555 Questions to Make *Digital Keywords* Harder

A Teaching Resource for *Digital Keywords: A Vocabulary of Information Society and Culture*

Benjamin Peters

October 8, 2016

Contents

Introduction

Use this document as you will. Many may use it to support preexisting courses; a bold few may organize critical responses to it. The questions that prompted its creation are straightforward: Is it possible to gather enough material to generate and sustain a semester of discussion in undergraduate and graduate courses based on or around the volume *Digital Keywords: A Vocabulary of Information Society and Culture* (Princeton, NJ: Princeton University Press, 2016)? Can this document, paired with that volume, sustain a stand-alone course? Whatever the answers, the document's purpose is to complicate—not to simplify—keyword analysis for all. Keywords are supposed to be hard.

Each essay in the volume receives four sections of notes. **(1) Background music** suggests music that could be played in the classroom as students shuffle in and out of class; the music is meant to prompt students' talking and thinking about the topic at hand. **(2) What can we learn from the contributor listing?** fosters the vital habit of learning to understand not only the reading content but also the author and his or her background. **(3) Exercise** suggests an activity to prompt discussion at the start of a lecture or seminar—and to be shared at the end of a class in order to encourage sustained thinking about a given keyword essay in the next class. Students may also be asked to bring prepared lists with them at the start of a class. Finally, **(4) discussion prompts** are meant to raise one thread of harder questions, not easy answers, for classroom debate. Most of these 555 questions are meant to model conversation pathways that elevate the theoretical stakes of thinking with and in language.

This document is in some ways an antidote to the editorial instinct to consolidate, polish, and finalize the topics raised in this volume. As the editor of this fine volume, I stand convinced that these twenty-five essays constitute state-of-the-art and definitive scholarly approaches to significant keywords. In fact it is *because* I am convinced of the volume's virtues that I seek here to test them—and I know no better way to do that than to ask questions that unravel, challenge, and extend the threads of thought woven together in the essays themselves. I am sure I join my fellow contributors in inviting readers, students, and scholars to challenge our essays here.

This document is also a methodological extension of Williams's keywords project—that is, these 555 questions are meant not to provoke particular responses so much as, in admittedly sometimes slapdash and zigzag ways, to model the type of language-based discussion that all sensitive users of language may engage in on their own terms. In other words, most of the questions raised in these pages require little more than taking language and its consequences seriously—at least initially. I am sure I have not done so in these pages with any more fertility or force than others; nevertheless, I offer these pages as a working witness to the generative capabilities of language analysis to get along swimmingly with both the real-world empiricism of the social sciences and the textual commitments of the humanities. I have not questioned my own introduction to the volume, which I leave to others, although I'll leave off with this quote from it: "No one can escape keywords so deeply woven into the fabric of daily talk. Whatever our motivations we—as editor and contributors—have selected these keywords because we believe the world cannot proceed without them. We invite you to engage and to disagree. It is this ethic of critical inquiry we find most fruitful in Williams. Keyword analysis is bound to reward all those who take up Williams's unmistakable invitation to all readers: Which words do unavoidably significant work in your life and the world, and why?"

Activism

Background music: Bob Dylan, “Masters of War”; Rage Against the Machine, “Killing in the Name of”

What can we learn from the contributor listing? “Guobin Yang is associate professor of communication and sociology at the Annenberg School for Communication and the Department of Sociology at the University of Pennsylvania, where he writes and teaches on digital media, political communication, and social movements in global and Chinese contexts. See https://www.asc.upenn.edu/people/faculty/guobin-yang-phd.”

Exercise: List five causes that you have stood for (what), and how you have expressed your support for them (how). Share your list with a neighbor and briefly discuss any connection or disconnect between the “how” and the “what” on your activism list.

Discussion prompts: What does it mean to argue, as Yang does, that activism is in decline since the 1976 publication of Williams’s book? As a practice involving pickets and protests? As a discourse of reform and change? As an increasingly broad and simultaneously diffused set of public practices? How does his argument about ambiguities play into these questions specifically? And how does that same argument resonate differently in different contexts—namely, the Chinese and Western Anglophone countries? If he is right, what should be done about the decline in activism, if anything, and why? If he is wrong, where is he wrong, and why?

What do we make of his argument that in some cases the same digital technologies that permit the mobilization of public interests in nondemocratic regimes, such as mainland China, also simultaneously permit the state to more swiftly and effectively observe such behavior? How, were you asked to prescribe such a terrible task, should a dictator respond to social networks that expressed some forms of protest? Under what conditions might the ability of democratic and nondemocratic states alike to observe online activism in fact grant those currently in power an advantage in maintaining the status quo—either by allowing strategically managed forms of protest to enable small groups to let off steam, or by anticipating and forcibly quashing larger populist swells of resistance? Whom does surveillance serve and why?

One of the key takeaways from Yang’s essay is that not all forms of activism are equal: in particular, not all forms of online activism are equal. If it is in fact the case that even online activism takes root very differently in different contexts, then what does this do to the commonplace notion of the internet as a uniform, open, shared space potentially connecting the entire globe in communication, commerce, and other common purposes? How should Western readers, among them many contributors in this volume and (likely) students in classrooms reading them, in turn, go about doubting or complicating or limiting the conclusions we all draw from largely Anglophone-focused case studies? What is the value of trying to understand the here and now, especially when it is hard to know when the “here” ends and the “there” begins? What other cautions or caveats should one bear in mind when seeking to understand either the local or the global media environments, and their relationship to political power, and why?

Algorithm

Background music: Paradox, "Mr. Bureaucracy"; Flight of the Conchords, "The Humans Are Dead"

What can we learn from the contributor listing? "Tarleton Gillespie is a principal researcher at Microsoft Research, New England, and an associate professor in the Department of Communication at Cornell University. He is the author of *Wired Shut: Copyright and the Shape of Digital Culture* (MIT Press, 2007) and the cofounder of the scholarly blog *Culture Digitally*, http://culturedigitally.org."

Exercise: List five algorithms (or related procedures) that have played some role in your life. Challenge: can you list five algorithms at work in your life today? Share your list with a neighbor and briefly discuss what you seem to mean by *algorithm*.

Discussion prompts: Gillespie, a pioneering researcher in algorithm studies, takes a mystifying term on loan from Arabic and parses the word into four uses.[1] It is at once (1) a trick of the trade for software programmers, (2) a synecdoche standing in for entire informational systems and their stakeholders in popular discourse, (3) a talisman used by those stakeholders for evoking cultural authority and avoiding blame (e.g., to blame "Facebook's algorithm" can implicitly shift responsibility away from the company that designed it), and (4) shorthand for the broader sociocultural shift toward, as Gillespie argues, "the insertion of procedure into human knowledge and social experience."

How do these four uses work with or against each other? Is it possible to see the algorithms at work in both the most specific (1) and general (4) levels? (When might a programmer's trick of the trade also be an insertion of procedure into human life?) How might the word be used both to hold a corporation responsible (2) and at the same time to absolve it of responsibility (3) for the behavior of its algorithms? (When do synecdoche and talisman uses of the word counteract one another?) Does Gillespie's analysis reveal the possibility that the same word can be used in one statement that means two opposite things to two audiences (say, boards of trustees and customer bases)?

Let's take Gillespie's logic to its natural conclusion: if there might be four distinct uses of this relative newcomer to English, then why could there not be many, many others as well? Carefully review the essay and Gillespie's "Critical Algorithm Studies: A Reading List" (see footnote), and also think about everyday life: which other uses can we derive for the keyword *algorithm*? What does that word use illuminate about working assumptions as to how we quantify, rationalize, automate, rehearse and check biases, personalize, socially sort, discriminate among, and otherwise process big-data questions today? (See *personalization*.) How do they map onto particular ideologies, accountability and policy regimes, and other methods for talking about partially automated procedures and their consequences in modern-day information systems?

[1] https://socialmediacollective.org/reading-lists/critical-algorithm-studies/.

Analog

Background music: Joe Walsh, "Analog Man"

What can we learn from the contributor listing? "Jonathan Sterne is professor and James McGill Chair in Culture and Technology at McGill University. He writes and teaches on sound, media theory and history, technology and culture, and disability. His latest book is *MP3: The Meaning of a Format* (Duke University Press, 2012). For more, see http://sterneworks.org."

Exercise: List five analog technologies you have interacted with. Share your list with a neighbor and discuss what you two appear to mean or not mean by the term *analog*.

Discussion prompt: This book pairs *analog* and *digital* essays in order to decouple the two conceptually. The popular opposition between *analog* and *digital*, to put it in a nutshell, is wrong. These two essays frame this fundamental point: the analog and the digital are not a pair (itself a rehearsal of that tired digital binary, 0 and 1). Nor are they necessarily separate. Neither mutually exclusive nor embedded, digital and analog techniques should be understood by and independent of their fundamental *nonrelation*. The digital is no simple realm of artificial and discrete symbols, nor is the analog everything made of natural and continuous real waves, and certainly the analog is no opposite of the digital. For Sterne, the analog is narrower than we thought, compatible with and subsequent to the digital. For Peters, the digital has roots in the extension of human hands. When we talk about the digital, the analog, or other technical processes, are we sure we know what we are talking about? What, if anything, might these two essays have to offer the conversation?

What Sterne offers, specifically, appears to be a novel approach to analog or analogic technical processes, although the approach in fact turns out to be historically normal.[2] What does it mean for the critical study of the modern media environment that *analog*, instead of meaning the opposite of *digital*, means a narrow technical process that is perfectly compatible with digital and many other means of information processing and transduction? What does it mean that the popular notion of *analog* as the opposite of *digital* is in fact more recent than the digital? What does it mean that our nostalgia for an imagined, more natural past in fact is more recent than the invention of digital technologies? What are the other costs of ignoring how *analog* does not map onto *everything nondigital*? Or, as Sterne asks, "how [do] meaning and collectivity work together?" "How [do] symbols and technologies both define what it means to be human and how humans fit into the larger world, ethically, ecologically, politically, historically?" "How [might we] live well in the large-scale societies we now inhabit?" What surprising role does food play in the chemical and synthetic alternative history to the analog that Sterne tells?

Now help reimagine approaches to the digital age in light of the new possibilities for shedding old nostalgias for pasts that never were and resuscitating dormant and latent traditions for approaching the interactions of nature, culture, and technology. How could you imagine, in light of Sterne's essay, an approach to the digital that, instead of being the opposite of nature, is explicitly friendly to and compatible with concerns about preserving and protecting nature? What would you say?

[2] Derek Robinson, "Analog," in *Software Studies: A Lexicon*, ed. Matthew Fuller (Cambridge, MA: MIT Press, 2008), 21–31.

Archive

Background music: Green Day, "At the Library"; (spoof) "Having Fun Isn't Hard When You've Got a Library Card," from *Arthur*

What can we learn from the contributor listing? "Katherine D. Harris is associate professor in English at San Jose State University, where she teaches about topics in literature and technology ranging from the mechanization of the printing press in nineteenth-century England to current uses of narrative in gaming. Find her latest work and public lecture schedule at http://triproftri.wordpress.com."

Exercise: List five archives that play some role in your life right now. Briefly describe those roles to your neighbor and discuss in what sense those archives are online, and in turn in what sense the "onlineness" of archives matters for the role they play.

Discussion prompts: Harris, embedded in rich literary networks of references, outlines an alternative approach to archives that refreshes thought on how texts and contexts are renewed in both print archives (material repositories) and digital archives. How might the digital archive be a culmination of the "social text" in ways that a print archive is not?

What role does "interruption" play in how a reader approaches a text in a digital archive? If it is fair to assume that the nonarchival approach to a text is to sustain linear attention to the text itself, how does an archive—whether digital or print, and how do those differ?—interrupt that approach? What can we learn from the ways that texts are archived, indexed, tagged, inventoried, coded, edited, correlated, collated, summarized, categorized, deemed complete or incomplete, or any number of other activities native to the information and library sciences?

Is Harris right to assume that the desire to archive is similar to the desire to "hold everything at once in the mind's eye"? And if so, how necessary is it for a character in literature to "faint, go mad, isolate herself, create alternate realities—all in the name of either escaping or explaining what cannot be known"? In what sense is an archive a proxy for the human courting of omniscience, and how do we describe the hubris of such attempts? What alternative ethics or narratives can we develop about archives? How, if at all, might Williams's notion of "networks of usage" with "an emphasis on historical origins [as well as] on the present—present meanings, implications, relationships—as history" help shape a different approach to the task and purpose of archiving? What would an ethics of archiving look like that embraced deletion, gaps, and partial records (where partial implies both bias and incompleteness)—not only after encountering the human hubris of striving for omniscience (or Derrida's "archive fever," or Borges's "Library of Babel"), but at the outset?

In particular, how, if at all, do digital archives—and their need for electric grids—compel the question of sustainability to the fore of the discussion? If, in other words, the digital archive effectively solves the problem of digital memory space, what costs does it raise in terms of the problem of digital memory time?

Cloud

Background music: Rolling Stones, "Get Off of My Cloud"; Jimmy Cliff, "I Can See Clearly Now"

What can we learn from the contributor listing? "John Durham Peters is A. Craig Baird Professor in Communication Studies at the University of Iowa, where he teaches courses on the cultural history of media and social theory. His work site is http://johndurhampeters.wordpress.com."

Exercise: What do clouds mean? List five ways that clouds have meant something to you. Share your list with a neighbor and discuss.

Discussion prompts: Cloud computing is computing with remote access to memory and programs. This essay on the cloud takes off from John Durham Peters's most recent book, *The Marvelous Clouds: Toward a Philosophy of Elemental Media* (Chicago: University of Chicago Press, 2015). Here are several questions that follow from the book and the *cloud* essay: What if our model of communication were not two humans sharing thoughts, but a population evolving in its environment? Digital media resurrect old media such as writing, addresses, numbers, names, calendars, timekeepers, maps, and money: what does the cloud in cloud computing resurrect? If it is true that "the old idea that media are environments can be flipped: environments are also media," then in particular what kind of media are clouds and cloudy environments, both natural and digital? If it is true that "knowledge is not the gathering but the throwing away of information," then what is not just discarded but continuously blown away in the remote storage of databases on the so-called cloud? What do we fail to know about ourselves when knowledge about us is always blowing elsewhere? If it is the case that "media theory faces a crisis of uncontainable relevance," what are the more urgent crises attending our use of cloud computing?[3] If, as Peters would have it, clouds belong centrally to media theory, what would media theory look like if it also contained "WikiLeaks, corn syrup, whale oil, squids, Facebook, jet lag, weather forecasts, and bipedal posture"? (Methodologically how do we square that impossible list with an approach to media studies that would not lose "the ballast of empirical investigation and common sense"?) What does it mean that clouds obscure and cover things in nature—and what do they obscure and cloud over in our digital environments? More broadly, why or why not would we agree with Peters that the "internet casts light onto many things, but rarely on itself; like all media, it comes with a built-in cloaking device?"

Cloud computing is clearly not the first artificial cloud ("smokestacks, nuclear bombs, cloud seedings, … geoengineering schemes"). What other kinds of nonnatural clouds can you imagine, and what can they tell us about how cloud computing talk works today? What else can you add to or subtract from Peters's claim that " 'the cloud' is a huge PR achievement for the IT industry, but it is profoundly deceptive." What does the cloud mean environmentally and in terms of control, and in terms of our military language ("cloud-attack" or "cloudburst")? Why or why not would we think, with Peters, that "in all moments of history, this would be the worst to think of clouds as purely immaterial, natural, and meaningless things."

[3] http://time.com/46777/your-data-is-dirty-the-carbon-price-of-cloud-computing/.

Community

Background music: Neil Diamond, "Brother Love's Traveling Salvation Show"

What can we learn from the contributor listing? "Rosemary Avance received her PhD from the Annenberg School for Communication at the University of Pennsylvania. Her research and teaching center on the intersection of new media, religion, and modernity. Her work site is http://www.rosemaryavance.com/."

Exercise: List five communities to which you have belonged in the last five years. If you are not sure whether something is a community, list it anyway. Share your list with a neighbor and briefly discuss.

Discussion prompts: How can you respond to the following questions in light of your list of five? What can you say in light of having read Avance? How, if at all, are communities and minority groups similar offline, and how, if at all, are they different offline? Is it possible for a community to not somehow differentiate their collective belonging from others who do not belong? If so, would it be desirable, and why? Is it possible to have community that includes everyone, and, if not, at what scale does that definition break down—the cosmos,[4] the globe, the nation-state, the state, the city, a school, a neighborhood, a friendship—even a self (does the DSM entry on "dissociative identity disorder" complicate that)? Can sports fans form communities—and what does it tell us that the size of sports fan groups scales from small-town high school rivalries to national teams? Assuming communities are *not* defined by opposition to outside others, on what grounds can a community rest—communication, a sense of shared belonging, community-specific activities?

Belonging: If I declare myself a member of a community, is that enough? If others declare me a member of a community (or just silently accept me), is that enough? What if I do not choose to be a member of a community that accepts me (e.g., family, class, ethnicity)? Is it enough to declare a community a community—and who gets to do the declaring? How, if at all, do our observations change depending on whether communities are offline or online? (See *participation*.) Or, as Avance puts it, "While past conceptions of community were generally outside one's agential selection—you are born and die in your town; your religion is the faith of your parents—today's diverse digital landscape means self-selection into communities of interest and affinity."

Imagine yourself as a debater affirming the notion that community is in fact a fully viable and meaningful term for online spaces. In what terms would you make your argument? In what sense, to paraphrase Avance, might online communities provide a *more* authentic relationship with others than "offline, embodied" communities? What might it mean for a community of strangers to exist independent of traditional notions of geography and history, and how else might those same old notions resurface in structuring and shaping how we interact online and off? How might it help to consider the etymological subtleties differentiating *community* ("common" in Latin) from *communication* ("share" in Latin)?

[4] J.C.R. Licklider jokingly called his early vision of the internet "an intergalactic net." See http://www.historyofcomputercommunications.info/Book/2/2.1-IntergalacticNetwork_1962-1964.html.

Culture

Background music: Buggles, "Video Killed the Radio Star"; (examples of cultural appropriation) Paul Simon, "Graceland," Mark Ronson, "Uptown Funk," etc.

What can we learn from the contributor listing? "Ted Striphas is associate professor of communication at the University of Colorado–Boulder. He teaches courses on the history and philosophy of technology; on the politics of everyday life; and on cultural studies and keywords. He is author of *The Late Age of Print* (Columbia University Press, 2009) and is at work on his next book, *Algorithmic Culture*. Twitter: @striphas."

Exercise: What is culture? What is not culture? List three things that are especially cultural and three things that are arguably not cultural at all. Share your list with a neighbor and briefly discuss why you think your lists hold.

Discussion prompts: *Culture* is a keyword among keywords for Raymond Williams, who contributed to the founding of cultural studies in the 1960s and 1970s. It is among the most common ways to talk about how we talk. In his essay, one of Williams's most careful readers, Ted Striphas, offers a sensitive update to Williams and a wide-ranging intellectual history, describing how culture has coevolved with the digital turn since the end of World War II. No longer an antithesis to technology, culture has recently interpenetrated with the computational (e.g., digital humanities, culturomics, and big-data-driven cultural studies).

Do you accept, as Williams and Striphas suggest, that earlier in history there was a reasonable distinction among the natural, the cultural, and the mechanical/artificial/technological? (How do we make sense of natural science, natural philosophy, natural numbers?) Is this distinction necessary to the validity of the argument that the last chapter of modernity has seen a meaningful merger of, or a "rapprochement between," the cultural and the technological? What does our notion of biological "cultures" and petri dishes do to the distinction between artificial and natural? How does Williams's tracing of *culture*'s etymological origins in agriculture, harvesting, cultivation, and the Latin root *colere* complicate or extend the artificial-natural distinction? (In what sense is farming intensely natural, and in what sense is it the opposite of nature, or the domestication of nature? Is it in fact possible for modern humans to ever do anything natural? In what sense, to paraphrase Walter Ong, might there be nothing more natural to humans than artifice?) How, in short, should we respond to Striphas's prompt that "*Colere* suggests the human species's dependency on and subordination to the natural world; *culture* loosens the tie and inverts the relationship (or at least gives the appearance of doing so)."

In particular, what would it mean to rewrite Arnold's *Culture and Anarchy* for the information age as *Culture and Entropy?* Would such a shift, together with the recognition that the communication revolution illuminates information systems in nature itself, be antihuman or posthuman? By the way what can the root word *coulter* reveal about the relationships among culture, sharing/dividing, and communication? (See *sharing*.) If culture can take on new technological meanings, is there anything it cannot take on? What are the limits and predicaments of those who would study culture in the twenty-first century, never mind simply participate in it?

Democracy

Background music: David Pogue, "Clown Town" (about the 2016 presidential election); Bruce Cockburn, "Call It Democracy"

What can we learn from the contributor listing? "Rasmus Kleis Nielsen is director of research at the Reuters Institute for the Study of Journalism, University of Oxford and editor of the *International Journal of Press/Politics*. His research deals with political communication, changes in news media and journalism around the world, and the role of digital technology in these areas. More on his work here: http://rasmuskleisnielsen.net."

Exercise: List three times when you have participated in something democratic. Now list three actions necessary for a national democracy to function. Discuss with a neighbor how or why your lists compare or differ.

Discussion prompts: Most people in the world have cell phones. Why can governments not simply poll all their citizens to vote on all major issues by cell phone? Why couldn't all governments be reduced to automated poll counters and a global telephone network? Why would that not be a better global digital democracy than what we have today? Are the democratic and the digital not natural allies? Are they not both fundamentally popular, open, individualized, peer-to-peer network techniques for communicating the will of the one and the many? Is the internet not the most democratizing medium yet? Is Google's PageRank not meta-Madisonian?

Given all that, what then is Nielsen's thesis? What is the difference between his "minimalist vision" of "actually existing democracy" and "maximalist alternatives" about direct, deliberative, and participatory democracies? (See *community*, *forum*, *participation*, *personalization*, *sharing*.) What's at stake if his argument is valid? If Nielsen's thesis holds, does his essay prompt us to despair of democracy, does it inject us with an antidote to such despair, or is its effect something else again? (What does the epigraph from Stanley Cavell suggest? How might Nielsen's suggestion differ from, say, the view of libertarian philosopher Jason Brennan in his most recent book, *Against Democracy*?) What does actually existing democracy look like, and what is its actual relationship to digital technologies? Why, if at all, does the force of that question differ from that of what a universal ideal digital democracy *might* look like?

What are some of the more mundane and everyday ways in which digital technologies actually do play a role in modern-day democratic practices? What role do digital technologies play in organizing votes on the ground, address books, calling trees, and other techniques outlined in what Nielsen calls "the ground wars" in his important book that takes that phrase for its title? How do digital techniques reinforce, rather than revolutionize, preexisting democratic practices? Moreover, what do we make of the fact that the internet is now almost 50 years old, and the electric telegraph over 150? How do we make sense of Iceland's crowd-sourced constitution, or the fact that its demographic is no more than 500,000 people, or that its current state has refused to consider that constitution? What are the end effects of the "We the People" online petition system under the Obama administration (e.g., the popular petition for the United States to build a Death Star, or for the unlocking of cell phones)? What are the high costs of cheap communication? How can we think about small government tools (e.g., @jobsingovt) instead of sweeping political revolution?

Digital

Background music: Radiohead, "2 + 2 = 5"; Kraftwerk, "Pocket Calculator"

What can we learn from the contributor listing? "Benjamin Peters is assistant professor of communication at the University of Tulsa, where he teaches courses on media history and theory with a particular emphasis on information technologies. He keeps working notes at http://petersbenjamin.wordpress.com." What else, if anything, can we glean from the acknowledgments section?

Exercise: List three digital technologies you have used today. List three digital techniques that do work in your life. Briefly discuss with a neighbor why or how these two lists compare or contrast.

Discussion prompts: What is Peters arguing for here and why? Are digits fingers? What do fingers do, and what do digits do? Is this just a bad pun taken too far—and how might we distinguish between bad puns and helpful theorizing? What does the Lacanian distinction among the symbolic, the real, and the imaginary have to do with Peters's tripartite distinction of fingers that count the symbolic, index the real, and manipulate the social imaginary? What, if anything, does Charles Sanders Peirce's semiotic distinction among symbols, indexes, and icons have to do with this three-way distinction? What other kind of work could digits be doing?

What does it mean if he is correct in arguing that "the sweeping success of digital techniques has rendered the term a quintessentially twentieth-, not twenty-first-, century keyword"? If the digital is a twentieth-century invention, and popular reinvention of the analog came after the digital (see *analog*), then what is next? Moreover, what does it mean for our sense of history and our place in it to argue that the notion of "digital [as] synonymous with discrete electronic computing techniques … is not nearly deep, broad, or basic enough"? In particular, what else could we add to the alternative deep history of digital media as those that we manipulate digitally, such as human fingers, the coin, the *yad*, the manicule, the piano keyboard, filing systems, the typewriter, and the electronic telegraph? In what sense can these be said to count, index, or manipulate the world digitally (especially digital singularity rhetoric)? Who benefits from stories of a singular future? Would a computationally singular future be indexically singular? Peters says no; do you agree or disagree, and why or why not? Also who benefits from stories of a more pluralist past? Since when does the chance of rain tomorrow invoke "multiple distinguishable futures" and so what? (See *cloud*.) What does it mean to claim that digital techniques are tools "ever *in* and *of* our hands"? What do we make of the claim that "perhaps we can begin by understanding the digit as an openly imitable and probabilistically imperfect index of any thinkable world, including this world, with which there can be no final convergence"? Peters also argues that "all meaningful relationships begin by creating a semiotic structure that excludes something else": if this is true, what does his essay exclude in his theorizing, historicizing, and fresh handling of the digital? Is there any way to recognize the express *nonrelation* between digital and analog that this volume advances, and Norbert Wiener's assertion that "every digital device is really an analogical device"?

Event

Background music: Billy Joel, "We Didn't Start the Fire" and Alan Jackson, "Where Were You When the World Stopped Turning?"

What can we learn from the contributor listing? "Julia Sonnevend is assistant professor of communication studies at the University of Michigan, where she teaches courses on events and symbols, icons and performances in global media. For more information: http://julia-sonnevend.com."

Exercise: Turn to your neighbor and find at least three events that you both remember experiencing through media. Briefly list what you personally remember about those events, and then compare your list with your neighbor's. How do your memories compare? What makes these happenings events? (Compare *memory*.)

Discussion prompts: What memories of 9/11 do you have? Where were you, and what do you remember about that event? What does it mean that most American college students do not personally remember 9/11, even though the occurrence has taken on serious meaning in their lives and none can claim to have no associational understanding of the event itself? Where did the event behind 9/11 come from if we have no memory of its occurrence? How does this vary by media and memory, space and time? (See also *archive*, *meme*, *memory*.)

If events are those things that come out of (*e-venire*), what does it mean to let "events" structure our life stories and global histories? How do occurrences and events differ? What roles do witnesses play in narrating occurrences into events? In what sense do events punctuate the flow of time? (See *flow*.) In what sense is Daniel Dayan and Elihu Katz's distinction of three media event types—*contests*, *conquests*, and *coronations*—in need of an update? In what sense is the digital age one period in history best understood not by what is new but by what is salient about it? What does it mean to say that "events are heavy: it is hard to carry them across time, space, and media"? Does that mean one occurrence can have zero and multiple events assigned to it, depending on which narration's time, space, and media are in play? Can we articulate a transportation theory of events in media? Are "events" mathematical?

What work does Sonnevend's five-part narration of a global iconic event do? Can you identify a global iconic event, and see how it does or does not follow this general narrative-creation arc? How well do her four "events in media" follow that arc, and to what effect? How might the digital age itself one day be understood as an event in a longer media history, and what can we do to hasten, prepare for, or equip ourselves now toward bringing that end about?

What limitations does this narrative theory of events in media bring? How might visual spectacle itself complicate the storytelling theory here? (Can you name hugely well-known media events that are not visually spectacular? Which one kills more people—heart disease or car crashes? Which one is more likely—a car crash or an airplane crash? Which feature in events in media and why?) What role does the *counter* in counternarration play in Sonnevend's five-part theory? Should we understand *counter* as directly opposed to, or also alongside or alternative to? Are there off-narrations or alt-narrations available as well? Which forces adjudicate which narrative voices—consensual and mainstream, or critical and off-the-beaten-path—tend to write the history books and mold memories, and why? Which events have traveled the farthest and the longest? (How about interstellar light in astronomy, astrology, and myth?)

Flow

Background music: Claude Debussy, Arabesque no. 1 and no. 2

What can we learn from the contributor listing? "Sandra Braman is John Paul Abbott Professor of Liberal Arts and professor of communication at Texas A&M University with research and teaching interests in digital technologies and their policy implications. Her work site is people.tamu.edu/~braman/."

Exercise: List five things that can arguably be said to flow. Briefly discuss with a neighbor what these five things share in common and also how they differ.

Discussion prompts: What does it mean to claim that all systems *flow*? How can the same word remind us to "go with the flow," with its own vibe of countercultural chill, as well as being the bread and butter of marketers' product flows, sophisticated mediascapes, and "places and flows" of modern information systems? How is the analysis of flows central to administrative research, or "ways of doing what is already being done better within a given system"? Where do you see flows in maps, charts, tables, and of course organizational flowcharts? How does the word *flow* compare with the notions of line, path, and fracture? How does *flow* tie back to Claude Shannon's information theory and Raymond Williams's notion of streams of content on a channel?

What fields are not included in Braman's sweeping review of flow literature, which does note neurological studies of consciousness, new technologies, videogame addiction, online advertising, social media, gaming, online banking, production and consumption chains, other interorganizational flows, concerns about online forums, telecommunication regulation, network neutrality, game theory, studies of crises, disruptions, emergencies, search-and-rescue operations, among many others? This is a partial listing: what would a fuller listing of the flow literature review? What are the bounds and the potentials of this kind of interdisciplinary literature? What other common themes and social stakes emerge out of the ways that a single word works its way through modern systems? When might flow patterns lead to willful choice as well as unhealthy addiction? How is *flow* an uneasy participant and limiting notion in the modern discourse about individual will? (See *participation*, *personalization*, etc.)

Braman begins and ends her essay by alluding to an insight attributed to Heraclitus: "for those who step into the same rivers, different and again different waters flow." What work does the image of the river do for the thesis and beyond that? What do we make of all the liquid metaphors at work in an electronic age: *surfing* the web, electrical *currents*, information *leaks*, *cloud* computing (see *cloud*), *wet*ware, filter *bubbles* and *bubble* sorts, media *saturation* (information *deluges*, *tidal waves*, *floods)*, bit *torrents*, *pirates*, data *filtering*, data *piping/pipes*, data *scrubbing/cleaning*, media ecosystems, coffeehouses, Amazon Glacier, Google Wave, among other metaphors? What role does the metaphor of *firewall* play against the liquid metaphors of information *flows*? Is it at all significant for all these liquid metaphors that electronic equipment tends not to be water-resistant? What else is at stake in such a family of flow terms?

Forum

Background music: Opening song to Stephen Sondheim's *A Funny Thing Happened on the Way to the Forum*

What can we learn from the contributor listing? "Hope Forsyth is a JD candidate with research interests in copyright and media history at the University of Tulsa, where she also earned her honors bachelors degree in communication (with minors in English and philosophy) as a Presidential Scholar." It should be noted that, when she wrote this essay, she was still an undergraduate. Should we accept the proposition that the world is run by undergraduates—and relatedly that perhaps most intelligent material should be written for them, if not also by them? How also should classrooms make the most of the other towering possibility in this essay, that some undergraduates can write more clearly than accomplished scholars?

Exercise: List five forums you have participated in (or are aware of); briefly discuss with a neighbor how those forums compare: what makes a forum?

Discussion prompts: Etymologically, a door must come before a forum, if a forum means "what is out of doors." What does it mean, then, that a forum is neither in the forest nor in private space? How do we understand public spaces as necessarily areas between nature (out of doors) and domestic privacy (indoors) in the long run of history? (How does this betweenness reflect itself in the three attributes shared by the Roman Forum and American constitutional forums—societal gathering, personal and public business, and physical embodiment?) Further, how does this between status inform or color our thinking about the between status of online forums as requiring embodied infrastructure? In particular, how should we respond to the new between status that Forsyth's essay presses upon online forums—namely, that online forums are not only between outdoors and indoors; they also occupy a sort of halfway point (or halfway house, perhaps!) between embodied material reality and symbolic virtuality? Why does Forsyth urge us not to read the comments on online forums? What do flame wars, YouTube comment sections, and trolls teach us about a human attraction to seductive spectacles dating back to at least gladiator battles?

What does it mean to claim that "the internet cannot exist without its profoundly material infrastructure of physical wires, plugs, pixels, fiber-optic cables, displays, electricity grids, and sundry other material supports"? Can you add to or subtract from that list? Does Forsyth end there in her register of necessary physical infrastructure behind every online forum, and why or why not? How could your own reading of the material embodied infrastructure of internet use and activity reach beyond coffeehouses, caffeinated drinks, Wi-Fi hot spots, and quasi-public gathering spaces? How, as suggested in the quote from Starbucks CEO Jim Donald, might this very logic be used to extend private commercial, corporate spaces into facilitating and co-opting quasi-public ones? Which is your "third home"? What is the role of noise as described in note 5 to this essay? What about smell, taste, touch, balance, pain, and other senses baked into the embodied experience of a forum, online or not? What, if any, limits are inherent in her claim about internet forums requiring human-supporting infrastructure? How are our modern-day forums grounded differently from what we may expect?

Gaming

Background music: Miracle of Sound,"Sovngarde Song" (Skyrim); "Complete History of the Soviet Union" (arranged to the melody of Tetris)

What can we learn from the contributor listing? "Saugata Bhaduri is professor of English and associate dean of students at Jawaharlal Nehru University, New Delhi, India. His areas of research and teaching interest include popular culture, of both folk and the mass-mediatized sort. See http://www.jnu.ac.in/Faculty/bhaduri/cv.pdf for more."

Exercise: Briefly describe five moments when you can reasonably say you were gaming in the last five years. Note in a half sentence what you were doing, and where and when you were doing it. Share lists with a neighbor, and discuss what's at stake in how you two are understanding gaming.

Discussion prompts: What's in a gerund? How, if at all, does *gaming* differ from words like *game*, *gamer*, and *gamesmanship*, and share something with the word *gambling*? What is at stake in the present participle suffix *-ing*? If Bhaduri is right to respond that doing something in the present invites risk and excess, then can we also say *gambling* is more risky than a *gambler*, or *computing* more risky than a *computer*? Games, especially digital gaming, are often thought to be trivial—something between a distraction and entertainment. In what sense might gaming be risky *and* trivial, and for whom and when? (Perhaps those who dismiss it as trivial are judging the time spent compared to other activities; perhaps those who dismiss it as risky are judging the content of the game itself?) Who tends to calls games trivial? Who tends to call games risky? How, if at all, might these two positions be related—maybe even two sides of the same coin? In what terms might it be possible to defend gaming from critics who would see it as either too dangerous or too meaningless to pursue, while at the same time properly accounting for the real social costs, abuses, and benefits of the extension of play logics and social gaming into everyday life (such as the gamification of the workplace)? Why can Ludwig Wittgenstein, one of the greatest analysts in modern history, not define a game? What about Calvinball (the *Calvin and Hobbes* game in which players make the rules up as they go along) is implicitly part of all gaming, but not all games, according to Bhaduri? Why is it that, according to Johan Huizinga's definition, play must be "not serious" and at the same time "intensely and utterly" absorbing? What other distinctions can we draw out between and beyond *game*, *gaming*, *gaming* the system, *gamesmanship*, and *gambling*?

What should we make of the problematic politics of gaming for race, class, gender, and sexuality, briefly outlined in the essay's endnote, such as GamerGate? Are these problems not precisely the sort of subversion and risks that attend all gaming, or do gaming identity politics play another role in Bhaduri's argument? In what sense does gaming risk gambling away modern identities? How do we differentiate between the moral panic of parents worried about loner children spending 6.3 hours per week, on average, playing video games and the real damage done to women, minorities, and others online?

Geek

Background music: Weezer, “Buddy Holly”; Katy Perry, “Last Friday Night (T.G.I.F.)”

What can we learn from the contributor listing? “Christina Dunbar-Hester teaches courses on technology and culture in the Annenberg School for Communication and Journalism at the University of Southern California, where she works as an assistant professor. She is the author of *Low Power to the People: Pirates, Protest, and Politics in FM Radio Activism* (MIT Press, 2014). She writes about media activism and political engagement with technology, and many of her pieces can be found on http://usc.academia.edu/ChristinaDunbarHester.”

Exercise: List your top five geek moments. What makes them geeky? When are these moments pleasing or embarrassing, and why? Briefly discuss your thoughts with a neighbor.

Discussion prompts: Do you self-identify as a geek? Why or why not? When have you? When would you? How does your willingness to self-identify as a geek correlate with your willingness (compared to that of your peers) to identify with a particular gender, your experience with mental work with technology, or your other affiliations with the technical classes? Those who do not identify as geeks, and yet who excel in academics: why do you not feel comfortable doing so? What is academics except another form of technical expertise? Would the artists and musicians among us feel any differently, and why or why not? (Finally, those who do identify as geeks, would you be as comfortable if the term referred, as it once did, to circus freaks who bit the heads off chickens, a term that came colored by a carnival sense of weakness and deformation, despite its gendered and socially privileged status today?) What does it suggest that the modern geek is still often depicted as not physically dominant—gawky, puny, bespectacled—even though geeks are also at the same time socially ascendant in terms of managerial work and intellectual class?

What other terms of original disparagement can you list that have since been adopted by the disparaged classes to their own advantage? (Hints: queer, Methodist, Yankee, redneck, Obamacare, impressionism, etc.) What is at stake socially in the reappropriation of former slurs? What in particular is at stake in the recent rising popularity of the computer classes and the social power of figures such as Bill Gates, Steve Jobs, and Mark Zuckerberg?

Why do geeks tend to be white middle-class males? Why in particular is there a positive association of geeks as wizards, and why are wizards so heteronormatively gendered (think of the name for a female wizard!)—and how then did geekdom become a privileged masculine domain in the West, even while the same emphasis on tinkering, freedom, and technical achievement does not correlate with gender in the programming classes outside of the West? What would a geek class look like that embraces a more diverse identity set (gender, class, ethnicity), especially in the Global South? Or, rather, how might the category of geek meaningfully and usefully break down as we seek to better understand how power and privilege break apart in local and comparative studies of cultural categories at work in technologizing the world?

What other terms of disparagement and privilege (particularly common to the information age) would you want to subject to closer analysis? How does this discussion inform or backlight thinking about looming issues of cyber harassment, cyberstalking, cyberbullying, and internet trolling? (What is a troll, and why all the fantasy tech terms: angel, daemon, dragon, dwarf, geek, gremlin, rock star, troll, unicorn, zombie?)

Hacker

Background music: Neil Young, “Computer Age”; Radiohead, “Paranoid Android”

What can we learn from the contributor listing? “Gabriella Coleman is the Wolfe Chair in Scientific and Technological Literacy at McGill University with teaching interests in computer hackers and digital activism. She has authored two books on computer hackers. For more, see http://gabriellacoleman.org/”

Exercise: List five examples or features of a hacker: who are hackers generally and what do they do? (Also acceptable: sketch what a hacker looks like when hacking.) What images do you hold in your head of a hacker, and why? Share your thoughts with a neighbor.

Discussion prompts: How does Coleman, a pioneering anthropologist of hackers, define what makes a hacker? When do hackers as an identifiable class take shape? What identity political categories—class, gender, ethnicity, etc.—are commonly associated with hackers, and how does Coleman respond to those stereotypical associations? What does she instruct about hacker as the stereotype of mostly white professional males—and in what specific places do professional upward mobility and middle-class libertarianism hold and not hold? What, for her, is a defining characteristic of the global technical class that self-identifies as hackers? More generally, what is the relationship between craftiness and craft, between cleverness and hacking? For Coleman, what does “craft autonomy” mean in the context of hackers—or in other fields?

What role do professionalization and “selling out” play in the development of a hacking technical class? What possible arguments could be made for or against white-hat hackers—or using hacking skills to advance cyber security protections against malicious or black-hat hackers? What role does free and open-source software (FOSS) play in Coleman’s analysis and in the development of an identifiably political approach to hacking? What role does FOSS play politically, economically, and socially in the construction of the modern information age? How does her analysis impinge on larger questions of how hackers do or should think about free speech and the liberal tradition?

Given that computer programming is already an intensively technical language that performs work by deploying semiotically precise and technical jargon, how do hackers identify other hackers linguistically? What role do abbreviations play not only as heuristics for simplifying complex language but for setting up semiotic barriers to entry into the craft of hacking (DDoS attacks, SQL injection, ARP spoofing, CSRF, etc.)? How, then, should we think about linguistic conditions for achieving craft autonomy? How quickly do the technical dialects change, and what drives those changes? On which particular character virtues, if any, do hacker social values and ethics rest, and how do those virtues map onto other demographic biases worldwide? What relationship, if any, does the term *hack* have with the term *mod*? What general intellectual relationship do the hacking classes have to *cleverness* and other forms of technical aesthetics and formally elegant problem solving—what, if any, relationship does this have with mathematical proof and elegance?

Information

Background music: Dire Straits, "Telegraph Road"; Beethoven, Symphony no. 5 (think fugues in *Gödel, Escher, Bach*)

What can we learn from the contributor listing? "Bernard Geoghegan is assistant professor at the Institut für Kulturwissenschaft at the Humboldt-Universität zu Berlin, where he teaches courses on media theory and the history of technology. See http://bernardg.com/ for more."

Exercise: List five examples of information; then defend your list to a neighbor. Why are your examples not data, knowledge, wisdom, or something else? What makes information information?

Discussion prompts: Information is undeniably a keyword of the current moment. According to a simple Google Ngram Viewer search, the term has exceeded in frequency of use other terms such as *wisdom*, *knowledge*, *data* (which has also shot up in the last sixty years), most other major media terms (only *book* comes close), as well as all other keywords in this volume. Why has *information* enjoyed the semantic success it has? How did it come to mean anything more or less than its previous meanings as "relevant facts" and a "report" common in the age of Kant, or, as it often did in the time of Milton, the process by which matter was given form (in-forming)?

What could it possibly mean to claim, as Geoghegan does, that information was not a keyword before the twentieth century? Was information not a thing before the twentieth century? Was there no way to talk about it, or was there no way to talk about it as we do today, and if the latter, what is that way, and what has changed about information talk since the turn of that century? How does Geoghegan's history of medieval and premodern information complicate any clear breaks in the development of modern senses of information? What role do Hume and measurement play in that history?

What role does telegraphy—or the practice of distance writing—play in his history and analysis? How, if at all, is that a different question from asking what role the electric telegraph—a specific technological mechanism for distance writing—plays in the same? In particular what are the roles of standardization, economization, and measurement instruments in telegraphic practices? What can we learn from attempts to use the word *intelligence* (or perhaps *intelligibility*?) in the late 1900s where we now use the word *information*? (In what ways did intelligence not work? In what ways might it work better?) What does Ralph Hartley mean when he writes that "we should ignore the question of interpretation," and what, if any, relation does this have to other computational activities (such as, say, the quantified life movement)? How can we put this point in other words: "telegraphy was no longer an informational medium for transmitting speech and meaning; speech and meaning became a medium for the production of telegraphic information"? What happened around World War II that helped crystallize these practices into the early versions of modern information sciences? What other analytic strategies native to natural philosophy might we find at work about us today?

Internet

Background music: Paul Wall, "I Got the Internet Going Nuts"; the Police, "De Do Do Do, De Da Da Da" (a prescient comment on social networks?)

What can we learn from the contributor listing? "Thomas Streeter is professor of sociology at the University of Vermont, where he teaches about media and culture, while researching the intersections between law, technology, culture, and language. He is currently studying the effects of the ongoing digitization of legal documentation on legal practices. More about him can be found at http://www.uvm.edu/~tstreete."

Exercise: Define "the internet" briefly, and include an example of what is the internet (is that example sufficient and why not?) and an example of what is not the internet (if you named a thing, what about "the internet of things"?). Also acceptable: list five ways your life would be different if there were no internet. Share your working definition or list with a neighbor and briefly discuss.

Discussion prompts: What does *internet* mean? How is *internets* different from *an internet*, different from *the internet*, different from *the Internet*? How is the term variously used, according to Streeter, to refer to software, hardware, protocols, interactivity, forum, institutions, collectives, telos, and social values? (What other terms could we add?) What would it mean to misuse the term *internet*, and what does misuse imply that variety of uses does not? Where does the term *internet* come from? What is it a shortening of, and what is exchanged whenever a verb is reformulated as a noun? What role does the term *network* (ARPANET, Milnet, R&DNet, etc.) play?

What work does the word *metonymy* do in Streeter's argument? (Metonymy is roughly understood as the substitution of a word for something proximate or contiguous to it.) How can we differentiate metonymy from metaphor, synecdoche, and irony? (Can we imagine a history of *the internet* as a term and a networking practice primarily in terms of metaphor, synecdoche, and irony instead? See Kenneth Burke's *Grammar of Motives* for more on these master tropes.)

What can we learn about 1990s American politics through Streeter's case study of the internet then? Could it be that the primary time when the internet appeared singular was in the 1990s, at the same time that "Web 1.0" enthusiasm was still the norm and digital singularity discourse was ascendant? (Never mind Al Gore's claims of a singular internet or G. W. Bush's slips about the *internets*.) (Compare *digital*.) What in particular do we make of Streeter's more general claim that the period between 1993 and 1996 was "essential to understanding" not only the keyword *internet* but "most of [the keywords in this volume]," such as *community*, *democracy*, *forum*, *activism*, *algorithm*, *geek*, *hacker*, *analog*, *cloud*, *memory*, *personalization* (among others he does not name)?

Do you suspect that the talk about the "internet" will decline, and why or why not? What would it mean to declare that there is not only no such thing as the internet but that the ways of talking about it are diffusing and declining? (Compare *digital* again.) What will future historians likely think about the internet as a characterizing feature of the current age, and why?

Streeter's endnotes are often fascinating. Choose one, follow its leads, and report back to the class: what did you learn, and how would that point help enrich or recolor a point in his essay?

Meme

Background music: Rick Astley, "Never Going to Give You Up" (inspired memes and Rickrolling); "A Potato Flew Around My Room" (inspired by memes)

What can we learn from the contributor listing? "Limor Shifman is associate professor in the Department of Communication and Journalism at the Hebrew University of Jerusalem. Her research and teaching interests include the social construction of humor, popular culture, and new media. For more information: http://pluto.huji.ac.il/~mslimors/."

Exercise: List three internet memes and two other (noninternet) memes. (Hint: could a hula hoop be a meme?) Share your lists with a neighbor and briefly discuss what makes a meme.

Discussion prompts: Shifman is one of the leading meme researchers at work today. What is a meme? What is an internet meme? How, if at all, are they different? What are a few examples of noninternet memes, beyond catchy jingles, hula hoops, myths, and other ideas that parasitize the mind? What do scale, transformation, structure, and transparency have to do with it, in Shifman's telling? Whom is Schifman defending the meme against, and why? (Less obviously, whom is she critiquing the meme for, and why?) What relationship do memes have to mutation and evolution? How, if at all, are viral and memetic videos different—especially in terms of exact copying versus (often parodic) mutation?

How, if at all, does meme vocabulary equip analysts to be better capable of describing media environments in terms of ecologies, nature, and science? (See *cloud*.) What does it mean to say that a meme evolves? Or to claim that internet parodies might mutate? How, overall, should the study of memes—memetics—go about choosing its language? What are some of the more general costs and advantages that come with natural and scientific metaphors for describing online and other forms of mediated human behavior? More particularly, how are these complications different if we invent words, like *meme*, that draw from parallel scientific terms, like *gene*? How might the term *creation* itself—understood as a wormhole word for porting scientific legitimacy into social scientific and humanistic study—help describe some of the pushback that it has received? Could a closer study of the reverse process—terms that port humanistic or social legitimacy into science (e.g., *salience*, *meaning*, *life*, *society*)—help complicate and rebut some of these critiques against (or for) memetics? In what sense is the political debate surrounding memetics an unintended Richard Dawkins microcosm for broader science-religion debates? In what sense do the political divides in America, particularly after crises, break apart into calling for memes on the left and prayers on the right? How, if at all, might memes resemble prayers, and prayers memes? (Perhaps both are ritual rehearsals of talking points that, without action, mean nothing.) In other words, might memes, once rethought, contain a middle way through a larger debate Dawkins himself has perpetuated?

Shifman concludes with a reflection on James W. Carey's classic distinction between ritual and transmission. Under what conditions do memes rehearse or challenge that distinction? Under what conditions is that distinction not a distinction at all? (When, because we can think more clearly about memes and their replication cycles, are ritual and transmission inseparable? How does a meme propagate in ways that involve both ritual rehearsals in time and transmission processes in space?)

Memory

Background music: the Beatles, "Yesterday"; the Supremes, "Reflections"

What can we learn from the contributor listing? "Steven Schrag is a PhD student in the Annenberg School of Communication at the University of Pennsylvania, with research interests at the intersection of technology, worldbuilding, and memory. For more information: https://www.asc.upenn.edu/people/students/steven-schrag."

Exercise: Turn to your neighbor and find at least three events that you both remember from your personal or media experience. Briefly list what you personally remember about those events, and then compare lists with your neighbor. How do your memories compare? What makes events into memories? (See *event*.)

Discussion prompts: How many memory media can we brainstorm? (Chisel and stone, ink and canvas, gramophones [records], tapes, magnetic discs, optical discs, etc.) What about bodies and neural networks? (DNA, scars, stretch marks, trauma.) What about architecture—are dorm rooms memory media? What makes a medium remember—the memory or the "rememberer," or something else? Is it significant that the amount of memory in storage devices is currently thought to double every three years?

When is it ethical to remember? When is it ethical to forget? (See concluding remarks about the right to be forgotten.) Both nature and technology introduce their own modes of memory into both of these questions: how does natural or mental memory complicate our ability to ethically remember and forget? (Think aporia, aphasia, trauma, lapses, Freudian slips, etc.) How does technological memory do the same? (What difference is there between an archive of the past and surveillance of the present?) Can there exist memory that is not mediated? Must all memory also be reconstructed? What happens when, like memes, those reconstructions take on lives of their own? Which, if any, antidotes might our responses to the mediated condition of memory offer to concerns about oblivion, Derrida's "archive fever," calls for radical transparency, declarations of the end of privacy, and other existential doubts? What work can memory, limited, do for us today?

How do, as Schrag argues, such memory techniques at once constitute who we are as well as necessarily reach beyond ourselves? Could we arrive at a clearer definition of the relationship between the self and the other once we locate them in the networks of memory techniques? In turn, what do our responses to memory and its problems reveal about our relationship to mortality and death, and the mediated records that we keep in the effort to stave off the creeping finitude of life? What does "worldbuilding" mean in Schrag's contributor listing—and what does science fiction have to offer to questions about how to respond to such basic human conditions?

What role do the paired block quotes at the beginning of this essay and toward its conclusion play in Schrag's argument? What, if any, (possibly performative?) role do they have in prompting a certain kind of referential thinking about the subject of memory? Why pairs?

What conceptual relationship does *memory* have with *meme*, *event*, *archive*, *prototype*, *surrogate*, among others?

Mirror

Background music: Arvo Pärt, "Spiegel im Spiegel"; Mudhoney, "Judgement, Rage, Retribution and Rhyme"

What can we learn from the contributor listing? "Adam Fish is a social anthropologist of digital industries and digital activism who teaches in the Sociology Department at Lancaster University in the United Kingdom. His work site is http://www.lancaster.ac.uk/arts-and-social-sciences/about-us/people/adam-fish."

Exercise: What social values are made possible by mirrors? (What social activities would be impossible without mirrors?) List five. (Self-examination/self-analysis/self-reflection/self-portraiture since at least Rembrandt, vanity and beauty industries ["other-analysis"?], politeness cultures, techniques for reversing images and misdirection?) How, if at all, are data mirrors different? List three of them and briefly discuss with a neighbor.

Discussion prompts: What's in a mirror? Polished metal surfaces, domesticating glass, silver amalgams, the first image of the ego? In what sense is the mature personality supposed to have passed through an early-childhood mirror stage or adolescent narcissistic stage of self-observation—and in what sense must the mature person remain to some extent the product of that stage? Other than the modern self, what else does the mirror bring into being? Light—a beam of analysis—cutting its way through to a correspondence of the reflection with the natural world? What else do we see with more light but more errors, more mistakes, more wrinkles, more data breaches, more disappointment—what else indeed but the same analysis that ushers in modern science (chemistry and cooking as products of glass and light magnified)? In what sense might the whole or mature self, and not the mere image of the ego, require the absence of a mirror?[5] What might this in turn say about our evolving relationship to the politics of data mirroring?

According to Fish, what is invisibility? What power lies in being able to make oneself and one's data visible to some and at the same time invisible to others? Correspondingly, what power lies in being able to view and not view others' data in turn? What does it mean to liberate and to capture an object—at the same time? How are these views often gendered gaze (is the photographer's view basically the male gaze?) or complicated by unequal structural relationships? How do the politics of Pirate Bay, Anonymous, and WikiLeaks "mirror" or replicate in their visibility language the politics of free and open-source software advocates? Are there alternatives to the hegemonic and counterhegemonic back-and-forth struggle that Fish describes in the battle to own and control data (and their subsequent visions of those they describe)? What relationship in particular does capture have with capitalization? In what sense is capital itself the visible capture of immaterial values as well as the invisible capture of material goods? What, if any, alternatives are available to a different politicization of data politics—or why, in other words, is the mirror metaphor so potent in the sharing and copying of files and data along computer networks? What might the language of replication, as opposed to visibility, in Fish's reading, offer data political analysts? Might alternatives such as multiplicity or doppelgänger politics otherwise refresh or mire Fish's analysis? How about the voicedness of glasnost, or weaving and textile metaphors?

[5] For more on mirrors, see Lewis Mumford, *Technics and Civilizations* (1934; Chicago: University of Chicago Press, 2010), 129–30.

Participation

Background music: Chubby Checker, "The Twist"; Village People, "YMCA"

What can we learn from the contributor listing? "Christopher Kelty is professor in the Institute of Society and Genetics, with appointments in the Department of Information Sciences and the Department of Anthropology at the University of California, Los Angeles. The author of *Two Bits: The Cultural Significance of Free Software* (Duke University Press, 2008), he teaches courses on the history of modern thought, science studies, and anthropology. More is available at http://kelty.org/."

Exercise: List five activities in which you have participated in the last five years (challenge: since your last meal). In which of these do you voluntarily participate, and in which of these must you participate—and which were more meaningful and why? Briefly discuss with a neighbor.

Discussion prompts: What does it mean to participate in something? Must participation be only voluntary? Must participation be only a given outside of our will? Participation, in Kelty's analysis, is also a lens for reflection on other digital keywords such as *peer production*, *crowdsourcing*, *big data*, *freedom* (see also *democracy*, *internet*). Which limitations, for Kelty, does the adjective *participatory* face compared to the noun *participation*; or, in other words, how might participatory budgeting and participatory democracy vary in terms of the nouns they modify? How might this perceived adjectival weakness, if accepted and reworked, become a strength? What would it mean to talk about *nonparticipatory* democracy? Nonparticipatory budgets?

How does the Greek term *methexis* reorganize our thinking about what participation does? What, if any, is its relationship to Neoplatonic ideals? (What does it mean to claim that "a given internet meme participates in the idea Internet Meme"?) How does Malebranche's occasionalism reframe how we might think about the direct and occasional causes for participation in different events? (See *event*.) What is added to the debate by twentieth-century science and its complication of observers that participate in their own observations? How, if at all, might the weak anthropic principle in cosmology in turn help us think about the basic social scientific condition of our own ability to see ourselves participating in the universe—but never to quite control for our own influence on those observations?

How does the relationship between individuals and collectives shape our thinking about participation? What other terms and dynamics are involved beyond Kelty's (helpful!) emphasis on direct and representative democracy in political theory? How have you participated in elections? Is your participation limited to voting, or quasi-public argumentation, or some other kind of public rituals? How do your experiences or the experiences of your peers participate in categories of "agency, autonomy, decision making, and involvement" on the one hand or "voice, agenda setting, direct democracy, deliberation, action" on the other? If you do not actively participate in political democracy, what would it mean to not participate altogether? Doesn't your choice not to participate itself constitute a (rational) choice and a type of action? Are you sure you are choosing inaction, or is the system incentivizing your rational inaction? What if all participation necessarily involved exclusion of selves and others (see Kelty's discussion of volume editing) and your choice not to participate were itself a "natural" result of a world whose participatory processes are always both partial and collective?

Personalization

Background music: Play the top hits on your YouTube/Spotify/etc. recommendation list

What can we learn from the contributor listing? "Stephanie Ricker Schulte is associate chair and associate professor of communication at the University of Arkansas, where she researches communication technologies, popular culture, and transnational media policy. She is the author of *Cached: Decoding the Internet in Global Popular Culture* (New York University Press, 2013)."

Exercise: List three personalization processes in your life, and then list the best and worst thing that could follow from not personalizing those processes. Briefly discuss with your neighbor.

Discussion prompts: When a technology personalizes your results, what is it doing? Can you describe that process in general enough terms that it could be applied to another technology (how does, for example, a news aggregator that personalizes your news hits help us understand when a bank personalizes your financial tool offerings)? What is the relationship among persons, personalization techniques and technologies, and capitalism? (And what work does the specific phrase "late capitalism" do in Schulte's essay?) What relationship does the word *individuals* have to the terms (in Deleuze's phrase) *dividuals* and *dividends*?

In what sense is an "ovulation predictor" a personalization technology? (If pregnancies are processes by which persons are made, what is its relationship to personalization technologies more broadly? How do human techniques for personalization differ, if at all, from automated or aggregated techniques for personalization?) How does *person* differ from *persona*? (Think interior performance and exterior presentation, especially online, perhaps.) How does *person* differ from *personal*? (Think a self and that which limits things from others.) (What role has the "personal computer" played in sharpening this language?) How does *person* differ from *personalization*? How, if at all, can the history of the computer itself be told as a story of a shift from person, to persona, to personal, to personalization (although perhaps not in that order)? (See *cloud*, *internet*, *mirror*, etc.)

Must personalization technologies necessarily involve digitization? If not, why do they tend to do so? (What digital techniques, such as merged consumer information spreadsheets, likely lie behind every personalized piece of spam post?) What are the differences between customization and personalization? (In particular, how do they relate to the flow of time differently? Can customization be predictive? Must personalization ideally be predictive? How do these differences play out in the markets of desire fabrication?) What is the relationship between personalized and spam services? Under what conditions is "self-brand" a contradiction, a culmination, or something else of cultural logics long at work (and which ones)? What is the relationship between personalization and privacy? Does depersonalizing your media use preserve or help protect a sense of privacy? If so, to whom is the person in personalization revealed if not the self? How else might privacy be conceptualized except as the right to (choose elements of) nondisclosure of the self to others? If not, what do depersonalizing media do?

If I take something personally, what does that mean about me? If I believe that taking something personally is often a form of weakness, what does that mean about me? If I believe that others should take things personally either more or less, what does that mean? What if all these questions were more helpful if they were not about me at all? Why all the "me"?

Prototype

Background music: St. Francis of Assisi, "All Creatures of Our God and King"; Tobacco, "Stretch Your Face"

What can we learn from the contributor listing? "Fred Turner is professor in the Department of Communication at Stanford University, where he teaches on the intersection of media, technology, and American cultural history. For more, see http://fredturner.stanford.edu/."

Exercise: Imagine an object that would be the *opposite* of a prototype in three specific ways, and list those three features along with a brief description of your experimental antiprototype. (How could it be useful?) Briefly discuss with a neighbor what makes and unmakes a prototype.

Discussion prompts: What is a "prototype"? Who uses them and why? (How does the prototype extend beyond and not all the way through Silicon Valley in particular?) What is "typology" in science and theology? Who uses it and why? (How does typology try to make sense of past and future at the same time, and in what ways does it fall short of doing so?) In which industries and historical contexts is "prototype" a distinctly *non*digital keyword? How do "prototypes" tend to mark unusual moments in the process from invention to innovation to mass production? How does a "prototype" try to make sense of an often unruly invention period, while also trying to make visible a particular productivist future? What historical or religious antecedents play similar roles, and how might various religious and historical pasts help benefit the cultural cache of Silicon Valley? What role does the "socio-material" concreteness of prototypes as namable things play in this process? (How, if at all, does this resonate with philosophical emphases from Heraclitus to Lao Tzu to the New Testament focus on incarnation and making the word flesh?) What in particular does Puritan theology have to say to this question? What would it mean to have a "field-level" prototype—and what role might free and open-source software or grassroots presidential campaigns, according to Turner, play in that model and mythology? How, if at all, can prototypes save the world? What would it mean to make that claim? Why do so many try to talk like that? (In what way does contemporary Bay Area California resemble seventeenth-century New England?) In what sense can things be stories, and stories be things? Do all things have teleological ends—must they? What would it look like to have a story without a teleological end? What might a rethinking of the narrative arcs of things have to offer a reworking of the salvific rhetoric of prototypes?

To quote Turner, "How does a given prototype summon the past, as well as foreshadow a particular future? For what purposes? What sort of teleology does it invoke? And what sort of historiography does it require? How do prototypes leave the lab bench and the coder's cubicle to become elements in stories about the world as a whole? How do engineering prototypes become social prototypes? And who wins when they do?" To this we might add: What would a prototype with an open-ended teleology look like? What would it look like for a prototype to summon an unresolved past as well as to foreshadow an unknown future? A story whose end is not and cannot be told: what would that sound like? Must it still be a thing or a story if it has no end to its arc? Who benefits when we learn to retell stories about things—and learn to remake things that tell stories, and why?

If aliens broke into your apartment right now, and asked for two things that would represent humanity to them, what would you give them, and why? What about two stories?

Sharing

Background music: Sesame Street, "Sharing Song"; Jack Johnson, "The Sharing Song"

What can we learn from the contributor listing? "Nicholas A. John is lecturer in the Department of Communication and Journalism at the Hebrew University of Jerusalem. His research interests include technology and society, social media, and sharing. Find him at http://nicholasjohn.huji.ac.il."

Exercise: List three industries that depend on people freely sharing media content with one another. Now list three media platforms that do the same. Briefly discuss with a neighbor how well, if at all, these industries and platforms compare.

Discussion prompts: Brainstorm to list verbs or phrases that have something to do with sharing: e.g., *sharing*, *Web 2.0 "share," social media sharing*, *file sharing*, *data sharing*, *time-sharing in computer science*, *time shares in real estate*, *knowledge sharing*, *ridesharing*, *couch-surfing/sharing*, *sharing economies*, *corporate shares* (allocation or portion), *share something personal*, *sharing your feelings* (therapy), *tragedy of the commons*, etc. What could the *OED* entry under *share* add to this list? How is it possible for a term to mean both communal wholes and fragmented shares? What does this have to do with John's communicative and distributive logics? (Cf. James Carey's "A Cultural Approach to Communication.") What does the keyword etymologically have to do with the word *shear*? How do "sharing economies" complicate the economic logic of scarce resources? What were and would be alternative verbs for similar social media actions (e.g., *upload*, *download*, *update*, *post*, *send*, *link*, etc.)—and how do these words differ from sharing, and whom do the differences serve? If you Google the word *sharing*, what kind of images, colors, and ethics result? (Who is thinking of the children, who is thinking like children, who wants whom to do what, and why?)

What relationship does contemporary sharing discourse have with twentieth-century therapeutic discourse? What in particular might it owe organizations such as Alcoholics Anonymous, the Oxford Group, or other early twentieth-century movements? How does this language of social sharing as a means of redemption or improvement participate, extend, and complicate progressive and evangelical politics? (What role does the final *and* play in the previous sentence?) Under what conditions is "collaborative consumption" a social value, and for whom?

How does sharing tie into the fundamental character of human sociability? When is sociability "unsocial"? What role do "fuzziness" and "fuzzy objects" play in John's analysis (and in his 2013 article in *New Media & Society*)? How might the vagueness and coziness of *fuzzy* play into making sense of what is at stake in sharing? How, if it all, might vagueness also (see C. S. Peirce) help us understand the nature of nature, and why sociability involves sharing but perhaps never everything, or why sociability involves overcoming solipsism but perhaps never entirely? If sharing is a constitutive act of the internet age, are we to be surprised that the network of links and exchanges now stands as a key organizing paradigm for our relations? (How might the network itself be an imperfect image of what sharing is and is not—including ties back to lacework, objects made up of links rather than entities, hubs and deeply unequal power dynamics, and spatial metaphors composed of gaps upon gaps?) What would it mean to share no object at all? What would it mean to share with no one at all? What does it mean to unshare?

Surrogate

Background music: Axis of Awesome, "Four Chords"

What can we learn from the contributor listing? "Jeffrey Drouin is assistant professor of English and codirector of the Modernist Journals Project at the University of Tulsa. He is the author of *James Joyce, Science, and Modernist Print Culture: 'The Einstein of English Fiction'* (Routledge, 2014) and creator of *Ecclesiastical Proust Archive*, http://proustarchive.org."

Exercise: Look up a definition of *modernism* and then translate that definition across a series of three media without copying it exactly (e.g., write it from memory, recite it as a poem, draw it as a picture). Briefly discuss your process with a neighbor, and what you think this has to do with modernism's relationship to document copies. (What might Walter Benjamin's age of the mechanical reproduction of artworks add to this?)

Discussion prompts: Which digital objects do your studies depend on? Can you name three such objects? Which of these have which claims to being authentic or somehow more original than others—more troublingly, which of these objects are used to *make* such claims? What does it mean to make copies, to be the source from which copies are made, and to differentiate priorities and privileges among such objects accordingly? (Is this type of thinking itself a result of thinking about objects too seriously?) Is it fair to assume, with Drouin and Walter Benjamin, that not only modernism as the age of mechanical reproduction of works of art but also the print age (and obviously the digital age as an extension of it) variously participate in a much longer tradition of copy making in the print age and modernity itself? It may be helpful to distinguish modernity as the last four hundred years or more from literary and philosophical "modernism" as the movement that rejected Enlightenment values in its coalescence around the turn of the twentieth century and its articulation after World War 1 (among other kinds of modernity and modernism, of course!). In other words, are document surrogates anything new to the digital age—and if not, how can we, with Drouin, understand what forms of print-digital-replication mediation deserve isolation and analysis?

What do Drouin's research interests teach us about his interest in English and French literature, and how do those interests refract in his analysis of the *BLAST* manifesto and subsequent reading of it as a surrogate document? Specifically, what can a close reading of the *BLAST* manifesto reveal? In addition, what is revealed by the fact that that grayscale image is itself a half-page replication of a two-page digital surrogate for a two-page spread in a mass-produced magazine? Why does Drouin's analysis include so many more measurements than the others? (Compare *information*.)

Is there such a thing as a material image? Can any image be anything but material?

***

Why, out of twenty-five essays, do the first fourteen take up keywords in the first six letters of the alphabet and the last one land alphabetically only on the letter *S*? What do our own alphabetic biases reveal about the contributors and other readers? How else does this shortened alphabetic list work, and does it serve as a structurally open invitation to readers to continue the project for themselves?

There is much more work to be done—a whole grammar to evaluate and refashion. Care to join in?

***

Digital Keywords:
A Skeleton of a Syllabus

Course purpose: In the information age, words are increasingly important, with some taking on new meanings. This course seeks to acquaint students with how language—particularly key terms in the age of search—cannot be separated from our cultural, economic, political, and social relations. Digital keywords are both indispensable and fickle; they matter ferociously and they bite back. In 1976, the Welsh literary critic Raymond Williams published his classic *Keywords: A Vocabulary of Culture and Society*, establishing a critical and ongoing project for taking seriously the work of over one hundred words in postindustrial Britain. This course, taking Williams as its (all-too-)timely inspiration, seeks to refresh the keywords project for English-language information societies and cultures worldwide. This course also looks to offer a more critical and interdisciplinary approach to "digital keywords" from what is currently championed, as a simple Google search will reveal, by search engine optimization (SEO). SEO, with its shady markets of pay-per-click advertising and results manipulation, cannot be the most sustainable approach to working with digital keywords. Without a generation of students and scholars sensitive to language in the age of search, SEO likely will remain the unchallenged approach to digital keywords. This course seeks to help reverse that trend.

Preliminary course schedule:

Week 1: Course introduction; C. Wright Mills, "On Intellectual Craftsmanship"
Week 2: B. Peters, *Digital Keywords,* introduction (Williams: introduction)

Unit 1: Subjects
Week 3: Coleman, "Hacker," and Dunbar-Hester, "Geek" (Williams: Capitalism, Work)
Week 4: Gillespie, "Algorithm," and Shifman, "Meme" (W: Bureaucracy, Ecology, Mechanical, Nature)
Week 5: Turner, "Prototype," and Drouin, "Surrogate" (W: Creative, Image, Myth)

Unit 2: Objects
Week 6: J. Peters, "Cloud," and Fish, "Mirror" (Williams: Aesthetic, Idealism, Taste)
Week 7: Harris, "Archive," and Schrag, "Memory" (W: Alienation, History, Tradition)
Week 8: *Midterm exam or paper draft*
Week 9: Streeter, "Internet," and Geoghegan, "Information" (W: Ideology, Jargon, Standards)

Unit 3: Actions
Week 10: Schulte, "Personalization," and John, "Sharing" (Williams: Community, Media, Personality)
Week 11: Kelty, "Participation," Braman, "Flow," and Bhaduri, "Gaming" (W: Popular)
Week 12: Sterne, "Analog," and B. Peters, "Digital" (W: Organic, Rational, Technology)

Unit 4: Environments
Week 13: Nielsen, "Democracy," and Yang, "Activism" (Williams: Democracy, Radical, Revolution)
Week 14: Avance, "Community," and Forsyth, "Forum" (W: Community, Society)
Week 15: Striphas, "Culture," and Sonnevend, "Event" (W: Culture, Mediation)
Week 16: *Final exam, final paper workshop*

Five Assignment Prompts

1. Compose a keyword review essay that reads and responds to a chain of keyword essays. Both Williams's *Keywords* and Peters's *Digital Keywords* include cross-references at the end of each essay to other keyword essays. Build a reference chain by following four to six essays across both books (at least two from each). (For example: Sterne's *analog* => Peters's *digital* => Williams's *capitalism*, *industry*, and *work*. Or, for another example, Williams's *communication* and *community* => Avance's *community*, Forsyth's *forum*, Kelty's *participation*, and John's *sharing*). Alternatively, in discussion with the instructor, a keyword review essay could also propose keywords that are not yet cross-referenced, making an argument as to how and why they hold together in ways not previously understood. Ideally, any review essay will attempt to draw out clustered connections among keywords, showing how, together, keyword clusters permit certain language uses and meanings that alone no single keyword essay could fully describe.

2. Compose your own digital keyword essay, using essays in *Digital Keywords* and *Keywords* as models. The appendix to *Digital Keywords* lists 250 sample candidate digital keywords. Choose among these or defend to your instructor the choice of a new one. If your keyword choice is a new one, consider tweeting it to #dkw for broader scholarly use. Ideally, this essay will describe, argue, and make plain some important point about the information age. In other words, its *description* should outline the basics of your chosen keyword and its stakes. Its *argument* should provoke all readers, including leading scholars and commentators on that topic, to rethink some basic point. And its *style* should be plain enough to be understood by all educated readers. Again, the goal of digital keyword essays is to take a topic that matters to the modern information age, to describe that topic and what matters about it in some significant term that the nonspecialist can understand, to make a point or argument specific enough to interest the specialist.

3. Read a draft essay by and prepare substantial critical feedback for one of your peers. The goal of your critique should be to improve the student's writing, argument, and thought. It should do at least three things: (1) it should describe the apparent or potential purpose (thesis) of the essay; (2) it should briefly describe, using evidence, what you think the draft does well and how those strengths serve the purpose; and (3) it should substantially describe, using evidence, what you think the final paper should improve on and how those areas of improvement will, once revised, better serve the purpose.

4. Choose one of the short proclamations or propositions laid out in the extended introduction to *Digital Keywords* and meaningfully disagree with or improve on it. Describe what the editor appears to be arguing and then show how his position is mistaken, makes faulty assumptions, entails unintended consequences, falls short in detailed analysis, or otherwise misses the mark. For example, that subjects, objects, verbs, and prepositions can be meaningfully correlated with actors, things, actions, and environments; that language is one of the "key epistemological materials of which the world is made"; that "terminological technologies" cannot function without keywords; that, as Leo Marx claimed, "keywords often serve as markers, or chronological signposts, of subtle, virtually unremarked, yet ultimately far-reaching changes in culture and society"; that "Whatever else it is, the digital revolution is a revolution in language"; that the core insight behind Foucault, Kittler, and Latour is the "mutual inscription of material and semiotic power, of technology and language, in modern terminological techniques (archives, discourse, networks, etc.)"; that a

"keyword is a socially significant word that does socially significant work" (even if that is true, should it be?); that "perhaps all keywords have always already been digital"; that "Keywords do not only organize the world for us. They also organize us in the world"; that "Keywords perform propositional forces in reality" (with a broad range of examples from Bronze Age taxation to naming children, to the corporate memo); that "the passport may be understood as [a] keyword list" or that a "signature seeks to be … *both* repeatable *and* inimitable"; that "[keywords] impinge on our analytic arithmetic for understanding the past, the present, and the future"; that "[keywords] complicate our distinctions, natural, artificial, and human; and they reveal the adamantine institutional and intellectual forces thought to be scripting our lives, sometimes even afterlives, always hard at work in the present"; that "the dark side of big data, in other words, is how scalably small analysis now is—its penetrating zoom"; that " 'personalizing' your media, simply put, means that both you and others get to see more of yourself, although who the others are is not up to you (if ever it was)"; that "the power of interested actors and institutions is inseparable from the language that exercises that power"; and that "the essence of digital keywords is neither the digit nor the keyword."

5. Do the same to one of the *Digital Keywords* essays. The introduction suggests organizing the essays into subjects, objects, verbs, and environments. Those four categories involve, among many others, the following key claims. For subject essays, consider *geek*, *hacker*, *algorithm*, *meme*, *prototype*, and *surrogate*. Christina Dunbar-Hester drives home a critique of the gender biases baked into contemporary computer geeks, while Gabriella Coleman upends hacker identity, diagnosing a root commitment to craft autonomy. Tarleton Gillespie and Limor Shifman examine two new forms of social life online, the algorithm and the meme; specifically, Gillespie demystifies the term *algorithm,* outlining four ways procedure worms its way into contemporary computer talk, while Shifman corrects scholarly and popular misunderstanding around that leaven of the internet, the meme. Fred Turner and Jeffrey Drouin read subjects that straddle virtual and real, projective and past: prototype and surrogate; specifically, Turner unearths the Puritan roots of the Silicon Valley prototype: models make "a possible future visible" and typify our past; Jeffrey Drouin complicates the modernist relationship between "original" documents and their digital surrogates.

For object essays, consider *cloud*, *mirror*, *archive*, *memory*, *internet*, *information*. John Durham Peters reseeds the cloud in cloud computing with meaning from myth to meteorology. Adam Fish reflects on the mirror in data mirroring, a site for capturing, duplicating, and making visible politics. Katherine D. Harris and Steven Schrag tackle memory objects: who remembers what, and who decides that? Harris distinguishes digital from print archives, showing what makes text and context social in each; all the while, Schrag puzzles on the riddle of modern memory, digital and embodied: memory is who we think we are and at once beyond ourselves. Thomas Streeter and Bernard Geoghegan topple two towering keywords—*internet* and *information*; for Streeter, there is no such thing as the internet. The singular noun has more 1990s hype than reality about it; Geoghegan meanwhile traces information back to nineteenth-century electrical telegraphy, renewing old instruments, standards, and sign economies.

For verbs and other action essays, consider *personalization*, *sharing*, *flow*, *gaming*, *participation*, *analog*, *digital*. Stephanie Ricker Schulte and Nicholas A. John flip how net narrows (personalizes) and broadens (shares) free information—for a profit. Schulte shows how personalization both empowers and debilitates liberal individual agency in late capitalism; meanwhile, John demystifies sharing. No greed antidote, sharing serves therapists, shareholders, and data brokers. Flow and gaming, in the able hands of Sandra Braman and Saugata Bhaduri,

reappear as forms of collective action in complex systems. Moving beyond Williams on television, Braman carefully analyzes how individual, group, and societal systems now all must flow; meanwhile, Bhaduri develops how gaming, like flow, is about continuous action, but mixed with social risk and subversion. Christopher Kelty mines the intellectual veins of participation. One gem among many: to belong collectively is not always to do so voluntarily.

Perhaps a key set of claims in the volume is that *analog* and *digital* are as binary as are the essays by Jonathan Sterne and Benjamin Peters that separate them: *Not. At. All*. Reread the notes to the *analog* and *digital* essays in this document and respond to their provocation.

For the environment essays, consider *democracy*, *activism*, *community*, *forum*, *event*, *culture*. Guobin Yang and Rasmus Kleis Nielsen take on political environments online: activism and democracy; for Nielsen, for example, democracy is not digital (deliberative, direct, or participatory). It is vital institutions with less sexy PR; meanwhile for Yang, ambiguous online activism in China and the West has deradicalized street politics since Raymond Williams. Rosemary Avance punctures the hype in digital, virtual, and hybrid communities, while embracing something greater than oneself. Hope Forsyth grounds the online forum in the soils of Rome; all forums take place between embodied humans. For Julia Sonnevend, to make an event, first found, universalize, condense, counternarrate, and diffuse narratives across borders. Finally, Ted Striphas updates Williams's key keyword *culture* with a rich reflection on the rise and merger of technology with modern culture.

Other Suggested Keyword Readings

Williams:

Williams, R. *Keywords: A Vocabulary of Culture and Society*. 2nd ed. London: Fantana/Collins, 1983.

Edited Collections:

Bennett, T., L. Grossberg, and M. Morris, eds. *New Keywords: A Revised Vocabulary of Culture and Society*. Oxford: Blackwell, 2013.

Burgett, B., and G. Hendler, eds. *Keywords for American Cultural Studies*. 2nd ed. New York: New York University Press, 2014.

Fuller, M., ed. *Software Studies: A Lexicon*. Cambridge, MA: MIT Press, 2008.

Koselleck, R., ed. *Geschichtliche Grundbegriffe*, 8 vols. 1972–93.

Mitchell, W.J.T., and M.B.N. Hansen, eds. *Critical Terms for Media Studies*. Chicago: University of Chicago Press, 2010.

Online Resources:

Key Words (the Raymond Williams Society Journal), https://raymondwilliams.co.uk/journal/.

The Keywords Project at the University of Pittsburgh, http://keywords.pitt.edu/.

Stanford Encyclopedia of Philosophy, http://plato.stanford.edu/.