bounty of nature.³⁸

Was energetic government a threat to liberty, or, in the hands of a virtuous citizenry, the embodiment of political freedom? For Paine, government was a necessary evil, a "badge of lost innocence." To Samuel Adams, writing in 1785, political authority could hardly be seen as a danger to freedom, since "our government at present has liberty for its object."³⁹ Yet the egalitarian upsurge unleashed by the Revolution produced fears among influential leaders in many states that the experiment in independence would founder unless ways were found to insulate government from popular passions. In creating a structure of government that aimed, among other things, at securing "the blessings of liberty," the writers of the Constitution institutionalized new understandings of political freedom and civil liberty that would profoundly affect the future course of American history.

During the struggle for independence, a Massachusetts writer commented while the Constitution was being debated, "the public rage was on the side of liberty." Among the framers, however, liberty had lost some of its luster. In 1775, John Adams had insisted that "a democratic despotism is a contradiction in terms." But nationalists like Madison became convinced during the 1780s that popular self-government, the essence of political freedom, threatened the security of property and must be restrained so that freedom might flourish. "Liberty," Madison would write in *The Federalist*, "may be endangered by the abuses of liberty as well as the abuses of power." Or to put it another way, private liberty could be endangered by public liberty, personal liberty by political liberty—that is, by power in the hands of the people. Madison had in mind the boisterous state-level democracy of the 1780s and collective attacks on pub-

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An elaborate allegory representing American independence as a triumph of liberty, from an almanac published in Boston in 1781. An accompanying key explains the symbolism: "1. America sitting on that quarter of the globe with the flag of the United States displayed over her head, holding in one hand the olive branch, inviting the ships of all nations to partake of her commerce, and in the other hand supporting the cap of liberty. 2. Fame proclaiming the joyful news to all the world. 3. Britannia weeping at the loss of the trade of America, attended with an evil genius [the devil]. 4. The British flag struck, on her strong fortress. 5. French, Spanish, Dutch shipping in the harbors of America. 6. A view of New York, wherein is exhibited the Traitor [Benedict] Arnold, taken with remorse for selling his country, and Judas-like hanging himself." (American Antiquarian Society)

lic order like Shays' Rebellion of 1786–87, when debt-ridden farmers, many of them former soldiers in the War for Independence, closed the courts in western Massachusetts to prevent the loss of their property to creditors. That they employed liberty trees and liberty poles, the emblems of the struggle for independence, as symbols of their own cause did nothing to endear them to defenders of law and order.⁴⁰

Ultimately, the framers of the Constitution sought to reconcile republican government and social stability by diffusing political power, barring states from abridging the rights of property, and balancing the self-interested ambitions of competing social groups against one another. Madison did not abandon the idea that "virtue in the people" was the essential underpinning of freedom. But

in a world in which self-interest appeared to overwhelm civic virtue, the preservation of liberty would have to rely on the machinery of government itself, not the character of the people—a major step in the shift from republican to liberal premises among the political elite. Nonetheless, the republican idea that political decisions and economic relationships ought to reflect concern for the common good rather than private gain survived the revolutionary era.

Madison, Alexander Hamilton, and the other architects of the Constitution were nation-builders. Hamilton was perhaps the most vigorous proponent of an "energetic" government that would enable the new nation to become a powerful commercial and diplomatic presence in world affairs. Power and liberty, he insisted, were complementary, not antithetical, for freedom required "a proper degree of authority, to make and execute the laws with vigor." Although he did not envision the federal government as quite so assertive a power as Hamilton did, Madison too sought to enhance national authority. The danger to liberty, Madison believed, lay in unchecked majority power at the state level. While the convention rejected Madison's proposal to empower Congress to override state laws, the Constitution created a central government far more powerful than the weak authority established by the Articles of Confederation, the preceding frame of government.⁴¹

Thus the framers of the Constitution viewed freedom both as the foundation of governmental authority and as a threat to proper governance that must be kept in check. In this sense, it represented a retreat from the ebullient democratic upsurge that had accompanied the struggle for independence. "The same enthusiasm, now pervades all classes in favor of government," that accented us in favor of liberty in the years 1774 and 1775," Whether "all classes" truly concurred may be doubted, for the ratification process unleashed a nationwide debate over the best means of preserving political freedom. Anti-Federalists, as opponents of ratification were called, insisted that the Constitution shifted the balance between liberty and authority too far in the direction of the latter. Freedom, they believed, was more secure in the hands of smaller communities pursuing the common good than a distant federal power protecting private interests. The "consolidated government" envisioned by the Constitution, complained Patrick Henry, might produce "a great and mighty empire," but at the cost of freedom. "What is Liberty?" asked James Lincoln of South Carolina. "The power of governing yourselves. If you adopt this Constitution, have you this power? No."⁴²

In the end, of course, ratification was achieved, partly in exchange for adding the Bill of Rights. The original document, Anti-Federalists charged, left un-

protected from governmental interference "those unalienable and personal rights of men" without which "there can be no liberty." Madison was so convinced that the balances of the Constitution would protect liberty that he believed a Bill of Rights "redundant or pointless." Amendments restraining federal power, he believed, would have no effect on the danger to liberty posed by unchecked majorities in the individual states, and no list of rights could ever anticipate the myriad ways that legislatures might operate in the future. "Parched barriers" to the abuse of authority would prove least effective when most needed—an observation amply borne out in such times of popular hysteria as the Red Scare following World War I or the McCarthy era of the 1950s, when all branches of government joined in trampling with impunity on freedom of expression.⁴³

Today, when Americans are asked to define freedom, they instinctively turn to the Bill of Rights and especially the First Amendment, with its guarantees of freedom of speech, the press, and religion. Yet the Bill of Rights aroused little enthusiasm on ratification and for decades was all but ignored. Not until the twentieth century would it come to be revered as a quintessential expression of American freedom. Nonetheless, the Bill of Rights subtly affected the language of liberty. Applying only to the federal government, not the states, it reinforced the idea that concentrated national power posed the greatest threat to freedom. And it initiated a long process whereby freedom came to be discussed in the vocabulary of rights—a descendant of the old definition of liberty as a set of specific legalized powers and privileges, now applying to all "the people" who formed the political nation, not particular groups or localities. What the twentieth century would call "rights talk" embodied a persistent tension in American life between liberty and democracy. For rights are simultaneously democratic and a negation of democracy—democratic in that they can be claimed by everyone; undemocratic in that they need to be protected against abuses of power, including the power of the people themselves. Freedom of speech and the press, for example, were defended both as protections against governmental intrusion on individual expression and as essential elements in democratic governance, since without a free flow of ideas and information, voters and legislators cannot reach decisions intelligently.⁴⁴

Nonetheless, the idea of free speech as a personal, individual right, a view encouraged by the First Amendment, was indeed a radical departure. The term "freedom of speech" had originated in Britain to protect unrestrained discussion in Parliament; initially, it referred to legislators' immunity from prosecution for statements made during debate, not the right of citizens to criticize the government. Throughout the colonial era, individuals and editors were prose-

cured for "seditious" remarks about members of legislatures and their actions. The colonial press teemed with polemics on political questions, and the 1734 acquittal of John Peter Zenger for his criticisms of New York's royal governor had long since established truth as a defense against prosecution for seditious libel. Yet even Jefferson, who fervently believed that "liberty depends on freedom of the press," also insisted that those who misled the public by printing "false facts" should be liable to punishment. Nonetheless, if the legal implementation of these rights remained to be worked out, the Bill of Rights did much to establish freedom of speech and the press as cornerstones of the popular understanding of American freedom.⁴⁵

Even more remarkable was the constitutional recognition of religious freedom. In Britain, Dissenters had long invoked the language of liberty in seeking repeal of the Test and Corporation Acts, which imposed various disabilities on non-Anglicans. (Few, however, included Catholics in their ringing calls for religious freedom.) With numerous religious denominations, among them Quakers, Anglicans, Mennonites, Moravians, Lutherans, Presbyterians, Baptists, Roman Catholics, and Jews, the colonies enjoyed a greater degree of religious liberty than the mother country. But while colonies like Rhode Island and Pennsylvania had long made a practice of toleration, religious freedom before the Revolution arose more from the reality of religious pluralism than from a theory of religious toleration. Nowhere in British North America did the complete separation of church and state exist. Even in Pennsylvania, which in 1682 offered "Christian Liberty" to all who acknowledge "one Almighty God," officeholders still had to take an oath affirming belief in Jesus Christ. Before the Revolution, most colonies supported religious institutions with public funds and discriminated in voting and officeholding against Catholics, Jews, and even dissenting Protestants. On the very eve of independence, Baptists who refused to pay taxes to support local Congregational ministers were still being jailed in Massachusetts. ("While our country are pleading so high for liberty," the victims complained, "yet they are denying of it to their neighbors.")⁴⁶

As in other realms, the Revolution catalyzed a movement that transformed the meaning of religious freedom. The drive to separate church and state brought together deists like Jefferson, who hoped to erect a "wall of separation" that would free politics and the untrammelled exercise of the intellect from theological control, and members of evangelical sects, who sought to protect religion from the corrupting embrace of government and saw toleration as a way to enable men and women to lead truly Christian lives. Throughout the new nation, established churches were disestablished—that is, deprived of public revenue and special legal privileges. On the state level, religion and public authority

continued to reinforce one another, in requirements barring non-Christians from office and in the continued prosecution of blasphemy and breaches of the sabbath. Nevertheless, the Constitution, which contains no reference to God, is a purely secular document. In prohibiting religious tests for federal officeholders and, in the First Amendment, barring the federal government from legislating on the subject of religion, it departed dramatically from both British and colonial practice. Under the Constitution, it was and remains possible, as one critic at the time complained, for "a papist, a Mohomatan, a deist, yea an atheist," to become president of the United States.⁴⁷

Like freedom of speech and the press, religious freedom reflected the conviction that, as Madison put it, conscience was the most "sacred" of all rights, and that no political authority should influence or punish its free exercise. Even more than other freedoms, religious liberty became the paradigm for the revolutionary generation's definition of "rights" as private matters that must be protected from governmental interference. Religious freedom offered a new rationale for the idea of the United States as a beacon of liberty. In successfully opposing a Virginia tax for the general support of Christian churches, Madison insisted that one reason for the complete separation of church and state was to reinforce the meaning of independence as "offering asylum to the persecuted and oppressed of every nation and religion." And religious liberty provided a model for the Madisonian system of preserving freedom. In a free society, Madison wrote, "the security for civil rights must be the same as for religious rights. It consists in the one case in the multiplicity of interests and, in the other, in the multiplicity of sects." A free market in religion would prevent any one group from using political power to impose its views on the others. In an overwhelmingly Christian (though not necessarily churchgoing) nation, the separation of church and state drew a sharp line between public authority and a realm defined as "private," reinforcing the idea that rights exist as restraints on the power of government.⁴⁸

Thus, the Revolution democratized not only American Christianity but also the idea of religious liberty itself. Ironically, even as the separation of church and state created the social and political space that allowed a myriad of religious institutions to flourish, the culture of individual rights of which that separation was a part threatened to undermine the authority of churches. One telling example lay in the experience of the Moravian Brethren, who had emigrated from Germany to North Carolina on the eve of independence. According to the Moravian elders, younger members of the community, like so many other Americans of the revolutionary generation, insisted on asserting "their alleged freedom and human rights." To the elders, "the American freedom" was little

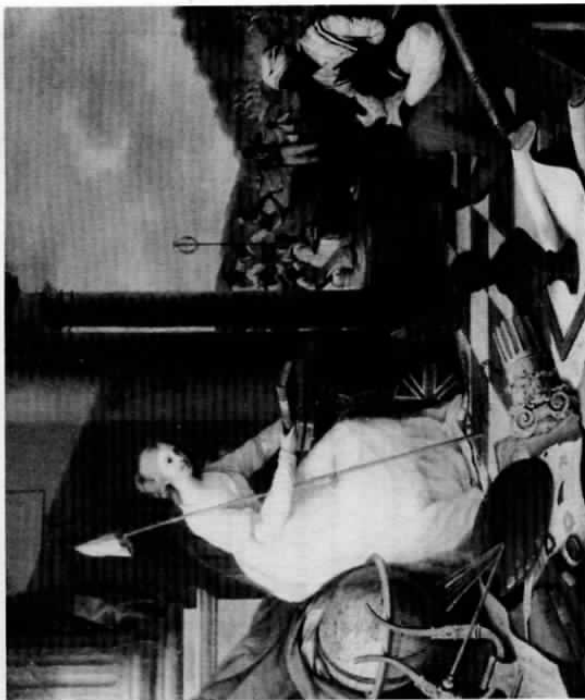
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colonies and regulate their commerce. Freedom, Otis insisted, must be universal: "What man is or ever was born free if every man is not?" Blacks, for Otis, were not allegorical figures whose status illustrated the dire fate awaiting free Americans, but flesh and blood British subjects "entitled to all the civil rights of such."²

Otis, however, was hardly typical. When most patriot leaders spoke of slavery, they meant the denial of the right of self-government or dependence on the will of another, not being reduced to a species of property. "Those who are taxed without their own consent," said John Dickinson of Pennsylvania, "are slaves." Thomas Paine identified hereditary rule as "a species of slavery." "Representative government," he asserted, "is freedom." Until the 1760s, colonists had shared in the celebration of Britain as a land of freedom. But as part and parcel of the patriotic struggle, their image of the mother country was transformed. By the eve of independence, the contrast between Britain, "a kingdom of slaves," and America, a "country of free men," had become a standard part of the idiom of resistance. "Liberty or slavery is now the question," declared the Philadelphia radical James Cannon in April 1776. Such language was employed without irony even in areas where a majority of the population in fact consisted of slaves. South Carolina, one writer declared in 1774, was a "sacred land" of freedom, where it was impossible to believe that "slavery shall soon be permitted to erect her throne."³

While rarely mentioned explicitly, the proximity of hundreds of thousands of real slaves was intimately related to the meaning of freedom for the men who made the American Revolution. In his famous speech to the British Parliament warning against attempts to coerce the colonies, Edmund Burke suggested that in the South, at least, it was familiarity with actual slavery that made colonial leaders so sensitive to the threat of metaphorical slavery. Where freedom was a privilege, not a common right, he observed, "those who are free are by far the most proud and jealous of their freedom." Much the same point was made by David Ramsay, a South Carolinian whose *History of the American Revolution*, published in 1789, helped to popularize an understanding of the American past as a progress of freedom. In the southern colonies, wrote Ramsay, slavery "nurtured a spirit of liberty among the free inhabitants," since nothing could excite slaveholders' opposition to British rule more effectively than fear of being "degraded" to a position analogous to that of their slaves.⁴

Americans were not the only people to worship liberty while profiting from slavery. In the ancient world, "one element of freedom was the freedom to enslave others." Christian liberty, a spiritual state, did not preclude slaveholding, a worldly condition recognized in the Bible. During the eighteenth century,



Liberty Displaying the Arts and Sciences (1792). This painting by Samuel Jennings, commissioned by the Library Company of Philadelphia, is one of the few visual images of the early republic explicitly to link slavery with tyranny and liberty with abolition. The female figure of Liberty offers books to newly freed slaves; beneath her left foot is a broken chain. (Winterthur Museum)

Britain, France, and Holland, countries where ideas of freedom flourished, were all deeply involved in the Atlantic slave trade; indeed, the freedom of the seas so cherished by Britons included the right to carry slaves to any port their merchants desired. British observers, while hardly above criticism on the same grounds, were fond of pointing out the colonists' apparent hypocrisy. "How is it," asked Dr. Samuel Johnson, "that we hear the loudest yelps for liberty from the drivers of negroes?" The Declaration of Independence inspired Thomas Hutchinson, the former royal governor of Massachusetts, to wonder how, "if these rights are so absolutely inalienable," Americans justified depriving "Africans of their rights to liberty, and the pursuit of happiness." British friends of American independence like Richard Price feared that slavery fatally compromised the Revolution's promise. If "the people who have been struggling so earnestly to save *themselves* from slavery are very ready to enslave *others*," he wrote to Jefferson in 1785, American independence would mean little more than a new chapter in the timeless story of "aristocratic tyranny and human debasement," and the "friends of liberty and virtue in Europe" would be "mortified."⁵

Indeed, the contradiction between freedom and slavery is so self-evident that it is difficult today to appreciate the power of the obstacles to abolition. At the time of the Revolution, slavery was already an old institution in America; it existed in every state and formed the basis of the economy and social structure from Maryland southward. It was slavery that made the staple-producing colonies the richest region in British America. Already, as a French visitor observed, "command of a few negroes" was essential to the self-definition, the social standing, of southern planters. Thomas Jefferson, as is well known, owned over one hundred slaves at the time he wrote the immortal lines affirming the inalienable right to liberty, and everything he cherished in his own manner of life, from lavish entertainments to the leisure that made possible the pursuit of arts and sciences, ultimately rested on slave labor.⁶

Slavery for blacks did not necessarily contradict white Americans' understanding of freedom. It could in fact be argued that slavery made republican freedom possible, for by eliminating the great bulk of the dependent poor from the political nation, it left the public arena to men of propertied independence. For many Americans, owning slaves offered a route to the economic autonomy widely deemed indispensable to genuine freedom (a point driven home by a 1780 Virginia law that rewarded veterans of the War for Independence with three hundred acres of land—and a slave). The republican vision of a society of independent men actively pursuing the public good could easily be reconciled with slavery for those outside the circle of citizenship. In a republic, Adam Smith pointed out, it would be all the more difficult to abolish

slavery since "the persons who make all the laws in that country are persons who have slaves themselves"—thus, the "freedom of the free" helped to produce "the great oppression of the slaves." So, too, the liberal definition of freedom as essentially private and of the political community as a group of individuals seeking protection for their natural rights could readily be invoked to defend bondage. Nothing was more essential to liberal freedom than the right of self-government and protection of property against interference by the state. These principles suggested that it would be an infringement of liberty to relieve a man of his property (including slave property) without his consent. The right to property, Virginian Arthur Lee insisted, was "the guardian of every other right, and to deprive a people of this, is in fact to deprive them of their liberty." If government by the consent of the governed was the essence of political freedom, then to require owners to give up their slave property would reduce *them* to slavery.⁷

Nonetheless, by imparting so absolute a value to liberty, sweeping away forms of partial freedom so prevalent in the colonial era, and positing freedom as a universal entitlement rather than a set of rights specific to a particular place or people, the Revolution inevitably raised questions about the status of chattel slavery in America. Before independence, the nation's first chief justice, John Jay, later remarked, "very few . . . doubted the propriety and rectitude" of slavery, even though enlightened opinion in the Atlantic world (exemplified, for example, in the writings of Montesquieu, David Hume, and Adam Smith) had come to view slavery as morally wrong and economically inefficient, the relic of a barbarous past. During the revolutionary era, slavery for the first time became a focus of public debate in America. It was not a British critic but the Pennsylvania patriot Benjamin Rush who in 1773 called upon "advocates for American liberty" to "espouse the cause of . . . general liberty," and warned that slavery was one of those "national crimes" that one day would bring "national punishment." In the following year, Massachusetts clergyman John Allen lamented that Americans were making a "mockery" of their professed love of liberty "by trampling on the sacred natural rights and privileges of the *Africans*." Not all these comments emanated from the North, where slavery was far less powerfully entrenched than in the plantation regions of Maryland, Virginia, the Carolinas, and Georgia. Jefferson, at least in private, strongly condemned chattel slavery as a system "one hour of which is fraught with more misery, than ages of that which [the colonists] rose in rebellion to oppose."⁸

The Revolution inspired widespread hopes that slavery could be removed from American life. Most dramatically, slaves themselves appreciated that by defining freedom as a universal right, the revolutionists had devised a rhetoric

that could be deployed against chattel bondage. The language of liberty echoed in slave communities, North and South. Living amid freedom but denied its substance, slaves appropriated the patriotic ideology for their own purposes. The first concrete steps toward emancipation were "freedom petitions"—arguments for manumission presented to New England's courts and legislatures in the early 1770s by enslaved African-Americans. Once the War for Independence began, the British offered freedom to slaves who joined the royal cause. Nearly one hundred thousand, including one-quarter of all the slaves in South Carolina, deserted their owners (although not a few were subsequently reenslaved in the West Indies). George Washington himself saw seventeen of his slaves flee to British lines. Thousands more escaped bondage by enlisting in the Revolutionary Army.

Blacks recognized both hypocrisy and opportunity in the ideology of freedom. The most insistent advocates of freedom as a universal entitlement were African-Americans, who demanded that the leaders of the struggle for independence live up to their professed creed, thus extending the concept of liberty into unintended realms. As early as 1766, white Charlestonians had been shocked when their opposition to the Stamp Act under the slogan, "Liberty and stamp'd paper," inspired a group of blacks to parade about the city crying "Liberty." Nine years later, the Provincial Congress of South Carolina felt compelled to investigate the "high notions of liberty" the struggle against Britain had inspired among the slaves.⁹

In 1776, the year of American independence, Lemuel Haynes, a black member of the Massachusetts militia and later a celebrated minister, urged that Americans "extend" their conception of freedom. If liberty were truly "an innate principle" for all mankind, Haynes insisted, "even an African [had] as equally good a right to his liberty in common with Englishmen." Throughout the revolutionary period, petitions, pamphlets, and sermons by blacks expressed "astonishment" that white patriots failed to realize that "every principle from which America has acted" demanded emancipation. Blacks sought to alter the language of politics, insisting that the nation understand slavery as a concrete, brutal reality, not an abstract condition or metaphor. Petitioning for their freedom in 1773, a group of New England slaves exclaimed: "We have no property! We have no wives! No children! We have no city! No country!" For blacks, slavery meant the denial of all the essential attributes of freedom, not merely the loss of personal autonomy or lack of political self-determination.¹⁰

Most slaves of the revolutionary era were only one or two generations removed from Africa. They did not need the ideology of the Revolution to persuade them that freedom was a birthright; the experience of their parents and

grandparents suggested as much. In contrast to Edmund Burke and David Ramsay, blacks insisted that the slave, not the master, genuinely craved liberty. "My love of freedom," wrote the black poet Phillis Wheatley in 1783, arose from the "cruel fate" of being "snatch'd from Africa's" shore. Yet, if traditional African societies knew the desire not to be a slave, the modern idea of freedom was born in the West. In the world from which the slaves had been forcibly removed, where individuals existed within a wide network of communal and kin relationships and social identity depended on being anchored in a web of power and authority, personal freedom was an oxymoron. By invoking the Revolution's ideology of liberty to demand their own rights and defining freedom as a universal entitlement, blacks demonstrated how American they had become, even as they sought to redefine what American freedom in fact represented.¹¹

For a brief moment, the "contagion of liberty" appeared to threaten the continued existence of slavery. During the 1780s, a considerable number of southern slaveholders, especially in Virginia and Maryland, voluntarily emancipated their slaves. Father south, however, the abolition process never got underway. In the North, every state from New Hampshire to Pennsylvania took steps toward emancipation, the first time in recorded history that legislative power had been invoked to eradicate slavery. But even here, where slavery was peripheral to the economy, the slowness of abolition reflected how powerfully the sanctity of property rights impeded emancipation. Generally, abolition laws provided for the liberty of any child henceforth born to a slave mother, but only after he or she had served the mother's master until adulthood as compensation for the owner's future loss of property rights.¹²

At the Constitutional Convention of 1787, as Madison recorded, "the institution of slavery and its implications formed the line of discrimination" in many debates. The fifty-five men who gathered in Philadelphia to draft the document included numerous slaveholders, as well as some dedicated abolitionists. Madison, who, like Jefferson, was a Virginia slaveholder who despised slavery, told the convention that the "distinction of color" had become the basis for "the most oppressive dominion ever exercised by man over man." Yet later, Madison assured delegates to the Virginia ratifying convention that the Constitution offered slavery "better security than any that now exists." And so it did. For the Constitution prohibited Congress from abolishing the African slave trade for two decades; required states to return to their owners fugitives from bondage; and provided that three-fifths of the slave population be counted in determining each state's representation in the House of Representatives and its electoral votes for president. To be sure, the words "slave" and "slavery" did not appear in the original Constitution—a concession to the sensibilities of dele-

gates who feared they would "contaminate the glorious fabric of American liberty." As Luther Martin, a Maryland attorney who opposed ratification, wrote, his fellow delegates "anxiously sought to avoid the admission of expressions which might be odious to the ears of Americans." But, he continued, they were "willing to admit into their system those things which the expressions signified."¹³

Clearly, the Constitution's slavery clauses were compromises, efforts to find a middle ground between the institution's critics and defenders. Taken together, however, they managed to strengthen the institution of slavery and leave it more deeply embedded in American life and politics. The slave trade clause allowed a commerce condemned by civilized society, and which had been suspended during the War for Independence, to continue until 1808. Partly to replace slaves who had escaped to the British, and partly to provide labor for the expansion of cotton production into the upcountry, South Carolina and Georgia took advantage of the twenty-year hiatus before the trade's abolition to import some ninety thousand additional Africans, about one-quarter of all the slaves brought to British North America after 1700. The fugitive slave clause accorded slave laws "extraterritoriality," that is, the condition of bondage adhered to a person even after he or she had escaped to a jurisdiction where slavery had been abolished. John Jay, while serving in Madrid on a diplomatic mission, once wrote of how he missed the "free air" of America. Jay was probably unaware of the phrase's ironic implications, for in the *Somerset* case of 1772, the lawyer for a West Indian slave brought to Britain had obtained his client's freedom by invoking the memorable words, "the air of England is too pure for a slave to breathe." Yet in the United States, the Constitution's fugitive slave clause made all the states, including those that had abolished slavery, complicitous in maintaining the institution's stability. For slaves, there was no "free air" in America.

The federal structure, moreover, insulated slavery in the states from outside interference, while the three-fifths clause allowed the white South, and especially the planter class, to exercise far greater power in national affairs than the size of its free population warranted. Partly as a result, of the first sixteen presidential elections, between 1788 and 1848, all but four placed a southern slaveholder in the White House. Even the initial failure to include a Bill of Rights resulted, in part, from the fact that, as South Carolina delegate Charles Cotesworth Pinckney explained, "such bills generally begin with declaring that all men are by nature born free," a declaration that would come "with a very bad grace, when a large part of our property consists in men who are actually born slaves."¹⁴

All in all, the Revolution had a contradictory impact on American slavery

and, therefore, on American freedom. Gradual as it was, the abolition of slavery in the North drew a geographical line across the new nation, creating the portentous division between free and slave states. Abolition in the North, voluntary emancipation in the Upper South, and the escape of thousands from bondage created, for the first time in American history, a sizable free black population (not a few of whose members took new family names like Freeman or Freeland). On the eve of independence, virtually every black person in America had been a slave. Now, a free community, with its own churches, schools, and leadership class, came into existence, constituting a standing challenge to the logic of slavery, a haven for fugitives, and a springboard for further efforts at abolition.¹⁵

For many Americans, white as well as black, the existence of slavery would henceforth be recognized as a standing affront to the ideal of American freedom, a "disgrace to a free government," as a group of New Yorkers put it. In 1792, when Samuel Jennings of Philadelphia painted *Liberty Displaying the Arts and Sciences*, he included among the symbols of freedom a slave's broken chain, graphically illustrating how freedom had become identified not simply with political independence but with emancipation. Certainly, after the Revolution it would be difficult to employ slavery as a metaphor without triggering thoughts about actual slaves. Nonetheless, the stark fact is that the Revolution did not rid American society of slavery. Indeed, thanks to the natural increase of the slave population, soon to be supplemented by a reopened slave trade, there were considerably more slaves at the end of the revolutionary era than at the beginning. The first national census, in 1790, revealed that the half-million slave population of 1776 had grown to some 700,000.¹⁶

Throughout the Atlantic world, the upheavals of the age of revolution posed a threat to slavery. In 1794, the French Convention proclaimed abolition (only to see slavery restored by Napoleon a few years later). Emancipation was a goal of the leaders of independent Haiti and nearly all the Latin American liberators. Only in the United States did the creation of a new nation-state strengthen the institution. The British poet Oliver Goldsmith might well have been speaking of the revolutionary generation when he commented on mankind's propensity "to call it freedom, when themselves are free."¹⁷

We the People

If the Revolution created a new nation, it also invented a new public entity: the American people. From a colonial population divided by ethnicity, religion,

class, and status, and united largely by virtue of their allegiance to Britain, the Revolution created a new collective body whose members were to enjoy rights and freedom as citizens in a new political community.¹⁸ The capacious nature of American freedom made it all the more imperative to identify "the people" entitled to enjoy it. "We the people," the words that open the Constitution, describe those who, among other things, are to possess "the blessings of liberty" as a birthright and bequeath them to "posterity." Although one might assume that "the people" of the United States included all those living within the nation's borders, the subsequent text made clear that this was not the case. The Constitution identified three populations inhabiting within the United States: Indians, treated as members of their own tribal sovereignties and not, therefore, part of the American body politic; "other persons"—that is, slaves; and "the people." Only the third enjoyed the blessings of liberty.

The debate unleashed by the Revolution about who was entitled to American freedom continues to this day. Americans' persistent disagreements about the bases of our "imagined community" reflect a larger contradiction in the Western tradition itself. For if the West, as we are frequently reminded, created the idea of liberty as a universal human right, it also invented the concept of race and ascribed to it all sorts of predictive powers about human behavior. Nationalism, in America at least, is the child of both these beliefs. Traditionally, scholars have distinguished between civic nationalism—which envisions the nation as a community based on shared political institutions and values, with membership open to all who reside within its territory—and ethnic nationalism, which defines the nation as a community of descent based on a shared ethnic and linguistic heritage. At first glance, the United States appears to conform to the civic model. Lacking a clear ethnic identity or long-established national boundaries, it was the political creed of the Revolution that held Americans together. To be an American, all one had to do was commit oneself to an ideology of liberty, equality, and democracy.¹⁹

From the outset, however, American nationality combined both civic and ethnic definitions. Americans, one scholar has written, are given to hiding their "particularism in the universals of 'freedom' and 'liberty.'" For most of our history, American citizenship has been defined by blood as well as by political allegiance. Both definitions can be traced to the earliest days of the republic, when a nation was created committed to liberty, yet resting, to a considerable extent, on slavery. Slavery helped to shape the identity, the sense of self, of all Americans. Constituting the most impenetrable boundary of citizenship, slavery rendered blacks all but invisible to those imagining the American community.²⁰

Already, Americans were speaking of their country as a place where "individuals of all nations" were transformed into a new people, "melted into a new race of men." But the popular idea that the shared experience of fleeing tyranny in the Old World for freedom in the New made Americans one people automatically excluded Africans. When the era's master mythmaker, Hector St. John Crèvecoeur, posed the famous question: "What then is the American, this new man?", he answered: "a mixture of English, Scotch, Irish, French, Dutch, Germans, and Swedes. . . . He is either a European, or the descendant of a European." This at a time when fully one-fifth of the population (the highest proportion in our history) consisted of Africans and their descendants. Slaves, as Edmund Randolph, the nation's first attorney general, wrote, were not "constituent members of our society," and the language of liberty and citizenship did not apply to them.²¹

Did blacks form part of the "imagined community" of the new republic? Nowhere does the original Constitution define who in fact are citizens of the United States, or what privileges and immunities they enjoy. The individual states were to determine the boundaries of citizenship and citizens' rights. The North's Emancipation Acts assumed that former slaves would remain in the country, not be colonized abroad, and during the era of the Revolution, free blacks enjoyed at least some of the legal rights accorded to whites. Most of the new state constitutions, including those in the Upper South, allowed newly emancipated black men to vote if they could meet property qualifications.

The Constitution, however, empowered Congress to create a uniform system of naturalization, and the Naturalization Act of 1790 offered the first legislative definition of American nationality. With no debate, Congress restricted the process of becoming a citizen to "free white persons." Thus, at the very outset, a nation that defined itself as an asylum for liberty excluded the vast majority of the world's population from partaking in the blessings of American freedom (a fact that belies the common description of the initial policy as "open" immigration). This limitation lasted a long time. For eighty years, only white immigrants could become naturalized citizens. Blacks were added in 1870, but not until the 1940s did persons of Asian origin become eligible. Only in the last quarter of the nineteenth century were groups of whites barred from entering the country and becoming citizens. Beginning with prostitutes, convicted felons, lunatics, polygamists, and persons likely to become a "public charge," the list of excluded classes would be expanded in the twentieth century to include, among others, anarchists, Communists, homosexuals, and the illiterate. But for the first century of the republic, while all non-whites were barred,

virtually the only white persons in the entire world ineligible to claim American citizenship were those unwilling to renounce hereditary titles of nobility, as required in an act of 1795.²²

The two groups excluded from naturalization—European aristocrats and non-whites—had more in common than might appear at first glance. Both were viewed as deficient in the qualities that made freedom possible: the capacity for self-control, rational forethought, and devotion to the larger community. These were the characteristics that Jefferson, in his famous comparison of the races in *Notes on the State of Virginia* (1785), claimed blacks lacked, partly due to natural incapacity and partly because the bitter experience of slavery had (quite understandably, he felt) rendered them disloyal to the nation. (Jefferson also thought that slavery had a disastrous impact on the morals of whites, since the “perpetual exercise” of despotic rule over other human beings rendered self-control impossible; he did not conclude from this, however, that slaveholders should be barred from citizenship.) Jefferson was obsessed with the connection between heredity and environment, race and intelligence. His environmentalism, combined with his belief that all men possessed an inner moral sense, inclined him not only to democratic values but to the hope that no group was fixed permanently in a status of inferiority. His racism led him to the “suspicion” that nature had rendered blacks permanently deficient in the qualities that made freedom possible.

In holding these two apparently contradictory beliefs—environmentalism and racism—in uneasy tension, Jefferson reflected the divided mind of his generation. He believed black Americans should eventually enjoy the natural rights enumerated in the Declaration of Independence, but in Africa or the Caribbean, not the United States. Madison, too, always coupled the idea of emancipation with colonization. America should have a homogenous citizenry whose common experiences, values, and innate capacities made it possible to realize the idea of the public good, and whose essential sameness underpinned the ideal of equality.²³

By narrowing the gradations of freedom among the white population, the Revolution widened the divide between free Americans and those who remained in slavery. Race, which had long constituted one of many kinds of legal and social inequality among colonial Americans, now emerged as a convenient justification for the existence of slavery in a land ideologically committed to freedom as a natural right. Man's liberty, John Locke had written, flowed from “his having reason.” To deny liberty to those who were not rational beings was not a contradiction. By the nineteenth century, the idea of innate black inferiority

advanced by Jefferson as a suspicion, would mature into a full-fledged ideology, central to many definitions of American nationality itself.²⁴

Gender, too, formed a boundary limiting those entitled to the full blessings of American freedom. Free women were certainly members of the nation; they could be naturalized if emigrating from abroad, and were counted fully in determining representation in Congress. Until after the Civil War, the word “male” did not appear in the Constitution, and there was nothing explicitly limiting the rights outlined in that document by sex. The pronoun “he” describing officeholders, however, expressed an assumption so pervasive that it scarcely needed explicit defense: politics was a realm for men. Political freedom for men meant the right to self-government, the power to consent to the individuals and political arrangements that ruled over them. For women, however, the marriage contract superseded the social contract, and their relationship to the larger society was mediated through their relationships with men. For many women, the Revolution did produce an improvement in status. According to the ideology of “republican motherhood” that emerged as a result of independence, women played an indispensable political role by training future citizens. The “foundation of national morality,” wrote John Adams, “must be laid in private families.” Even though republican motherhood ruled out direct female involvement in politics, it encouraged the expansion of educational opportunities for women, to enable them to inculcate political wisdom in their children.²⁵

In both law and social reality, however, women lacked the essential qualification of political participation—the opportunity for autonomy based on ownership of property or control of one's own person. Since the common law subsumed women within the legal status of their husbands, women could not be said to have property in themselves in the same sense as men. Their very subordinate status within the family heightened the contrast between masculine autonomy and female dependence. Indeed, among the deprivations of slavery cited by a group of male black petitioners in 1774 was that it prevented their wives from “submitting themselves to husbands in all things,” as the natural order of the universe required. For women, as well as for blacks, the denial of full freedom rested on the assumption of natural incapacity, since women were widely thought (by men) to be naturally submissive and irrational, creatures of sentiment unfit for citizenship. The subordination of free women, however, did not become a source of public debate until long after American independence; Mary Wollstonecraft's *Vindication of the Rights of Woman*, a stirring call for civil and political equality published in Britain in 1792, inspired a few similar efforts in

the young republic, and even a short-lived women's rights magazine in New York City. But the time had not yet arrived for a broad assault on gender inequality. Although New Jersey's constitution of 1776, which granted suffrage to all "inhabitants" who met a property qualification, inadvertently enfranchised some women until 1807, the republican citizen was, by definition, male.²⁶

Despite these limitations, most Americans would probably have agreed with the members of the first Congress, who, in congratulating George Washington on his inauguration, spoke of their countrymen as "the freest people on the face of the earth." To Washington's dismay, however, freedom did not produce public harmony, for his accession to office was soon followed by the outbreak of fierce political conflict. Yet the very passion of the partisan debates of the 1790s revealed how deeply the idea of freedom had taken root in American political culture. Parties and social movements laid claim to the language of liberty, each accusing their opponents of engaging in a conspiracy to undermine freedom. Federalists, who were generally elitist in their view of politics and society, feared, as Washington put it, that the "spirit of liberty" unleashed by the Revolution was degenerating into "licentiousness." This conviction was reinforced by the Whiskey Rebellion of 1794, when backcountry Pennsylvania farmers invoked the symbols of 1776, such as liberty poles, as they sought to block enforcement of a new excise tax. When the Federalist leader Rufus King wrote an essay on the "words . . . with wrong meaning" that had "done great harm" to American society, his first example was "Liberty." Freedom, Federalists insisted, did not mean the right to set one's self up in opposition to government, but rested on deference to authority.²⁷

Jeffersonian Republicans were more prone to accept what a New Hampshire editor called the "boisterous sea of liberty" as preferable to the "calm of despotism." Their outlook was far more egalitarian and critical of social and economic hierarchies, more accepting of democratic participation as essential to freedom. Each side accused the other of undermining the liberty bequeathed to Americans by the Revolution. Jeffersonians feared that the program of national economic development pursued by Secretary of the Treasury Alexander Hamilton, involving close commercial ties with Great Britain, a national debt, and a national bank to stabilize and regulate the currency, were harbingers of the same political corruption that had undermined liberty in Britain in the decades before the American Revolution. To Jeffersonian Republicans, the greatest threat to American freedom lay in the alliance of a powerful central government and an emerging class of commercial capitalists, such as Hamilton appeared to envision.²⁸

The debates of the 1790s produced not only one of the most intense peri-

ods of partisan warfare in American history but an enduring expansion of the democratic content of American freedom. The decade witnessed the rapid expansion of the American press and a vigorous debate over public policies, with hundreds of "obscure men" writing pamphlets and newspaper essays and forming political organizations. The emergence of the Democratic-Republican societies, organized by critics of the Washington administration, suggested that political liberty meant not simply voting at elections but constant involvement in public affairs. Denounced by the president as "self-created" and divisive, these societies were forced to justify their existence. In so doing they articulated a defense of what scholars would later call the "public sphere"—a realm independent of government where debate on political issues can take place and citizens organize themselves to affect public policy. To the societies, "free inquiry" and "free communication"—the right of "any portion of the people," regardless of station in life, to express political opinions—were among "the inalienable rights of free men." The political crisis came to a head in 1798, when, beset by foes at home and abroad, the administration of John Adams enacted the Alien and Sedition Acts. The first allowed the deportation of aliens deemed dangerous by federal authorities, a repudiation, Republicans claimed, of the idea of the United States as an asylum of liberty. The second authorized the prosecution of virtually any public assembly or publication critical of the government.²⁹

The Alien and Sedition Acts and the subsequent jailing of a number of Republican editors thrust freedom of speech and of the press to the center of discussions of American liberty. In denouncing these measures, Jefferson and Madison repudiated the common law tradition that the national government enjoyed the power to punish "seditious" speech (although Jefferson was careful to insist that the states "fully possessed" this power). Other Republicans went further, challenging the entire idea of legal restraints on the free expression of ideas. State-level prosecutions of newspapers for seditious libel did not end when the Sedition Act expired in 1801. But the "crisis of freedom" of the late 1790s strongly reinforced the idea that "freedom of discussion" was an indispensable attribute of American liberty. The broad revulsion against the Alien and Sedition Acts contributed greatly to Jefferson's election as president in 1800. As the campaign slogan, "Jefferson and Liberty," indicated, Republicans saw their victory not simply as a partisan success but as the triumph of American freedom, securing for posterity the fruits of the Revolution.³⁰

Yet the events of the 1790s, culminating in Jefferson's victory, also underscored how powerfully slavery defined and distorted American freedom. The same Jeffersonians who hailed the French Revolution as a step in the universal

4 4 The Story of American Freedom

progress of liberty reacted in horror against the slave revolution that began in 1791 in Saint-Domingue, the jewel of the French overseas empire, situated not far from the southern coast of the United States. The slave uprising affirmed the universality of the revolutionary era's credo of liberty. But the reaction to it revealed how easily slavery could be subsumed into the revolutionary cause. The rebellious slaves were viewed not as men and women seeking their liberty in the tradition of 1776, but as a danger to American institutions. Their resort to violence was widely taken to illustrate that blacks were unfit for republican freedom. Ironically, it was the Adams administration, which hoped that American merchants could replace their French counterparts in the island's lucrative sugar trade, that encouraged the independence of black Haiti, whereas Jefferson as president sought to quarantine and destroy the hemisphere's second independent republic. But then, the triumph of "Jefferson and Liberty" would not have been possible without slavery. Had three-fifths of the South's slaves not been counted in apportioning electoral votes, John Adams would have won reelection in 1800.³¹

Jefferson referred to his election as the "Revolution of 1800." Yet that momentous year witnessed not only a metaphorical revolution but an attempted real one, a plot by slaves in Virginia itself to gain their freedom. Organized by a Richmond blacksmith, Gabriel, and his brother Martin, a slave preacher, the conspirators evidently planned to march on the city from surrounding plantations and kill most of the white residents. On the night they were to gather, a storm washed out the roads to Richmond. The plot was soon uncovered and the leaders arrested. Like other Virginians, participants in Gabriel's conspiracy spoke the language of liberty forged in the American Revolution. The rebels even planned to carry a banner emblazoned with a slogan borrowed from Patrick Henry: "Death or Liberty." "We have as much right," one conspirator declared, "to fight for our liberty as any men." Another likened himself to George Washington, who had also rebelled against established authority to "obtain the liberty of [his] countrymen" (an analogy that carried the disturbing implication that American officials had now replaced the British as enemies of freedom).³²

If the Gabriel conspiracy demonstrated anything, George Tucker, a member of one of Virginia's most prominent families, commented, it was that slaves possessed "the love of freedom" as fully as other men. Tucker believed Virginians should emancipate their slaves and colonize them outside the state. The legislature, however, moved in the opposite direction: it tightened controls over the black population and severely restricted opportunities for voluntary manumission. Any slave emancipated after 1806 was required to leave Virginia.

To Call It Freedom 4 5

Did not closing the door to freedom violate the ideals of the Revolution? "Tell us not of principles," a Richmond newspaper declared. "Those principles have been annihilated by the existence of slavery among us."³³

In March 1776, on the eve of independence, Boston lawyer Peter Thatcher identified the central dilemma confronting the new nation: would the "rising empire of America," he asked, "be an empire of slaves or of freemen?"³⁴ By the time the revolutionary era drew to a close, history had provided the answer: it would be both.

Democratize the Internet Now!



“Some buddies of mine need your help with a database,” my friend said.

“I’m good at databases,” I replied. “And I like to help.”

So I found myself in a large conference room with two nervous men who wanted to know exactly how exposed they were by the Ashley Madison [leak](#). They wanted me to look inside the leaked data to see if I could find any traces of their exploits.

“I can do this,” I said.

This was several leaks ago, so a refresher: [Ashley Madison](#) is a web site that helps you have affairs. You enter your personal information and the site lets you look at other people who have also entered their information. Then you can make arrangements to have sex with these other people. And because it is digital, it felt anonymous, which meant you could structure the social interactions so that no one in your immediate vicinity (spouse, children) would ever know.

Ashley Madison is a heavily advertised digital product, and until the leak it was doing pretty well. [Roughly 35 million](#) people had signed up, and presumably more than one of them had sexual intercourse without the knowledge of their spouses. By which I mean wives—the users were overwhelmingly men.

Then it all went pear-shaped. One day last summer, an individual or individuals known as [“The Impact Team”](#) determined that all of the information in the Ashley Madison database should be made public. This was a lot of data: tens of millions of names, addresses, profiles, and credit card transactions. The database, in essence, was Ashley Madison.

It felt as if a nuclear bomb had gone off in the datasphere. The files were spread through the [BitTorrent network](#), which meant that lots of people could easily download them; it also meant that the files were difficult to suppress, because they were so widely distributed.

I downloaded the database in anticipation of my new friends' arrival. And while I was unimpressed by the database itself—the typical mess of MySQL fields, with functional but hardly exemplary data modeling—I was staggered by its scope, the fact that one big database could serve all these people looking for affairs. It was the encapsulation of so much human desire. I poked around. Then, seeing a name I recognized, I stopped poking around. It wasn't worth knowing.

One of the visitors was sweating as he handed me a list of names written in pencil on the back of an envelope. I'd never seen that before: a man in a cold, air-conditioned room sweating, slightly wild-eyed.

“I just need to know,” he said. “How bad is it?”

I started with last names.

“That's not me,” said the other man. “That's my brother. I'll have to talk with him.”

We found some profiles, and I read them. Walks on the beach. Long nights, fine wines. Nothing cruel or strange. We also found records of credit card transactions. They'd signed up, left a trail, and it was still there. One of them had a credit card connected to his home address. His friend shook his head. Poor bastard.

“OK,” the man said. “It's better to know.”

Once there was a time when if you wanted to have an affair, you had to take charge of keeping it a secret. Wink slyly at a prospective lover and receive a subtle nod in return. Leave a scented note in a mailbox. Meet at a motel off the main route. Pay the bill in cash; never call your lover's house. Ashley Madison's innovation was that it took care of all that for you. The entire come-on of the site was that it would make seamless—*frictionless*—something that had previously been difficult and time-consuming. All while reducing the risk.

It seemed safe and secure, but it wasn't. Ashley Madison knew what you told it: name, email address, sometimes a home address. It knew your credit card information, provided so that you could pursue conversations and thus sex. It promised anonymity, but the service it delivered was sitting right in the middle of a world of transactional processing. Thirty-five million individuals had placed responsibility for the continuance of their marriages and relationships in the hands of a single company. Ashley Madison was a massive, centralized agglomeration of indiscretion.

The internet was once a highly [decentralized system](#). In the earliest days, there were no large corporations or service providers like Ashley Madison or Facebook or Twitter, or behemoth databases to house your information. If you wanted to join up, you plugged in a computer and found a connection through a service provider, and that was

basically it. You were online. Your computer was a [“peer”](#) of the other computers. It was a computocracy.

When the web came along, it was the same. You wanted to say something, so you ran a web server on a computer. You put some web pages in a folder. Your web server waited, night and day, for other computers to ask it for pages and files, and then sent those files back over the network. The servers were still off on their own, but now they could talk to each other.



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A TR 48 desktop computer from the 1960s. James Ball

That’s really all there is to it. It is, at its core, a wonderfully autonomous, independent, and decentralized arrangement. Anyone can set up a web site and point to all the other web pages. Everyone is a publisher. Everyone is a peer. That’s why it’s called a web. Individuals knit themselves together by linking to one another. Everyone tends his or her own little epistemological garden, growing ideas from seed and sharing them with anyone who comes by.

Yet as the web grew, the problem of *finding* information arose. Search engines were needed that could crawl across the web, indexing the words in web pages; this way someone could type a word in a box and the machine could consult its index and list the pages that matched. But once you do that successfully, you have created something that appeals to larger forces. The search engine has power over other pages—you’re no longer a peer.

Imagine you had a huge bread machine and an enormous bag of flour. You made so much bread that you gave some away. And people came to eat the free bread, and they liked it and wanted more. They told their friends. Free bread! People just kept coming—ten people; 100; 100,000; 100,000 million. A googol. To keep up with demand, you find yourself in need of not just more flour, but more bread machines. Fortunately, there are companies that are willing to pay you—not for your bread, but for the right to say, “This bread was brought to you by...” All because you’ve done the work of getting a lot of people in one place to eat free bread. Eventually you turn out enough loaves that you’re designing wearable technology and self-driving cars.

There were other technical demands that chipped away at the decentralized nature of the internet. All those files spread across the web, it turned out, are a chore to manage. You need to update the copyright statement at the bottom of every page you’ve published, because you’re in a new year. Or you need to wipe the CEO’s name from all the pages after he resigned in the wake of a sexual harassment scandal. Doing that one page at a time would be a real pain. At the same time, it became possible to rent access to a database on a server somewhere. To solve this too-many-pages problem, people began to put their “content” into databases, and then publish everything through consistent, replicable “templates.” As a result, every page on your web site—and everyone else’s—eventually came to look roughly the same. Data went into the database via forms and came out via templates. Content was thusly managed. To change the copyright notice across all 100,000 pages of your retro sneaker site, you only needed to change a single line of one template. The CEO’s photo could be briskly removed and replaced by the photo of the new, interim CEO. This was obviously a better state of affairs.

Soon the home page, which had enabled individual expressions of interest in [mycology](#) or *Star Trek* or bondage, was subsumed by the blog, which brought form and chronological order to the universe of web content. Tools like [Movable Type](#), [Blogger](#), and [Typepad](#) emerged, which “hosted” your content in their databases. No longer did people tend their own digital gardens. The gardens were tended for them.

Freed from the need to build and manage their own web sites, people could do more social things with their computers. They could talk to each other, start conversations, argue endlessly. They could leave private messages. Many found a community. And the companies that hosted the databases found a business model. Make the messages short, and adapt the database to manage millions of “friends” and “followers” ([Friendster](#), then Twitter). Make a blogging engine that allows you to post short updates and keep track of your friends ([MySpace](#), then Facebook). The computocracy was now something else—a Googlopoly.

The technology that let people make web sites never went away. You can still set up a site as if it were 1995. But culture changes, as do expectations. It takes a certain set of skills to create your own web site, populate it with cool stuff, set up a web server, and publish your own cool-stuff web pages. I would argue that those skills should be a basic part of living in a transparent and open culture where individuals are able to communicate on an equal field of play. Some fellow nerds would argue the same. But most everyone else, statistically, just uses Facebook and plays along.

There’s an obvious connection between a decentralized internet, in which individuals create and oversee their own digital identities, and a functioning democracy, in which we make informed choices about who rules us and how we are ruled. Yet too few people make that link. We live in a world in which sensitive information of every conceivable sort—financial, sexual, medical, legal, familial, governmental—is now kept, and presumably guarded, online. It’s guarded in gigantic treasure chests labeled “important data here.” So many plums for hackers to pluck.

If you don’t take care of yourself online, someone else will. That someone is likely not a peer but a megacorporation that is tracking and selling your preferences in a silent auction, a government surveilling your movements and religious affiliations, or a hacker collective that feels entitled to publish your sexual indelicacies. That someone probably already is.

So what is the alternative? For starters: In a utopian vision of a better, devolved-but-more-human internet, I would never post to your database. There’d be zillions of personal data sets, and every individual would have the technical capacity and social resolve to share only what they wanted, plus the power to revoke information from the commons. It’s much easier to load my thoughts into someone else’s little box and hit “Submit” (perhaps the most well-chosen interface word of all time). But submission comes at a price. My personal information, my finances, my family connections, my ideas—all are now in the hands of those to whom I have submitted.

The temptations of centralization are powerful. With a few employees you can make something worth a billion dollars, as Instagram did. You don’t need to worry about advertising. You just create a situation where a larger company sees an opportunity to insert lots of ads. People are desperate to buy places to insert lots of ads so they can resell those places, which is what Facebook did when it bought Instagram. It bought future ad inventory. No one is paying attention to individuals online, at least not any more. There’s no money in it. What they are looking for is tens of millions of people all in one place, moving in one direction. If you’re Facebook, you need to get in front of that mass of humanity; you need to define their destiny. You need centralization.

Standing against this tide of centralization is the indie web movement. (And hackers, [the black hat kind](#) and otherwise.) Perhaps “movement” is too strong—it’s more an aesthetic of independence and decentralization. The [IndieWebCamp web page](#) states: “When you post something on the web, it should belong to you, not a corporation.” You should own your information and profit from it. You should have your own servers. Your destiny, which you signed over to Facebook in order to avoid learning a few lines of code, would once again be your own.

But an affair? That’s trickier. A decentralized dating system would end up being a lot like Bitcoin—confusing, briefly exciting, and overpopulated by desperate, libertarian men. And the sites would be vulnerable, hackable. But big decentralized systems have many points of failure, rather than just one. The government could still spy on you, but the damage would be limited. The data wouldn’t be in one place.

I’m not proposing some sort of digital back-to-the-land, communal-living, anti-regulation paradise that does away with food-delivery apps and secure online banking. I am an avid self-publisher and web site geek, but I also make a living as a paid client of centralizers.

Oddly, the people most excited about peer-to-peer technologies are not hackers but bankers. “Decentralized applications will someday surpass the world’s largest software corporations in utility, user-base, and network valuation,” [writes](#) David Johnston, managing director of the [Dapps Fund](#), which helps bankroll decentralized consumer apps. There will always be money to be made in big and few. But there is also money—lots of it—in small and many.

Think of [Bitcoin](#), which pioneered a block chain model of financial transactions that has been used by millions. Or Ethereum, [which raised \\$18 million in a single crowd-funding campaign](#) for its secure, peer-to-peer platform for consumer transactions. Or all those little apps on our phones—those incredible pocket supercomputers—talking to billions of other little apps. This is how file-sharing networks already work. BitTorrent uses “trackers” to keep, well, track of the files that people are sharing; the software functions as a tiny server. “I am here,” it says. “I have these files, some in completeness and others in parts. I seek parts of some files as well.” And that signal goes out to one or more trackers, and then to other clients, and in this way files are distributed. This was how the centralized Ashley Madison database was ultimately decentralized, by force. Someone took the pirated data, zipped it up, and made it available as one big torrent. An older, smaller internet protocol brought down a newer, larger, corporatized database.

Making a shift to a more democratized internet won’t be easy. Once you start to rally your energies toward a more open future, you will be shocked by the forces arrayed against you; the intransigence of the people who want to buy and sell your information; the amorality of the hackers who play with millions of people for sport; the cold, endemic corruption of intellectual property and patent law; the infinite protections for copyright. It can get a person down.

We could still live in that decentralized world, if we wanted to. Despite the rise of the all-seeing database, the core of the internet remains profoundly open. I can host it from my apartment, on a machine that costs \$35. You can link to me from your site. Just the two of us. This is an age of great enterprise, no time to think small. Yet whatever enormous explosion tears through our digital world next will come from exactly that: an individual recognizing the potential of the small, where others see only scale.

Paul Ford is a contributing editor at the *New Republic*. His book about web pages will be published in 2016 by Farrar, Straus and Giroux.

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Screen. Image. Text.

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I once heard Leon Botstein, the President of Bard College, compare books to stairs. "They've invented the elevator," he said, "but sometimes you still walk up." There are countless discussions on the future of the book—they are picked up in magazine feature articles, in trade conferences, and in academic roundtables—and in all of these, the future of the printed word seems certain: in a generation or two, print will become obsolete. In this age of changing habits, if print is the stairs and screens the elevator, then what could the escalator be?

This moment in time, and the awareness of the possibilities electronic publishing grant, affect the manner in which we relate to texts in a way that is under constant scrutiny. But images prove to be a different problem. The separation between text and images has a long history. In fact, images have posed a challenge for publishers from the early days of print—be it the cost of printing them; the payments for illustrators, photographers, and designers; or simply contextualizing the images and their relation to the text—but they have become crucial to our understanding of texts. When the *Illustrated London News*, the world's first illustrated weekly newspaper, began publishing in 1842, the relationship between the text and the engraved images in the paper was such a novelty that it took the weekly about a decade to stake a hold in that era's news distribution channels. Once it did, it became one of the most widely circulated newspapers in Victorian Britain. The marriage of text and the engraved image marked a new level of fluency in communication via images, which does away with staples of early print day, even though the separation between image and text lasted for many decades later, and can still be traced today. (Think, for example, of the plate pages, where color images were glued onto the paper, so that the book or magazine would be printed in black and white, adding the color pages later in a way that saves money on printing, but also generates a wholly different relationship with images. These are often associated with encyclopedias, but a large number of artist's monographs retained this design even after color printing became widely accessible, creating the odd text-image relationship where an artwork is described to the most minute detail, with a comment in parenthesis directing the reader to "color plate 3," where the mentioned piece could be seen in glossy print.)

The generations to come of age in the days of digital publishing and reading on screens have a much more complicated relationship with images. The human eye-brain system is capable of reading a large number of high quality images in a matter of split seconds, and this, alongside the hand-eye coordination—think about the pleasure of a touch screen versus inky newspaper pages—is rapidly developing to mirror our changing habits of consuming information. So much so that the contemporary heightened sensitivity to the way we read images can lead to an ability to, at times, ignore the quality of the images when inserted into a text, the way our brain glides over a typo in the flow of reading. The way we read images online is only one thing these magazines deal with in the process of publishing, but it is surely an element that dictates a large portion of the reading experience of these publications.

The endless discussions on the future of print bring up the contemporary fluency with images on a regular basis. Aside from the fact that digital publishing is often cheaper and always easier to disseminate, many consider the role of the image in digital publishing to be a key aspect in the contemporary experience of reading. The benefits of handheld devices are considered time and again, especially in relation to embedding a variety of image formats: slideshows, moving images, animated GIFs, and so forth. A number of start-ups like Flyp bring screen-based reading beyond the initial technology, and enhanced e-books are quite widely considered to be the next major option offered by electronic reading devices.

Whereas some of the aforementioned key possibilities that publishing online presents may seem so pertinent to contemporary art publishing, they also bring up a number of crucial issues in the relationship between the screen, the text, and the image. In the past few years, contemporary art publishing has had to somehow consider all of these questions—be it print publications that have to strategize their web presence or online publications that need to carve out a place for themselves in the web's infinite possibilities for distraction. Taking into consideration a number of web-based contemporary art magazines, I asked editors to answer a number of questions about the way their editorial lines react to the possibilities and restrictions of the internet environment. Questions considered things like what online

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distribution offered, the economies of attention on the internet, sourcing images online, and finally, the relationship between print and web-based media, especially considering current tendencies of online art publications to come out with print readers.

Distribution: The Internet’s Nuts and Bolts

“Intention follows a platform that you can deal with and afford,” says *Mousse*’s Head of Publications Stefano Cernuschi. *Mousse* is printed in newspaper form, but also has extensive online presence and recently launched a dedicated iPad app. The distribution of print publications follows certain sets of rules—perfect binding, for example, helps—and a number of print publications utilize the internet as another distribution platform. *Artforum* and *Frieze*, for instance, upload each issue’s table of contents but only make a number of articles in each issue available online for free, thus enticing readers to buy the print magazine. *Frieze* uploads all older content, whereas *Artforum* has a unique website too, which includes web-only features like certain reviews and the infamous Diary section.

At the early days of the internet, users became accustomed to getting things for free, content especially, but once the first popular sites introduced paywalls, many followed and many will trail. Online magazine *Triple Canopy* recently introduced a membership system, asking its readers for \$3 a month; the magazine will still be freely accessible to non-members, but a system of remuneration is indeed being considered, a complex idea based on a notion of community: That readers will pay for what they can get for free because they would like to support the magazine. So what about Cernuschi’s “platform you can afford”? Clearly, publishing online comes to a fraction of the printing costs, which is one of the obvious reasons to go online. Another is distribution. While going viral on the internet is still a process that is a mystery to many (not to mention the example of the somewhat unexpected online popularity of cats), web readership, even if murky and somewhat untrackable really, can be a constant surprise that is inexistent in a print magazine, even when considering the idea that a print product might circulate between more than the one person who pays for it at a given store. And with online readership comes the new idea of participation. In “The Journey West,” his editorial and declaration of intent, Thomas Lawson, the Editor-in-Chief of Los Angeles-based online magazine *East of Borneo*, explains that the magazine’s “genesis has been long and deliberative: several years of thinking past the delights and constraints of the printed page, and one very intense year of thinking through the actual possibilities of current online publication.” [1] One of the publication’s stated intents is to build up an ongoing archive about Los Angeles and its cultural scene, and one way *East of Borneo* found to do this is incorporate its readers. Thus, readers can upload content to the site, contribute texts and source material, and partake in the construction of the site as a resource. These examples take the idea of the dated notion of web 2.0 user-generated content to a level different than Facebook, to use the obvious example. While Facebook makes its users work for it, they do not partake in a larger Facebook community (in fact, the social network parcels out users’ sense of community for them: a school attended, a workplace, etc.). What these publications do is harness the user-generated labor and value (monetary or cultural) in order to create a sense of public.

What We Pay for Attention

The internet gets confusing at times. We consume enormous amounts of information online, the origins of which we often can’t point to, except for in our browser’s history. Publishing online seems like such an obvious choice—it’s cheap, widely accessible, and so “of our time,” to paraphrase Baudelaire’s *il faut être de son temps*—but it also means that online publications are continuously fighting for the reader’s attention. Online attention is a constant battle. Apart from the traffic of a site, web analytics also measure how much time a given person will spend on this or that website. Five minutes is not bad at all. The economy of attention online is radically different than anything known in print. “Though we all spent hours each day scanning screens for information, what on the internet did we actually read?” [2] Ask the editors of *Triple Canopy*, whose (much repeated) mantra is to “slow down the internet.” Text has a built-in duration: we take a few milliseconds to recognize words; being image literate also means that even those seconds may seem like much. “Slowing down the internet” seems like one way in, both textually and visually: “Our thinking of images in relationship to economies of attention is no different than how we consider writing,” says *Triple Canopy*’s Hannah Whitaker. “The photographs that we publish might require more attention and consideration than others online. We cater to a readership that accepts expending time and effort on a piece.” The process of contextualizing online images, among the amazing diversity of the web, takes time. Demanding that the reader spend this time with the magazine is in fact quite refreshing and may push the viewer to, indeed, read online.

Another possible answer to the question of what content online do we actually read is built-in to mobile devices’ interfaces. Ironically enough, even though mobile devices are supposedly designed to keep us company in transit (even considering the fact that Apple now advertises the iPad as a handheld device meant mainly for people who tend to sit on the couch most of the time, and don’t want to walk over to their macbooks), the relatively new idea of apps actually introduces a new sense of undivided attention

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online. iOS, Apple’s operating system, does not really allow for simultaneous use of two apps. The result is that while on our computer we always have another tab open on the browser, another program open in the background, or another memo blinking on the calendar view, when we use the internet on our mobile devices, we focus on the app we are using. Reading the New York Times on its dedicated app doesn’t allow for a quick change to look at the new email that just came in without leaving the newspaper app and switching to the email one—a decision much more conscious than that of switching tabs, for example. The iPad, iPhone, and other handheld devices also rid themselves of the cursor, so that their users are not really directed anywhere anymore. This is an interaction that designers are apparently much challenged by—a way of looking at a page that is closer to reading print. Where the cursor was a stand-in for the user’s finger, the finger is now used again, and the eye follows a part of the body rather than an element embedded in the screen.

Now that such a screen-based platform exists, how to use it? “No one reads *Mousse* from cover to cover—and I’d imagine the iPad app is the same,” says Cernuschi. “When it comes to attention, I think it is also a derivative of the way in which information is presented graphically. We try to work with reduction—when the quantity of textual and visual content you can upload is limitless, it gets quite difficult—and we didn’t want to be a Wikipedia kind of experience. We use one font across the range, keep the text simple, and try to focus on the images.” Cernuschi moves on to explain, “In a way, we’re all children of the iPod.” The act of using a touch screen is so pleasurable, such a radically different movement, scrolling with one’s finger rather than flipping through paper, that it changes the user’s interaction with the visual content. What the editors at *Mousse* claim was difficult in the development of the app is its boundless nature. In print, every addition might be translated to printing costs—so physical constraints bring about the necessity of making choices, and with it, an editorial line. Which led the editors to understand the iPad as a reading platform—“it’s still two-dimensional,” said Cernuschi—and so the app is not completely based on multimedia, even though it does include a number of videos, for example. But the shift from a printed copy of *Mousse* to its iPad app is not as sweeping as one may imagine.

The Location of the Online Image

When requesting images for a print publication, some guidelines are quite clear: The digital image needs to be 300dpi, it needs to be of a certain size, measured in inches and centimeters rather than pixels, and (at least usually) the rights for it need to be cleared.^[3] Online publishing muddles all of these. While some of the publications contacted for this article attested that they have a photo editor or image editor (the leap to “image editor” in order to describe publishing in the online sphere is slowly being made. As Whitaker noted, “It points to an opening up of the field to include the non-photographic image”), their role is more curatorial than that of a traditional image editor. Are there any rules as to which images are published, the way they are retrieved, and their integration in the magazines? Surely, many images are harvested from a variety of online repository, Google Images being the obvious example. This nods to the flattening of the digital image in a complicated way. On screen, the different kinds of images—say, film stills, digital or analogue photography, digital renderings, and so forth—can be quite similar. While we are becoming increasingly visually literate, few are the people who truly interact with the distinction between the digital image and the physical print. No one is stunned anymore by the idea of a collector buying a photograph based on an image sent to him or her via email from a gallery. The printing process—moving from the screen to the physical object, that is—becomes a formality. In her introduction to *Triple Canopy*’s issue on photography, “Black Box,” Whitaker points out the fact that a large number of the images found online (be they images uploaded to social networks, news-related ones, or commercial photographs) were shot digitally and uploaded to the internet, without, according to her, “so much as a passing consideration of printing them in a physical form.”^[4]

The Center for Curatorial Studies at Bard College recently introduced *Red Hook*, an online journal for curatorial studies. *Red Hook*’s relationship with images is one example that truly considers the magazine’s online existence and presence. In the editorial for the first issue, its editor Tirdad Zolghadr states, “Although this journal will certainly attempt to do justice to opportunities for revisiting traditional hierarchies between image and text, it will be careful not to imply that language is diminishing in comparative importance, or that the online sphere can heal old wounds. On the contrary, the idea is to highlight and complicate an enduring hegemony in the hermeneutic food chain of online circulation.”^[5] One way to complicate those old wounds Zolghadr mentions—the text/image divide being a painful one—is the magazine’s particular approach to images. Issue 1 is fully illustrated by one artist project: Katya Sander’s Hard Drive, where all images accompanying the texts are automatically pulled from the web, based on each reader’s hard drive as well as key words and themes in the articles. *Red Hook* does not have an image editor, but rather, it recruits artists to think through and further explore the magazine’s relationship to images. Zolghadr further explains, “This was not meant to delegate image-editing responsibilities, at least not in a lazy and self-effacing way, but to avoid putting the cart before the horse. In a curatorial context, the specific mode of knowledge production I find the most productive is one that is developed and tested via an imbrication of theory and practice, saying and doing—preferably though not necessarily in tandem with artists. When Sander was invited to partake in the first issue, the

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instrumentalization of images in a publication context—and the lack of online signposts that traditionally steer this kind of process—was a cornerstone of the conversation.” The resulting project is refreshing—I haven’t seen an image repeated twice in the issue—, and also confusing—the images accompanying the texts on my screen varied from milk bottles in a crate to demonstrators in Eastern Europe, and the link to the images’ original contexts may be an interesting addition, but one that can be distracting, in that it sends the reader back to the wilderness of online image repositories, asking him or her to make sense of the images once those no longer have any relationship to the original text where they were encountered. It may be an interesting exercise in decoding images, but it’s also a losing hand in the battle on online attention.

From Print to Screen and Back Again

(from print to screen):

“When *Triple Canopy* was founded,” its editors recall, “the content was bounded in a box and you ‘flipped’ through the pages as you would a print magazine. We hoped that this page metaphor would underline our relationship the kind of serious content more associated with printed media—to (as we’ve often stated) ‘slow down the internet.’ In the end, this format proved to be limiting and, ultimately, anathema to our mission to consider the internet’s specific qualities as a form. We eventually redesigned the magazine and scrapped the page in favor of horizontally scrolling columns. In this new format, the relationships between image and text are more fluid. A given image is seen in the context of text that comes both before and after it and the bounds of the magazine are constrained by the size of the browser window and by the computer’s screen size, or are in other words, set by the reader.” What this description exemplifies is the way in which the design of web-based art publications considers itself in face of print. The design of numerous online art publications considers the history and tradition of print in a myriad of nostalgic, more or less skeuomorphic ways while bringing up old fears that reading habits are almost unchangeable. Even though *Triple Canopy* is quite unique in its horizontal scroll, it shares a similar attention to the print versus screen reading experience. One interesting element of which is the persisting presence of the table of contents in web-based publications: as part of the linking culture of the internet, the links to the other articles in the same issue are visible across the board. Another aspect of online culture that these publications have picked up on is tagging by subject and “for further reading” tabs, which try to anticipate the reader’s interests according with the stated themes of a given article.

Where do images fall within these design questions? *Triple Canopy*’s editors attest that, “One issue that came up in the transition between the two formats [the flip box and the horizontal scroll] is that you lose the impact of a photograph when it slides onto the page rather than appearing in an instant. But, we do have a full screen function for those images that require more white space around them.” Most other publications have a vertical design that introduces images as sidebars or directly aligned in the text, mainly without linking the images out or allowing for a full-screen viewing option. I would argue that this is another remnant of print culture in the digital sphere. Considering that the content of these online publications generally sways toward the theoretical more so than the glossy-print-magazine type, this brings forth a relationship with images where they are more illustrative and do not require a very specific—say, full-screen view—attention. *Mousse*’s Cernuschi says, “We have a complicated relationship with images because we print in a newspaper format but we’re a fine arts magazine. So we flirt with this idea of inaccurate reproduction in the first place. The priority with images is not exactly to ‘get it,’—for that, I think paper printing is a very honest filter: it looks cool, but not really good. On the screen, images look much better. I would much prefer an image printed on appropriate paper than on a screen, but that’s usually not the case. So for us it’s very different, especially considering that we can reproduce media. You develop a so-called video still aesthetic on paper.”

(and back again):

When considering the multiplicity of valid reasons why so many contemporary art publications choose to go online, it is quite astonishing to see how extensively they consider print as an option.^[6] Take *e-flux journal*: It was launched by an organization that made its name and brand by being the first to give a very specific—and much called-for—online service. The journal, too, started in 2008 as a web-based initiative; but it soon introduced a series of readers in book form, published in collaboration with the Berlin-based publishing house Sternberg Press, and a print-on-demand system that allows readers and institutions to print out full issues followed. *e-flux journal*’s distribution system includes art institutions and bookstores around the world, who all download a PDF generated directly from the online articles, in what is a nod to ideas of open circulation and transmission of ideas on the internet, only in an offline, widely distributed but still independent, version.

A number of other web-based magazines seem inclined to follow *e-flux journal*’s direction. *Triple Canopy* published a first reader, *Invalid Format*, in the end of 2011. The cover of the book reads “Volume 1”—and indeed, the reader only covers issues 1 through 4, bringing up the amusing question of whether *Triple*

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Canopy will forever chase its own tail: Will the book-form readers catch up with the online journals? And *Red Hook* editor Zolghadr states that publishing a reader could be one direction for the magazine, but according to him “we’re taking these things pedantically seriously, and are in no hurry to expand to other media just yet. The journal will first need to take its time to familiarize itself with its technical and institutional specificities.”

So what does it mean to print out the internet? In the introduction to *Invalid Format*, the editors of *Triple Canopy* discuss their initial speculations as to the possible longevity of a web-based publication: “We had a sense of the inevitability of obsolescence—think of cassette tapes, LaserDiscs, Mosaic Netscape 0.9—and of the need to safeguard our work being reduced to so many broken links and 404 errors.” The idea of publishing books based on the online journal came up as a way of “artful archiving.”

Downloading, so to say, the content of these publications from the online sphere to print can also introduce new problem of design. When taken offline, the images gain a new visual character: whereas on the screen, all images are in color but are indiscernible in context (especially when linked out of the specific journal—an image used in an online publication is totally different when viewed through Google Images) and in origin, in a printed form it is tied in with the text and the design in a way that relates to the history of publishing and to our expectations as readers in a wholly different way. Take, for example, Boris Groys’s article, “The Weak Universalism,” in *e-flux journal*. The piece, where Groys considers avant-garde’s nondistinction between artists and non-artists, is accompanied by a number of images, like a photograph of Kasimir Malevich teaching a class, a painting by Kandinsky, and a screenshot of Andy Warhol’s Facebook page (“Sign up for Facebook to connect with Andy Warhol!”). The randomness of the screenshot may seem more intentional in print—in the print version of that issue, for example, it sits on the same spread as a still from *Empire*—and it loses its interconnected nature that it may have with its online home (imagine reading that article on one browser tab while keeping Facebook open in another tab). And, unlike traditional print, where a screenshot or a video still may be of visibly lesser quality than a high-resolution photograph of a Kandinsky, the printed versions of online art publications tend to retain the flattened-out, non-hierarchical nature of the image as it was seen online. But whether images printed in poor quality, off the internet, become simply signifiers or rather, an “aesthetic of screenshots,” remains with the reader.

To end at the beginning, let me bring up the question of the escalator one more time. Unlike an elevator or stairs, which can be featured in private homes or apartment buildings, an escalator is generally inherently public. It’s not the exact middle ground between the stairs and the elevator because it picks up on certain elements of both while remaining a different variant of them as a mode of transport. Like the stairs, it considers only the human body (it will barely tolerate a baby carriage or luggage); and like the elevator, it has a built-in sense of pace. It seems pertinent here that the escalator is a trope of public space—train stations, airport, department stores, and so forth. What are the needs of the escalator riders? It allows them the possibility of cutting distances short while eliminating the sense of a group that an elevator may create.

The specificities of contemporary art publishing initiatives online may echo the escalator at times, while also embodying certain characteristics of the stairs and the elevator. We are only getting more image-savvy with time, which confuses and collides the relationship between text and images. The current decade is a very particular one in the history of publishing, as it will be full of moments that will be declared to be decisive for the “fate of the book.” And maybe books are like taking the stairs—it may be old-fashioned, but still seems natural, and our brain-eye coordination is accustomed to it in a way similar to how quickly toddlers learn to crawl and walk up and down stairs. But the elevator? Standing in a slow-moving elevator seems more nerve wrecking than walking up the stairs. This is what reading an old e-book will be like one day. The need for constant reinvention in digital publishing calls for a certain flexibility, and one that online art publications seem to be offering simply by the sheer fact of their constant consideration of what publishing online means. A hybrid model of print-to-screen-and-back-again might teach us much about our relationship with images, which will define and shape the history of art and the way it is taught and written about in coming years. This might just be the equivalent of the possibility to run up or down the escalator in the opposite direction than it is heading. It’s possible, even if exhausting. But sometimes, you just want to stand there on the escalator and see the ground distance itself from you while you take in the view.

notes

[1] See Thomas Lawson introduction-cum-editorial statement, “The Journey West,” on *East of Borneo* (October 10, 2010).

[2] See *Triple Canopy*’s editors’ article, “The Binder and the Server,” at the College Art Association’s *Art Journal* (vol. 70, n. 2: winter 2011), 40–57.

[3] The “wild west” of online reproduction and intellectual property rights in the internet environment is an incredibly complex subject that is currently tackled by people in many fields in a constant attempt to define it for themselves at the moment. The question of best practices for online reproduction and online intellectual property rights is too large to consider seriously here and the literature about it is slowly building.

[4] Whitaker’s introduction deals with the space of photography in contemporary society a way that the elusive terminology of “images” (therefore converting all photographs, illustrative drawings, film stills, and so forth to one all-encompassing class—which can mainly be characterized by the fact that the people who view it do not often think about those images’ origins) in a way this article could never do. See her essay, “A Note on Black Box,” in *Triple Canopy*, issue 12.

[5] See Zolghadr’s editorial, “Notes from the Editor,” in *Red Hook*, issue 1.

[6] The idea of the possible obsolescence of online media and the fact that technology seems to be developing at a pace much more rapid than the pace of editorial decision is cheekily picked up by Zolghadr in his editorial: “Curatorial education aside, a second moving target here, one that is at least as mystifying, perhaps even more so, is the new field of online publishing. This is where you get an even clearer sense of the privilege and vertigo of inhabiting a historical threshold, leading to a constant suspicion that you’re missing key conversations unfolding concurrently all around you, coupled with yet another nagging suspicion, that much of your eagerness and anxiety will be considered quaint only a few years from now.”

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Case Study: Gossip as Communication System

Sarah Hamerman

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Gossip is a historically maligned form of communication, frequently cast as idle, feminized chatter in contrast to the masculine public sphere. But gossip's bad reputation speaks to its power. Through its rapid spread and the instability of its content, gossip, as public secret, calls into question established social hierarchies and ways of knowing. Perhaps the oldest form of 'social networking,' gossip's ubiquity is made more apparent today by viral scandals and security breaches—though its flows are now more constrained by the networks of power it bristles against. A growing chorus of artists, scholars and writers have recognized gossip's significance and investigated it as a positive social force—one whose work lies not in fixing truths but in performing the daily maintenance of our interpersonal relationships.

In her essay 'Witch-Hunt,' for *Tank* magazine, artist Hannah Black frames gossip both as a language of female resistance and as an indispensable form of emotional labor. She writes: "Hatred of gossip is hatred of women talking to each other—it is generally women who do this work of love.... Communities of gossips nurse each other through the degradations that partners, bosses and families inflict on us." For marginalized people, gossip has a dual function: it works to both affirm communal bonds and unsettle the positions of those in power.

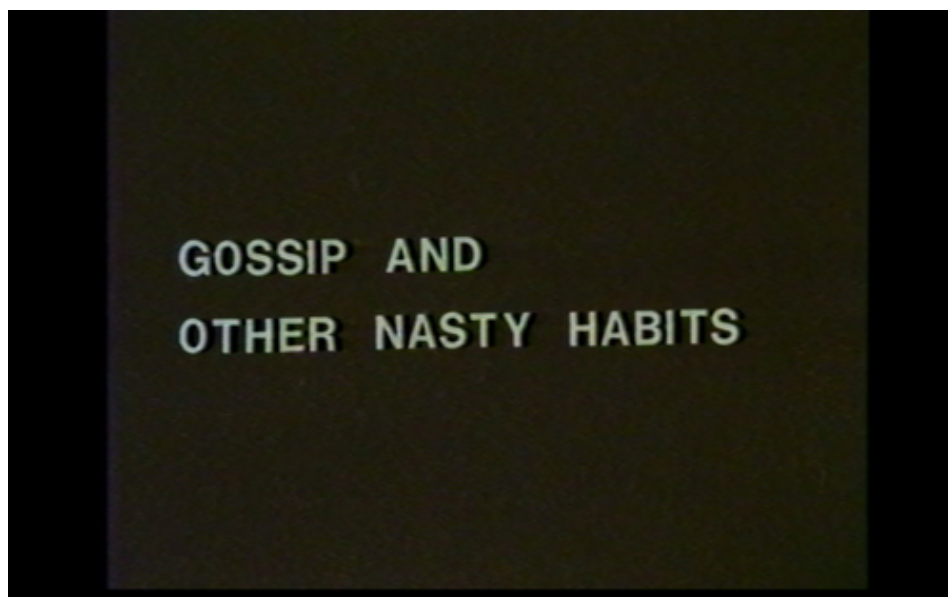
Architect and scholar Keller Easterling also examines the ways that gossip and rumor can function as destabilizing forces in her book *Extrastatecraft*. She notes their effects on politics, citing the impact of the false rumor that Barack Obama is a Muslim. For Easterling, the content of gossip is less significant than the way that content behaves; she writes, "what must be designed is not only the content, but also the bounce of the rumor—its active forms."

In anthropological studies during the 1960s and 1970s, a focus on gossip and rumor emphasized the ways that information is transmitted in social networks, shifting the field away from a focus on 'universal' social structures. These network-based studies drew a

variety of conclusions. For instance, Nate Epstein's 1969 study of gossip within an African township examined how it secured the social standing of elite members of the society. Writing in 1967, Robert Paine defined gossip as 'information management': a mode of informal communication leveraged to advance and protect individual interests.

These anthropological studies were a key inspiration for Ulises Carrión's 1981 work *Gossip, Scandal, and Good Manners*. In the preliminary notes to the project, Carrión states that his goal is 'not gossip as art, but art as gossip.' He recruited ten collaborators to spread several bits of concocted gossip about himself throughout the city of Amsterdam over the course of a few months; the collaborators were given notebooks in which to record their findings and track the spread of the gossip. Interestingly, Carrión's collaborators reported difficulty in spreading the gossip—either because it was not believable, because it might be upsetting, or because they simply forgot to pass it on.

Carrión presented the results of his experiment in an academic-style lecture at the University of Amsterdam, intermingling semiotic and scholarly theories with the recounting of Hollywood scandals. The seriousness of the format was intended to contrast the supposed frivolity of the topic at hand. He defined gossip as an erratic, informal and collectively-created communication system that transcends the limitations of the individual artist and the artistic work. While such a concept of "art as gossip" might seem endemic to our current context of pervasive social networks, it was equally relevant to Carrión's era, in which communications technologies—from video cameras to the first personal computers—were rapidly evolving. Likewise, the international network of Mail Art functioned as an expansive alternative to the gallery system in the 1970s and early 1980s.



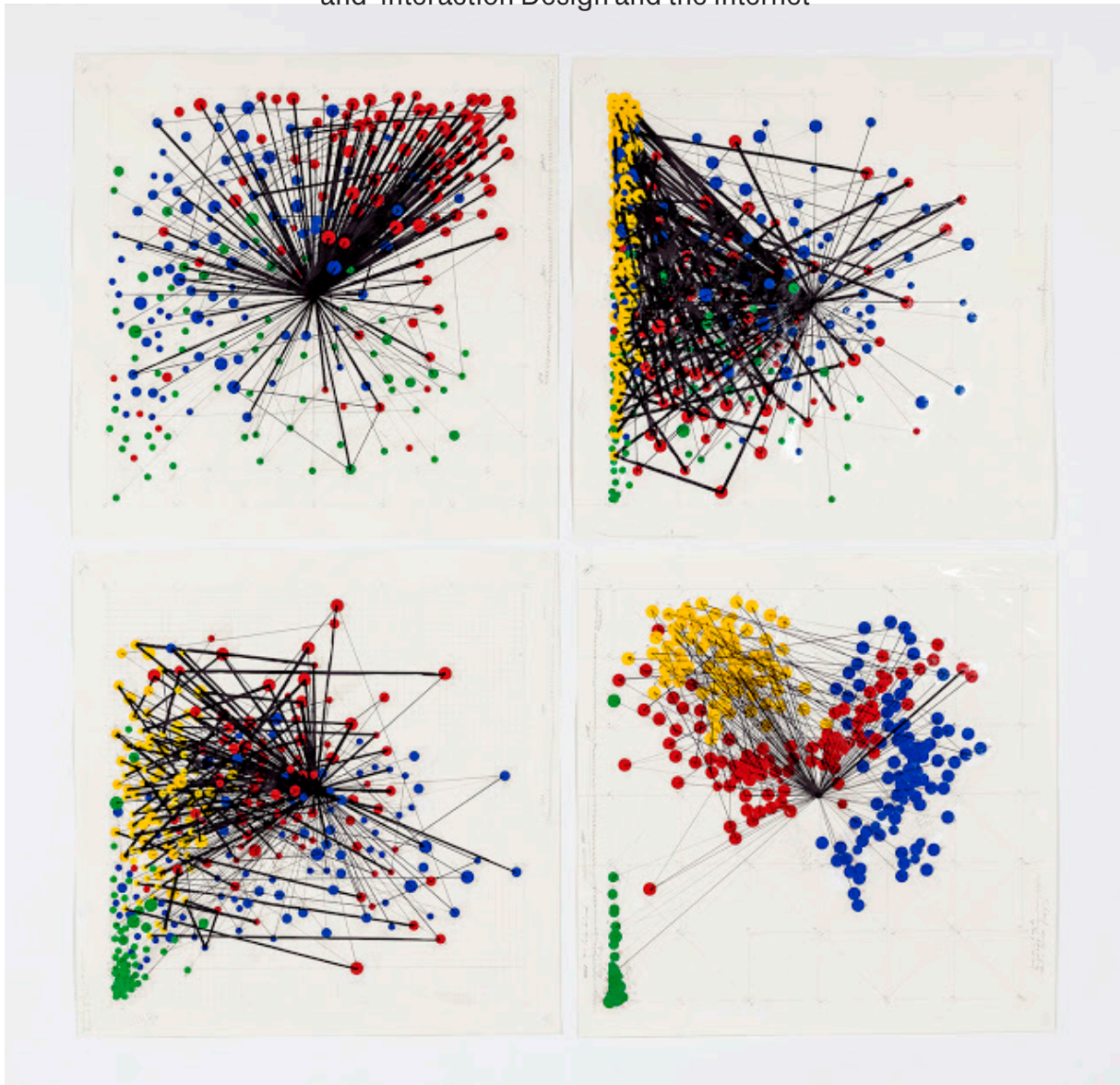
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Carrión's work on gossip is echoed by other artists' investigations, in which gossip frequently functions as a tactic, rather than an object of study. Lee Lozano, who famously 'dropped out' of the art world in 1969, juxtaposed informal communication to the strictures of the gallery system with her *Dialogue Piece* of that same year. Lozano invited her interlocutors—friends with whom she would have otherwise interacted in public art settings—to have private dialogues in her loft. The informal and ephemeral nature of these chats contrasted with the ways discourse is leveraged for social capital in institutional settings. Lozano stated that the dialogues were not intended as 'works,' but as joyous social occasions in their own right.

In 2013, the artist and author Pablo Helguera invited close family, friends and professional contacts, as well as 25 attendees of the work's opening, to participate in his piece *Vita Vel Regula*, a work that also uses personal communication as a disseminating force.

Translated into English as *The Rules Of Life*, the piece is a game in which participants were given sealed envelopes with specific opening dates and instructions. Slated to end in 2097, the piece's extended timeframe subverts the public ritual of gallery display by deferring the unveiling of the sealed, personalized secrets. It also calls into question the longevity of social networks at a time when so much communication is predicated on immediacy.

Contemporary Swiss artist Ramaya Tegegne has explored gossip in a number of projects, such as the visual essay and performance series *Bzzz Bzzz Bzzz (2014-2017)* and the recent zine *Liquid Autist*. The zine takes its title from a 2013 exhibition also called *Liquid Autist*, organized by artist-curator Daniel Keller, that included only male artists (including Keller himself). The show sparked a lengthy Facebook debate from an all-female artists' Facebook group that challenged the show's blatant exclusiveness. Tegegne translated screenshots of the thread into a zine for a 2017 exhibition and performance at *First Continent Gallery* in Baltimore, thus documenting and recirculating an intellectually thorny and compelling instance of 'callout culture' within the art world. This outrage-fueled gossip is an effective means of critiquing oppression and seeking visibility, but callout culture is a double-edged sword: It often bolsters a fragmented political culture in which blocking usurps consensus as an endpoint.



In a piece entitled *Un Diagrama Familiar*, the artist and journalist Jaime Serra stuck to the interactions of his personal network, using data to construct a portrait of the evolution of his family's relationships over time. Serra adopted the visual language of infographics to map the daily communications of his immediate family between 2011 and 2014. The X and Y axes in the graphic indicate emotional vs. intellectual communication, and the thickness of the lines indicate the length of the interaction.

Diagrams also figure into Carrión's examination of gossip. In one of the most unique aspects of *Gossip, Scandal, and Good Manners*, a series of hand-drawn charts distinguish gossip from related forms of communication, like rumor, scandal, and slander. In one series, he defines gossip as an information chain, while rumor is defined by multiple movement, scandal by growing intensity, and slander by a definite target. Another

series of diagrams examines the directionality of each information structure: gossip displays a free evolution, rumor shows chaotic progress, scandal is marked by intensity radiation, and slander is a concentrated effort. A further series depicts the four modes metaphorically: gossip as undulating reference, rumor as rotating joint, scandal as positive weight, and slander as precision bomb.

Carrión lifts the diagrammatic presentation mode from the social sciences in order to perform a poetic and open-ended investigation of informal communication systems. However, Carrión's neat taxonomy of gossip may lose relevance today, as digital networks collapse distinctions between private chatter and public broadcasting while rapidly intensifying information's flow. Gossip has always functioned as a making-public of private information, but these indiscretions are now not only circulated among peers, they are also surveilled and archived by systems far beyond our reach. The pleasure in gossip's telling had been accompanied, if not by a certainty of its destination, at least by a knowledge of its relative ephemerality. Gossip's record now lies not in marginalia but in server farms.

Today, the decentralized and overlapping structure of digital information, ensnared by dominant corporate platforms and content-promoting algorithms, is a far cry from the person-to-person whispering implied by Carrión's diagrams. The term 'gossip' has perhaps even been replaced by counterpart digital-native buzzwords such as 'fake news' and 'viral content.' Similarly, the troll has emerged as a toxic—and stereotypically male—breed of online gossip; a troll's primary weapons are his abilities to disrupt discourse and circulate shame. Meanwhile, callout culture has arisen as a powerful but contested form of resistance on social media for marginalized communities. The same incendiary tone of callouts is used as a lure in countless clickbait articles, reflecting a media ecology in which the performative work of online activism and the profit-seeking motives of content farms enter into a tightening feedback loop. Both trolling and callouts reflect a blurring of gossip into scandal in online environments.

For artists such as Lozano, Carrión, and Helguera, gossip's intimate networks functioned as an 'outside' to the codified discourses of commercial, political, or artistic institutions. This outsider status has for centuries secured gossip's power to subvert established knowledge and to bind marginalized communities. As gossip becomes deeply embedded within techno-capitalist information flows, it loses its outsider status, but not its radical potential. Gossip, slander, and other impolite forms have woven themselves into the heart of today's strange geopolitics, and may produce as-yet-unforeseen effects. Such an environment demands fluency both in performing gossip and in interpreting it.

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1960s-style terrorists and the former KGB, along with youthful and ruthless ecological nationalists, veteran international industrial spies, and an aged Finnish writer of children's books immensely popular in Japan. Meanwhile, Bollywood actors in flight from the Indian tax system have the great good luck to happen on the biggest mass grave in history, in Bolton, in an England decimated by the plague and now good only for making cheap movies on location; while, in Germany, in Düsseldorf, the new institution of the *Wende* is explored, in which, observed by a "spex" salesman from Chattanooga, periodically all the destructive collective movements of the time, from football hooligans to anti-modern moral majorities, coincide in a ritual "turbulence". Indeed, it is Chattanooga, with its burnt-out downtown future megastucture, now a rat's nest of squatters, which serves as the stage for a more complex and characteristic encounter: between a de-sexed bicycle repairman (new gender movements have proliferated in this future, including that of Sexual Deliberation, which artificially eradicates the sex drive) and the private police of a long-serving and now senile congressional stalwart, whose artificial identity replacement (the so-called mook) risks being unmasked by an unwanted package in the mail. Finally, classic Science Fiction returns with the discovery in a Central Asian desert, by twenty-first-century bounty-hunters, of an enormous artificial underground cavern, in which the Zone (the latest future form of the old East Asian Co-Prosperity Sphere, now run, to be sure, by China) has housed three world-sized sealed-off human communities as an experiment in testing the viability of 400-year-long space flights. I have only incidentally mentioned some of the wacky SF technology taken for granted in these tales: what is significant are the priorities of global cyberpunk, in which technological speculation and fantasy of the old Toeffler sort takes second place to the more historically original literary vocation of a mapping of the new geopolitical Imaginary.

This is why such Hunter Thompsonian global tourism has real epistemological value: cyberpunk constitutes a kind of laboratory experiment in which the geographical-cultural light spectrum and band-widths of the new system are registered. It is a literature of the new stereotypes thrown up by a system in full expansion, which, like the explosion of a nova, sends out a variety of uncharted signals and signs of new communities and new and artificially differentiated *ethnies*. Stereotypes are preeminently the vehicle through which we relate to other collectivities (no one has ever confronted one of the latter without their mediation); they are allegorical cartoons which no longer convey the racist contempt of the older imperialism but can often (as Žižek has observed for the racist jokes popular in the old Yugoslavia) function as affectionate forms of inclusion and of solidarity.

Indeed, an inspection of this literature already provides a first crude inventory of the new world system: the immense role, first and foremost – and very much in Gibson's evocations (all the way down to *Pattern Recognition* itself) –

II

Fear and Loathing in Globalization

Has the author of *Neuromancer* really "changed his style"? Has he even stopped writing Science Fiction, as some old-fashioned critics have put it, thinking thereby to pay him a compliment? Maybe, on the contrary, he is moving closer to that "cyberpunk" with which he is often associated, but which seems more characteristically developed in the work of his sometime collaborator Bruce Sterling? In any case, the representational apparatus of Science Fiction, here refined and transitorized in all kinds of new and productive ways, sends back more reliable information about the contemporary world than an exhausted realism (or an exhausted modernism either).

William Gibson, now the author of *Pattern Recognition*, has certainly more often illustrated that other coinage, "cyberspace" and its inner networks of global communication and information, than the object-world of late commodification through which the latest novel carefully gropes its way. To be sure, Sterling celebrated the hackers, the heroic pirates of cyberspace, but without Gibson's tragic intensity and as the oddballs and marginals of new frontiers to come; and the rush and exhilaration of his books, rather alien to the cooler Gibson, has always seemed to me to derive as much from global entrepreneurship and the excitement of the money to be made, as from paranoia.

But that excitement also expresses the truth of emergent globalization; and Sterling deserves more than a mere paragraph or parenthesis here. The novels are often episodic, but stories like those collected in *A Good Old Fashioned Future* (New York, 1999) are authentic artifacts of postmodernity and little masterpieces in their own right, offering a Cook's tour of the new global waystations and the piquant dissonances between picturesque travellers and the future cities they suddenly find themselves in: Tokyo to be sure (Tokyo now and forever), in which a Japanese-American federal prosecutor from Providence, Rhode Island, finds herself enveloped in a conspiracy waged with ceramic cats; but also the California of misfit inventors, in which a new process for manufacturing artificial (and aerial) jellyfish threatens to convert all the oil left in the ground in Texas into so much worthless *Unschlim*, then offering an unsurprisingly happy hunting ground for meetings between old

of Japan as the monitory semiotic combination of First World science-and-technology with a properly Third World population explosion. Russia now also looms large, but above all in the form of its various mafias (from all the former Republics), which remind us of the anarchy and violent crime (as well as of the conspiratorial networks and jobless futures) that lurk just beneath the surface of capitalism. It also offers the more contemporary breakneck drama of the devolution of a country that had already reached parity with the First World. Europe's image ambiguity, a kind of elegant museum or tourist playground which is also an evolutionary and economic dead end, is instructive; and the absence of Islam is a welcome relief, in a moment in which it is reality rather than culture or literature which is acting on the basis of that particular stereotype.

This new geopolitical material marks a significant historical difference between such commercial adventure stories and the equally cynical gonzo journalism of an older period (indeed, the affinities and distinctions between the cultural products of the 1960s and 1970s and those of the 1990s and 2000s would be well worth exploring further). Equally significant is that these protagonists – busy as they are in locating rare products, securing secret new inventions, outsmarting rivals and trading with the natives – do not particularly need the stimulus of drugs (still a preponderant, one may even say a metaphysical, presence in so recent a world-historical expression as David Foster Wallace's *Infinite Jest*, of 1996).

But it is by way of the style that we can best measure these differences and position the new literature on some kind of time continuum; and here we may finally return to the main course, which is to be sure the distinctiveness of *Pattern Recognition*, where this style has reached a kind of classical perfection. I will define it as a kind of hyped-up name-dropping, and the description of the clothes selected by the protagonist (Cayce Pollard) for her first day in London is a reliable indicator: "a fresh Fruit T-shirt, her black Buzz Rickson's MA-1, anonymous black skirt from a Tulsa thrift, the black leggings she'd worn for Pilates, black Harajuku schoolgirl shoes. Her purse-analog is an envelope of black East German laminate, purchased on eBay – if not actual Stasi-issue then well in the ballpark." I have no way of knowing whether all these items actually exist; but eBay is certainly the right word for our current collective unconscious; and it is clear that the references work, whether you know the product is real or that it has been made up by Gibson (neither being my own case). What is also clear is that the names being dropped are brandnames, names whose very dynamic conveys both instant obsolescence and the global provenance and neo-exoticism of the world market today in time and space.

1 William Gibson, *Pattern Recognition* (New York, 2003), p. 8 (all further pages references to this edition are given within the text).

There is a further point, namely that little by little, in the current universe, everything is slowly being named; nor does this have anything to do with the older Aristotelian universals in which the idea of a chair subsumes all its individual manifestations. Here the "high-backed workstation chair" (4) is almost of a different species than the seat in the BA 747 "that makes her think of a little boat, a coracle of Hexcel and teakfinish laminate" (122). But there are also exercise chairs, called or named "reformers": "a very long, very low, vaguely ominous and Weimar-looking piece of spring-loaded furniture" (6), which can also be translated into another language, where it becomes "a faux-classical Japanese interpretation in black-lacquered wood, upholstered with something that looks like sharkskin" (178). Each of these items is on its way to the ultimate destination of a name of its own; but not the kind we are familiar with when we speak of a "Mies chair" or a "Barcelona chair": not the origin, but rather the named image is at stake, so that an "Andy Warhol electric chair" might be a better reference.

In this postmodern nominalism, however, the name must also include the new and fashion. What is worn-out or old-fashioned is only useful as a cultural marker: "empty chrome stools of the soda-fountain spin-around kind, but very low, fronting on an equally low bar" (152), where it is the "low", the "very low" that connotes Japan. And in Moscow the table "flanked by two enormous, empty wingback armchairs" (294) only stands for backwardness. This is probably why Gibson's Russian episode is less interesting: he brings a residual Cold War mentality to this built space, "as though everything was designed by someone who'd been looking at a picture of a Western hotel room from the eighties, but without ever having seen even one example of the original" (282). Current Soviet and Eastern European nostalgia art (*Ostalgie* in German) is far more vibrant and exciting than this, and reflects the situation of an alternate universe in which a complete set of mass-produced industrial products, from toilet seats to windowpanes, from shower heads to automobiles, had been invented from scratch, altogether different from the actually existing Western inventory. It is as though the Aztecs had beaten Cortez and survived to invent their own Aztec radio and television, their own Aztec power-vehicles, their own Aztec film genres and popular culture.

At any rate, the premise here is that Russia has nothing new to offer us (the Sterling aesthetic offers much better chances of appreciating what is genuinely new, world-historically innovative in Eastern nostalgia art); and the conclusion to be drawn is that name-dropping is also a matter of knowledge and an encyclopedic familiarity with the fashions of world space as those flow back into the boutiques or flea markets of the West. What I have called name-dropping is therefore also to be grasped as in-group style: the brand names are also the wink of familiarity, to the reader in the know. Even the cynicism (taking the word in Sloterdijk's rather than in its post-Watergate sense) is a joyous badge of group adherence, the snicker as a form of hearty laughter, class status as

a matter of knowing the score rather than of having the money and the power. In-group style was, I believe, the invention (or better still, the discovery) of Thomas Pynchon, as early as *L* (1963), even though Ian Fleming deserves a reference ("Thank you, Commander Bond," murmurs Cayce, as she pastes a hair across the outside apartment door [73]). But just as we no longer need drugs, so we no longer need Pynchon's staples of paranoia and conspiracy to wrap it all up for us, since global capitalism is there to do so more efficiently (or so we are told).

Nonetheless, *The Crying of Lot 49* remains a fundamental paradigm; and, as with Hunter Thompson, the differences are historically very instructive indeed. For the posthumous and the other telltale graffiti have here been replaced by something like a "work of art"; the clues point, not to some unimaginable reality in the social world, but to an (as yet) unimaginable aesthetic. It is a question of an unidentified film of some kind, which has come to be known (among insiders) as "the footage", and which shows up in stills and clips in the most unlikely places (billboards, television ads, magazines, the Internet), in "one hundred and thirty-four previously discovered fragments ... endlessly collated, broken down, reassembled, by whole armies of the most fanatical investigators". Indeed, as one might expect, a whole new in-group has formed around the mysteries of the footage; we are experiencing, one of the characters observes, the "birth of a new subculture"; a world-wide confraternity comes into being, committed to this new object and passionately exchanging and arguing contradictory theories about it. The footage thus makes *Pattern Recognition* over into something like Bloch's conception of the novel of the artist, which carries the unknown unrealized work of art inside itself like a black hole, the empty present of a future indeterminacy, the absent sublime within the everyday real:

Light and shadow. Lovers' cheekbones in the prelude to embrace.

Cayce shivers.

So long now, and they have not been seen to touch.

Around them the absolute blackness is alleviated by texture. Concrete?

They are dressed as they have always been dressed, in clothing Cayce has posted on extensively, fascinated by its timelessness, something she knows and understands.

The difficulty of that. Hairstyles, too.

He might be a sailor, stepping onto a submarine in 1914, or a jazz musician entering a club in 1957. There is a lack of evidence, an absence of stylistic cues, that Cayce understands to be utterly masterful. His black coat is usually read as leather, though it might be dull vinyl, or rubber. He has a way of wearing its collar up.

The girl wears a longer coat, equally dark but seemingly of fabric, its shoulder-padding the subject of hundreds of posts. The architecture of

padding in a woman's coat should yield possible periods, particular decades, but there has been no agreement, only controversy.

She is hairless, which has been taken either as the clearest of signs that this is not a period piece, or simply as an indication that she is a free spirit, untrammelled by even the most basic conventions of her day. Her hair has been the subject of similar scrutiny, but nothing has ever been definitively agreed upon.

The one hundred and thirty-four previously discovered fragments, having been endlessly collated, broken down, reassembled, by whole armies of the most fanatical investigators, have yielded no period and no particular narrative direction.

Zaprudered into surreal dimensions of purest speculation, ghost-narratives have emerged and taken on shadowy but determined lives of their own, but Cayce is familiar with them all, and steers clear.

And here in Damien's flat, watching their lips meet, she knows that she knows nothing, but wants nothing more than to see the film of which this must be a part. Must be.

The problem, for the group forming around this artifact, as indeed for all group formation, is that of the contradiction between universality – in this case the universality of taste as such – and the particularity of this unique value that sets us off from all the others and defines us in our collective specificity. A political sect (as we now seem to call these things) wishes to affirm the universal relevance of its strategy and its ultimate aims, and at one and the same time to keep them for itself, to exclude the outsiders and the late-comers and those who can be suspected of insufficient commitment, insufficient passion and belief. The deeper anxiety of the practitioners of the footage website and chatroom is, in other words, simply that the footage will go public: that CNN will get wind of this interesting development; that the footage, or the completed film, the identified and reconstructed work of art, will become, as they say, the patrimony of mankind, or in other words, just another commodity. As it turns out, this fear is only too justified; but I omit the details, as I hate people who tell you the ending, except to express my mixed feeling that Pynchon's solution was perhaps the better one, namely to break off *Lot 49* on the threshold of the revelation to come, as Oedipa is on the point of entering the auction room.

After all this, it may come as something of a surprise to learn that the footage is not the central issue of this novel, even though it supplies the narrative framework. Yet it ought already to have been clear that there is a striking and dramatic contradiction between the style, as we have described it, and the footage itself, whose "absence of stylistic clues" suggests a veritable Barthesian "white writing". Indeed, it is rather this very contradiction which is the deeper subject of *Pattern Recognition*, which projects the Utopian anticipation of a new art premised on "semiotic neutrality", and on the systematic effacement

of names, dates, fashions and history itself, within a context irretrievably corrupted by all those things. The name-dropping in-group language of the novel thus revels in everything the footage seeks to neutralize; the work becomes a kind of quicksand, miring us ever more deeply in what we struggle to escape. Yet this is not merely an abstract interpretation, nor even an aesthetic: it is also the existential reality of the protagonist herself, and the source of the "gift" that informs her profession.

Cayce Pollard's talent, lying as it does halfway between telepathy and old-fashioned aesthetic sensibility, is in fact what suspends Gibson's novel between Science Fiction and realism and lends it its extraordinary resonance. To put it simply (as she does), Cayce's business is to "hunt cool"; or in other words, to wander through the masses of now and future consumers, through the youth crowds, the "Children's Crusade" that jams Camden High Street on weekends, the teeming multitudes of Roppongi and Shinjuku, the big-city agglomerations of every description all over the world, in order mentally to detect the first stirrings of anything likely to become a trend or a new fashion. She has in fact racked up some impressive achievements, of which my favorite, reeking somewhat of DeLillo, is the identification of the first person in the world to wear his baseball cap backwards. But these "futures" are very much a business proposition, and Cayce is something like an industrial spy of times to come. "I consult on design ... Manufacturers use me to keep track of street fashion" (87); these modest formulas are a little too dry and underplay the sheer physicality of this gift, which allows her to identify a "pattern" and then to "point a commodifier at it". There is here no doubt something of the specialized training of the authenticator of paintings and the collector of antique furniture; but its uncanny temporal direction condemns Cayce irredeemably, and despite her systematically black and styleless outfit, to the larger category of fortune-tellers and soothsayers (and also occasionally puts her in real physical danger).

This new *métier* thus draws our world insensibly into some science-fictional future one, at least on the borders, where other details also fail to coincide: such as the paid job of another character to start rumors, to drop the names of products and cultural items enthusiastically in one bar after another, in order to set in motion what would in Pynchon have been a conspiracy, but what is here just another fad or craze.

But Cayce's gift is drawn back into our real (or realistic) world by the body itself; she must pay for it by nausea and anxiety attacks, the commodity bulimia, which are the inevitable compensation for her premonitory sensibility. It is as if the other face of the "coming attraction", its reification and the dead-end product of what was once an active process of consumption and desire itself, were none other than the logo. The mediation between these two extremes of *ergon* and *energeia*, of product and process, lies no doubt in the name itself, of which we have said that in the commercial nominalism of the

postmodern everything unique and interesting tends towards the proper name. Indeed, within the brand name the whole contradictory dialectic of universality and particularity is played out as a tug of war between visual recognition and what we may call the work of consumption (as Freud spoke of the work of mourning). And yet, to paraphrase Empson, the name remains, the name remains and kills; and the logo into which the brand name gradually hardens soaks up its toxicity and retains the poison.

Cayce's whole body is a resonator for these omnipresent logos, which are nonetheless louder and more oppressive in certain spaces (and places) than in others. To search for an unusual item in Harvey Nichols, for instance, is a peculiarly perilous activity:

Down here, next to a display of Tommy Hilfiger, it's all started to go sideways on her, the trademark thing Less warning aura than usual. Some people ingest a single peanut and their head swells like a basketball. When it happens to Cayce, it's her psyche. Tommy Hilfiger does it every time, though she'd thought she was safe now. They said he'd peaked, in New York. Like Benetton, the name would be around, but the real poison, for her, would have been drawn ... This stuff is simulacra of simulacra. A diluted tincture of Ralph Lauren, who had himself diluted the glory days of Brooks Brothers, who themselves had stepped on the product of Jermyn Street and Savile Row, flavoring their ready-to-wear with liberal lashings of polo knit and regimental stripes. But Tommy Hilfiger surely is the null point, the black hole. There must be some Tommy Hilfiger event horizon, beyond which it is impossible to be more derivative, more removed from the source, more devoid of soul. (17-18)

These nauseas are part of Cayce's navigational apparatus, and they stretch back to some of the oldest logos still extant, such as her worst nightmare, Bibendum, the Michelin Man, which is like that crack through which the Lacanian Real makes its catastrophic appearance. "National icons", on the other hand, "are always neutral for her, with the exception of Nazi Germany's ... a scary excess of design talent."

Now it is a little easier to see the deeper meaning of the footage for Cayce: its utter lack of style is an ontological relief, like black-and-white film after the conventional orgies of bad Technicolor, like the silence of solitude for the telepath whose mind is jammed with noisy voices all day long. The footage is an epoch of rest, an escape from the noisy commodities themselves, which turn out, as Marx always thought they would, to be living entities preying on the humans who have to coexist with them. Unlike the footage, however, Gibson's novel gives us homeopathy rather than antidote.

It does not seem anticlimactic to return to the future and to everything also autoreferential about this novel, whose main character shares the sound of the

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name of that of *Neuromancer*, if not its spelling (or gender). Is it possible that Cayce's premonitions of future novelty can also stand as the allegory of some emergent "new Gibson novel" as well? *Pattern Recognition* at any rate does seem to constitute a kind of pattern recognition for Gibson as well, as indeed for Science Fiction generally.

2003

The Concept of a Meta-Font

Donald E. Knuth

A single drawing of a single letter reveals only a small part of what was in the designer's mind when that letter was drawn. But when precise instructions are given about how to make such a drawing, the intelligence of that letter can be captured in a way that permits us to obtain an infinite variety of related letters from the same specification. Instead of merely describing a single letter, such instructions explain how that letter would change its shape if other parameters of the design were changed. Thus an entire font of letters and other symbols can be specified so that each character adapts itself to varying conditions in an appropriate way. Initial experiments with a precise language for pen motions suggest strongly that the font designer of the future should not simply design isolated alphabets; the challenge will be to explain exactly how each design should adapt itself gracefully to a wide range of changes in the specification. This paper gives examples of a meta-font and explains the changeable parameters in its design.

Some of Aristotle's philosophical writings were called *Metaphysics*, because they came *after* his *Physics*, in the conventional arrangement of his works. By the twentieth century, most people had forgotten the original meaning of Greek prefixes, so that 'meta-' was assumed to add a transcendent character to whatever it qualified. We now have metapsychology (the study of how the mind relates to its containing body), metamathematics (the study of mathematical reasoning), and metalinguistics (the study of how language relates to culture); a metamathematician proves metatheorems (theorems about theorems), and a computer scientist often works with metalanguages (languages for describing languages). Newly coined words beginning with 'meta-' generally reflect our contemporary inclination to view things from outside, at

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a more abstract level, with what we feel is a more mature understanding.

In this sense a 'meta-font' is a *schematic description of how to draw a family of fonts*, not simply the drawings themselves. Such descriptions give more or less precise rules about how to produce drawings of letters, and the rules will ideally be expressed in terms of variable *parameters* so that a single description will actually specify many different drawings. The rules of a meta-font will thereby define many different individual fonts, depending on the settings of the parameters. For example, the American Type Founders specimen book of 1923 included the following members of its 'Caslon' family: plain, oldstyle, lightface, bold, heavy, condensed, lightface condensed, bold condensed, extra condensed, bold extended, shaded, and openface, not to mention American Caslon, New Caslon, Recut Caslon, and Caslon Adbold; each of these was available in about sixteen different point sizes, so the total number of Caslon roman fonts was about 270. There was an overall design concept loosely tying all these fonts together so that they were recognizably 'Caslon', although the changes in size and weight were accompanied by more or less subtle changes in the letter shapes. We can regard this overall design as a meta-font that specified how the letters would change in different circumstances—the meta-font governed the metamorphoses.

Of course, the actual design of all these Caslon varieties was not completely explicit; it was conveyed implicitly by means of a few drawings

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that specified a few critical examples. A skilled workman could make the appropriate modifications for intermediate sizes and styles just as skilled animators do the 'in-betweening' for Walt Disney cartoons. It would be preferable, however, to have a completely explicit design, so that the designer's intentions would be unambiguously recorded; then we wouldn't have to resort to the vague notion of 'appropriate modifications'. Ideally, the designer's intentions should be so explicit that they can be carried out satisfactorily by somebody who doesn't understand letter shapes at all—even by a stupid, inanimate, electronic computer!

George Forsythe once wrote that 'The question "What can be automated?" is one of the most inspiring philosophical and practical questions of contemporary civilization.' We know from experience that we understand an idea much better after we have succeeded in teaching it to someone else; and the advent of computers has brought the realization that even more is true: The best way to understand something is to know it so well that you can teach it to a computer. Machines provide the ultimate test, since they do not tolerate 'hand waving' and they have no 'common sense' to fill the gaps and vagaries in what we do almost unconsciously. In fact, research in artificial intelligence has shown that computers can do virtually any task that is traditionally associated with 'thinking,' but they have great difficulty accomplishing what people and animals do 'without thinking.' The art of letter design will not be fully understood until it can be

explained to a computer; and the process of seeking such explanations will surely be instructive for all concerned. People often find that the knowledge gained while writing computer programs is far more valuable than the computer's eventual output.

In order to explain a font design to a machine, we need some sort of language or notation that describes the process of letter construction. Drawings themselves do not suffice, unless the design is so simple that all fonts of the family are related to each other by elementary transformations. Several notations for the precise description of letter shapes have been introduced in recent years, including one that the author developed during 1977–1979. The latter system, called METAFONT, differs from previous approaches in that it describes the motion of the center of a 'pen' or 'eraser' instead of describing the boundary of each character. As a result, the METAFONT language appears to facilitate the design of font families; for example, it took only about two weeks of work to create the crude but passable meta-font described in reference [5].

After another six months of development, during which literally thousands of refinements were made, the design of this prototype meta-font has reached its current state, which was used to typeset the present article. The name Computer Modern has been attached to the resulting group of fonts, a family that includes meta-fonts for both roman and italic styles in addition to the Greek and Cyrillic alphabets and an upper-case calligraphic script, together with an extensive set of mathematical

symbols. The basic idea underlying the design of this font family was to capture the spirit of the 'Monotype Modern Extended 8A' fonts used in the first printings of the author's books on computer programming, but to cast the design in the METAFONT idiom and to include a wide range of parametric variations.

So many variations are possible, in fact, that the author keeps finding new settings of the parameters that give surprisingly attractive effects not anticipated in the original design; the parameters that give the most readability and visual appeal may never be found, since there are infinitely many possibilities. On the other hand, it would be possible to parameterize many other things that cannot be varied in the present design; an almost endless series of interesting experiments can be performed, now that METAFONT is available.

Computer Modern Roman has 28 parameters that affect the shapes of its letters, plus three parameters that help control inter-letter spacing. There are also a few miscellaneous parameters whose sole function is to select alternate character and ligature shapes in different fonts. For example, one of the latter parameters is used to select between two styles for the letter 'g'; the reader may have already noticed that the g's in the present paragraph are different from those used elsewhere in this article. A few other typographic tricks like this will be played in what follows; large type has been used so that the effects will not be impossible to perceive.

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The most interesting and important parameters of Computer Modern will be changed in the following paragraphs, one at a time, in order to show how much variability is possible. Of course it is easy to find settings of the parameters that don't give satisfactory results, since a single design cannot be expected to solve all conceivable problems; therefore our examples will attempt to illustrate the limiting cases where things break down as well as the in-between regions where usable fonts are to be found.

The first and most obvious group of parameters controls the vertical dimensions of letters: The x-height and the heights of ascenders and descenders can be independently specified. There are, in fact, two independent measurements for descenders, one to control the depths of the letters g j p q y and the other to control the depths of other symbols like commas and the tail of the letter Q. The height of upper-case letters is independent of the height of lower-case letters, and the height of the numerals 0 to 9 can also be varied at will. The most unusual parameter relating to vertical dimensions is called the e-height, namely the height of the bar in a lower-case e; in the current designs the e-height also affects several other lower-case letters:

**the sack, the sack, the sack, the sack,
the sack, the sack,**

Another fairly obvious group of parameters governs the horizontal dimensions of the characters: It is possible to obtain fonts that are

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An ellipse like '●' has an aspect ratio of 1/3, while the aspect ratio of '●' is 3/1. It is interesting to see what happens when sans-serif letters are drawn with pens of different aspect ratios:

- A pen of aspect 1/3 generated these letters.
- A pen of aspect 2/3 generated these letters.
- A pen of aspect 1/1 generated these letters.
- A pen of aspect 3/2 generated these letters.
- A pen of aspect 3/1 generated these letters.

The aspect ratio can also be varied when the pens have different widths and serifs are present; in this case the aspect affects the darkness of letters like g and s that have thick horizontal strokes:

- A pen of aspect 1/3 generated these letters.
- A pen of aspect 2/3 generated these letters.
- A pen of aspect 1/1 generated these letters.
- A pen of aspect 3/2 generated these letters.
- A pen of aspect 3/1 generated these letters.

(In the examples above, the widths of thick vertical stems for aspect ratios less than 1 are equal to the heights of thick horizontal stems for aspect ratios greater than 1.)

Special care is needed in the choices of the pen-width parameters. For example, undesirable blotches appear when the bulbs are too large for the stems; and the type has a disturbing inconsistency when the curved stems are substantially wider than the straight ones. **A font cannot get too bold without having portions of the letters run into each other.** Perhaps future meta-fonts will be

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extremely extended or extremely condensed without changing the heights or widths of the strokes. One can also imitate a typewriter by extending or condensing the individual characters so that each one has the same width. Note that the length of serifs is proportional to the width, so that an i has much longer serifs than an m in the typewriter style.

Of course we get a much better imitation of a typewriter when the distinction between thick and thin strokes disappears. Such a font looks typewriter-like even when its letters do not all have the same width.

The letters of Computer Modern are all drawn by pens having an elliptical nib; for example, the thick strokes of the h's in this sentence were made by a pen that would look like '—' if enlarged ten times. The ellipses have perfectly horizontal axes, not tipped as '／', because the letters are intended to have vertical stress. Different pens are used to draw different parts of the letters.

Five parameters control the dimensions of these elliptical pens: One for the thin hairlines, another for thick stem lines that are straight, another for thick stem lines that are curved, another that gives bulbs on letters like acf..y, and another that gives an aspect ratio between horizontal and vertical dimensions. The height of the hairline pen is used also as the height of the pens that draw the thick vertical stem lines. If the first four of these pen-width parameters are equal and if the aspect ratio is 1/1, the pens will be perfect circles.

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set up to compute desirable pen dimensions from a smaller set of independent parameters, since the proper widths depend in a subtle way on each other; at the moment, trial and error is necessary to get a compatible set of pens, but further research should shed some light on this dependence.

Only five pen-width parameters have been mentioned, for simplicity, but the actual situation is somewhat more complex. In the first place, the pens used for drawing upper-case letters are specified separately from those used to draw the lower-case ones, and numerals are drawn by mixing these two specifications. There is also a parametric 'fudge factor' that takes some weight off of letters like *w* and *m*, which otherwise would look too dark in some styles; true uniformity in line widths does not lead to uniform appearance, because our eyes play tricks on us.

Another slightly subtle parameter of the Computer Modern fonts is the so-called 'overshoot' by which curves and sharp corners descend below the baseline and above the mean line. For example, the letters in this sentence have no overshoot at all. And certain letters in this sentence overshoot their boundaries by thrice as much as they do in the following sentences. Experimentation is still necessary to find the amount of overshoot that makes the letters look most stable, and on low resolution printing equipment it is desirable to eliminate overshoot entirely; further study of this parameter, in combination with the others, would be quite interesting.

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Serif details can be varied in several ways. For example, there are no 'sheared' serifs on the letters in this sentence. And the letters you are now reading have thrice as much shear as usual, just to make sure that the concept of shear is clear. Another serif-oriented concept is the amount of 'bracketing'; the serifs in this sentence have no brackets. But the brackets are exaggerated in this sentence, so the serifs appear darker. The difference can be understood most easily if we enlarge the letters:

no bracketing;

normal bracketing;

noticeable bracketing.

A curve that starts at the edge of the serif will be tangent to the stem at some distance above or below the serif; this vertical distance is the 'bracketing' parameter.

A third parameter affecting serifs is called the 'crispness': The example serifs above have been crisply squared off, using a special rectangular pen instead of an ellipse, but one can also specify

no crispness,

in which case only the elliptical pens are used. The typewriter-like font examples above are non-crisp.

The length of serifs is, of course, controllable too. The letters in this sentence have serifs that are 50% shorter than before. And in this sentence they are 50% longer than before—so long

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that they sometimes touch where they shouldn't. To get sans-serif letters, one simply sets the serif length to zero (and makes appropriate changes in the inter-letter spacing). The sans-serif letters in Computer Modern Roman have 'soft' endpoints because they are drawn with elliptical pens; it would be possible to get crisp edges by extending the Computer Modern routines, but sans-serif fonts were not given high priority in this particular design.

A 'slant' parameter transforms the pen motion, as shown in this sentence, but the pen shape remains the same. The degree of slant can be negative as well as positive, if unusual effects are desired. *Too much slant leads, of course, to letters that are nearly unreadable.* Perhaps the most interesting use of the slant parameter occurs when Computer Modern Italic fonts are generated without any slant: Italic letters have a different style from roman, and we are so used to seeing such letters slanted forward that they appear to be slanting backward when they are actually upright or slanting slightly forward.

The final parameter we shall discuss is the most interesting one; it is called 'the square root of 2'. From a mathematical standpoint, there is of course only one square root of 2, but the Computer Modern meta-fonts treat $\sqrt{2}$ as a variable parameter that is used to compute the 45° points when a pen is drawing elliptical curves. As a result, a value that is smaller than the true one will change an ellipse to a super-ellipse and open up the bowls, while a higher value will have the opposite effect:

The 'square root of 2' in these letters is 1.100.
The 'square root of 2' in these letters is 1.300.
The 'square root of 2' in these letters is 1.414.
The 'square root of 2' in these letters is 1.500.
The 'square root of 2' in these letters is 1.700.

Several additional parameters can be varied in addition to those we have mentioned; for example, there is an amount by which sharp corners in letters like V and M are spread apart to avoid unnecessary fill-in, and some parameters such as the serif length are specified independently for upper-case and lower-case letters. But a complete description of Computer Modern Roman is beyond the scope of this paper.

We have been studying the parameters one at a time—what happens when they are all changing at once? The next page shows one of the interesting transformations that are possible. At the top we have a font with an old-fashioned feeling, essentially the same as the style of type used so far in the text of this paper, except for scale: The h-height is 8.4 points, the x-height is 4 points, the e-height is 2.3 points, and the descender depth is 3 points. Hairlines are 0.26 points wide, compared to 1.2-point straight stems and 1.34-point curved stems; the bulb diameter is 1.36 points and the aspect ratio is 1/1. One em in this style equals 12.6 points; serifs are .07777 of an em long, and they have 0.54 points of shear, 0.8 points of bracketing. The overshoot parameter is 0.3 points, and the 'square root of 2' has its mathematically correct value 1.414214.

The letters at the end of the example on the previous page have been transformed into an almost hypermodern font, which will be used for the remainder of this article.

The h-height is still 8.4 points, but the x-height has grown to 6.4 points and the e-height to 3.2; the descender depth is now 4 points. Hairlines and stem lines are both exactly one point wide, and bulbs have a diameter slightly larger (1.1 points); the aspect ratio is 3/5. One em is now 21.6 points; the serif length is zero, and so are the shear and bracketing parameters. There are 0.1 points of overshoot, and the 'square root of 2' is 1.3.

Each of the 593 letters, spaces, and punctuation marks in the example belongs to a different font, obtained by going 1/592 of the way further toward the final parameter settings. Thus, although each letter appears to be in the same font as its neighbors, the cumulative

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Continuous variation of parameters can gradually convert a font with an old-fashioned flavor into a contemporary style. All of the letters in this example have the same h-height, but their em width increases as their x-height increases. This gives a perspective effect in which the words come out of the past to the present, as they approach the future.

The LORD is my shepherd;
I shall not want.
He maketh me to lie down
in green pastures:
he leadeth me
beside the still waters.
He restoreth my soul:
he leadeth me
in the paths of righteousness
for his name's sake.
Yea, though I walk through the valley
of the shadow of death,
I will fear no evil:
for thou art with me;
thy rod and thy staff
they comfort me.
Thou preparest a table before me
in the presence of mine enemies:
thou anointest my head with oil,
my cup runneth over.
Surely goodness and mercy
shall follow me
all the days of my life:
and I will dwell
in the house of the LORD
for ever.

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change is quite dramatic—it is something like the gradual changes in our own faces as we grow older, except that this typeface is getting younger.

Hundreds of typefaces have appeared in this article, yet all of them belong to the Computer Modern Roman and Italic meta-fonts. Each letter has been specified by a computer program written in the **METAFONT** language, and the computer can draw any desired variant of that letter when the parameter values have been supplied. It is important to remember that none of these conventions and parameters are built into **METAFONT** itself; **METAFONT** is a general-purpose language intended to facilitate the design of meta-fonts, and Computer Modern is but one approach to font design using such a language.

Let us take a brief look at the program for the letter h, since this will give some insight into the way a meta-font can

be designed. Each Computer Modern Roman h is drawn essentially as follows, if we paraphrase the **METAFONT** code into English:

This character will be 10 units wide, where there are 18 units per em; however, the width should be adjusted by the 'serif correction' after the character has been drawn, to account for long or short serifs.

There are several key points in this letter, defined as follows: Take an elliptical pen whose height is equal to the hairline width times the aspect ratio, and whose width is equal to the straight stem width for lower-case letters. When this pen is centered at point 1, its center is approximately 2.5 units from the left edge of the character (rounded so that the center is in a good position with respect to the raster), and its top is at the h-height for lower-case letters. Point 2 is directly below point 1; the bottom of the pen will be exactly at the baseline when its center is at point 2. Points 3 and 4 both lie approximately 2.5 units from the right edge of the character; point 4 is directly to the right of point 2, while point 3 is $1/3$ of the way from the e-height to the x-height.

Take the pen and draw a straight stem from point 1 to point 2, and another from point 3 to point 4. Put a sheared serif at the left of point 1, and attach serifs at both sides of points 2 and 4, using the serif sub-programs (which take proper account of the shear, bracketing, crispness, and serif-length parameters).

Finally, the shoulder of the h is drawn as follows: The stroke begins vertically at a point $1/8$ of the way from the e-height to the x-height, using a hairline pen positioned flush right with the left stem line. This hairline pen traces a quarter-ellipse, ending at a point that is horizontally centered in the character and such that the pen's top is at the x-height plus half of the overshoot; let us call this point 5.

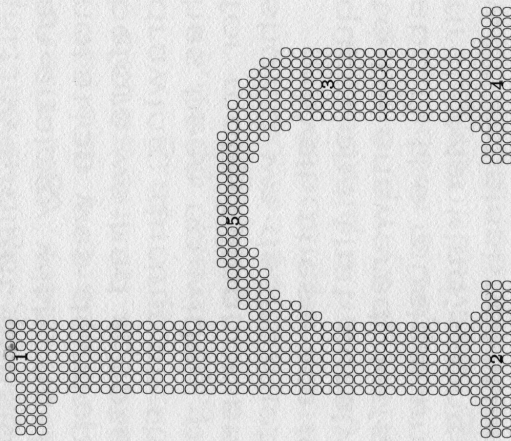
The shoulder is completed by drawing one quarter of a superellipse from point 5 to point 3 as the pen grows from the hairline width to the straight stem width; the midpoint of this arc is computed by using the geometric mean of the number 1.23114413 and the 'square root of 2' parameter, instead of $\sqrt{2}$, in the usual formulas for ellipses. (The strange constant 1.23114413 is $2^{3/10}$, chosen so that Piet Hein's famous superellipse will be obtained if the 'square root of 2' equals $\sqrt{2}$.)

Similar routines will yield the m and the n. Effects of the 'slant'

We might consider also an analogy with music: Musical notation was developed centuries before we had a notation for drawing; during all this time there has been no widely perceived need for meta-symphonies, so why should we desire meta-fonts?

Well, these are legitimate questions that surely deserve to be answered; let's think about the musical analogy first. Mankind's long experience with musical notation shows clearly that the mere existence of a precise language does not by itself call for the introduction of parameters into that notation. Indeed, parameters have not crept into serious music, even in primitive ways, until very recently, except in a few almost-forgotten pieces like Mozart's meta-waltz [11]. It would surely be interesting and instructive to write meta-music that would produce variable degrees of suspense, excitement, pathos, sturm und drang in the

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The program that is paraphrased in the text might prepare this character for a low-resolution printing device. Note the five key points numbered 1, 2, 3, 4, and 5; the center of the 'pen' travels through these points as it draws the letter.

parameter are not mentioned in this description, since slanting is done by a different part of the computer program, at the time the actual drawing is being produced.

The idea of a meta-font should now be clear. But what good is it? The ability to manipulate lots of parameters may be interesting and fun, but does anybody really need a $6\frac{1}{7}$ -point font that is one fourth of the way between Baskerville and Helvetica?

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listener, depending on the setting of certain parameters; but there would be little apparent use for such music except in the sound track of motion pictures.

All analogies break down, of course, and font design is different from musical composition because alphabets are not symphonies; an alphabet is a 'medium' while a symphony is a 'message'. We get a much better analogy between fonts and music when we consider background music rather than symphonies; since fonts serve as the background for an author's printed ideas. Many people resent background music because they feel that music should either be the main focus of a person's attention or it should be absent entirely, while it is generally agreed that the reader of a book should not be conscious of the g's and the k's in that book. A font should be sublime in its appearance but subliminal in its effect.

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The utility of parametric variations comes from mankind's need for variety. We don't all want to live in identical houses or drive identical cars. Background music becomes especially tedious when it comes from a limited score having only a few motifs; and five centuries of typographic practice have witnessed a continual craving for new alphabets and for large families of related alphabets. Thus, although any one particular setting of a meta-font's parameters may seem to be somewhat silly and unnecessary, the ability to choose arbitrary parameter settings fills a real need. Book designers and the designers of advertising copy will have greater freedom than ever before when they have several meta-fonts to work with. Personalized fonts and one-time-only fonts will also be easy for anyone to obtain.

Another reason why meta-fonts and meta-music were not

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highly developed long ago is the fact that computers did not exist until recently. People find it difficult and dull to carry out calculations with a multiplicity of parameters, while today's machines do such tasks with ease.

Perhaps the most important practical result of parametric variations is the ability to make adjustments for each point size; the contemporary tendency to obtain 7-point fonts by 70% reduction of 10-point fonts has led to a lamentable degradation of quality. Another advantage is that a meta-font can adapt its curves so that they are properly 'rounded' for the digital typesetting machines that are based on discrete rasters. This leads to a significant reduction in the need for manual editing of the raster patterns.

It is, of course, quite a challenge to design a meta-font instead of a single font. A designer wants to remain in control, yet the great variety

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of possible parameter settings means that the meta-font is able to generate infinitely many alphabets, most of which will never be seen by human eyes; only a few of the possibilities can really be looked at, much less fine-tuned, before the specification of the meta-font has been completed. On the other hand, the designer of a meta-font has compensating advantages, because it is often convenient to be able to postpone making decisions about many aspects of a design and to leave them as parameters, instead of 'freezing' their specifications in the initial stages. Such things as the amount of overshoot, the width of hairlines, the length of serifs, and so on, need not be decided once and for all; it is easy to ask the computer to make experiments by which the designer will be able to choose the best settings of these subtle quantities after viewing actual typeset material. Experiments of

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Annotated Bibliography

The nine-point type used to set this bibliography reflects the parameter settings for Computer Modern Roman that were used in its original design, based on the 'Monotype Modern 8' font; the more extreme settings used to typeset the text of the paper were chosen long after the design itself was complete, in order to illustrate the meta-font concept.

- [1] P. J. M. Coueignoux, *Generation of roman printed fonts*, Ph.D. thesis, Dept. of Electrical Engineering, M.I.T., June 1975. This thesis represents the first use of sophisticated mathematical curves to describe letter shapes to a computer. Coueignoux and his students are presently continuing this research at the École Nationale Supérieure des Mines de Saint-Etienne, France.
- [2] Adrian Frutiger, *Type Sign Symbol* (Zürich: ABC Verlag, 1980); see especially pages 15–21, which describe 'Why Univers was designed and how it developed.' Univers was the first true meta-font, in the sense that a wide variety of different sizes and weights played a central rôle in its design from the very beginning. 'The decisive factor for the many new design possibilities provided by Univers was that it became possible, for the first time, to work with a set of typefaces as a complete system.' Page 59 of this fascinating book shows a meta-letter n, called the 'proportional schema of a typeface family,' graphically depicting the desirable stroke variations as the font gets bolder.
- [3] Peter Karow et al., 'IKARUS: computer controlled drafting, cutting and scanning of characters and signs. Automatic production of fonts for photo-, CRT and lasercomp machines. Summary.' (September 1979.) This booklet is available from URW Unternehmensberatung, Karow Rubow Weber GMBH, Harksheder Straße 102, 2000 Hamburg 65, Germany. The IKARUS system is now widely used to capture the shapes of letters in mathematical form, based on original artwork [cf. *Baseline* 3 (1981), 6–11]. The computer programs will also interpolate between different weights, although the number of independent parameters is quite limited; this feature was used successfully by Matthew Carter to develop several weights of his new Galliard type, including Ultra Roman [cf. Charles Bigelow, 'On type: Galliard,' *Fine Print* 5 (1979), 27–30].
- [4] David Kindersley and Neil Wiseman, 'Computer-aided letter design,' *Printing World* (October 31, 1979), 12, 13, 17. Discusses the ELF system at Cambridge University, which features a novel method of optical spacing between letters.
- [5] Donald E. Knuth, 'Mathematical typography,' *Bulletin of the American Mathematical Society* (new series) 1 (March 1979), 337–372; reprinted with corrections as part 1 of *TeX and METAFONT: New Directions in Typesetting* (Providence, R.I.: American Mathematical Society, and Bedford, Mass.: Digital Press, 1979). A paper written shortly after the author began his research on font generation; it explains the initial motivations for this work and shows an experimental roman meta-font.
- [6] Donald E. Knuth, 'The letter S,' *The Mathematical Intelligencer* 2 (1980), 114–122. Discussion of the letter that is most difficult to incorporate into a parameterized meta-font.
- [7] Donald E. Knuth, *Seminumerical Algorithms*, Volume 2 of *The Art of Computer Programming* (Reading, Mass.: Addison-Wesley, 1981). This book was the first large work to be typeset entirely with the Computer Modern meta-fonts; indeed, Computer Modern was developed expressly for the books in this series. The design of Computer Modern had still not been fully completed at the time of

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this kind would be unthinkable if each character had to be drawn individually—i.e., if each character were simply in a font rather than a meta-font.

In the long run the scientific aspects of meta-fonts should prove to be the most important. The ability to adjust continuous parameters makes it possible to carry out controlled experiments about how such variations affect readability or visual appeal. And even more significant will be the knowledge that will be explicitly embedded in the descriptions of meta-fonts. For example, the author learned a great deal about font design while refining the Computer Modern alphabets, and this information is now accessible to anybody who reads the **META-FONT** code. It is tantalizing to think how much further the art of font design will be advanced when professionals who really know the subject begin to create meta-fonts in an explicit language like **METAFONT**.

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printing; for example, the x-height settings were slightly higher than they are now, and certain characters like '2' have been revised. However, the alphabets in the present paper were obtained from those in *Semimmetrical Algorithms* by making only a few dozen refinements. Such revisions and afterthoughts are probably inevitable, especially when the computer representation of a meta-font makes changes so easy; it is very hard to stop and say 'there will be no more improvements made!'

Donald E. Knuth, *The Computer Modern Family of Type Faces*, a book in preparation, will contain the complete **METAFONT** programs for the Computer Modern Roman and Italic meta-fonts. A preliminary version of this book was published as Stanford Computer Science report STAN-CS-80-780 (January 1980), in order to illustrate the state of the work at that time, but hundreds of important refinements have been incorporated since those early days.

J. R. Manning, 'Computer-aided footwear design: A method of constructing smooth curves', Research report 251, Shoe and Allied Trades Research Association (December 1972, revised February 1953); available from Satra House, Rockingham Road, Kettering, Northants NN16 9JH, England. The clothing industry has needs analogous to those of type designers; this paper discusses the generation of curves that pass through given key points, and it includes a 'meta-shoe' as an example.

[10] H. W. Mergler and P. M. Vargo, 'One approach to computer assisted letter design', *Visible Language* [née *The Journal of Typographic Research*] **2** (1968), 299-322. This paper describes the first computer system for parametric letter design; it included a meta-font for upper-case roman letters. The approach was limited and unsuccessful because it was entirely based on edge generation with a limited class of curves and because of the equipment limitations of the 1960s, but the authors had laudable goals.

[11] Wolfgang A. Mozart, *Musikalisches Würfelspiel*, Edition Schott, 4474 (Mainz: B. Schott's Söhne, 1957); see also Köchelverzeichnis 516f Anh. C30.01. This unusual score presents a waltz that can be played in 759,499,667,966,482 different ways, since there are eleven possibilities for most of the individual bars; the harmonic principles have been analyzed by Hermann Scherchen in *Gravesaner Blätter* **4** (May 1956), 3-14. Mozart also devised a meta-contradanse, and the British Museum reportedly owns a meta-score by Haydn. A noteworthy 20th-century example of meta-music can be found in *The Schillinger System of Musical Composition* by Joseph Schillinger (two volumes), New York: Carl Fischer, 1946.

[12] Edward Rondthaler, 'From the rigid to the flexible,' *Penrose Annual* **53** (1959), xv, 1-9. An early description of the variability of type that is possible with photographic transformations alone.

The research reported in this paper was supported in part by National Science Foundation grants IST-7921977 and MCS-7723738, and in part by the IBM Corporation. The author also wishes to thank Charles Bigelow, Matthew Carter, Douglas Hofstadter, Jill Knuth, and Michael Parker for numerous suggestions that helped to improve the presentation; and he owes a special debt of gratitude to Hermann Zapf for dozens of invaluable suggestions that helped greatly to improve the design of the Computer Modern meta-fonts. This paper was typeset on an Alphatype CRS machine, using software developed by the author and an interface developed by David R. Fuchs. Apologies are made to language purists who object to mixing Greek and Latin stems: The Greek equivalent of *font* is *πηγή*, so a word like 'metapeg' might be superior to 'metafont'. However, such a name would not be readily understood by people who encounter it for the first time, at least not until the day that the science of font design becomes known as *pegology*.

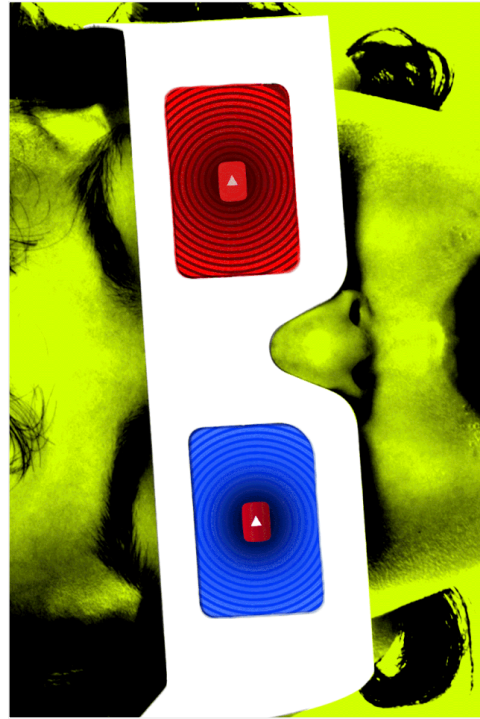
1/23/2018

The Algorithm That Makes Preschoolers Obsessed With YouTube Kids - The Atlantic

The Atlantic

The Algorithm That Makes Preschoolers Obsessed With YouTube

Surprise eggs and slime are at the center of an online realm that's changing the way the experts think about human development.



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The Algorithm That Makes Preschoolers Obsessed With YouTube Kids - The Atlantic

Toddlers crave power. Too bad for them, they have none. Hence the tantrums and absurd demands. (*No, I want this banana, not that one, which looks identical in every way but which you just started peeling and is therefore worthless to me now.*)

They just want to be in charge! This desire for autonomy clarifies so much about the behavior of a very small human. It also begins to explain the popularity of YouTube among toddlers and preschoolers, several developmental psychologists told me.

If you don't have a 3-year-old in your life, you may not be aware of YouTube Kids, an app that's essentially a stripped-down version of the original video blogging site, with videos filtered by the target audience's age. And because the mobile app is designed for use on a phone or tablet, kids can tap their way across a digital ecosystem populated by countless videos—all conceived with them in mind.

The videos that surface on the app are generated by YouTube's recommendation algorithm, which takes into account a user's search history, viewing history, and other data.* The algorithm is basically a funnel through which every YouTube video is poured—with only a few making it onto a person's screen.

This recommendation engine poses a difficult task, simply because of the scale of the platform. "YouTube recommendations are responsible for helping more than a

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billion users discover personalized content from an ever-growing corpus of videos,” researchers at Google, which owns YouTube, wrote in a [2016 paper](#) about the algorithm. That includes many hours of video uploaded to the site every second of every day. Making a recommendation system that’s worthwhile is “extremely challenging,” they wrote, because the algorithm has to continuously sift through a mind-boggling trove of content and instantly identify the freshest and most relevant videos—all while knowing how to ignore the noise.

The architecture of YouTube’s recommendation system, in which “candidate videos” are retrieved and ranked before presenting only a few to the user.
([Google / YouTube](#))

And here’s where the ouroboros factor comes in: Kids watch the same kinds of videos over and over. Videomakers take notice of what’s most popular, then mimic it, hoping that kids will click on their stuff. When they do, YouTube’s algorithm takes notice,

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and recommends *those* videos to kids. Kids keep clicking on them, and keep being offered more of the same. Which means video makers keep making those kinds of videos—hoping kids will click.

This is, in essence, how all algorithms work. It’s how filter bubbles are made. A little bit of computer code tracks what you find engaging—what sorts of videos do you watch most often, and for the longest periods of time?—then sends you more of that kind of stuff. Viewed a certain way, YouTube Kids is offering programming that’s very specifically tailored to what children want to see. Kids are actually selecting it themselves, right down to the second they lose interest and choose to tap on something else. The YouTube app, in other words, is a giant reflection of what kids want. In this way, it opens a special kind of window into a child’s psyche.

But what does it reveal?

“Up until very recently, surprisingly few people were looking at this,” says Heather Kirkorian, an assistant professor of human development in the School of Human Ecology at the University of Wisconsin-Madison. “In the last year or so, we’re actually seeing some research into apps and touchscreens. It’s just starting to come out.”

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Kids' videos are among the most watched content in YouTube history. This video, for example, has been viewed more than 2.3 billion times, according to YouTube's count:

You can find some high-quality animation on YouTube Kids, plus clips from television shows like *Peppa Pig*, and sing-along nursery rhymes. "Daddy Finger" is basically the [YouTube Kids anthem](https://www.youtube.com/watch?v=2017/07/what-youtube-reveals-about-the-toddler-mind#534765/), and ChuChu TV's dynamic interpretations of popular kid songs are inescapable.

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Many of the most popular videos have an amateur feel. Toy demonstrations like surprise-egg videos are huge. These videos are just what they sound like: Adults narrate as they play with various toys, often by pulling them out of plastic eggs or peeling away layers of slime or Play-Doh to reveal a hidden figurine.

Kids go nuts for these things.

Here's a video from the YouTube Kids vloggers Toys Unlimited that's logged more than 25 million views, for example:

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ways YouTube Kids is better suited to the attention span of a young child—just by virtue of its length—than something like a half-hour or hour broadcast program can be.”

Rich and others compare the app to predecessors like *Sesame Street*, which introduced short segments within a longer program, in part to keep the attention of the young children watching. For decades, researchers have looked at how kids respond to television. Now they’re examining the way children use mobile apps—how many hours they’re spending, which apps they’re using, and so on.

“Something about the act of choosing ... makes a difference for little kids.”

It makes sense that researchers have begun to take notice. In the mobile internet age, the same millennials who have ditched cable television en masse are now having babies, which makes apps like YouTube Kids the screentime option *du jour*. Instead of being treated to a 28-minute episode of *Mr. Rogers’s Neighborhood*, a toddler or preschooler might be offered 28 minutes of phone time to play with the *Daniel Tiger’s Neighborhood* app. *Daniel Tiger’s Neighborhood* is a television program, too—a spin-off of *Mr. Rogers’s*—aimed at viewers aged 2 years old to 4 years old.

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The vague weirdness of these videos aside, it’s actually easy to see why kids like them. “Who doesn’t want to get a surprise? That’s sort of how all of us operate,” says Sandra Calvert, the director of the Children’s Digital Media Center at Georgetown University. In addition to surprises being fun, many of the videos are basically toy commercials. (*This video of a person pressing sparkly Play-Doh* onto chintzy Disney princess figurines has been viewed 550 million times.) And they let kids tap into a whole internet’s worth of plastic eggs and perceived power. They get to choose what they watch. And kids love being in charge, even in superficial ways.

“It’s sort of like rapid-fire channel surfing,” says Michael Rich, a professor of pediatrics at Harvard Medical School and the director of the Center on Media and Child Health. “In many

But toddlers and preschoolers are actually pretty separate groups, as far as researchers are concerned. A 2-year-old and a 4-year-old might both like watching Daniel Tiger, or the same YouTube Kids video, but their takeaway is apt to be much different, Kirkorian told me. Children under the age of 3 tend to have difficulty taking information relayed to them through a screen and applying it to real-life situations. Many studies have reached similar conclusions, with a few notable exceptions. Researchers recently discovered that when a screen time experience becomes interactive—Facetime with Grandmère, let's say—kids under 3 years old actually can make strong connections between what's happening onscreen and offscreen.

Kirkorian's lab designed a series of experiments to see how much of a role interactivity plays in helping a young child transfer information this way. She and her colleagues found striking learning differences among what young children learned—even kids under 2 years old—when they could interact with an app versus when they were just watching a screen. Other researchers, too, have found that incorporating some sort of interactivity helps children retain information better. Researchers at different institutions have different definitions of “interactivity,” but in one experiment it was an act as simple as pressing a spacebar.

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“So there does seem to be something about the act of choosing, having some kind of agency, that makes a difference for little kids,” Kirkorian says. “The speculative part is why that makes a difference.”

One idea is that kids, especially, like to watch the same things over and over and over again until they really understand it. I watched the *Dumbo* VHS so many times as a little kid that I would recite the movie on long car rides. Apparently, this is not unusual—at least not since the age of VCRs and, subsequently, on-demand programming and apps. “If they have the opportunity to choose what they’re watching, then they’re likely to interact in a way that meets their learning goals,” Kirkorian says. “We know the act of learning new information is rewarding, so they’re likely to pick the information or videos that are in that sweet spot.”

“Children like to watch the same thing over and over,” says Calvert, of Georgetown. “Some of that is a comprehension issue, so they’ll repeatedly look at it so they can understand the story. Kids often don’t understand people’s motives, and that’s a major driver for a story. They don’t often understand the link between actions and consequences.”

Young kids are also just predisposed to becoming obsessive about relatively narrow interests. (Elephants! Trains! The moon! Ice cream!) Around the 18-month mark, many toddlers develop

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“extremely intense interests,” says Georgene Troseth, an associate professor of psychology at Vanderbilt University. Which is part of why kids using apps like YouTube Kids often select videos that portray familiar concepts—ones that feature a cartoon character or topic they’re already drawn to. This presents a research challenge, however. If kids are just tapping a thumbnail of a video because they recognize it, it’s hard to say how much they’re learning—or how different the app environment really is from other forms of play.

Even the surprise-egg craze isn’t really novel, says Rachel Barr, a developmental psychologist at Georgetown. “They are relatively fast-paced and they include something that young children really like: things being enclosed and unwrapped,” she told me. “I have not tested it, but it seems unlikely that children are learning from these videos since they are not clearly constructed.”

“Interactivity is not always a good thing,” she added.

Researchers differ on the degree to which YouTube Kids is a valuable educational tool. Obviously, it depends on the video and the involvement of a caregiver to help contextualize what’s on screen. But questions about how the algorithm works also play a role. It’s not clear, for instance, how heavily YouTube weighs previous watching behaviors in its recommendation engine. If a kid binge-watches a bunch of videos that are lower

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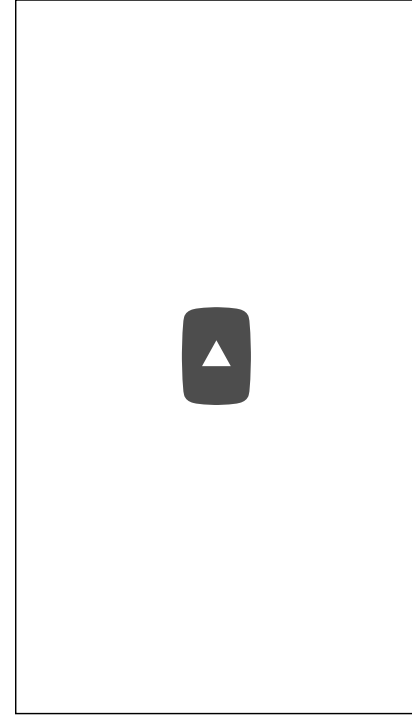
quality in terms of learning potential, are they then stuck in a filter bubble where they’ll only see similarly low-quality programming?

There isn’t a human handpicking the best videos for kids to watch. The only human input on YouTube’s side is to monitor the app for inappropriate content, a spokesperson for YouTube told me. Quality control *has still been an issue*, however. YouTube Kids last year featured a video that showed Mickey Mouse-esque characters shooting one another in the head with guns, *Today reported*.

“The available content is not curated but rather filtered into the app via the algorithm,” said Nina Knight, a YouTube spokesperson. “So unlike traditional TV, where the content is being selected for you at a specified time, the YouTube Kids app gives each child and family more of the type of content they love and anytime they want it, which is incredibly unique.”

At the same time, the creators of YouTube Kids videos spend countless hours trying to game the algorithm so that their videos are viewed as many times as possible—more views translate into more advertising dollars for them. Here’s a video by Toys AndMe that’s logged more than 12.5 million views since it was posted in September 2016:

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“You have to do what the algorithm wants for you,” says Nathalie Clark, the co-creator of a similarly popular channel, Toys Unlimited, and a former ICU nurse who quit her job to make videos full-time. “You can’t really jump back and forth between themes.”

What she means is, once YouTube’s algorithm has determined that a certain channel is a source of videos about slime, or colors, or shapes, or whatever else—and especially once a channel has had a hit video on a given topic—videomakers stray from that classification at their peril. “Honestly, YouTube picks for you,” she says. “Trending right now is Paw Patrol, so we do a lot of Paw Patrol.”

There are other key strategies for making a YouTube Kids video go viral. Make enough of these things and you start to get a


sense of what children want to see, she says. “I wish I could tell you more,” she added, “But I don’t want to introduce competition. And, honestly, nobody really understands it.”

The other thing people don’t yet understand is how growing up in the mobile internet age will change the way children think about storytelling. “There’s a rich set of literature showing kids who are reading more books are more imaginative,” says Calvert, of the Children’s Digital Media Center. “But in the age of interactivity, it’s no longer just consuming what somebody else makes. It’s also making your own thing.”

In other words, the youngest generation of app users is developing new expectations about narrative structure and informational environments. Beyond the thrill a preschooler gets from tapping a screen, or watching [The Bing Bong Song](#) video for the umpteenth time, the long-term implications for cellphone-toting toddlers are tangled up with all the other complexities of living in a highly networked on-demand world.

Related Video

Does the Internet Threaten Creativity or Nurture It?



** Unlike YouTube’s main website, YouTube Kids does not use an individual child’s geographic location, gender, or age to make recommendations, a spokesperson told me. YouTube Kids does, however, ask for a user’s age range. The YouTube spokeswoman cited the Children’s Online Privacy Protection Rule, a Federal Trade Commission requirement for operators of websites aimed at kids under 13 years old, but declined to answer repeated questions about why the YouTube Kids algorithm used different inputs than the original site’s algorithm.*

ABOUT THE AUTHOR



ADRIENNE LAFRANCE is the editor of TheAtlantic.com. She was previously a senior editor and staff writer at *The Atlantic*.

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Part III Course readings for 'Networks and Transactions' and 'Interaction Design and the Internet'

Making the Memorial

Maya Lin (*The New York Review of Books*, 2 November, 2000)

It's taken me years to be able to discuss the making of the Vietnam Veterans Memorial, partly because I needed to move past it and partly because I had forgotten the process of getting it built. I would not discuss the controversy surrounding its construction and it wasn't until I saw the documentary Maya Lin: A Strong Clear Vision that I was able to remember that time in my life. But I wrote the body of this essay just as the memorial was being completed—in the fall of 1982. Then I put it away...until now.

—M.L.

I think the most important aspect of the design of the Vietnam Veterans Memorial was that I had originally designed it for a class I was taking at Yale and not for the competition. In that sense, I had designed it for me—or, more exactly, for what I believed it should be. I never tried to second-guess a jury. And it wasn't until after I had completed the design that I decided to enter it in the competition.

The design emerged from an architectural seminar I was taking during my senior year. The initial idea of a memorial had come from a notice posted at the school announcing a competition for a Vietnam veterans memorial. The class, which was on funereal architecture, had spent the semester studying how people, through the built form, express their attitudes toward death. As a class, we thought the memorial was an appropriate design idea for our program, so we adopted it as our final design project.

At that point, not much was known about the actual competition, so for the first half of the assignment we were left without concrete directions for what “they” were looking for or even who “they” were. Instead, we had to determine for ourselves what a Vietnam memorial should be. Since a previous project had been to design a memorial for World War III, I had already begun to ask the simple questions: What exactly is a memorial? What should it do?

My design for a World War III memorial was a tomblike underground structure that I deliberately made to be a very futile and frustrating experience. I remember the professor of the class coming up to me afterward, saying quite angrily, “If I had a brother who died in that war, I would never want to visit this memorial.” I was somewhat puzzled that he didn't quite understand that World War III would be of such devastation that none of us would be around to visit any memorial, and that my design was instead a pre-war commentary. In asking myself what a memorial to a third world war would be, I came up with a political statement that was meant as a deterrent.

I had studied earlier monuments and memorials while designing that memorial and I continued this research for the design of the Vietnam memorial. As I did more research on monuments, I realized most carried larger, more general messages about a leader's victory or accomplishments rather than the lives lost. In fact, at the national level, individual lives were very seldom dealt with, until you arrived at the memorials for World War I. Many of these memorials included the names of those killed. Partly it was a practical need to list those whose bodies could not be identified—since dog tags as identification had not yet been adopted and, owing to the nature of the warfare, many killed were not identifiable—but I think as well the listing of names reflected a response by these designers to the horrors of World War I, to the immense loss of life.

The images of these monuments were extremely moving. They captured emotionally what I felt memorials should be: honest about the reality of war, about the loss of life in war, and about remembering those who served and especially those who died.

I made a conscious decision not to do any specific research on the Vietnam War and the political turmoil surrounding it. I felt that the politics had eclipsed the veterans, their service, and their lives. I wanted to create a memorial that everyone would be able to respond to, regardless of whether one thought our country should or should not have participated in the war. The power of a name was very much with me at the time,

partly because of the Memorial Rotunda at Yale. In Woolsey Hall, the walls are inscribed with the names of all the Yale alumni who have been killed in wars. I had never been able to resist touching the names cut into these marble walls, and no matter how busy or crowded the place is, a sense of quiet, a reverence, always surrounds those names. Throughout my freshman and sophomore years, the stonecutters were carving in by hand the names of those killed in the Vietnam War, and I think it left a lasting impression on me...the sense of the power of a name.

One memorial I came across also made a strong impression on me. It was a monument to the missing soldiers of the World War I Battle of the Somme by Sir Edwin Lutyens in Thiepval, France. The monument includes more than 100,000 names of people who were listed as missing because, without ID tags, it was impossible to identify the dead. (The cemetery contains the bodies of 70,000 dead.) To walk past those names and realize those lost lives—the effect of that is the strength of the design. This memorial acknowledged those lives without focusing on the war or on creating a political statement of victory or loss. This apolitical approach became the essential aim of my design; I did not want to civilize war by glorifying it or by forgetting the sacrifices involved. The price of human life in war should always be clearly remembered.

But on a personal level, I wanted to focus on the nature of accepting and coming to terms with a loved one's death. Simple as it may seem, I remember feeling that accepting a person's death is the first step in being able to overcome that loss.

I felt that as a culture we were extremely youth-oriented and not willing or able to accept death or dying as a part of life. The rites of mourning, which in more primitive and older cultures were very much a part of life, have been suppressed in our modern times. In the design of the memorial, a fundamental goal was to be honest about death, since we must accept that loss in order to begin to overcome it. The pain of the loss will always be there, it will always hurt, but we must acknowledge the death in order to move on.

What then would bring back the memory of a person? A specific object or image would be limiting. A realistic sculpture would be only one interpretation of that time. I wanted something that all people could relate to on a personal level. At this time I had as yet no form, no specific artistic image.

The use of names was a way to bring back everything someone could remember about a person. The strength in a name is something that has always made me wonder at the "abstraction" of the design; the ability of a name to bring back every single memory you have of that person is far more realistic and specific and much more comprehensive than a still photograph, which captures a specific moment in time or a single event or a generalized image that may or may not be moving for all who have connections to that time.

Then someone in the class received the design program, which stated the basic philosophy of the memorial's design and also its requirements: all the names of those missing and killed (57,000) must be a part of the memorial; the design must be apolitical, harmonious with the site, and conciliatory.

These were all the thoughts that were in my mind before I went to see the site.

Without having seen it, I couldn't design the memorial, so a few of us traveled to Washington, D.C., and it was at the site that the idea for the design took shape. The site was a beautiful park surrounded by trees, with traffic and noise coming from one side—Constitution Avenue.

I had a simple impulse to cut into the earth.

I imagined taking a knife and cutting into the earth, opening it up, an initial violence and pain that in time would heal. The grass would grow back, but the initial cut would remain a pure flat surface in the earth with a polished, mirrored surface, much like the surface on a geode when you cut it and polish the edge.

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The need for the names to be on the memorial would become the memorial; there was no need to embellish the design further. The people and their names would allow everyone to respond and remember.

It would be an interface, between our world and the quieter, darker, more peaceful world beyond. I chose black granite in order to make the surface reflective and peaceful. I never looked at the memorial as a wall, an object, but as an edge to the earth, an opened side. The mirrored effect would double the size of the park, creating two worlds, one we are a part of and one we cannot enter. The two walls were positioned so that one pointed to the Lincoln Memorial and the other pointed to the Washington Monument. By linking these two strong symbols for the country, I wanted to create a unity between the nation's past and present.

The idea of destroying the park to create something that by its very nature should commemorate life seemed hypocritical, nor was it in my nature. I wanted my design to work with the land, to make something with the site, not to fight it or dominate it. I see my works and their relationship to the landscape as being an additive rather than a combative process.

On our return to Yale, I quickly sketched my idea up, and it almost seemed too simple, too little. I toyed with adding some large flat slabs that would appear to lead into the memorial, but they didn't belong. The image was so simple that anything added to it began to detract from it.

I always wanted the names to be chronological, to make it so that those who served and returned from the war could find their place in the memorial. I initially had the names beginning on the left side and ending on the right. In a preliminary critique, a professor asked what importance that left for the apex, and I, too, thought it was a weak point, so I changed the design for the final critique. Now the chronological sequence began and ended at the apex so that the time line would circle back to itself and close the sequence. A progression in time is memorialized. The design is not just a list of the dead. To find one name, chances are you will see the others close by, and you will see yourself reflected through them.

The memorial was designed before I decided to enter the competition. I didn't even consider that it might win. When I submitted the project, I had the greatest difficulty trying to describe it in just one page. It took longer, in fact, to write the statement that I felt was needed to accompany the required drawings than to design the memorial. The description was critical to understanding the design since the memorial worked more on an emotional level than a formal level.

Coincidentally, at the time, I was taking a course with Professor Vincent Scully, in which he focused, just happened to focus, on the same memorial I had been so moved by—the Lutyens memorial to the missing. Professor Scully described one's experience of that piece as a passage or journey through a yawning archway. As he described it, it resembled a gaping scream; after you passed through, you were left looking out on a simple graveyard with the crosses and tombstones of the French and the English. It was a journey to an awareness of immeasurable loss, with the names of the missing carved on every surface of this immense archway.

I started writing furiously in Scully's class. I think he has always been puzzled by my connection to the Lutyens memorial. Formally the two memorials could not be more different. But for me, the experiences of these two memorials describe a similar passage to an awareness about loss.

The competition required drawings, along with the option to include a written description. As the deadline for submission approached, I created a series of simple drawings. The only thing left was to complete the essay, which I instinctively knew was the only way to get anyone to understand the design, the form of which was deceptively simple. I kept reworking and reediting the final description. I actually never quite finished it. I ended up at the last minute writing freehand directly onto the presentation boards (you can see a few misprints on the actual page), and then I sent the project in, never expecting to hear about it again.

The drawings were in soft pastels, very mysterious, very painterly, and not at all typical of architectural drawings. One of the comments made by a juror was "*He* must really know what he is doing to dare to do

something so naive” (*italics mine*). But ultimately, I think it was the written description that convinced the jurors to select my design.

On my last day of classes my roommate, Liz Perry, came to retrieve me from one of my classes, telling me a call from Washington had come in and that it was from the Vietnam Veterans Memorial Fund; they needed to talk to me and would call back with a few questions about the design. When they called back, they merely said they needed to ask me a few questions and wanted to fly up to New Haven to talk to me. I was convinced that I was number 100 and they were only going to question me about drainage and other technical issues. It never occurred to me that I might have won the competition. It was still, in my mind, an exercise—as competitions customarily are for architecture students.

And even after three officers of the fund were seated in my college dorm room, explaining to me that it was the largest competition of its kind, with more than 1,400 entries, and Colonel Schaet, who was talking, without missing a beat calmly added that I had won (I think my roommate’s face showed more emotion than mine did at the time), it still hadn’t registered. I don’t think it did for almost a year. Having studied the nature of competitions, especially in Washington (for instance, the FDR Memorial, still unbuilt in 1981, nearly forty years after it was first proposed, or the artwork Robert Venturi and Richard Serra collaborated on for L’Enfant Plaza, which was completely modified as it went through the required Washington design process of approvals), my attitude about unusual projects getting built in Washington was not optimistic. Partly it’s my nature—I never get my hopes up—and partly I assumed the simplicity of the design, and its atypical form and color, would afford it a difficult time through the various governmental-approval agencies.

After the design had been chosen, it was subject to approval by various governmental agencies at both the conceptual and design development phases. I moved to Washington and stayed there throughout these phases. I expected the design to be debated within the design-approval agencies; I never expected the politics that constantly surrounded its development and fabrication. I was driven down to Washington the day of my college graduation, and I immediately became part of an internal struggle for control of the design. I think my age made it seem apparent to some that I was too young to understand what I had done or to see it through to completion. To bring the design into reality would require that I associate with an architect of record, a qualified firm that would work with me to realize the design. I had a very difficult time convincing the fund in charge of the memorial—the Vietnam Veterans Memorial Fund—of the importance of selecting a qualified firm that had experience both in architecture and landscape-integrated solutions, and that would be sympathetic to the design.

I had gone to Cesar Pelli, then dean of Yale’s School of Architecture, for the names of some firms that could handle the job. A firm by the name of Cooper-Lecky was the one he recommended, and I presented its name to the fund, unaware that the competition’s adviser was the fund’s choice as architect of record. I was told by the fund that this person was the architect of record, and that was that.

After a few weeks of tense and hostile negotiations (in which at one point I was warned that I would regret these actions, and that I would “come crawling back on my hands and knees”), I was finally able to convince the fund to go through a legitimate process of selecting a firm to become the architect of record. The then architecture critic for *The Washington Post*, Wolf Von Eckardt, was instrumental in pressing the fund to listen to me. But the struggle left a considerable amount of ill will and mistrust between the veterans and myself.

Through the remaining phases of the project I worked with the Cooper-Lecky architectural firm. We worked on the practical details of the design, from the addition of a safety curb to a sidewalk to the problems in inscribing the names. Many of the issues we dealt with were connected to the text and my decision to list the names chronologically. People felt it would be an inconvenience to have to search out a name in a book and then find its panel location and thought that an alphabetical listing would be more convenient—until a tally of how many Smiths had died made it clear that an alphabetical listing wouldn’t be feasible. The MIA groups wanted their list of the missing separated out and listed alphabetically. I knew

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this would break the strength of the time line, interrupting the real-time experience of the piece, so I fought hard to maintain the chronological listing. I ended up convincing the groups that the time in which an individual was noted as missing was the emotionally compelling time for family members. A system of noting these names with a symbol that could be modified to signify if the veteran was later found alive or officially declared dead would appease the concerns of the MIA groups without breaking the time line. I knew the time line was key to the experience of the memorial: a returning veteran would be able to find his or her time of service when finding a friend's name.

The text of the memorial and the fact that I had left out everything except the names led to a fight about what else needed to be said about the war. The apex is the memorial's strongest point; I argued against the addition of text at that point for fear that a politically charged statement, one that would force a specific reading, would destroy the apolitical nature of the design. Throughout this time I was very careful not to discuss my political beliefs; I played it extremely naive about politics, instead turning the issue into a strictly aesthetic one. Text could be added, but whatever was said needed to fit in three lines—to match the height of the dates "1959" and "1975" that it would be adjacent to. The veterans approved this graphic parameter, and the statements became a simple prologue and epilogue.

The memorial is analogous to a book in many ways. Note that on the right-hand panels the pages are set ragged right and on the left they are set ragged left, creating a spine at the apex as in a book. Another issue was scale; the text type is the smallest that we had come across, less than half an inch, which is unheard of in monument type sizing. What it does is create a very intimate reading in a very public space, the difference in intimacy between reading a billboard and reading a book.

The only other issue was the polished black granite and how it should be detailed, over which I remember having a few arguments with the architects of record. The architects could not understand my choice of a reflective, highly polished black granite. One of them felt I was making a mistake and the polished surface would be "too *feminine*." Also puzzling to them was my choice of detailing the monument as a thin veneer with barely any thickness at its top edge. They wanted to make the monument's walls read as a massive, thick stone wall, which was not my intention at all. I always saw the wall as pure surface, an interface between light and dark, where I cut the earth and polished its open edge. The wall dematerializes as a form and allows the names to become the object, a pure and reflective surface that would allow visitors the chance to see themselves with the names. I do not think I thought of the color black as a color, more as the idea of a dark mirror into a shadowed mirrored image of the space, a space we cannot enter and from which the names separate us, an interface between the world of the living and the world of the dead.

One aspect that made the project unusual was its politicized building process. For instance, the granite could not come from Canada or Sweden. Though those countries had beautiful black granites, draft evaders went to both countries, so the veterans felt that we could not consider their granites as options. The actual building process went smoothly for the most part, and the memorial was built very close to my original intentions.

As far as all of the controversy is concerned, I really never wanted to go into it too much. The memorial's starkness, its being below grade, being black, and how much my age, gender, and race played a part in the controversy, we'll never quite know. I think it is actually a miracle that the piece ever got built. From the very beginning I often wondered, if it had not been an anonymous entry 1026 but rather an entry by Maya Lin, would I have been selected?

I remember at the very first press conference a reporter asking me if I did not find it ironic that the memorial was for the Vietnam War and that I was of Asian descent. I was righteous in my response that my race was completely irrelevant. It took me almost nine months to ask the VVMF, in charge of building the memorial, if my race was at all an issue. It had never occurred to me that it would be, and I think they had taken all the measures they could to shield me from such comments about a "gook" designing the memorial.

I remember reading the article that appeared in *The Washington Post* referring to “An Asian Memorial for an Asian War” and I knew we were in trouble. The controversy exploded in Washington after that article. Ironically, one side attacked the design for being “too Asian,” while others saw its simplicity and understatement, not as an intention to create a more Eastern, meditative space, but as a minimalist statement which they interpreted as being nonreferential and disconnected from human experience.

This left the opinion in many that the piece emanated from a series of intellectualized aesthetic decisions, which automatically pitted artist against veterans. The fact that I was from an Ivy League college and had hair down to my knees further fueled this distrust of the design and suspicions of a hippie college liberal or aesthetic elitist forcing her art and commentary upon them.

Perhaps it was an empathetic response to the idea about war that had led me to cut open the earth—an initial violence that heals in time but leaves a memory, like a scar. But this imagery, which some detractors would later describe as “a black gash of shame and sorrow” in which the color black was called the “universal color of shame and dishonor,” would prove incredibly difficult to defend. The mis-reading of the design as a negative political statement that in some way was meant to reflect upon the service of the veterans was in part fueled by a cultural prejudice against the color black as well as by the misreading or misinformation that led some veterans to imagine the design as a ditch or a hole. It took a prominent four-star general, Brigadier General George Price, who happened to be black, testifying before one of the countless subcommittee hearings and defending the color black, before the design could move forward.

But the distrust, the fact that no veterans had been on the jury, the unconventionality of the design and the designer, and a very radical requirement made by the Vietnam veterans to include all the names of those killed made it inevitable that the project would become controversial. I think ultimately that much of the negative response goes back to the very natural response to cover up or not acknowledge that which is painful or unpleasant. The very fact that the veterans themselves had required the listing and therefore the acknowledgment of the more than 57,000 casualties, which is a landmark in our country in terms of seeing a war through the individual lives lost, was very hard for many to face. I remember Ross Perot when he was trying to persuade the veterans that it was an inappropriate design, asking me if I truly didn't feel that the veterans would prefer a parade instead, something happy or uplifting, and I can remember thinking that a parade would not in the long term help them to overcome the enormous trauma of the politics of that war.

I do not think I fully realized until the dedication and homecoming parade that the veterans needed both. In effect the veterans gave themselves their own homecoming. In November 1982, I was in tears watching these men welcoming themselves home after almost ten years of not being acknowledged by their country for their service, their sacrifice.

But until the memorial was built I don't think they realized that the design was experiential and cathartic, and, most importantly, designed not for me, but for them. They didn't see that the chronology of the names allowed a returning veteran the ability to find his or her own time frame on the wall and created a psychological space for them that directly focused on human response and feeling. I remember one of the veterans asking me before the wall was built what I thought people's reaction to it would be. I realized then that these veterans were willing to defend a design they really didn't quite understand. I was too afraid to tell him what I was thinking, that I knew a returning veteran would cry.

An architect once told me to look always at what was originally envisioned and try to keep it. I left Washington before ground-breaking. I had to. The fund and I knew that we had to accept a compromise. The closer you watch something grow, the less able you are to notice changes in it. When I saw the site again, the granite panels were being put up and the place was frighteningly close to what I thought it should be. It terrified me. It was a strange feeling, to have had an idea that was solely yours be no longer a part of your mind but totally public, no longer yours.

There was always the expectation that since the war had been controversial, the memorial must be also. It wasn't so much an artistic dispute as a political one. The choice to make an apolitical memorial was in

itself political to those who felt only a positive statement about the war would make up for the earlier antiwar days, a past swing to the left now to be balanced. It was extremely naive of me to think that I could produce a neutral statement that would not become politically controversial simply because it chose not to take sides.

Anyway, the push, as one congressman put it, to "politicize" the design didn't really affect the memorial in this way. The addition of the statue of infantrymen and then the addition of the female statue to make them equal are to me sad indicators that some politicians believe that you can please all of the people all of the time by compromise and conglomerate works. These statues leave only the false reading that the wall is for the dead and they are for the living, when the design I made was for the returning veterans and equally names all who served regardless of race, creed, or sex. I am only glad that the three infantrymen are not where they had been originally intended to be, right in the center of the memorial, heads sticking up higher than the walls, converting the walls to a backdrop and violating that private contemplative space. Ironically, the compromise memorializes the conflict in the building of the piece.

People cannot resolve that war, nor can they separate the issues, the politics, from it. As for me, the first time I visited the memorial after it was completed I found myself searching out the name of a friend's father and touching it. It was strange to realize that I was another visitor and I was reacting to it as I had designed it.

Monday, February 8th, 2010

Can one be bad at the Internet?

Can one use the Internet in such a way that it is objectively-speaking bad?

Well, yes, and no.

On the one hand, yes, I'm personally bad at the Internet because I don't know every trick to get free music.

I'm also bad at the Internet because I don't know *that much* about how the Internet works or its history or coding languages.

In a very real way, I'm bad at that stuff.

So, yes, one can be bad at the Internet.

I'm certainly bad at the Internet.

But, on the other hand, so is everyone else.

If you're good at understanding the legal frame of the Internet, you may not be good at understanding the cultural memes of the Internet – you may be bad at it.

If you've developed an elegant mathematical model of the Internet which accounts for every node, you may not understand the current security threats posed by hackers.

And so on.

In fact, we're all pretty wildly bad at using the Internet.

Perhaps that's why we cluster in circles, spinning our wheels amongst the same voices in a fit of future shock – it's a way to deal with the troubling fact of the human brain's limitations that the Internet makes obvious.

So, the problem is not whether one can be good or bad at using the Internet.

The question is badly stated.

Perhaps we can say “does one use the Internet with intention?”

Post Internet

Notes on the Internet and Art

12.29.09 > 09.05.10

Friday, July 23rd, 2010

Performance

The democratic culture of the Internet (blogs, YouTube, Wikipedia, etc.) is increasingly a part of daily life. If somebody wants their voice heard, they can do it with a couple of clicks. However, as this democratic culture creates more instantaneously available media on a daily basis than anyone could possibly consume in a lifetime, a tension emerges in which each of these individual units of media is transformed into noise. In this scenario, both Proust and pornography flatten out in value to right around zero – each just a drop of water in a continuously expanding ocean.

Information theorists like Claude Shannon and Norbert Wiener discussed this problem in the early days of cybernetics research. Information is a ratio of signal to noise. The more noise – or entropy – in a system, the less clear the information. On the Internet, there is so much culture that it becomes like what Wiener, in a different context, called a “Niagara of entropy.” There are so many people shouting in the room that one voice cannot be heard clearly.

For a contemporary artist, this scenario poses an interesting problem. In prior models of media dissemination it was difficult for an artist's work to reach large public audiences, critics, or curators without the artist being based in one of a handful of cities or receiving support from a commercial art space or a not-for-profit art institution. The democratic culture enabled by the Internet, though, allows for anyone and everyone with a connection to have their work viewed by both casual audiences and international arts professionals. This means that an aspiring young artist is now able to radically disseminate her work. The flip side of this situation, though, is that the meaningful value of this work becomes relatively minuscule because it's now just one drop in an ocean of other works. As an artist uploads a work to the Internet, the chance that it will be viewed by more than a handful of people or reflected upon for more than a couple of minutes is minuscule due to the massive amount of other media through which it's competing against. The artist, then, is left in a tangle: what's the point of making anything if, at best, the work becomes a viral meme for a couple of hours and, at worst, is completely ignored by anyone other than the person that uploaded it? For some, I guess, this is the dream of the Internet in which the postmodern death of the author is made official and

all culture just swirls around as anonymous memes. For others, though, it may be frustrating.

One artistic stance in response to this question takes an ongoing, constructive approach to creating meaning on the Web. This stance sees that, if there is meaning in this context, then it is accrued through the ongoing performance of an artist making individual works through time – less the individual work and more the ongoing exhibition of multiple instances of work.

Before continuing, a step back in time:

Pablo Picasso began to consider the location of his art as residing in his entire ongoing practice – one action after another after another. Picasso wrote, “Paintings are nothing but research and experiment. I never paint a picture as a work of art. Everything is research. I keep researching, and in this constant enquiry there is a logical development. That is why I number and date all my paintings. Maybe one day someone will be thankful for it.” For Picasso, who pictured himself as a blind minotaur crashing his way through a labyrinth in many of his paintings, the work occurs in the cumulative effect of his ongoing search for meaning; each individual painting functioning as a piece of “research” conducted in the name of this search.

As Leo Steinberg demonstrates in his long essay “The Algerian Women and Picasso at Large,” Picasso's medium is not even painting at the point in his career in which he made the “Algerian Women” paintings, but, rather, “the artist” – in this case, the artist performing an allegorical quest for a “realistic” two-dimensional representation of three-dimensional perceptual space. It is, for Steinberg, only through the catharsis of following this performed myth wherein the most powerful meaning of Picasso's work is realized for his audience. As such, Steinberg takes it upon himself to critique the performance as a whole, subjecting Picasso himself to the lens of “the work of art.”

In re-constructing the historical drama of a myth surrounding Picasso, Steinberg painstakingly re-constructs the order of historical events, giving the viewer a sense of Picasso's evolution. One can surmise that the essay was something of a labor of love for the author to construct due to, if nothing else, the raw amount of time consumed in traveling to see these dozens of works in dozens of museums and other collections all over the world.

And that's the wager of Steinberg's analysis – it operates on a highly privileged scale and, as such, describes things that are effectively impossible to view for anyone but an academic art historian with an expertise in that particular field. For almost anyone else, be they casual art fans or enthusiastic ones, access to Picasso's work is limited to the handful of art museums one has the ability to visit firsthand in the course of one's lifetime. Because of this limit, Picasso's audience cannot easily appreciate the work as an ongoing performance.

Viewed through the lens of the Web, though, this distance between dramatic stage and audience is dramatically squashed. When an artist uploads a work, anyone with an Internet connection can view it. Furthermore, the vast majority of work – from artists working both on the Web and outside of it (such as painters [even dead painters like Picasso]) – is now viewed in the context of the artist's chronological development as it is displayed on a Web page. That is to say, the idea which Steinberg is at pains to describe in regards to Picasso – the artist's self-authoring performance of the role of "the artist" in time – becomes, on the Internet, automatic.

The artist's website, as a publicly accessible database, may be followed by a public interested in the artist's work. As an artist continues to create work, this creation is knowingly performed – one views the drama of an unfolding practice in which each "move" is in dynamic dialogue with past practice as well as a navigation into future practice. If I encounter the work of the contemporary artist through their managed presence on the Internet and I do it again and again and again and again, then this managed presence itself becomes a performative work.

There are many examples of this type of approach to making work in the context of the Web. One of those examples is Poster Company by Travess Smalley and Max Pitegoff.

Poster Company is a Flickr page consisting of over two hundred paintings produced between July 2009 and May 2010. In this project, the artists, first, focus on collisions between automatic effects which read as either "painterly" or "digital," and, second, shift the focus of their labor in the work from the production of the individual painting to the performance of producing many paintings over the course of months. As such, their work is in dialogue with the painter On Kawara's *Today* series and Josh Smith's influential painting project – each of which are meaningful when considered as reactions to the automatic reproducibility of images as well as an ongoing, long-form performance.

The question "what is a digital painting?" (a noun) is here better phrased as "what is digital painting?" (a verb). The significance of Poster Company's work lies not in the individual compositions, nor in the volume of output (although these elements are undeniably crucial for the full execution of the work to occur), but rather in the *performance* of the work.

In many ways, digital technologies and the Web make life easier for those who use them. This ease, though, frustrates the sense of accomplishment and meaning involved in laboring over something. When everyone can easily broadcast themselves on the Web or create a modern art masterpiece with a few clicks of a mouse, these actions become meaningless. In the face of this quandary, some artists have conceived of art production less in terms of the creation of a single work and more in terms of the performance involved in creating multiple works over time which an audience may follow live.

Cedric Price

Hans Ulrich Obrist — The Conversation Series

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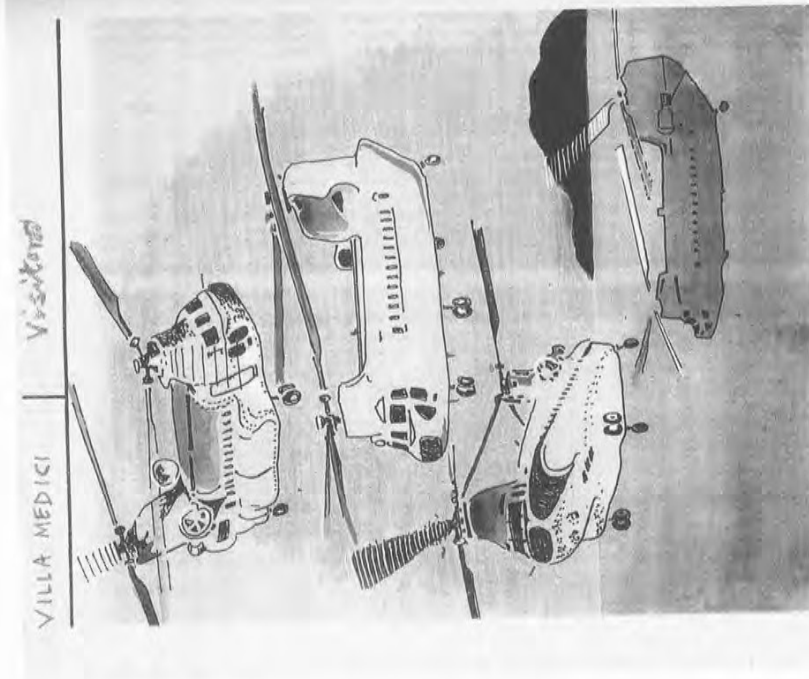
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IV — Cities, Symbols, Labels, Umbrellas
London, September 2000



Cedric Price. Part of the exhibition *La Villa, le Jardin, la Mémoire*, curated by Laurence Bosse, Carolyn Christov-Bakargiev and Hans Ulrich Obrist, Villa Medici, Rome 2000

Hans Ulrich Obrist — You recently worked on a new urban project for New York. Five architects and urbanists were invited to rethink an area of the West Side of Manhattan.

Cedric Price — I wasn't the winner. I'm not surprised, because mine required commitment for a very long time. It was suggesting that this area of the West Side was the last vacant area allowing fresh air to come off the river, and therefore they should do very little with it; the last thing they should do was cover the railway and build over it. But all the other schemes did just that: they built a stadium, a thirty-thousand-seater centre for something—always unspecified for architects. I would have been delighted to win, but knowing the jury and knowing New York, short-term advantage

took preference over anything else. The jury, Frank Gehry, Philip Johnson, Phyllis Lambert and various other people, awarded the prize to another man [Peter Eisenman] who did the normal, predictable thing.

Hans Ulrich Obrist — Your project for New York is about being fluid, not being stuck in an identity overkill, the city becoming more and more a museum. Your proposal was more about life than about dead masses of buildings. What role did the river play in your ideas?

Cedric Price — Well, the Hudson River is cleaning up all the time in any case. It's a fresh water river, and therefore I was aware of the vast amount of water running down the Hudson and into the ocean. And the winds are from the south-west and west, so the conditions were ideal without anything. The last thing I wanted to do was to increase the foul, static nature of the air by producing more buildings. New York suffers from over-development. They had a recent history of schemes that failed or weren't developed, but they see an advantage in short terms. This competition is being held every two years, so next year it will be another city. It's about the future of cities, but the key word was the "future" of cities, not the past or the present of cities, and this is the only way, in a crowded area of Manhattan, that you could guarantee the future use or under-use of a large area of land. It was largely owned by the state and railways from the East.

Hans Ulrich Obrist — The River leads us to Bangkok, a city which Jeff Kipnis described as Superfluid City. After the Hayward

Gallery in London, our exhibition¹¹ toured to Kiasma in Helsinki and to Bangkok, where it happened all over the city.

Cedric Price — I particularly liked the exhibition in Bangkok and your dependence on change and the media, and that time was the key element, the fourth dimension: height, breadth, length and time. The whole nature, not the presentation of materials and ideas, but the consuming of ideas and images exist in time, so the value of doing the show was a sort of immediacy, an awareness of time that isn't in somewhere like London or indeed Manhattan. A city that doesn't change and replace itself is a dead city; but the question is whether one should use the word "cities" anymore. I think it's a questionable term.

Hans Ulrich Obrist — What could replace it?

Cedric Price — Certainly not "megapolis" or anything like that, but it may be a word associated with the human awareness of time, turned into a noun which relates to space. I haven't thought of the word yet, but it shouldn't be too difficult. It's got to be verbally edible but sufficient.

Hans Ulrich Obrist — But the city changes all the time, so it cannot be a frozen word: it would have to be a word in permanent transformation.

Cedric Price — The last experiment in some way relating to Bangkok was the place settings for a university I was involved with. You got three place settings under-

(11) *Cities on the Move*, 1997-2000, curated by Hans Haerig and Hans Ulrich Obrist.

neath plates in restaurants, and the plates were glass, so as you ate your pork and beans or hamburgers, you would read the place settings with the message of this new educational facility. The fact that you'd had a good meal and finished it meant you could read the message, and this was the right order. Because you'd had a good meal, you knew you'd enjoyed it because the plate was clean. If you hadn't enjoyed it, the plate wasn't clean and you couldn't read the message. So it worked for you! The initial contact with thoughtful people well fed was through the bottom of a glass plate. That's the way you should hear about universities and things like that—after your meal.

Hans Ulrich Obrist — Picabia once said that museums are cemeteries. In the early twentieth century there was Alexander Dörner's visionary museum practice, defining dynamic, elastic institutions. Could you tell me about the dynamic notion which is in all your museum-related projects?

Cedric Price — Le Corbusier designed a museum for Liverpool which they never built. When the *Queen Mary* was up for sale, I suggested a museum in the ship [circa 1957]. So that you could travel as millionaires could travel while the ship stayed across the bar in Liverpool; it was at sea but only a short boat ride away. The Atlantic crossing which takes four or five days was concentrated into one day or less, to eight hours, and that was the time you could take to go around the ship. You could see the machine rooms, the kitchens, the lavatories, the tennis courts, all the paraphernalia of the ship, but primarily the luxury of it. It was on hydraulic jacks, so you would get seasonal

crossings related to the weather you might have experienced in the Atlantic. You could pick your season at the museum, so then you would realise why in rough weather, for example, the tables had edges on them to hold onto the plates. You'd use the same plates, the same cutlery, everything! It would be programmed by hydraulic jacks, but in deep water, which is why *Queen Mary* went to Liverpool in the first place.

I also did a scheme for the Tate, which they did not select. It turned the power station into an object. I proposed building a glass box over the whole thing, so that the business of producing exhibitions would have become secondary to the main exhibit, which was in a box with a single door. In bad weather it would have been like one of those snowstorms, with Jesus being the one to shake up the snow! I was assuming that it could last at least a year or so, and then they could decide what kind of object they would put in the Tate.

Hans Ulrich Obrist — So it was like a Russian doll, since the exhibition would have been an exhibition within an exhibition.

Cedric Price — Yes, that is right.

Hans Ulrich Obrist — Are there other projects of yours which follow this idea of the time-based museum?

Cedric Price — We did one in Sheffield, and another in Glasgow, each related to time. The Sheffield museum was in the 1960s, for the Sheffield Festival [1966] which had just started in those years. We were originally asked to do an exhibition in a static gallery, but they then didn't have enough money. I said we could

do something which doesn't need money to advertise. Sheffield is a very concentrated urban town with large towers and chimneys and slum housing, a steel town. I said we could paint huge figures of the height of the chimney in feet and inches. So at the top of a huge chimney in the middle of town which everyone saw, we painted "6½ inches". Then on a rather small office block we wrote "380 feet 10 inches". So we wrote the wrong numbers. Immediately, the local papers were full of complaints saying, "How could the city waste our money? They can't even get the heights right! I know that chimney is not 6½ inches high. I've lived here for forty years." So the advertising was being done for us: people were using their eyes and being outraged. People who never looked at their factory or chimney were going around town looking to see if some damn fool hadn't written the wrong height on another building!

The other project was in Glasgow [Circolorama, Glasgow Fair, 1962], where the city hall is in the centre. They are very proud of it and they don't let people in very often, unless you've got a complaint against the city. We decided to improve the lift to the top of the tower, put carpet in, lovely mirrors, perfume it, and invite the public in. But not to tell them why, except that they can go to the top of the tower, and it's free. As they go up the lift, there is a tape announcing, "Tonight, all the areas which we think should be saved without question will be floodlighted red." Only parts are lit up, so their attention is focused, and they are told that whatever is in red will be saved by the city of Glasgow whether they like it or not. So you could hear, "Well of course that church should be saved,"

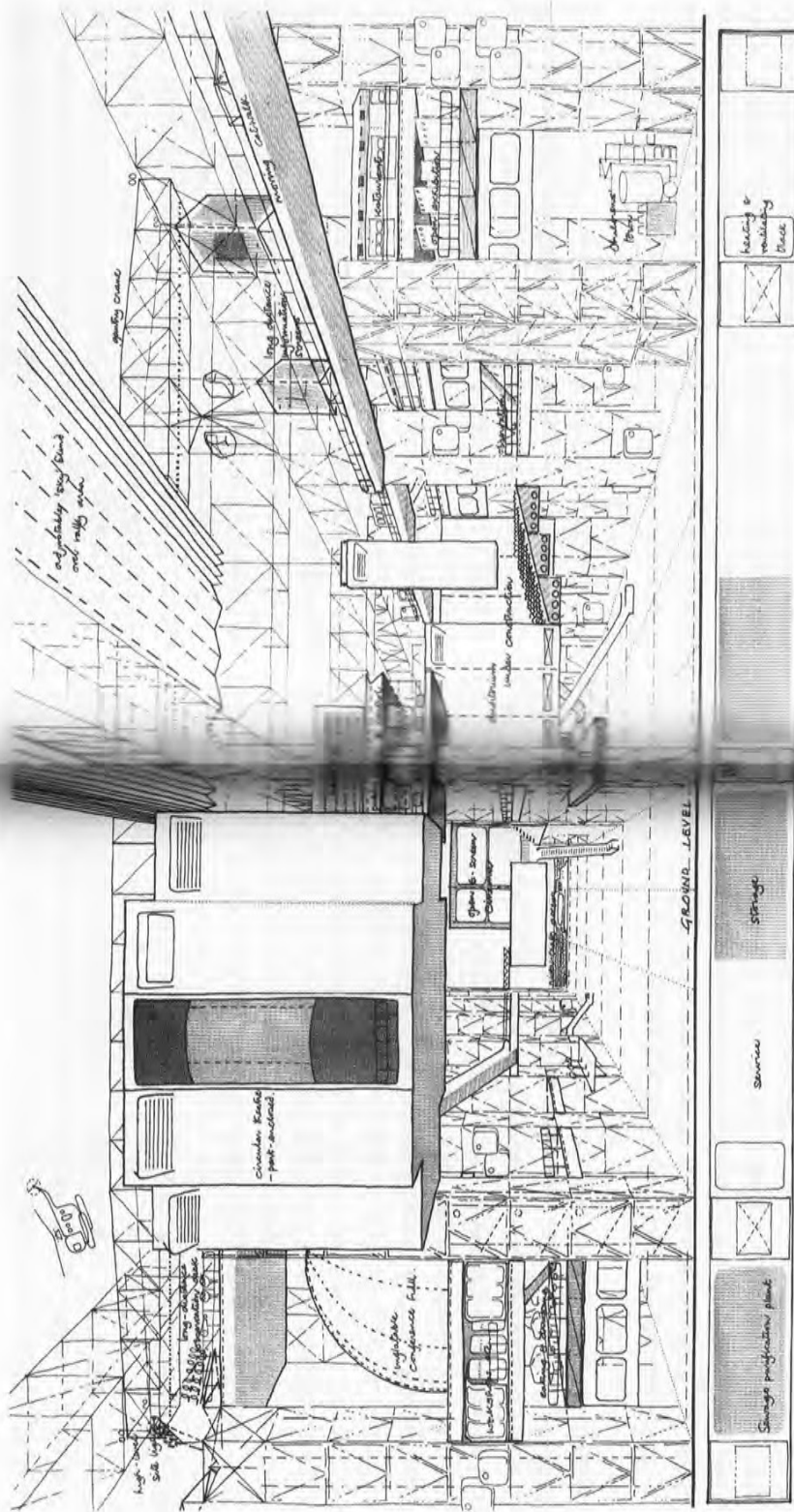
or, "Why keep that slum?" The next night, different areas would be flooded with green. Those were areas which they decided should be improved.

Hans Ulrich Obrist — They made invisible decisions visible.

Cedric Price — Exactly! The only people who objected were the town planners, because they wanted the cut-out plans in their offices for people to pay to come look at. But this was done in three or four days. On the last day the public was invited to tell the city what they should do with the spaces lit up in white. There were no superiors involved. The city, the voice, was saying, "We've thought for years and we still don't know what to do with the white areas: you tell us. But tell us within a month, because after that it's lost, and as you go down, pick up these free postcards for your response."

Hans Ulrich Obrist — Alexander Dörner, who ran the Hannover museum in the early twentieth century, wrote that art institutions should be like a "Kraftwerk", like dynamic power plants. Can you tell me more about the *Fun Palace* and its time-based and dynamic parameters?

Cedric Price — The *Fun Palace* was not planned to last more than ten years—therefore we wanted a temporary site, and that's what we got from the GLC [Greater London Council]. The ten-year duration had an effect on the costs in any case. It wasn't a problem; no one, including the designers, wanted to spend more money to make it last for fifty years and be a waste for ten years. When I say "the designers", those were the people involved in the production of the day-to-day life



ARRIVE AND LEAVE BY TRAIN, bus, motorcar, hovercraft, car, bike or foot at any time YOU wish to - or just have a break at it as you pass. The information screens will show you what's happening. No need to look for an entrance - just walk in anywhere. No doors, queues or commissionaires: it's up to you how you use it. Look around - take a lift, a ramp, an escalator to wherever or whenever looks interesting.

CHOOSE what you want to do - or watch someone doing it. Learn how to handle tools, paint, machinery, or just listen to your favourite tune. Do talk or be lifted up to where you can see how people make things work. Sit out over space with drink and tune in to what's happening elsewhere in the city. Try starting a riot or beginning a painting - just lie back and stare at the sky.

WHY ALL THIS LOT? "If any action is to be lost or saved by the character of its great cities, our own is that nation". - Robert Vaughan 1843

We are building a short-term plaything in which all of us can realise the possibilities and delights that a 20th Century city environment owes us. It must last no longer than we need it.

of the *Fun Palace*, as well as the structuring—in other words, the designers were both the generators and the operators. The aim was to get these people to be economic in terms of both time and money. The owners of the land, the GLC—the London County Council at the time—also had the same economics in mind. It created the same priorities for everyone. They all got the same thing without being told they must think alike; through sheer necessity. So that is another rule for the whole nature of architecture: it must actually create new appetites, new hungers—not solve problems; architecture is too slow to solve problems.

Hans Ulrich Obrist — Douglas Gordon always says that art should not only be an object but an excuse for a dialogue. That's what makes your *Fun Palace* so revolutionary and important for today.

Cedric Price — Funnily enough, as you are speaking about the beginning of the twenty-first century, dialogue might be the only excuse for architecture. What do we have architecture for? It's a way of imposing order or establishing a belief, and that is the cause of religion to some extent. Architecture doesn't need those roles anymore; it doesn't need mental imperialism; it's too slow, it's too heavy and, anyhow, I as an architect don't want to be involved in creating law and order through fear and misery. Creating a continuous dialogue with each other is very interesting; it might be the only reason for architecture, that's the point.

In the seventeenth century, Sir Henry Wotton's translation of Vitruvius's Latin text defined architecture as "Commodotie, Firmines and Delight". Commodity is

good housekeeping, money; firmness is structure. The delight factor might be the dialogue. They've served me well—commodity, firmness and delight—because I can hang anything on them. There are so many readily edible experiences of life, both for the poor and the rich. The dialogue isn't necessarily "Hello birds, hello bees"; it might be very harrowing. The dialogue involves people with the future and with the intention, even if only for themselves, that the future might be a bit better than the present. That is a common want, for rich and poor persons alike and for all populations.

Hans Ulrich Obrist — On that subject of dialogue, let's return to the *Cities on the Move* show in Bangkok. Due to the open structure and the lack of a contemporary art museum in Bangkok, the city entered the museum and the contents of the show were carried into the city. The museum opened to the world.

Cedric Price — That's it—museum world, world museum. The exhibition in Bangkok was all about dialogue; it acted as a key for the people who experienced the show, only to realise that they were experiencing it all the time. It was the same with the *Fun Palace*; it was never intended as a Mecca—a lovely alternative to the horror of living in London—but instead it served as a launch pad to help people realise how marvellous life is. After visiting the *Fun Palace* they went home thankful that their wife looked as she did and that their children were noisy; the "key" had opened the door for them. The *Fun Palace* was a launch pad to reality, mixed with a large portion of delight.

However, I think that, at present, architecture does not do enough; it does not enrich or enliven people's

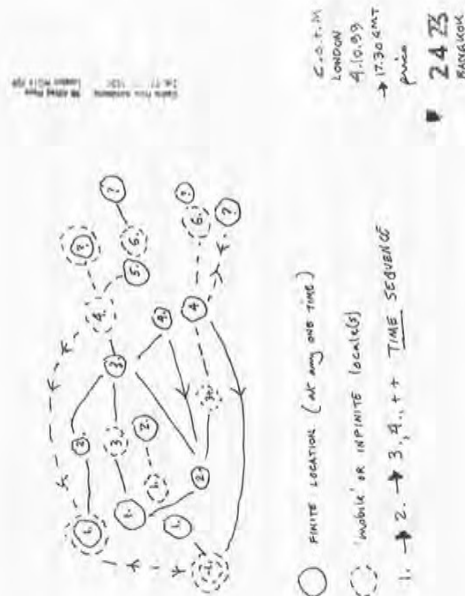
lives as much as, say, the Internet, or a good story, or music, does. Architecture is a poor performer; even the *Magnet* schemes never happened. As an architect, I am trying to make architecture a better performer. With human beings answering questionnaires and me reading the answers, I hope to recognise opportunities for improving the human lot by architecture.

Hans Ulrich Obrist — To make it a richer, more complex condition.

Cedric Price — Yes. So once again, you've got to write your own briefs. It's no use doing concert halls and theatres, because it's the music or the theatre that's variable. But architecture is always relevant, even if the users aren't interested in it—the fact that it stops the wind, or provides protection, gives shelter, or casts shadows.

Hans Ulrich Obrist — Julia Kristeva wrote a text recently about the anxiety of going beyond one's own discipline. One of the main problems for museums and universities is that they are closed institutions, and they need to think in a more transdisciplinary way. How far can buildings reflect that transdisciplinary thinking? Is this something you think about?

Cedric Price — Yes, there is no doubt, but you have to eat it at some time. In defining architecture you don't necessarily define the consumption of it. All the designs we did for Generator [Florida, 1966] were written as menus, and then we would draw the menu, and because I like bacon and eggs for breakfast it was all related to that bit of bacon and that bit of egg; they were all drawn, however, cartoon-like, in the same order—not in the order the chef or cook would



arrange them on your plate, but in the order in which the consumer would eat them. And that is related to the consumption or usefulness of architecture, not to the dispenser of it.

Hans Ulrich Obrist — There is a paradox—possibly a very productive one—between on the one hand your projects for dynamic institutions which eventually would auto-dissolve, and on the other your interest in some old, slow museums.

Cedric Price — I've always thought the notion of the classic museum still has viability, although limited. My local asset is the British Museum: at three o'clock every afternoon I get very tired; I'm no use in the office so I go to this wonderful distorter of time and place called the British Museum. It distorts the climate because there's a roof over it; it distorts my laziness so I don't have to go to Egypt to see the Pyramids. The distortion of time and place, along with convenience and delight, introduces another element, a distortion of time future... there is something in there—it may be the dialogue again—that's reminding people how much freedom they have for the second half of their life.

Hans Ulrich Obrist — Talking of time and its distortion, you once mentioned to me a survey the Tate made of its visitors.

Cedric Price — Yes, that's right. It's only a single sentence I'm interested in—"Most people observed spend from five seconds to one minute reading texts about the work and from two seconds to fifteen seconds glancing or looking at the work." They spend more time reading the guides than looking at the work!

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Hans Ulrich Obrist — You used this sentence for your exhibition project at CCA [Canadian Centre for Architecture] in Montreal in 1999, called *Mean Time*. You also mentioned some symbols you worked on for the same show...

Cedric Price — I did a series of symbols which were short-hand for the points I wanted to make about the exhibits. They were graphic reminders of the meantime significance of the exhibits, and they were displayed like postage stamps against the exhibits. The actual printed catalogue explaining the exhibits was available only upon leaving the exhibition. Up until then they had to use the symbols and look at the objects. A further development was that I wanted the people who had been working on the exhibition to choose these symbols: not the designer—me—not the audience, but the staff who assembled the exhibition. If there was a photograph or drawing or object that they thought had more than one symbol, they could stick two or three symbols on it. I want them to position those symbols before I see the exhibition, which I am meant to open. So that is a bit of participation by the workers. Not by the observers, not by the designer but by the visual artisans who have been working all the time on this exhibition.

Hans Ulrich Obrist — What symbols were drawn?

Cedric Price — There was a man on a parachute as a symbol for gravity, a furled umbrella which means anticipation in time—an open umbrella means that it's raining, a furled umbrella means you're anticipating something—a clock in a mirror for distortion of time, a metronome for the interval...

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Hans Ulrich Obrist — What is the metronome for you, time wise?

Cedric Price — The metronome is—look, there are thousands of them and I've got every heading but I can't do it now! I forget what the metronome is. There is a clock in a mirror, so it's the distortion of time. Ah, there it is, I'll tell you. [*looks at notes*] Oh, metronome is interval: the interval or maybe a series of intervals. These are related to drawings by me, some from hundreds of years ago—the whole collection has been plundered. It's a very small exhibition but I've chosen everything. Here. This is the latest press release on *Mean Time*. I don't mind, but it's interesting, even the CCA, which knows everything have put the date of the *Fun Palace* [1960–61] as 1961 to 1974, because they can't imagine that a project can be done in one year! It wasn't 1974, I've looked in every record, it isn't in any book.

Hans Ulrich Obrist — Last time you mentioned the logos and the symbols. I was thinking it could maybe be nice for the Soane if you would do it almost like you described it for Toronto, in different parts of the Soane Museum, because the Soane Museum doesn't have this labelling system: Soane was against labels. That instead of labels there would be your symbols around the Soane Museum.

Cedric Price — Yes, but look. The thing about that is that I don't like—this is not a personal thing—but I don't necessarily want to do things, apart from the lecture, which I agreed to, when other architects are doing other things. Who is there? There's Richard McCormack isn't there? I read about it.

Hans Ulrich Obrist — Yes, but that is completely independent of my show. Because the Soane has this gallery and they have that gallery.

Cedric Price — Ah. And that's separate is it?

Hans Ulrich Obrist — Yes. They have this gallery which is a new space for exhibitions and that is where the museum does architecture shows.

Cedric Price — I don't want to be part of those.

Hans Ulrich Obrist — My exhibition is going to be all over the museum. I invited mostly visual artists.

Cedric Price — Ah, right. I see.

Hans Ulrich Obrist — It is spread out all over the museum and that's why I was thinking that symbols could be nice: symbols as almost anti-labels. Because it is only in the Victorian age that the Soane Museum added labels, cause Soane was against labels.

Cedric Price — Good, yes, so am I. When is that?

Hans Ulrich Obrist — It's only in December, so we have time.

Cedric Price — [*laughs*] No, we do, you're right! No, I'd like to do something like that. Because you bring a new perspective, which is a perspective only caused through time, through the difference between Soane's time and our time that one makes a contribution which reinforces both the original thing, but actually provides a new usefulness. Because John Summerson,

Margaret and the rest have been mad enough to pre-serve this superb museum for so long. So it's only because of someone else's endeavours and activity over 200 years that has preserved the museum that I can take advantage of the fact that it exists now. That is what the labels should be doing, you know, the symbols. But that's very interesting.

Hans Ulrich Obrist — So the symbols could pop up in different parts of the Soane Museum.

Cedric Price — Oh yes, yes. That's right.

Hans Ulrich Obrist — I was wondering when you were talking about the symbols before, you mentioned the umbrella as a "time anticipation". When I listened to this cassette, *Technology is the answer but what is the question?* there is this lovely passage about the Municipal Umbrellas. So I was wondering if you could tell me a bit about this project because I have never seen this before.

Cedric Price — No! I can, but I can't remember! [laughs]

Hans Ulrich Obrist — There is this slide of these giant sausages.

Cedric Price — Yes, the giant sausages. There's an issue of AD [*Architectural Digest*], *The Municipal Umbrellas*. There are other illustrations. I mean, that is one of the illustrations of the article, but it would take some time to find it.

Hans Ulrich Obrist — The idea was that the umbrellas could be inflated if it were raining... Was the project realised?

Cedric Price — Yes, yes. And there are photographs of the thing in an issue of *Architectural Design*. It was partially realised because we inflated them and we had them made, but they didn't keep them there all the time. So it was like summer time umbrellas because there was an advantage of not deflating them when in fact there was very bright sun, because you were then using the umbrella as a parasol, as keeping the sun off. So in one place it transferred the rain. It could respond to the change in the relief, the physical relief of the street by having at least two or three umbrellas that they could then join when there was rain. I don't know how many were in that drawing, maybe two was it? Ah, there were three then. That's right. The reason for that is that the shops—this was a pedestrian street, still is, in Southend—the shops on one side of the road are quite different heights and formation from the other side, but the main place is in the middle of the street, so you needed three umbrellas so that the two uneven on either side could be joined up together with the third. [*Southend Roof*, 1972]

Hans Ulrich Obrist — And they would inflate immediately when it starts to rain?

Cedric Price — Yes, yes. But it was a duel use. I used this self same umbrella. I always had these black and white umbrellas. I get them made by Smith's.

Hans Ulrich Obrist — Your own umbrellas? I would love to see it. [*Cedric Price unfurls a big black and white checked umbrella.*] Oh, that's fantastic. So you have them made according to your instructions?

Cedric Price — Yes. You see now in the office I'm sheltering from the light, not from the rain. And when I did some work in Braden in Nigeria, I carried this Smith's umbrella all the time as my sunshade.

Hans Ulrich Obrist — When were you in Nigeria?

Cedric Price — It was a university project at the University of Braden which I'd worked on while I was working for Free University. So actually I stayed in the guest house which I had designed twenty-five years earlier. I had worked on the building as an assistant to Duncan Horne who was in charge of the job. I was using some of the furniture, particularly the dressing table, that had been built by Maples in Tottenham Court Road and sent out to Nigeria. Nowadays it would be called a "vanity", a dressing table unit: Duncan and I had designed it without handles—like having no labels in a museum—you just had to move parts which were slightly different from other parts. There was a big thick shelf and you had to lift off the top and it would expose the mirror, and things like that. Of course this was too subtle for visitors, so this unit was never used. It was bad design because no one could figure out how to use it. The label for Maples was still stuck to the mirror with cobwebs. So I was the first person to use it! Twenty-five years later I was exposing the weakness of my own design.

Hans Ulrich Obrist — It's again about time; it's like a time machine.

Cedric Price — A real time machine, yes. It was a wonderful experience.

Hans Ulrich Obrist — When we were talking about the Hayward you mentioned these Egg Chairs. Time and again you did furniture—what role did furniture play, because it often appears in your work, but not so systematically, it just pops up.

Cedric Price — It's like cooking a meal: I don't cook them all day long, only when I want to eat them. I don't see any difference between the design of furniture and the urban decisions made producing designs such as the *Municipal Umbrellas*. I draw very few barriers whether it's *Cities of the Future* or an umbrella or a piece of bad furniture in the middle of Africa. I thought it was beautiful furniture, I still can't understand that people are so thick that they didn't realise that the top could lift! It's a case of me preserving the integrity of my stupidity against all, because it isn't questioned.

Hans Ulrich Obrist — [laughs]

Cedric Price — I mean I still can't understand it. I mean, it was very thick, there must have been something in it. It was just that the top lid opened. But I didn't have handles on it, it was flush, worked perfectly! [laughs]

Hans Ulrich Obrist — It was untouched, wasn't used?

Cedric Price — Untouched! They just used it as a shelf, they didn't realise that it had mirrors and everything inside. It's a warning to me on the way I use words, that I always assume that it is extraordinarily easy to understand what I say. When I write it I think it's almost like tablet from the mount, you know, it must be so clear, but it isn't!

Hans Ulrich Obrist — Let's return to the idea of dead cities, tell me more about why they die.

Cedric Price — Cities exist for citizens, and if they don't work for citizens, they die. Only in over-educated, over-paid Western civilisations do people worry about dead cities—like Petra, or the biggest city in the world, Angkor Wat in Cambodia, which just vanished in the jungle because it wasn't needed any more.

Hans Ulrich Obrist — So cities can die...

Cedric Price — Oh yes. Cities die through lack of usefulness.

Hans Ulrich Obrist — I think one of the reasons your work has been so influential and important to many architects and artists in Asia has a lot to do with the notion of time, something which is understood better in Asia than in Europe.

Cedric Price — I know! It's far more recognised and not seen as anything very strange in Asia. Even something as vast as Angkor Wat lasted for less than two hundred years. Here it is in my book: "Angkor Wat, present-day Cambodia, originally Khmer Kingdom founded in 877–889, completed in the twelfth century, abandoned 1433."

Hans Ulrich Obrist — Yesterday I was asked by a magazine to name my favourite existing buildings in London. I sent them a short text on your aviary [*Zoo Aviary*, London, 1961; with Lord Snowdon and Frank Newby]. But there was also an unbuilt aviary on the move...

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Cedric Price — It was a temporary one, but it was built [*CP Experimental Aviary*, London University, 1981]. It moved. The problem of the London *Zoo Aviary* was that you couldn't get all the birds out when you wanted to repair the thing. And also, the birds tended to destroy the landscape, particularly ducks and waders—they'd shit everywhere. But this other aviary belonged to a man who was breeding rare birds and didn't want them diseased. He had a lot of land—and the aviary itself walked about it very slowly without frightening the birds.

Hans Ulrich Obrist — So it was an aviary on the move.

Cedric Price — Yes, all the time, because you couldn't let the birds out; you couldn't catch them, and this way the birds could destroy a new patch of land while the old patch of land could be cleared.

Hans Ulrich Obrist — Did this also include the idea of the winds changing?

Cedric Price — No, this was more like Ron Herron's Walking City, except it was just space that was enclosed with a very minimal curtaining.

Hans Ulrich Obrist — So the birds, I mean the inhabitants, would move the city, not some mechanical device.

Cedric Price — Yes, that's right.

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[Clay Shirky's Writings About the Internet](#)

Economics & Culture, Media & Community

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Group as User: Flaming and the Design of Social Software

First published November 5, 2004 on the "Networks, Economics, and Culture" mailing list.
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When we hear the word "software," most of us think of things like Word, Powerpoint, or Photoshop, tools for individual users. These tools treat the computer as a box, a self-contained environment in which the user does things. Much of the current literature and practice of software design -- feature requirements, UI design, usability testing -- targets the individual user, functioning in isolation.

And yet, when we poll users about what they actually do with their computers, some form of social interaction always tops the list -- conversation, collaboration, playing games, and so on. The practice of software design is shot through with computer-as-box assumptions, while our actual behavior is closer to computer-as-door, treating the device as an entrance to a social space.

We have grown quite adept at designing interfaces and interactions between computers and machines, but our social tools -- the software the users actually use most often -- remain badly misfit to their task. Social interactions are far more complex and unpredictable than human/computer interaction, and that unpredictability defeats classic user-centric design. As a result, tools used daily by tens of millions are either ignored as design challenges, or treated as if the only possible site of improvement is the user-to-tool interface.

The design gap between computer-as-box and computer-as-door persists because of a diminished conception of the user. The user of a piece of social software is not just a collection of individuals, but a group. Individual users take on roles that only make sense in groups: leader, follower, peacemaker, process nazi, and so on. There are also behaviors that can only occur in groups, from consensus building to social climbing. And yet, despite these obvious differences between personal and social behaviors, we have very little design practice that treats the group as an entity to be designed for.

There is enormous value to be gotten in closing that gap, and it doesn't require complicated new tools. It just requires new ways of looking at old problems. Indeed, much of the most important work in social software has been technically simple but socially complex.

Learning From Flame Wars

Mailing lists were the first widely available piece of social software. (PLATO beat mailing lists by a decade, but had a limited user base.) Mailing lists were also the first widely analyzed virtual communities. And for roughly thirty years, almost any description of mailing lists of any length has mentioned flaming, the tendency of list members to forgo standards of public decorum when attempting to communicate with some

ignorant moron whose too stupid to know how too spell and deserves to DIE, die a PAINFUL DEATH, you PINKO SCUMBAG!!!

Yet despite three decades of descriptions of flaming, it is often treated by designers as a mere side-effect, as if each eruption of a caps-lock-on argument was surprising or inexplicable.

Flame wars are not surprising; they are one of the most reliable features of mailing list practice. If you assume a piece of software is for what it does, rather than what its designer's stated goals were, then mailing list software is, among other things, a tool for creating and sustaining heated argument. (This is true of other conversational software as well -- the WELL, usenet, Web BBSes, and so on.)

This tension in outlook, between 'flame war as unexpected side-effect' and 'flame war as historical inevitability,' has two main causes. The first is that although the environment in which a mailing list runs is computers, the environment in which a flame war runs is people. You couldn't go through the code of the Mailman mailing list tool, say, and find the comment that reads "The next subroutine ensures that misunderstandings between users will be amplified, leading to name-calling and vitriol." Yet the software, when adopted, will frequently produce just that outcome.

The user's mental model of a word processor is of limited importance -- if a word processor supports multiple columns, users can create multiple columns; if not, then not. The users' mental model of social software, on the other hand, matters enormously. For example, 'personal home pages' and weblogs are very similar technically -- both involve local editing and global hosting. The difference between them was mainly in the user's conception of the activity. The pattern of weblogging appeared before the name weblog was invented, and the name appeared before any of the current weblogging tools were designed. Here the shift was in the user's mental model of publishing, and the tools followed the change in social practice.

In addition, when software designers do regard the users of social software, it is usually in isolation. There are many sources of this habit: ubiquitous network access is relatively recent, it is conceptually simpler to treat users as isolated individuals than as social actors, and so on. The cumulative effect is to make maximizing individual flexibility a priority, even when that may produce conflict with the group goals.

Flaming, an un-designed-for but reliable product of mailing list software, was our first clue to the conflict between the individual and the group in mediated spaces, and the initial responses to it were likewise an early clue about the weakness of the single-user design center.

Netiquette and Kill Files

The first general response to flaming was netiquette. Netiquette was a proposed set of behaviors that assumed that flaming was caused by (who else?) individual users. If you could explain to *each* user what was wrong with flaming, *all* users would stop.

This mostly didn't work. The problem was simple -- the people who didn't know netiquette needed it most. They were also the people least likely to care about the opinion of others, and thus couldn't be easily convinced to adhere to its tenets.

Interestingly, netiquette came tantalizingly close to addressing group phenomena. Most versions advised, among other techniques, contacting flammers directly, rather than replying to them on the list. Anyone who has tried this technique knows it can be surprisingly effective. Even here, though, the collective drafters of

netiquette misinterpreted this technique. Addressing the flamer directly works not because he realizes the error of his ways, but because it deprives him of an audience. Flaming is not just personal expression, it is a kind of performance, brought on in a social context.

This is where the 'direct contact' strategy falls down. Netiquette docs typically regarded direct contact as a way to engage the flamer's rational self, and convince him to forgo further flaming. In practice, though, the recidivism rate for flammers is high. People behave differently in groups, and while momentarily engaging them one-on-one can have a calming effect, that is a change in social context, rather than some kind of personal conversion. Once the conversation returns to a group setting, the temptation to return to performative outbursts also returns.

Another standard answer to flaming has been the kill file, sometimes called a bozo filter, which is a list of posters whose comments you want filtered by the software before you see them. (In the lore of usenet, there is even a sound effect -- *plonk* -- that the kill-file-ee is said to make when dropped in the kill file.)

Kill files are also generally ineffective, because merely removing one voice from a flame war doesn't do much to improve the signal to noise ratio -- if the flamer in question succeeds in exciting a response, removing his posts alone won't stem the tide of pointless replies. And although people have continually observed (for thirty years now) that "if everyone just ignores user X, he will go away," the logic of collective action makes that outcome almost impossible to orchestrate -- it only takes a couple of people rising to bait to trigger a flame war, and the larger the group, the more difficult it is to enforce the discipline required of all members.

The Tragedy of the Conversational Commons

Flaming is one of a class of economic problems known as [The Tragedy of the Commons](#). Briefly stated, the tragedy of the commons occurs when a group holds a resource, but each of the individual members has an incentive to overuse it. (The original essay used the illustration of shepherds with common pasture. The group as a whole has an incentive to maintain the long-term viability of the commons, but with each individual having an incentive to overgraze, to maximize the value they can extract from the communal resource.)

In the case of mailing lists (and, again, other shared conversational spaces), the commonly held resource is communal attention. The group as a whole has an incentive to keep the signal-to-noise ratio high and the conversation informative, even when contentious. Individual users, though, have an incentive to maximize expression of their point of view, as well as maximizing the amount of communal attention they receive. It is a deep curiosity of the human condition that people often find negative attention more satisfying than inattention, and the larger the group, the likelier someone is to act out to get that sort of attention.

However, proposed responses to flaming have consistently steered away from group-oriented solutions and towards personal ones. The logic of collective action, alluded to above, rendered these personal solutions largely ineffective. Meanwhile attempts at encoding social bargains weren't attempted because of the twin forces of door culture (a resistance to regarding social features as first-order effects) and a horror of censorship (maximizing individual freedom, even when it conflicts with group goals.)

Weblog and Wiki Responses

When considering social engineering for flame-proofed-ness, it's useful to contemplate both weblogs and

wikis, neither of which suffer from flaming in anything like the degree mailing lists and other conversational spaces do. Weblogs are relatively flame-free because they provide little communal space. In economic parlance, weblogs solve the tragedy of the commons through enclosure, the subdividing and privatizing of common space.

Every bit of the weblog world is operated by a particular blogger or group of bloggers, who can set their own policy for accepting comments, including having no comments at all, deleting comments from anonymous or unfriendly visitors, and so on. Furthermore, comments are almost universally displayed away from the main page, greatly limiting their readership. Weblog readers are also spared the need for a bozo filter. Because the mailing list pattern of 'everyone sees everything' has never been in effect in the weblog world, there is no way for anyone to hijack existing audiences to gain attention.

Like weblogs, wikis also avoid the tragedy of the commons, but they do so by going to the other extreme. Instead of everything being owned, nothing is. Whereas a mailing list has individual and inviolable posts but communal conversational space, in wikis, even the writing is communal. If someone acts out on a wiki, the offending material can be subsequently edited or removed. Indeed, the history of the Wikipedia, host to communal entries on a variety of contentious topics ranging from Islam to Microsoft, has seen numerous and largely failed attempts to pervert or delete entire entries. And because older versions of wiki pages are always archived, it is actually easier to restore damage than cause it. (As an analogy, imagine what cities would look like if it were easier to clean graffiti than to create it.)

Weblogs and wikis are proof that you can have broadly open discourse without suffering from hijacking by flamers, by creating a social structure that encourages or deflects certain behaviors. Indeed, the basic operation of both weblogs and wiki -- write something locally, then share it -- is the pattern of mailing lists and BBSes as well. Seen in this light, the assumptions made by mailing list software looks less like The One True Way to design a social contract between users, and more like one strategy among many.

Reviving Old Tools

This possibility of adding novel social components to old tools presents an enormous opportunity. To take the most famous example, the Slashdot moderation system puts the ability to rate comments into the hands of the users themselves. The designers took the traditional bulletin board format -- threaded posts, sorted by time -- and added a quality filter. And instead of assuming that all users are alike, the Slashdot designers created a karma system, to allow them to discriminate in favor of users likely to rate comments in ways that would benefit the community. And, to police *that* system, they created a meta-moderation system, to solve the 'Who will guard the guardians' problem. (All this is documented in the [Slashdot FAQ](#), our version of [Federalist Papers #10](#).)

Rating, karma, meta-moderation -- each of these systems is relatively simple in technological terms. The effect of the whole, though, has been to allow Slashdot to support an enormous user base, while rewarding posters who produce broadly valuable material and quarantining offensive or off-topic posts.

Likewise, Craigslist took the mailing list, and added a handful of simple features with profound social effects. First, all of Craigslist is an enclosure, owned by Craig (whose title is not Founder, Chairman, and Customer Service Representative for nothing.) Because he has a business incentive to make his list work, he and his staff remove posts if enough readers flag them as inappropriate. Like Slashdot, he violates the assumption that social software should come with no group limits on individual involvement, and Craigslist works better because of it.

And, on the positive side, the addition of a "Nominate for 'Best of Craigslist'" button in every email creates a social incentive for users to post amusing or engaging material. The 'Best of' button is a perfect example of the weakness of a focus on the individual user. In software optimized for the individual, such a button would be incoherent -- if you like a particular post, you can just save it to your hard drive. But users don't merely save those posts to their hard drives; they click that button. Like flaming, the 'Best of' button also assumes the user is reacting in relation to an audience, but here the pattern is harnessed to good effect. The only reason you would nominate a post for 'Best of' is if you wanted other users to see it -- if you were acting in a group context, in other words.

Novel Operations on Social Facts

Jonah Brucker-Cohen's [Bumplist](#) stands out as an experiment in experimenting the social aspect of mailing lists. Bumplist, whose motto is "an email community for the determined", is a mailing list for 6 people, which anyone can join. When the 7th user joins, the first is bumped and, if they want to be back on, must re-join, bumping the second user, ad infinitum. (As of this writing, Bumplist is at 87,414 subscribes and 81,796 re-subscribes.) Bumplist's goal is more polemic than practical; Brucker-Cohen describes it as a re-examination of the culture and rules of mailing lists. However, it is a vivid illustration of the ways simple changes to well-understood software can produce radically different social effects.

You could easily imagine many such experiments. What would it take, for example, to design a mailing list that was flame-retardant? Once you stop regarding all users as isolated actors, a number of possibilities appear. You could institute induced lag, where, once a user contributed 5 posts in the space of an hour, a cumulative 10 minute delay would be added to each subsequent post. Every post would be delivered eventually, but it would retard the rapid-reply nature of flame wars, introducing a cooling off period for the most vociferous participants.

You could institute a kind of thread jail, where every post would include a 'Worst of' button, in the manner of Craigslist. Interminable, pointless threads (e.g. Which Operating System Is Objectively Best?) could be sent to thread jail if enough users voted them down. (Though users could obviously change subject headers and evade this restriction, the surprise, first noted by Julian Dibbell, is how often users respect negative *communal* judgment, even when they don't respect the negative judgment of individuals. [See [Rape in Cyberspace](#) -- search for "aggressively antisocial vibes."])

You could institute a 'Get a room!' feature, where any conversation that involved two users ping-ponging six or more posts (substitute other numbers to taste) would be automatically re-directed to a sub-list, limited to that pair. The material could still be archived, and so accessible to interested lurkers, but the conversation would continue without the attraction of an audience.

You could imagine a similar exercise, working on signal/noise ratios generally, and keying off the fact that there is always a most active poster on mailing lists, who posts much more often than even the second most active, and much *much* more often than the median poster. Oddly, the most active poster is often not even aware that they occupy this position (seeing ourselves as others see us is difficult in mediated spaces as well,) but making them aware of it often causes them to self-moderate. You can imagine flagging all posts by the most active poster, whoever that happened to be, or throttling the maximum number of posts by any user to some multiple of average posting tempo.

And so on. The number of possible targets for experimentation is large and combinatorial, and those targets exist in any social context, not just in conversational spaces.

Rapid, Iterative Experimentation

Though most of these sorts of experiments won't be of much value, rapid, iterative experiment is the best way to find those changes that are positive. The Slashdot FAQ makes it clear that the now-stable ratings+karma+meta-moderation system could only have evolved with continued adjustment over time. This was possible because the engineering challenges were relatively straightforward, and the user feedback swift.

That sort of experimentation, however, has been the exception rather than the rule. In thirty years, the principal engineering work on mailing lists has been on the administrative experience -- the Mailman tool now offers a mailing list administrator nearly a hundred configurable options, many with multiple choices. However, the *social* experience of a mailing list over those three decades has hardly changed at all.

This is not because experimenting with social experience is technologically hard, but because it is conceptually foreign. The assumption that the computer is a box, used by an individual in isolation, is so pervasive that it is adhered to even when it leads to investment of programmer time in improving every aspect of mailing lists except the interaction that makes them worthwhile in the first place.

Once you regard the group mind as part of the environment in which the software runs, though, a universe of un-tried experimentation opens up. A social inventory of even relatively ancient tools like mailing lists reveals a wealth of untested models. There is no guarantee that any given experiment will prove effective, of course. The feedback loops of social life always produce unpredictable effects. Anyone seduced by the idea of social perfectibility or total control will be sorely disappointed, because users regularly reject attempts to affect or alter their behavior, whether by gaming the system or abandoning it.

But given the breadth and simplicity of potential experiments, the ease of collecting user feedback, and most importantly the importance users place on social software, even a few successful improvements, simple and iterative though they may be, can create disproportionate value, as they have done with Craigslist and Slashdot, and as they doubtless will with other such experiments.

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[Subscribe](#) to the mailing list.

Clay Shirky's Writings About the Internet

Economics & Culture, Media & Community, Open Source

clay@shirky.com

```
** initialization complete. **\r
```

Welcome to Meta-the-Difference-Between-the-Two-Font.

Today is Fri Mar 2 15:27:30 EST 2012

✻

```
Current working directory is /Users/reinfurt/Documents/Projects/META THE DIFFERENCE BETWEEN THE 2 FONT/Source/Meta-the-difference-between-the-two-Font/v0.6c
```

SLANT | SUPERNESS

PEN ==>

[illegible][illegible]

SUPER=.5750000000000000000000

PENTYPE=0

[illegible]

PENY=100

[illegible]

Welcome to Meta-the-Difference-Between-the-Two-Font.

Today is Fri Mar 2 15:27:30 EST 2012

```
Current working directory is /Users/reinfurt/Documents/Projects/META THE DIFFERENCE BETWEEN THE 2 FONT/Source/Meta-the-difference-between-the-two-Font/v0.6c
```

mfttrace 1.2.16

Font: 'mtdbt2f4d'...

Using encoding file: '/usr/local/texlive/2011basic/texmf/fonts/enc/dvips/tetex/m
tdb2f.enc'

Running Metafont...

```
Tracing bitmaps... [0][1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17]
[18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37]
[38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57]
[58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77]
[78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97]
[98][99][100][101][102][103][104][105][106][107][108][109][110][111][112][113][
114][115][116][117][118][119][120][121][122][123][124][125][126][127][129][130][
131][132][134][135][136][137][138][140][141][142][143]
```

```
Assembling raw font to `mtdbt2f4d.pfa.raw'...
```

Copyright (c) 2000-2011 by George Williams.

Executable based on sources from 13:48 GMT 22-Feb-2011-D.

Library based on sources from 13:48 GMT 22-Feb-2011.

** metafont ok **

```
** fontforge ok **
```

```
** mtdbt2f ok **
```

Bye.

```
** mtdbt2f-make ok **
```

Bye.

```

** sleep for 0 seconds **

```

Dexter Sinister: LETTER & SPIRIT

This bulletin flows directly from "A Note on the Type" by Dexter Sinister, first published in *The Curse of Bigness*, Queens Museum of Art (2010), then as wall vinyl that comprised an exhibition called "The Plastic Arts," Gallery 400 at University of Illinois, Chicago (2010), subsequently as a text in *Dot Dot Dot 20* (2010), in vinyl for the exhibition "A Note on the Signs" at Artissima, Torino, Italy (2010), and the exhibition "A Note on the T" at Graphic Design Worlds, Milan, Italy (2011), as a text in *Bulletins of the Serving Library #1, Afterall* (2011), and in the forthcoming *Graphic Design (History in the Making)*, Occasional Papers (2012).

The full caption for the image on p.158 is: Herbert Bayer, *Research in the development of Universal Type*, 1925. Black ink on paper, 11 3/4 x 23 5/8" (29.8 x 60 cm). Harvard Art Museums/Busch-Reisinger Museum, Gift of the artist. Photo: Imaging Department ©President and Fellows of Harvard College. ©2012 Artists Rights Society (ARS), New York/ VG Bild-Kunst, Bonn

Cover image: from The Hollows

Dexter Sinister: LETTER & SPIRIT

In the early 1980s, on the pages of academic design journal *Visible Language*, a classic thesis-antithesis-synthesis played out around the technological and philosophical fine points of computer-assisted type design. Stanford professor Donald Knuth begins with his article, "The Concept of a Meta-font" (Winter 1981). Two years prior, Knuth had conceived and programmed MetaFont—a software that enabled users to generate unlimited numbers of fonts by controlling a limited set of parameters. The article is a performative account of his intervening attempts, using MetaFont to harness the essential "intelligence" of letterforms. In Knuth's view, the way a single letter is drawn—an *a priori* A, say—presupposes and informs all other letters in the same font. This information can be isolated, turned into a set of instructions, and put to work computer-automating the generation of new characters by filling in the features between two or more variables such as weight or slant.

Such intelligence is (and has always been) implicit in any typeface, but Knuth is out to omit all ambiguity and install a more definite system. He acknowledges that this preoccupation with designing meta-level instructions rather than the fonts themselves is typical of the contemporary inclination to view things "from the outside, at a more abstract level, with what we feel is a more mature understanding." From this elevated vantage, MetaFont was set up to oversee "how the letters would change in different circumstances."

A year later, fellow mathematician Douglas Hofstadter responded with his "MetaFont, Metamathematics, and Metaphysics" (Autumn 1982). While "charmed" by Knuth's thesis, and admitting the bias of his own interests in artificial intelligence and aesthetic theory, Hofstadter proceeds to shoot down his colleague's apparent claim that the shape of any given letterform is "mathematically containable." To support his case, he invokes mathematician Kurt Gödel's Incompleteness Theorems, which assert that any account of a logically coherent system always contains one root-level instance that cannot itself be contained by that account. Hofstadter's antithesis then usefully couches the debate in terms of "the letter of the law" versus "the spirit of the law," a familiar antinomy that posits an absolute deference to a set of set rules against a consistent-yet-fluid set of principles. Our prevailing legal system is, of course, based on both: judges base their decisions on firmly established precedent, but also map

Dexter Sinister: LETTER & SPIRIT

uncharted territory by bringing the full range of their experience to bear on specific cases “in a remarkably fluid way.” In this manner, the law itself adapts.

Hofstadter argues that an accordingly *spirited* conception of type design would therefore renounce Knuth’s ur-A-FORM in favor of a yet-higher-level abstraction, an ur-A-ESSENCE; the fundamental difference being that Hofstadter’s notion of “intelligence” extends beyond a Platonic shape, allowing for the concept of *what constitutes an A* to change, too—beyond what we can reasonably conceive of this possibly being in the future. Each new instance of an A adds to our general understanding of this idea (and ideal), which is necessarily assembled backwards over time.

Hofstadter includes this illustration of two letters vying for the same “typographic niche,” to make himself clear:



help help help
help help help
help help help help

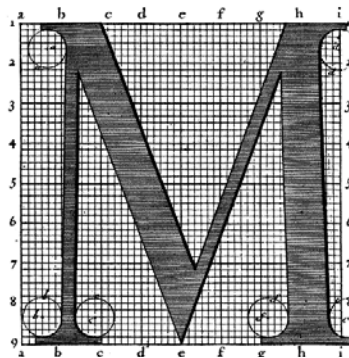
Neatly enough, the following year a linguistics professor called Geoffrey Sampson drafted a brief response to Hofstadter’s response to Knuth, titled “Is Roman Type an Open-Ended Question?” (Autumn 1983), which, it turns out, is decidedly rhetorical. Sampson argues that Hofstadter’s hairsplitting unfairly and unnecessarily exaggerates Knuth’s claims to the point of warping both his meaning and intentions. There is enough metaphysical latitude, the linguist referees, to accommodate both points of view without recourse to the misery of analytical one-upmanship. Sampson’s synthesis of letter and spirit contends that it is perfectly reasonable to conceive of letterforms as both a closed system (Knuth’s A-shape) AND as an open-ended system (Hofstadter’s A-ness).

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Relatively speaking, it depends *what you're after.*

. . .

The history of typography is marked by a persistent drive to rationalize. Following the invention of movable type in the mid-15th century, the Renaissance saw several attempts to prescribe the construction of the Roman alphabet: Fra Luca Pacioli's alphabet of perfect relations, Albrecht Dürer's letters of mathematical instructions, and Geoffroy Tory's humanistic rationalizations. These attempts were, however, essentially calligraphic exercises in determining "divine proportions;" the first to apply Enlightenment rationality to properly technical ends was the so-called Romain du Roi, or the "King's Roman." Commissioned by Louis XIV in Paris at the end of the 17th century, it was a typical Age of Reason project—the imposition of a mathematically-rigorous structure on forms that had, until now, developed organically, initially shaped by the human hand (calligraphy, inscriptions, woodcuts) and adapted according to the various demands and opportunities of the printing press and its attendant technologies. Designed by "a royal committee of philosophers and technologists" from the Academy of Sciences, the Romain du Roi was initially plotted on an orthogonal 48 x 48 grid, and a corollary "sloped Roman" italic variant derived by skewing the upright version.



The coordinates were first engraved as a set of instructions, then cut into punches to make metal type, which were to be used exclusively on official or state-approved materials. In this way, the King's letters exerted state power like a great seal or particular signature.

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Such ratiocination was revived at the Bauhaus in the 1920s, in line with two of the school's foundational principles set up to meet the demands of industrialization: the omission of ornament and the reduction to geometric elements. The most celebrated outcome was Herbert Bayer's 1925 Universal Alphabet, a pared-down sans-serif comprised exclusively of lower-case characters. Bayer adapted the basic glyphs for typewriter and handwriting, experimented with phonetic alternatives, and proposed a wide family of variants, such as the condensed bold version drawn on this panel:



Alongside the basic character set (minus a presumably redundant o, but with alternatives to a and g, as well as two d's that anticipate lighter weights), Bayer has further abstracted the tools he used to draw it: ruler, T-square, set square, compass and protractor. As such, the drawing captions itself, pointing to its point—that this is a project *intrinsically concerned with a particular mode of construction.*

Around the same time, fellow Bauhausler Josef Albers followed similar principles to slightly different ends with his Stencil Alphabet. This, too, was a single-case font, now entirely configured from ten rudimentary shapes, also typically isolated and presented alongside the assembled letters. Drawn and photographed for exclusive use in the school's own publications and publicity, these elemental Bauhaus fonts remained closeted explorations rather than properly industrial products. Neither was properly developed into a “working” typeface, mass-manufactured in metal for wider use. Outside the school, though, prominent *Werkbunder* Paul Renner toned down the hard geometry with gentler, “humanist” sensibilities—more modulation, less harsh on the eye—to yield

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his commercially successful Futura. When it was issued in 1927, godfather of the nascent “New Typography,” Jan Tschichold, wrote that

it cannot be open to one person to create the letterform of our age, which is something that must be free of personal traces. It will be the work of several people, among whom one will probably find an engineer.

During the 1930s, British type designer Stanley Morison was in charge of Monotype, the most significant type foundry of the day. Morison was solicited by *The Times*, London’s principal newspaper, to take out a £1,000 full-page ad. Morison responded yes, as long he could typeset the page himself, because the newspaper’s existing design was in such a dire state. This conversation reportedly carried itself up the *Times*’ chain of command, prompting its director to invite Morison to oversee a complete overhaul of the paper’s typography. Morison accepted, again on one condition—that the paper abolish the use of full points after isolated proper nouns, which he (rightly) considered superfluous and a prime example of the sort of typographic depravity he intended to stamp out. The paper removed the offending punctuation, and Morison climbed aboard.

Newspaper typography is a particularly sensitive art. Minute adjustments have critical knock-on effects for the amount of news that can be issued—especially when multiplied by the massive circulation figures of *The Times*. In a 25-page memorandum, Morison concluded that the house typeface needed to be updated. What became Times New Roman, however, was neither redrawn from scratch nor merely an amendment of the existing version, but rather *amalgamated* from a number of different typefaces made at various points over the previous 400 years. The mongrel result was effectively collaged from past forms, so the lowercase e doesn’t exactly “match” the lowercase a—at least not according to the usual standards of typographic consistency. Up close, Times New Roman is full of such quirks.



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The design of letterforms usually manifests an individual designer's aesthetic impulse at a given point in time, but Times New Roman was the bastard offspring of MANY designers working ACROSS time, with Morison's role something like that of producer, editor, or arranger. The most frequently repeated account of the type's development suggests that Morison gave an existing type sample and some rough sketches to an assistant in the paper's advertising department, who duly cobbled together the new font. Whatever the story, in a note on HIS type, Morison concluded, auspiciously enough: "Ordinary readers, for whom a type is what it does, will be pleased to leave them to analyze the spirit of the letter."

French type designer Adrian Frutiger took the rational mapping of the Romain du Roi to another plateau with Univers, released by the foundry Deberny & Peignot in 1957. In line with the all-encompassing aspirations of mid-20th century Swiss design—locus of the so-called International Style—Univers was conceived as an unusually extended family of fonts. The standard palette of variants, traditionally limited to regular, italic, bold, and sometimes bold italic, was expanded sevenfold, yielding a total of 21 fonts to be cut at any given size. In the foundry's publicity, the family was usually housed in a two-dimensional matrix: an X-axis charts relative WIDTH interspersed with POSITION (Frutiger's term for slant), while the Y-axis charts relative WEIGHT. The family DNA is manifest in a few eccentricities, such as a square dot over the i and a double-barred lower-case a, while individual character sets are named according to their position in the matrix—55 for standard roman, 56 for standard oblique, 65 for medium roman, 66 for medium oblique, and so on.



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Univers’ matrix implies that the family could potentially procreate in any direction *ad infinitum*, and, in fact, the project has remained notably open since its inception. Frutiger himself reworked the typeface for digital release by Linotype in 1997, raising the total number of distinct character sets from the original 21 to 63. These included additions to both ends of the chart (Ultra Light and Extended Heavy), along with new monospace variants, requiring a third number to be added to the identifying code. In the wake of Univers’ popularity, further dimensions have since been introduced, including extended character sets such as Central European, and non-Latin alphabets such as Greek, Cyrillic, Arabic, and Japanese. This globalization culminated in 2011 with Linotype rechristening the entire design “Univers Next.”

...

Towards the end of “The Concept of a Meta-font,” an admirably frank Knuth wonders: “The idea of a meta-font should now be clear. But what good is it?”

Hofstadter, for one, had an idea: “Never has an author had anything remotely like this power to control the final appearance of his or her work.” Indeed, seeing his own writing in print years earlier, Knuth had been so upset by the shoddy standards of early digital typesetting that he resolved to do it himself—not unlike Morison with his *Times* ad. It took longer than expected, but a decade later, Knuth had designed TeX, an automated typesetting system still in wide use today within academic publishing. MetaFont was initially developed as handmaiden to TeX, to generate the fonts to be used within the broader tasks of document markup and page assembly. However, as MetaFont developed as a project in its own right, its purpose was less immediately apparent. At the time of his *Visible Language* article at least, MetaFont appears to be more a case of hobbyist tinkering in search of an eventual application.

To be fair, Knuth does propose a few uses, all of which were already possible but certainly enhanced by the speed of computer processing. One is the ability to adjust the details of a particular font in line with the limits of a given output device—to make letters thinner or less intricate, for instance, so as to resist type “filling in” with either ink (on paper) or pixels

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(on low-resolution monitors). A second is the possibility of generating countless iterations of the same basic design with slight differences in order to compare and contrast. But a more surprising (and most emphatically-stated) third function of MetaFont, according to its creator, is to meet the “real need” of “mankind’s need for variety.” In other words, to create difference for the sake of difference.

And so the notion of developing MetaFont as an autonomous project rather than as one of TeX’s machine-parts appears to aim foremost at expanding the possibilities of literary expression—anticipating “greater freedom,” a “typeface of one’s own,” “multiple fonts to articulate multiple voices,” and so on. It’s worth recalling, though, that when Knuth invented TeX in order to better typeset his own pages, or Morison refurbished *The Times*, their impetus was fundamentally reactive, not constructive. They weren’t out to expand the possibilities for expression *per se*, only to reinstate standards that had been eroded—ones that had been established in the first place to articulate written language as clearly as possible, not to pile on the effects. As Knuth himself states, typefaces are more medium than message, to the extent that “A font should be sublime in its appearance but subliminal in its effect.” What he didn’t foresee (or at least worry over) is that mankind’s real need for variety would tend towards the wholesale takeoever of novelty as an end in itself.

. . .

In his 1928 book *One-Way Street*, the German cultural critic Walter Benjamin had already anticipated Knuth’s “power to control the final appearance of his or her work,” alluding to the artistic ends that an increased intimacy between writer and technology might foster. Specifically, he predicted that the writer will start to compose his work with a typewriter instead of a pen when “the precision of typographic forms has entered directly into the conception of his books,” to the degree that “new systems with more variable typefaces might then be needed.”

By writing directly into a mechanical form rather than a manuscript (as we’re doing right now) the writer would be working closer to the nature of the multiplied result, and through an increasing awareness and gradual mastery of the form’s new limitations and possibilities *the writing itself

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would evolve;* the shorter the distance between the raw material of words and their processed output, the more entwined the content and form from the outset. This line of thinking was more famously expounded by Benjamin in his 1936 essay "The Work of Art in the Age of Mechanical Reproduction," which more broadly argues that an authentic, pertinent art is the result of engagement with the latest technological innovations.

Benjamin was an active Marxist, committed to the notion that the technologies of manufacture—the "means of production"—ought to be owned by the people who operate them. In 1934's "The Author as Producer," instead of focusing on factories and workers, he attempts to pinpoint the nature of a *socially committed art.* Writing and the other arts, he writes, are grounded in social structures such as educational institutions and publishing networks, but rather than merely asking how an artist's work stands in relation TO these structures, he queries how it stands IN them. He demands that artists refrain from merely adopting political "content," propagating an ideological cause, and work instead to transform the root-level MEANS by which their work is produced and distributed. This "progressive" artistic approach INEVITABLY manifests a "correct" political tendency. The work practices in lieu of preaching.

Benjamin's first case study in "The Author as Producer" is the Soviet writer Sergei Tretiakov, who lived and worked on an agricultural commune for extended periods before writing his experiences up into a novel. He is offered as an exemplary "operative writer," implicating himself in the matter at hand, as opposed to the common hack who merely observes and "gives information." Benjamin's Exhibit A, though, is his immediate contemporary Bertolt Brecht, who subverted orthodox drama by way of his epic theatre's celebrated "distancing effects"—leaving the lights on, renouncing expository narrative, presenting a series of objective "situations" in order that the spectators draw their own conclusions. Via these and other manipulations of "technique," Brecht transformed "the functional relation between the stage and the public, text and production, director and actor."

Necessarily leading by his own and others' example, then, Benjamin urges the artist to perpetually reconsider his role away from prevailing norms, job descriptions, professional standards, and outside expectations

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generally. What MIGHT the work of a constructively-minded “writer” constitute? Are the abilities to distill an opinion and turn a phrase adequately deployed via the regular mediums—newspaper columns, books, journals and pamphlets—or might they be more usefully channeled through writing, say, captions to photographs, or scripts to make films; or indeed by renouncing writing altogether and taking up photography instead? Hence the essay’s title is also its proposition: the writer (or artist) should be less a hemmed-in author than a free-ranging producer, closing the divide between her “intellectual” and “productive” activities.

. . .

In “A Note on the Type” (2010) we previously offered a history and extension of Knuth’s MetaFont project. Our appreciative “note” (more a love-letter written 30 years late) was then typeset in our own updated version of MetaFont—basically Knuth’s project rebooted for the PostScript generation and, following a throwaway remark by the late David Foster Wallace, rechristened Meta-The-Difference-Between-The-Two-Font. That “single” note has since been published in multiple contexts and formats—on screens, pages, and walls. While all conform to the same basic essay template, each new instance adds three bits of writing by other people, each typeset in unique, freshly-generated MTDBT2-fonts to demonstrate the software’s essential plasticity. These extra texts have alluded to various facets of the project—*repetition,* *habit,* or *the gray area between art and design,* for example—that have suggested themselves as it has rolled palimpsestuously along.

Meta-The-Difference-Between-The-Two-Font picked up where Knuth’s MetaFont left off. In fact, the only OSTENSIBLE difference between the two is that the new version was re-scripted in contemporary code to run on current computers. When typefaces are reduced to on/off bits of information, the typographic norms established by metal type (and carried over into photocomposition) are no longer bound to material necessity—they can be ignored and modified, and this is precisely what Knuth did. However, it was only with the advent and proliferation of PostScript in the early 1980s that typefaces became “device independent,” freed from their association with particular composing machines and their controlling companies. But beyond this nominal “language difference,” MTDBT2F

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remained more or less faithful to MetaFont’s founding principles — not least its wacko parameters borrowed from Knuth’s Computer Modern font, which include “SUPERNESS,” “CURLINESS,” and so on.

The ACTUAL difference between the two, on the other hand, is less easy to discern. One clue is the simple difference in time: what it meant to make it **then**, and what it means to make it **now**.

In his essay “On the New” (2002), Russian art theorist Boris Groys wrote:

Being new is, in fact, often understood as a combination of being different and being recently-produced. We call a car a NEW car if this car is different from other cars, and at the same time the latest, most recent model produced ... But as Kierkegaard pointed out, to be new is by no means the same as being different ... the new is a DIFFERENCE WITHOUT DIFFERENCE, or a difference which we are unable to recognize because it is not related to any pre-given structural code.

He continues:

For Kierkegaard, therefore, the only medium for a possible emergence of the new is the ordinary, the “non-different,” the identical — not the OTHER, but the SAME.

MTDBT2F is, more-or-less, the same as MetaFont, abiding the obvious fact that it swallows its predecessor. Although the result may look the same, it clearly can’t be, because in addition to the “productive” software, the new version embeds its “intellectual” backstory—a story which is not merely supplementary but absolutely essential. MTDBT2F is a tool to generate countless PostScript fonts, sure, but it is **at least equally** a tool to think around and about MetaFont.

This broader notion is already ingrained in that original *Visible Language* debate, again most keenly foreseen by Hofstadter, who wrote that one of the best things MetaFont might do is inspire readers to chase after the intelligence of an alphabet, and “yield new insights into the elusive ‘spirits’ that flit about so tantalizingly, hidden just behind those lovely shapes we call ‘letters.’” Hofstadter is still referencing fonts and computers here, but

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his sentiments can easily be read under what art critic Dieter Roelstraete recently called “the taunting of thought.” In fact, Walter Benjamin closed “The Author as Producer” with the following summary:

You may have noticed that the chain of thought whose conclusion we are approaching only presents the writer with a single demand, the demand of REFLECTING, of thinking about his position in the process of production.

At least as much as MTDBT2F serves as a functioning typeface, or set of typefaces, then, it is also a red herring, a carrot, and a mirror. It is a nominal setup for a nominal subject to play out, typically moving in and out of focus, veering off into other fields, and trespassing on other topics. In this unruly manner, the font serves us (or anyone else) exactly as it serves language—as rubber cement, a bonding agent.

. . .

In “The Designer as Producer,” a quick riff on “The Author as Producer” from 2004, design critic Ellen Lupton writes that Benjamin “celebrated the proletarian ring of the word ‘production,’ and the word carries those connotations into the current period,” offering us “a new crack at materialism, a chance to reengage the physical aspects of our work.” To claim, or reclaim, the “tools of production” in the arts today, though, shouldn’t imply some form of engagement, or worse, REengagement, with heavy machinery, hand tools, hard materials, or the studio (art-equivalent of the factory floor). More plausibly, it implies digital code.

Code resides in The Hollows, the curiously-named engine room of immaterial media, domain of scripts and programs, that has been likened by design group Metahaven to the stock market crash: “surface without surface, the exposure of the naked infrastructure or root level system language which precedes surface itself, surface without its effects.”

Another recent essay titled after Benjamin and written by Boris Groys, “Religion in the Age of Digital Reproduction,” invokes the protagonists of *The Matrix* as being uniquely equipped to perceive the workings of The Hollows. While Neo and co. were able to read image files as code, the average spectator “does not have the magic pill ... that would allow him

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or her to enter the invisible digital space otherwise concealed behind the digital image.” And auspiciously enough, Groys also draws on our by-now-familiar terms, letter and spirit.

In updating Benjamin’s title, Groys signals the same basic investigation —of an existing phenomenon (this time religion rather than art) in a new milieu (digital rather than mechanical). Religious practice, he writes, has always involved the reproduction of institutionalized forms, but as Western religion has become increasingly personal and privatized, an unconditional “freedom of faith” has developed alongside traditional, conditional forms. Contemporary fundamentalist religion remains, by definition, grounded in the devout repetition of a fixed “letter” rather than a free “spirit” —material and external rather than essential and implied. This antinomy of “dead letter vs. living spirit” (which tallies easily enough with the legal one related by Hofstadter) informs all Western discourse on religion. On one hand, the typically “spirited” anti-fundamentalist account favors a living, powerful tradition capable of adapting its central message to different times and places, thus maintaining its vitality and relevance. Conversely, the ritualized repetition of the fundamentalist “letter” amounts to a kind of revolutionary stasis or violent rupture in the ever-changing order of things. Religious fundamentalism can thus be conceived as religion *after the death of the spirit:* letter and spirit are separated and polarized to the extent that the former no longer guarantees the latter. “A material difference is now JUST a difference,” Groys writes, “—there is no essence, no being, and no meaning underlying such a formal difference at a deeper level.”

While earlier media suited and so precipitated the circulation of conditional religion (1:1 mechanically-reproduced texts and images disseminated via orthodox channels), contemporary web-based media more closely approximate and so facilitate the unconditional —the wild dissemination of idiosyncratic views. And as digital reproduction supplants mechanical reproduction, the video image becomes the medium of choice. The cheap, anonymous, promiscuous character of digital information guarantees reproduction and dissemination more than any other historical medium. But what’s REALLY being duplicated is, of course, the image’s code —its invisible DNA.

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In the 1930s, Benjamin had reasonably assumed that future technologies would only continue to guarantee the resemblance between an original and its copy, but now the opposite is true: each manifestation of the original is actually **different,** because typically overridden and recalibrated according to each spectator’s local preferences (resolution, color calibration, style sheets, etc.) while ONLY THE CODE REMAINS THE SAME. In Groys’ final analysis, spirit and letter are transposed from a meta-physical to a technological plane, where “spirit” is script, and each new visualization of that script is a corresponding “letter.” (Picture m4v’s, jpeg’s and mp3’s as angels “transmitting their divine command.”) By now the terms are confused to the point of inversion: the so-called “spirit” of digital code is fixed, while the so-called “letter” of its various manifestations is fluid. Consequently, forms — surfaces — are no longer tethered to definite meaning, no longer plausible, and so no longer to be trusted.

This is old news. However, as digital media become increasingly ubiquitous, templates increasingly homogenous and entrenched, the most likely place a “writer” might usefully “produce” today is in The Hollows. Hidden or invisible, and otherwise inaccessible to most, this is where we might conceivably reconnect spirit and letter, essence and identity —for “Ordinary readers, for whom a type is what it does.”

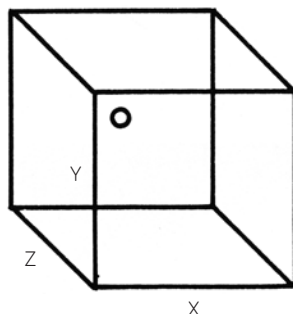
...

How to keep things moving?

MetaFont and MTDBT2F were both set up to generate an infinite number of individual typefaces by tweaking a few simple parameters at different points in time. But what if we make one of those parameters **time itself*?*

First let’s transpose the extant ones onto a 3-D graph, running WEIGHT (a kind of bold) along the X-axis, SLANT (more or less italic) up the Y, and extending SUPERNESS (a kind of chutzpah) off into the Z beyond. We’ll ignore CURLINESS for the time being, but we do have to account for a fourth factor, PEN, best conceived as a digital “nib” that determines the line’s fundamental shape and angle at any given point.

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Now let's send that point *constantly moving* through this imaginary cube. As it wanders randomly and aimlessly through the space, it trails a script that renders an alphabet whose form morphs according to its position relative to the other parameters—not forgetting the fact that the point-nib-pen itself is in perpetual flux. And, crucially, it never stops. The outcome might be usefully apprehended as the potentially endless matrix of Frutiger's Univers, amalgamated over time like Morison's Times New Roman, articulating itself in the manner of Bayer's Geometric Alphabet, over the precise wireframe of Louis XIV's Romain du Roi. Which amounts to a typographic oxymoron: a SINGLE typeface that's simultaneously MANY typefaces and never stops moving.

Naming this shapeshifter is easy enough—just shunt another couple of boxcars onto the end of the night train to arrive at (deep breath) Meta-The-Difference-Between-The-Two-Font-4-D, or MTDBT2F4D for short.

...

Writing in one place inevitably *performs* in another.

Here, for example, reflecting on Hofstadter's and Morison's and Groys' various assimilations of the terms "letter" and "spirit" fosters a more robust, compound sense of their allegorical purpose. It produces a cosmopolitan thought. When grappling with ideas in one domain is brought to bear on another, those ideas are more firmly grasped and so more readily utilized somewhere else ... towards considering (say) the ways in which relative chauvinism and relative open-mindedness manifest themselves in daily life and work.

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Or, equally, writing the first small script when learning a new programming language, the sole purpose of which is to generate two words that mark the border between instruction & instance. Swaddled in asterisks and set without a full point, this text always reads:

****Hello world****

For Feòrag, with love

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ences it, microelectrodes in his hypothalamus trigger sensitive neurons. Revulsion and shame flood him at the sight of her face, the sense of his vulnerability. Manfred's metacortex, in order to facilitate his divorce, is trying to decondition his strange love. It has been working on him for weeks, but still he craves her whiplash touch, the humiliation of his wife's control, the sense of helpless rage at her unpayable taxes, demanded with interest.

Aineko watches him from the pillow, purring continuously. Retractable claws knead the bedding, first one paw, then the next. Aineko is full of ancient feline wisdom that Pamela instilled back when mistress and master were exchanging data and bodily fluids rather than legal documents. Aineko is more cat than robot, these days, thanks in part to her hobbyist's interest in feline neuroanatomy. Aineko knows that Manfred is experiencing nameless neurasthenic agonies, but really doesn't give a shit about that as long as the power supply is clean and there are no intruders.

Aineko curls up and joins Manfred in sleep, dreaming of laser-guided mice.

• • •

Manfred is jolted awake by the hotel room phone shrilling for attention.

"Hello?" he asks, fuzzily.

"Manfred Macx?" It's a human voice, with a gravelly East Coast accent.

"Yeah?" Manfred struggles to sit up. His mouth feels like the inside of a tomb, and his eyes don't want to open.

"My name is Alan Glashwicz, of Smoot, Sedgwick Associates. Am I correct in thinking that you are the Manfred Macx who is a director of a company called, uh, agalmic dot holdings dot root dot one-eight-four dot ninety-seven dot A-for-able dot B-for-baker dot five, incorporated?"

"Uh." Manfred blinks and rubs his eyes. "Hold on a moment." When the retinal patterns fade, he pulls on his glasses and powers them up. "Just a second now." Browsers and menus ricochet through his sleep-laden eyes. "Can you repeat the company name?"

"Sure." Glashwicz repeats himself patiently. He sounds as tired as Manfred feels.

"Um." Manfred finds it, floating three tiers down an elaborate object hierarchy. It's flashing for attention. There's a priority interrupt, an incoming lawsuit that hasn't propagated up the inheritance tree yet. He prods at the object with a property browser. "I'm afraid I'm not a director of that company, Mr. Glashwicz. I appear to be retained by it as a technical contractor with nonexecutive power, reporting to the president, but frankly, this is the first time I've ever heard of the company. However, I can tell you who's in charge if you want."

"Yes?" The attorney sounds almost interested. Manfred figures it out; the guy's in New Jersey. It must be about three in the morning over there.

Malice—revenge for waking him up—sharpens Manfred's voice. "The president of agalmic.holdings.root.184.97.AB5 is agalmic.holdings.root.184.97.201. The secretary is agalmic.holdings.root.184.D5, and the chair is agalmic.holdings.root.184.E8.FF. All the shares are owned by those companies in equal measure, and I can tell you that their regulations are written in Python. Have a nice day, now!" He thumps the bedside phone control and sits up, yawning, then pushes the do-not-disturb button before it can interrupt again. After a moment he stands up and stretches, then heads to the bathroom to brush his teeth, comb his hair, and figure out where the lawsuit originated and how a human being managed to get far enough through his web of robot companies to bug him.

• • •

While he's having breakfast in the hotel restaurant, Manfred decides that he's going to do something unusual for a change: He's going to make himself temporarily rich. This is a change because Manfred's normal profession is making other people rich. Manfred doesn't believe in scarcity or zero-sum games or competition—his world is too fast and information dense to accommodate primate hierarchy games. However, his current situation calls for him to do something radical: something like making himself a temporary billionaire so he can blow off his divorce settlement in an instant, like a wily accountancy octo-

pus escaping a predator by vanishing in a cloud of his own black ink.

Pam is chasing him partially for ideological reasons—she still hasn't given up on the idea of government as the dominant superorganism of the age—but also because she loves him in her own peculiar way, and the last thing any self-respecting dom can tolerate is rejection by her slave. Pam is a born-again postconservative, a member of the first generation to grow up after the end of the American century. Driven by the need to fix the decaying federal system before it collapses under a mound of Medicare bills, overseas adventurism, and decaying infrastructure, she's willing to use self-denial, entrapment, predatory mercantilism, dirty tricks, and any other tool that boosts the bottom line. She doesn't approve of Manfred's jetting around the world on free airline passes, making strangers rich, somehow never needing money. She *can* see his listing on the reputation servers, hovering about thirty points above IBM: All the metrics of integrity, effectiveness, and goodwill value him above even that most fundamentalist of open-source computer companies. And she knows he craves her tough love, wants to give himself to her completely. So why is he running away?

The reason he's running away is entirely more ordinary. Their unborn daughter, frozen in liquid nitrogen, is an unim- planted ninety-six-hour-old blastula. Pam's bought into the whole Parents for Traditional Children parasite meme. PTC are germ-line recombination refuseniks: They refuse to have their children screened for fixable errors. If there's one thing that Manfred really *can't* cope with, it's the idea that nature knows best—even though that isn't the point she's making. One steaming row too many, and he kicked back, off to traveling fast and footloose again, spinning off new ideas like a memetic dynamo and living on the largesse of the new paradigm. File for divorce on grounds of irreconcilable ideological differences. No more whiplash-and-leather sex.

• • •

Before he hits the TGV for Rome, Manfred takes time to visit a model airplane show. It's a good place to be picked up by a CIA stringer—he's had a tip-off that someone will be there—

and besides, flying models are hot hacker shit this decade. Add microtechnology, cameras, and neural networks to bal- wood flyers, and you've got the next generation of military stealth flyer: It's a fertile talent-show scene, like the hacker cons of yore. This particular gig is happening in a decaying out-of-town supermarket that rents out its shop floor for events like this. Its emptiness is a sign of the times, ubiquitous broadband and expensive gas. (The robotized warehouse next door is, in contrast, frenetically busy, packing parcels for home delivery. Whether they telecommute or herd in meat-space offices, people still need to eat.)

Today, the food hall is full of people. Eldritch ersatz insects buzz menacingly along the shining empty meat counters without fear of electrocution. Big monitors unfurled above the deli display cabinets show a weird, jerky view of a three-dimensional nightmare, painted all the synthetic colors of radar. The feminine-hygiene galley has been wheeled back to make room for a gigantic plastic-shrouded tampon five meters long and sixty centimeters in diameter—a microsat launcher and conference display, plonked there by the show's sponsors in a transparent attempt to talent-spot the up-and-coming engineering geeks.

Manfred's glasses zoom in and grab a particularly fetching Fokker triplane that buzzes at face height through the crowd: He pipes the image stream up to one of his websites in real time. The Fokker pulls up in a tight Immelman turn beneath the dust-shrouded pneumatic cash tubes that line the ceiling, then picks up the trail of an F-104G. Cold War Luftwaffe and Great War Luftwaffe dart across the sky in an intricate game of tag. Manfred's so busy tracking the warbirds that he nearly trips over the fat white tube's launcher-erector.

"Eh, Manfred! More care, *s'il vous plait*!"

He wipes the planes and glances round. "Do I know you?" he asks politely, even as he feels a shock of recognition.

"Amsterdam, three years ago." The woman in the double-breasted suit raises an eyebrow at him, and his social secretary remembers her for him, whispers in his ear.

"Annette from Arianespace marketing?" She nods, and he focuses on her. Still dressing in the last-century retro mode that confused him the first time they met, she looks like a

Kennedy-era Secret Service man: cropped bleached crew cut like an angry albino hedgehog, pale blue contact lenses, black tie, narrow lapels. Only her skin color hints at her Berber ancestry. Her earrings are cameras, endlessly watching. Her raised eyebrow turns into a lopsided smile as she sees his reaction. "I remember. That cafe in Amsterdam. What brings you here?"

"Why"—her wave takes in the entirety of the show—"this talent show, of course." An elegant shrug and a wave at the orbit-capable tampon. "It's good talent. We're hiring this year. If we re-enter the launcher market, we must employ only the best. Amateurs, not time-servers, engineers who can match the very best Singapore can offer."

For the first time, Manfred notices the discreet corporate logo on the flank of the booster. "You outsourced your launcher vehicle fabrication?"

Annette pulls a face as she explains with forced casualness, "Hotels were more profitable, this past decade. The high-ups, they cannot be bothered with the rocketry, no? Things that go fast and explode, they are passé, they say. Diversify, they say. Until—" She gives a very Gallic shrug. Manfred nods; her earrings are recording everything she says, for the purposes of due diligence.

"I'm glad to see Europe re-entering the launcher business," he says seriously. "It's going to be very important when the nanosystems conformational replication business gets going for real. A major strategic asset to any corporate entity in the field, even a hotel chain." *Especially now they've wound up NASA and the moon race is down to China and India*, he thinks sourly.

Her laugh sounds like glass bells chiming. "And yourself, *mon cher*? What brings you to the Confederation? You must have a deal in mind."

"Well"—it's Manfred's turn to shrug—"I was hoping to find a CIA agent, but there don't seem to be any here today."

"That is not surprising," Annette says resentfully. "The CIA thinks the space industry, she is dead. Fools!" She continues for a minute, enumerating the many shortcomings of the Central Intelligence Agency with vigor and a distinctly Parisian rudeness. "They are become almost as bad as AP and

Reuters since they go public," she adds. "All these wire services! And they are, ah, stingy. The CIA does not understand that good news must be paid for at market rates if freelance stringers are to survive. They are to be laughed at. It is so easy to plant disinformation on them, almost as easy as the Office of Special Plans..." She makes a banknote-riffing gesture between fingers and thumb. By way of punctuation, a remarkably maneuverable miniature ornithopter swoops around her head, does a double-back flip, and dives off in the direction of the liquor display.

An Iranian woman wearing a backless leather minidress and a nearly transparent scarf barges up and demands to know how much the microbooster costs to buy. She is dissatisfied with Annette's attempt to direct her to the manufacturer's website, and Annette looks distinctly flustered by the time the woman's boyfriend—a dashing young air force pilot—shows up to escort her away. "Tourists," she mutters, before noticing Manfred, who is staring off into space with fingers twitching. "Manfred?"

"Uh—what?"

"I have been on this shop floor for six hours, and my feet, they kill me." She takes hold of his left arm and very deliberately unhooks her earrings, turning them off. "If I say to you I can write for the CIA wire service, will you take me to a restaurant and buy me dinner and tell me what it is you want to say?"

. . .

Welcome to the second decade of the twenty-first century; the second decade in human history when the intelligence of the environment has shown signs of rising to match human demand.

The news from around the world is distinctly depressing this evening. In Maine, guerrillas affiliated with Parents for Traditional Children announce they've planted logic bombs in antenatal-clinic gene scanners, making them give random false positives when checking for hereditary disorders. The damage so far is six illegal abortions and fourteen lawsuits.

The International Convention on Performing

Rights is holding a third round of crisis talks in an attempt to stave off the final collapse of the WIPO music licensing regime. On the one hand, hard-liners representing the Copyright Control Association of America are pressing for restrictions on duplicating the altered emotional states associated with specific media performances: As a demonstration that they mean business, two "software engineers" in California have been kneecapped, tarred, feathered, and left for dead under placards accusing them of reverse-engineering movie plot lines using avatars of dead and out-of-copyright stars.

On the opposite side of the fence, the Association of Free Artists is demanding the right to perform music in public without a recording contract, and is denouncing the CCAA as being a tool of Mafia apparachiks who have bought it from the moribund music industry in an attempt to go legit. FBI Director Leonid Kuibyshev responds by denying that the Mafia is a significant presence in the United States. But the music biz's position isn't strengthened by the near collapse of the legitimate American entertainment industry, which has been accelerating ever since the nasty naughties.

A marginally intelligent voicemail virus masquerading as an IRS auditor has caused havoc throughout America, garnishing an estimated eighty billion dollars in confiscatory tax withholdings into a numbered Swiss bank account. A different virus is busy hijacking people's bank accounts, sending ten percent of their assets to the previous victim, then mailing itself to everyone in the current mark's address book: a self-propelled pyramid scheme in action. Oddly, nobody is complaining much. While the mess is being sorted out, business IT departments have gone to standby, refusing to process any transaction that doesn't come in the shape of ink on dead trees.

Tipsters are warning of an impending readjustment in the overinflated reputations market, follow-

ing revelations that some u-media gurus have been hyped past all realistic levels of credibility: The consequent damage to the junk-bonds market in integrity is serious.

The EU council of independent heads of state has denied plans for another attempt at eurofederalism, at least until the economy rises out of its current slump. Three extinct species have been resurrected in the past month; unfortunately, endangered ones are now dying off at a rate of one a day. And a group of militant anti-GM campaigners are being pursued by Interpol, after their announcement that they have spliced a metabolic pathway for cyanogenic glycosides into maize seed corn destined for human-edible crops. There have been no deaths yet, but having to test breakfast cereal for cyanide is really going to dent consumer trust.

About the only people who're doing well right now are the uploaded lobsters—and the crusties aren't even remotely human.

. . . .

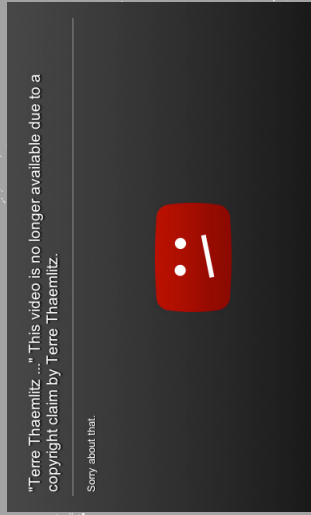
Manfred and Annette eat on the top deck of the buffet car, chatting as their TGV barrels through a tunnel under the English Channel. Annette, it transpires, has been commuting daily from Paris, which was, in any case, Manfred's next destination. From the show, he messaged Aineko to round up his baggage and meet him at St. Pancras Station, in a terminal like the shell of a giant steel woodlouse. Annette left her space launcher in the supermarket overnight: An unfueled test article, it is of no security significance.

The railway buffet car is run by a Nepalese fast-food franchise. "I sometimes wish for to stay on the train," Annette says as she waits for her *mismas bhat*. "Past Paris! Think. Settle back in your couchette, to awaken in Moscow and change trains. All the way to Vladivostok in two days."

"If they let you through the border," Manfred mutters. Russia is one of those places that still requires passports and asks if you are now or ever have been an anti-anticommunist: It's still trapped by its bloody-handed history. (Rewind the video



"What the hell is Terre's problem?!"



Please don't let this happen to you!

Terre Thaemlitz kindly asks you not to upload her releases - including into YouTube, SoundCloud and other social media sites. To understand the specific reasons why (which are *not* about copyright claims), [click here](#).

Did you know:

- YouTube, SoundCloud and other sites only allow registered users (or Gmail account holders) to leave comments and send messages to one another.
- Because Terre is not registered with any social media sites, nor Gmail, he has no way of directly sending you a friendly takedown request.
- YouTube, SoundCloud and other sites refuse to forward friendly messages from non-registered users such as Terre to registered users. (Yes, she has spoken to YouTube and SoundCloud at length about this. At this time, both companies refuse to implement open communication between registered and non-registered users.)
- Even if you write on your YouTube or SoundCloud page, "Hey artist, I'm a big fan! Contact me if you want this taken down!" *the corporate policies of the websites you are using prohibit Terre from contacting you.*
- Therefore, with no way to contact you directly, Terre's only option is to file a 'copyright claim' - *which he hates doing!* Anyone familiar with Terre's work knows she has always been critical of copyright, authorship, originality, creativity, and any other ego-claims to production processes. That has not changed! This situation makes him incredibly stressed, frustrated and sad. The ironies and hypocrisies of the situation cut deeply!
- ...So do angry emails received from YouTube and SoundCloud users after their uploads are removed, and 'strikes' have been placed against their accounts. Please realize your problem is not with Terre. It is with the communication policies of YouTube, SoundCloud, etc. Those policies, in combination with your actions, are forcing Terre's hand. This is truly regrettable for everyone.

Terre wishes to keep 'queer' audio and media functioning queerly, contextually, and with smallness.

Populist social media engines that blast media 'globally' to as many people as possible may be appropriate for corporate pop music, but they function contrary to everything Terre believes about cultivating and protecting the hyper-specificities of 'underground' and minor situations. Indiscriminate file sharing, YouTube and SoundCloud grant *too much exposure with too little precision*.

Clearly, many of you disagree. However, please be sensitive to the fact that uploads into YouTube and SoundCloud enact an explicitly anti-social situation that prohibits open communication between you and non-registered users such as Terre - the very people you are likely trying to 'support' through your uploads!

Such uploads display no specific concept of audience, and take no responsibility for who has access to the content. It is no different than dumping a box of 100,000 CD-R copies of your favorite track at the largest shopping mall in town, and just walking away. You are placing (at times rather delicate) materials into the hands of homophobes, transphobes, religious zealots, anti-pacifists, anti-Marxists, anti-feminists, corporate anti-sampling lawyers and their legions of content scanning spider-bots.

The latter is also a major reason *people should never list audio sample sources in website comment fields or websites/apps like Discogs, WhoSampled, etc.* Remember, many countries do not have the legal category of "fair use." This includes Japan - where Terre lives. While the average end-user who lists things on such sites is preoccupied with a false sense of freedom of expression rooted in fun, it is on the production level that one is always aware of the risks and liabilities of cultural content development - particularly with collage-based media.

As a result, Terre considers indiscriminate uploads and file sharing to be a risk to her cultural praxis on multiple levels. Although his views on uploading may be contrary to everything you have been taught to believe, please understand, in some instances *NOT UPLOADING* shows greater cultural support and understanding than uploading.

Your awareness and restraint are greatly appreciated.

Protect the unusual and minor!

The Crystal Goblet, or Printing Should Be Invisible by Beatrice Warde (1900 -- 1969)

Imagine that you have before you a flagon of wine. You may choose your own favourite vintage for this imaginary demonstration, so that it be a deep shimmering crimson in colour. You have two goblets before you. One is of solid gold, wrought in the most exquisite patterns. The other is of crystal-clear glass, thin as a bubble, and as transparent. Pour and drink; and according to your choice of goblet, I shall know whether or not you are a connoisseur of wine. For if you have no feelings about wine one way or the other, you will want the sensation of drinking the stuff out of a vessel that may have cost thousands of pounds; but if you are a member of that vanishing tribe, the amateurs of fine vintages, you will choose the crystal, because everything about it is calculated to reveal rather than hide the beautiful thing which it was meant to contain.

Bear with me in this long-winded and fragrant metaphor; for you will find that almost all the virtues of the perfect wine-glass have a parallel in typography. There is the long, thin stem that obviates fingerprints on the bowl. Why? Because no cloud must come between your eyes and the fiery heart of the liquid. Are not the margins on book pages similarly meant to obviate the necessity of fingering the type-page? Again: the glass is colourless or at the most only faintly tinged in the bowl, because the connoisseur judges wine partly by its colour and is impatient of anything that alters it. There are a thousand mannerisms in typography that are as impudent and arbitrary as putting port in tumblers of red or green glass! When a goblet has a base that looks too small for security, it does not matter how cleverly it is weighted; you feel nervous lest it should tip over. There are ways of setting lines of type which may work well enough, and yet keep the reader subconsciously worried by the fear of 'doubling' lines, reading three words as one, and so forth.

Now the man who first chose glass instead of clay or metal to hold his wine was a 'modernist' in the sense in which I am going to use that term. That is, the first thing he asked of his particular object was not 'How should it look?' but 'What must it do?' and to that extent all good typography is modernist.

Wine is so strange and potent a thing that it has been used in the central ritual of religion in one place and time, and attacked by a virago with a hatchet in another. There is only one thing in the world that is capable of stirring and altering men's minds to the same extent, and that is the coherent expression of thought. That is man's chief miracle, unique to man. There is no 'explanation' whatever of the fact that I can make arbitrary sounds which will lead a total stranger to think my own thought. It is sheer magic that I should be able to hold a one-sided conversation by means of black marks on paper with an unknown

person half-way across the world. Talking, broadcasting, writing, and printing are all quite literally forms of thought transference, and it is the ability and eagerness to transfer and receive the contents of the mind that is almost alone responsible for human civilization.

If you agree with this, you will agree with my one main idea, i.e. that the most important thing about printing is that it conveys thought, ideas, images, from one mind to other minds. This statement is what you might call the front door of the science of typography. Within lie hundreds of rooms; but unless you start by assuming that printing is meant to convey specific and coherent ideas, it is very easy to find yourself in the wrong house altogether.

Before asking what this statement leads to, let us see what it does not necessarily lead to. If books are printed in order to be read, we must distinguish readability from what the optician would call legibility. A page set in 14-pt Bold Sans is, according to the laboratory tests, more 'legible' than one set in 11-pt Baskerville. A public speaker is more 'audible' in that sense when he bellows. But a good speaking voice is one which is inaudible as a voice. It is the transparent goblet again! I need not warn you that if you begin listening to the inflections and speaking rhythms of a voice from a platform, you are falling asleep. When you listen to a song in a language you do not understand, part of your mind actually does fall asleep, leaving your quite separate aesthetic sensibilities to enjoy themselves unimpeded by your reasoning faculties. The fine arts do that; but that is not the purpose of printing. Type well used is invisible as type, just as the perfect talking voice is the unnoticed vehicle for the transmission of words, ideas.

We may say, therefore, that printing may be delightful for many reasons, but that it is important, first and foremost, as a means of doing something. That is why it is mischievous to call any printed piece a work of art, especially fine art: because that would imply that its first purpose was to exist as an expression of beauty for its own sake and for the delectation of the senses. Calligraphy can almost be considered a fine art nowadays, because its primary economic and educational purpose has been taken away; but printing in English will not qualify as an art until the present English language no longer conveys ideas to future generations, and until printing itself hands its usefulness to some yet unimagined successor.

There is no end to the maze of practices in typography, and this idea of printing as a conveyor is, at least in the minds of all the great typographers with whom I have had the privilege of talking, the one clue that can guide you through the maze. Without this essential humility of mind, I have seen ardent designers go more hopelessly wrong, make more ludicrous mistakes out of an excessive enthusiasm, than I could have thought

possible. And with this clue, this purposiveness in the back of your mind, it is possible to do the most unheard-of things, and find that they justify you triumphantly. It is not a waste of time to go to the simple fundamentals and reason from them. In the flurry of your individual problems, I think you will not mind spending half an hour on one broad and simple set of ideas involving abstract principles.

I once was talking to a man who designed a very pleasing advertising type which undoubtedly all of you have used. I said something about what artists think about a certain problem, and he replied with a beautiful gesture: 'Ah, madam, we artists do not think--we feel!' That same day I quoted that remark to another designer of my acquaintance, and he, being less poetically inclined, murmured: 'I'm not feeling very well today, I think!' He was right, he did think; he was the thinking sort; and that is why he is not so good a painter, and to my mind ten times better as a typographer and type designer than the man who instinctively avoided anything as coherent as a reason. I always suspect the typographic enthusiast who takes a printed page from a book and frames it to hang on the wall, for I believe that in order to gratify a sensory delight he has mutilated something infinitely more important. I remember that T.M. Cleland, the famous American typographer, once showed me a very beautiful layout for a Cadillac booklet involving decorations in colour. He did not have the actual text to work with in drawing up his specimen pages, so he had set the lines in Latin. This was not only for the reason that you will all think of; if you have seen the old typefoundries' famous Quousque Tandem copy (i.e. that Latin has few descenders and thus gives a remarkably even line). No, he told me that originally he had set up the dulllest 'wording' that he could find (I dare say it was from Hansard), and yet he discovered that the man to whom he submitted it would start reading and making comments on the text. I made some remark on the mentality of Boards of Directors, but Mr Cleland said, 'No: you're wrong; if the reader had not been practically forced to read---if he had not seen those words suddenly imbued with glamour and significance---then the layout would have been a failure. Setting it in Italian or Latin is only an easy way of saying "This is not the text as it will appear".'

Let me start my specific conclusions with book typography, because that contains all the fundamentals, and then go on to a few points about advertising. The book typographer has the job of erecting a window between the reader inside the room and that landscape which is the author's words. He may put up a stained-glass window of marvellous beauty, but a failure as a window; that is, he may use some rich superb type like text gothic that is something to be looked at, not through. Or he may work in what I call transparent or invisible typography. I have a book at home, of which I have no visual recollection whatever as far as its typography goes; when I think of it, all I see is the Three Musketeers

and their comrades swaggering up and down the streets of Paris. The third type of window is one in which the glass is broken into relatively small leaded panes; and this corresponds to what is called 'fine printing' today, in that you are at least conscious that there is a window there, and that someone has enjoyed building it. That is not objectionable, because of a very important fact which has to do with the psychology of the subconscious mind. That is that the mental eye focuses through type and not upon it. The type which, through any arbitrary warping of design or excess of 'colour', gets in the way of the mental picture to be conveyed, is a bad type. Our subconsciousness is always afraid of blunders (which illogical setting, tight spacing and too-wide unleaded lines can trick us into), of boredom, and of officiousness. The running headline that keeps shouting at us, the line that looks like one long word, the capitals jammed together without hair-spaces---these mean subconscious squinting and loss of mental focus.

And if what I have said is true of book printing, even of the most exquisite limited editions, it is fifty times more obvious in advertising, where the one and only justification for the purchase of space is that you are conveying a message---that you are implanting a desire, straight into the mind of the reader. It is tragically easy to throw away half the reader-interest of an advertisement by setting the simple and compelling argument in a face which is uncomfortably alien to the classic reasonableness of the book-face. Get attention as you will by your headline, and make any pretty type pictures you like if you are sure that the copy is useless as a means of selling goods; but if you are happy enough to have really good copy to work with, I beg you to remember that thousands of people pay hard-earned money for the privilege of reading quietly set book-pages, and that only your wildest ingenuity can stop people from reading a really interesting text.

Printing demands a humility of mind, for the lack of which many of the fine arts are even now floundering in self-conscious and maudlin experiments. There is nothing simple or dull in achieving the transparent page. Vulgar ostentation is twice as easy as discipline. When you realise that ugly typography never effaces itself; you will be able to capture beauty as the wise men capture happiness by aiming at something else. The 'stunt typographer' learns the fickleness of rich men who hate to read. Not for them are long breaths held over serif and kern, they will not appreciate your splitting of hair-spaces. Nobody (save the other craftsmen) will appreciate half your skill. But you may spend endless years of happy experiment in devising that crystalline goblet which is worthy to hold the vintage of the human mind. (Originally printed in London in 1932, under the pseudonym Paul Beaujon. This version printed in London 1955).

From <http://gmunch.home.pipeline.com/typo-L/misc/ward.htm>



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