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### The web as exception: The rise of new media publishing cultures

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# 1. Cyberculture and the computational metaphor

When the World Wide Web surfaced in the early 1990s, it seemed set to fulfill the utopian promises of cyberculture. As the disembodied, virtual world called cyberspace, the web would set its users free from real-world constraints, forming a “new home of Mind” and the site of unprecedented, transcendent experiences.<sup>1</sup> In cyberculture, self-organized virtual communities would revitalize the public sphere, and cybernauts - released from the material confines of geography, gender, race and class - would construct virtual identities that better reflected their fragmented, distributed lives and lifestyles.<sup>2</sup>

Cyberculture is normally defined as the culture of cyberspace, but this definition obscures the extent to which notions of cyberculture and cyberspace, as well as those of virtual community and virtual identity, were the products of speculation about the effects of new media in the 1980s and 1990s, and the fact that these terms - especially in their utopian configurations - have largely been abandoned today.<sup>3</sup> In this chapter, I build on existing critical and historical accounts of cyberculture to forward a different understanding of it as a particular mode and period of new media rupture-talk, a discourse in which virtual reality, the internet and eventually the web would be perceived as sources of radical change. Cyberculture, in other words, was a discourse through which new media appeared to be “critical,” marking a cultural, political and economic turning point, and implying the transition from one state or general condition to another.<sup>4</sup> Although it is difficult to point to exact dates marking a beginning or end of cyberculture, it seems likely that cybercultural depictions of the internet and the web as critical reached their zenith in February 1996, when John Perry Barlow issued his famous - and now often derided - “Declaration of the Independence of Cyberspace.”<sup>5</sup> The manifesto, written in response to U.S. legislation for regulating internet content, portrayed the internet as a medium free of the various physical, social and cultural restraints normally placed on

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<sup>1</sup> Barlow, 1996.

<sup>2</sup> Rheingold, 1993; Turkle, Sherry. 1995. *Life on the Screen: Identity in the Age of the Internet*. New York: Simon & Schuster.

<sup>3</sup> For the definition of cyberculture as the culture of cyberspace, see especially Lévy, Pierre. 2001. *Cyberculture*. Minneapolis: University of Minnesota Press; this definition’s persistence is seen for example in Wikipedia’s definition of cyberculture as “the culture that has emerged, or is emerging, from the use of computer networks for communication, entertainment, and business.” See Wikipedia contributors. 2013. “Cyberculture.” *Wikipedia, the Free Encyclopedia*. <http://en.wikipedia.org/w/index.php?title=Cyberculture&oldid=539672923>.

<sup>4</sup> Chun, Wendy Hui Kyong. 2011a. “Crisis, Crisis, Crisis, or Sovereignty and Networks.” *Theory, Culture & Society* 28 (6) (November 1): 91–112.

<sup>5</sup> Barlow, 1996.

self-expression, and one that should stay so. Barlow called cyberspace the “new home of Mind,” and predicted that the “Governments of the Industrial World” would soon be expelled.<sup>6</sup>

Cyberculture as the culture of cyberspace also obscures the lineage of both notions in the cybernetic sciences and attempts to understand biological, psychological and social phenomena as systems of communication, information exchange and feedback. Although cyberculture appeared to be (and is often dismissed as) a hyperbolic reaction to new technology, histories of cyberculture show how it was in fact an extension of key ideas that originated in cybernetics. The utopian dislocation from matter implied in Barlow’s cyberspace, for instance, relies on what N. Katherine Hayles called “the condition of virtuality,” or “the cultural perception that information and materiality are conceptually distinct and that information is in some sense more essential, more important, and more fundamental than materiality.”<sup>7</sup> Because Hayles’s term is primarily directed at the problem of embodiment, I use the more general description of ‘the computational metaphor’ to describe this conceptual separation of information: in cybercultural rhetoric such as Barlow’s, what is being left behind is not just the body, but a whole range of ostensibly ‘artificial’ social structures and forces that might simply be summarized as ‘history.’ I don’t mean to suggest that casual use of computational metaphors (such as when I say I am ‘processing new information’ when I mean I am thinking) ventures into cybercultural utopianism, but want to emphasize how the latter is grounded in the metaphorical notion of a ‘pure’ information space: if the essence of social and cultural life is the flow of information, and if psychology and social relations can be broken down to bits, then it becomes possible to imagine their revolutionary transformations in the virtual realm of cyberspace. Rupture-talk such as Barlow’s, then, is perhaps best understood as a site of continuity: in preaching radical change fashioned by cyberspace, the utopian narratives of cyberculture in fact sustain a key product of cybernetics and thus the state and military institutions that cyberspace was ostensibly opposed to.

The contingency of cyberculture’s emancipatory connotations is already clear when considering its immediate sources, the term cyberspace and the cyberpunk science fiction genre where it originated. Cyberspace was coined by William Gibson in 1982, and made famous as the graphical representation of a global computer network in his 1984 science fiction novel *Neuromancer*.<sup>8</sup> By invoking cybernetics, or the science of communication and control, the term vaguely suggested a communication space, and Gibson’s descriptions portray it as a spectacular

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<sup>6</sup> *ibid.*

<sup>7</sup> Hayles, 1999: 18.

<sup>8</sup> Gibson, William. 1984. *Neuromancer*. New York: Ace.

visualization inspired by arcade video games. Cyberspace further appears as a vast, mystical entity characteristic of the militarized and commercialized world of *Neuromancer*, where corporations, governments, terrorist groups and lone hackers like the novel's hero, Case, all compete to control resources. Soon after the term was popularized, however, cyberspace would be used to describe comparatively mundane communications technologies such as Bulletin Board Systems (BBSs) and, starting around 1993, the World Wide Web.<sup>9</sup> And instead of a space of military power and corporate secrecy, it suggested an information space without barriers or constraints - physical, political, economic, cultural or otherwise.<sup>10</sup> In addition to Barlow's "new home of Mind," this perception was present in accounts of the empowering potential of virtual community and virtual identity.<sup>11</sup> What united these various arguments, I argue below, was the assumption that cyberspace, as a space of pure information, allowed for the removal of 'artifice' - the constraints imposed by the physical and social world on community and identity - and enabled more natural, fluid and complex modes of communication, culture and enterprise. This association was strange, not only because it paradoxically conflated technology with nature - a conflation Kevin Kelly, writing in 1994, described as the hallmark of the fast-arriving "neo-biological civilization" - but because, as Fred Turner has noted, computing was widely considered a symbol of state and corporate bureaucracy as recently as the 1960s.<sup>12</sup>

The question of cyberculture's conditions of possibility, then, may be broken down into two related subquestions. First, how was it possible that cyberspace was conceptualized as an information space necessarily separate from the physical world, one that denied matter at the same time that it enabled more organic forms of social interaction and organization? Second, how was it possible this space was considered a source of freedom and individual empowerment, when information technology had previously been understood as instruments of power and control? In the following sections, I argue that the answers to both questions lie in the history of the computational metaphor, an umbrella term for a broad range of expressions that imagine the sum of human experience - from cognition to the physical world, from genetic codes to social ties - as systems of quantifiable information. As I argue in the next section, the computational metaphor is closely

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<sup>9</sup> Markoff, John. 1993. "A Free and Simple Computer Link." *The New York Times*, December 8. <http://www.nytimes.com/library/tech/reference/120893markoff.html>

<sup>10</sup> Chun, 2006.

<sup>11</sup> Rheingold, 1993; Dibbell, Julian. 1998. *My Tiny Life: Crime and Passion in a Virtual World*. New York: Holt.

<sup>12</sup> Kelly, Kevin. 1994. *Out of Control: The Rise of Neo-Biological Civilization*. New York, Addison Wesley Publishing Company; Turner, 2006; Lubar, Steven. 1992. "'Do not fold, spindle or mutilate': a cultural history of the punch card." *The Journal of American Culture*, 15 (4) (Winter): 43-55.

connected to the history of cybernetics, a relationship that is the subject of various concepts such as the cybernetic vision (described by Peter Galison), the closed world and cyborg discourses (Paul N. Edwards) and the condition of virtuality (N. Katherine Hayles).<sup>13</sup> By conceptualizing behavior as a process of communication between an object and its environment, each of these authors argue, cybernetics made it possible to begin understanding both the human mind and the material world as patterns of information. When information is considered distinct from and more essential than matter, Hayles argues, it becomes possible to perceive in computer technology a fulfillment of Cartesian dualism - for example, cyberspace as both disembodiment and a new home of Mind. To answer the second question, one must additionally examine how the computational metaphor, which was strongly tied to World War II and Cold War contexts, became linked to a rhetoric of individual freedom. Following Fred Turner's *From Counterculture to Cyberculture*, in section 1.2 I review how cybernetic thought was appropriated by important figures in the 1960s counterculture, and became a key element in their attempts to create communal alternatives to mainstream society. In section 1.3, I show how the lineage of the computational metaphor in cybernetics and the counterculture resonated with cybercultural practice and technology as these were articulated by practitioners and commentators in the mid- to late-1990s.

By tracing the computational metaphor's trajectory from its origins in military-related research to its use in cybercultural rupture-talk and understandings of the exceptional qualities of new media, this chapter offers an answer to the question of how the web was seen as a source of rupture as it came to prominence in the 1990s. The chapter concludes with a brief discussion of how elements of cyberculture persist, and in particular how the computational metaphor may be seen to continue to format (unrealistic) expectations of the web's significance and effects.

## 1.1 Cybernetics and its legacies

When, in 1994, Kevin Kelly argued that information technology was ushering in a new civilization in which the lines between technology and nature were blurring, he outlined a powerful vision of the future that simultaneously recalled a specific past. On the one hand, his book *Out of Control* invited readers to glimpse a future in which exceptional technology like the internet was facilitating a new world of artificial life, e-money, self-organizing systems, virtual communities, genetic engineering and simulated realities. On the other hand, as Kelly observed, such neo-biological forms were rooted conceptually in the questions, theories and models posed by an influential group

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<sup>13</sup> Galison, 1994; Edwards, Paul N. 1996. *The Closed World: Computers and the Politics of Discourse in Cold War America*. Cambridge, MA: MIT Press; Hayles, 1999.

of researchers in the natural and social sciences in the 1950s, retroactively called the cybernetics group. In fact, Kelly wrote, his work could be summarized as “an update on the current state of cybernetics research,” if cybernetics were still practiced (he notes it died out in the 1970s).<sup>14</sup> To begin to understand the conceptual links between cybernetics and cyberculture, here I turn to the history of the former. I focus on what various authors have identified as cybernetics’ main concerns and its legacies (both in the sciences and beyond). This will help contextualize the countercultural embrace of cybernetics discussed in section 1.2.2, and cyberculture’s articulation of the internet and the web as exceptional, discussed in section 1.2.3.

Cybernetics originated with the work of the Harvard mathematician Norbert Wiener, and is the study of goal-oriented systems that self-regulate by processing information in a feedback loop. As N. Katherine Hayles succinctly puts it, the discipline represented the marriage of 19th century theories of mechanical and electro-mechanical control technologies, called servomechanisms (the classic example of which is the thermostat), to an emerging theory of information in the work of Wiener and Claude Shannon.<sup>15</sup> Soon, though, it would be applied far beyond the concerns of engineering, and offer a general theory of what Wiener called “control and communication in the animal and machine.”<sup>16</sup> Its success, as Scott Heims and Paul Edwards have argued in separate accounts, had much to do with the mobilization of the sciences during World War II and the Cold War. And although Wiener would later distance himself from the optimism surrounding the application of cybernetics across disciplines, it had a profound impact on the social and behavioral sciences.<sup>17</sup> Because of this, it laid the groundwork for metaphorical uses of the computer in theories of the human mind, what Edwards calls “cyborg discourse.”<sup>18</sup> In her complementary account, Hayles argues that it instituted a “condition of virtuality,” in which information is assumed to be distinct from and somehow more essential to life than matter - an assumption that in one of its most extreme forms results in the belief that human consciousness may be downloaded to a computer.<sup>19</sup> Such expressions of the computational metaphor, as I’ll argue below, featured prominently in cyberculture during the 1990s. But first, it is worth detailing the history of how such ideas were

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<sup>14</sup> Kelly, 1994: 453.

<sup>15</sup> Hayles, 1999: 8.

<sup>16</sup> Wiener, Norbert. 1948a. *Cybernetics: Or the Control and Communication in the Animal and Machine*. Cambridge, MA: MIT Press.

<sup>17</sup> Heims, Steve J. 1991. *The Cybernetics Group*. Cambridge, MA: MIT Press.

<sup>18</sup> Edwards, 1996: 21.

<sup>19</sup> Hayles, 1999.

made possible, as it reveals the importance of the contexts of military research for their success. It therefore also serves as reminder that, as Wendy Chun argues, the kinds of technology-enabled freedom imagined today (including fantasies of downloading human consciousness to a machine) are in many ways the same as the dreams of perfect control that fueled military funding of computer technology in the post-war era.<sup>20</sup>

The foundation of cybernetics can be traced to Wiener's efforts to improve the accuracy of antiaircraft guns during World War II.<sup>21</sup> His antiaircraft (AA) predictor, prototyped and tested in laboratories in 1942 but never fully realized, would use statistical analysis of what today might be called 'realtime' data - the zig-zagging, irregular movements of an enemy airplane - to predict the plane's future position. The innovation, however, lay not so much in calculating probable flight movements or using control mechanisms to improve artillery fire: other methods of predicting an airplane's future position were already in use, part of larger sets of electromechanical equipment called "gun directors" that performed ballistics calculations and controlled the guns semi-automatically.<sup>22</sup> Rather, as Peter Galison has argued, the AA predictor's lack of success had no impact on Wiener's estimation of his conceptual breakthrough, which was to imagine the enemy aircraft and its pilot as an integrated system of information exchange. Wiener reasoned that irregularity in the flightpath, or "noise," was introduced by the pilot as he tried to maneuver the plane in response to (or under pressure from) visual and other stimuli - noise was in effect a kind of oscillation that came from attempts to correct the airplane's behavior based on new information. From there, Wiener was able to reason further that pilot, aircraft, anti-aircraft gun and gunner constituted a system in which the actions of each constituted information that (through feedback mechanisms) affected the system as a whole.<sup>23</sup>

Cybernetics was thus derived from what Galison calls the "ontology of the enemy," or Wiener's decision to treat pilot and airplane as essentially similar - as servomechanisms (or "purposeful machines") whose behavior could be described in terms of feedback and self-regulation.<sup>24</sup> For the purposes of studying control, the boundaries between human and machine were blurred to the extent that there was no reason to make an analytical distinction between them:

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<sup>20</sup> Chun, 2006.

<sup>21</sup> Wiener, 1948a.

<sup>22</sup> Edwards, 1996: 45.

<sup>23</sup> Galison, 1994: 236.

<sup>24</sup> *ibid.* Galison uses the term "ontology of the enemy" to highlight the historical specificity of cybernetics as a wartime science. The description of servomechanisms as "purposeful machines" is from Rosenblueth, Arturo, Norbert Wiener and Julian Bigelow. 1943. "Behavior, Purpose and Teleology." *Philosophy of Science*. 10(1), January: 18-24.

what mattered was the range of possible behaviors and their degree of predictability. And despite the specificity of this ontology (a pilot operating an airplane under deadly conditions), it soon became a model for studying human psychology more generally. As Galison writes, from early on Wiener saw a potential to transfer this outlook to behaviorism, the then-dominant paradigm in psychology that focused solely on perceivable changes in the individual and the environment.<sup>25</sup> What behaviorism lacked, as Wiener saw it, was a sophisticated theory of “the intrinsic possibilities of types of behavior,” and the servo-mechanical behavior he perceived in the enemy pilot was one of these types.<sup>26</sup> An inspiration for such an approach was the engineering concept of a black box, where the range of functions of an apparatus are determined before one considers what its actual components may be.<sup>27</sup> Wiener, together with neurophysiologist Arturo Rosenblueth and engineer Julian Bigelow, both regular collaborators, fleshed out this position in the article “Behavior, Purpose and Teleology.”<sup>28</sup> The authors proposed a number of classes and types of behavior, arranged as a nested hierarchy: at the top, they distinguish between active and passive behavior (where active means the object displaying a behavior is also the source of energy for it - in the authors’ example, a thrown rock is passive, since its energy is supplied by an external input); active behavior is then categorized as purposeful (“directed to the attainment of a goal”) or purposeless; purposeful behavior is divided into “feed-back” or “non-feed-back” (where the former refers to “teleological” behavior guided by negative feedback toward a goal), and so on.<sup>29</sup> Purposeful behavior that is extrapolated from feedback is also what the authors call *predictive behavior* - the category that Wiener understood enemy aircraft to be in. This insight was of course omitted from the paper (published during the war), although one of their examples of self-correcting, predictive behavior - in which a person or machine attempts to track a moving light projected onto the wall - is unmistakably taken from the experiments Wiener and Bigelow designed to simulate firing an anti-aircraft gun at an enemy plane.<sup>30</sup> The ontology of the enemy, then, had helped Wiener and his colleagues to formulate a general theory of purposeful behavior, one that did not distinguish between humans and machines.

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<sup>25</sup> The authors contrasted behaviorism with functionalism, where “the main goal is the intrinsic organization of the entity studied, its structure and its properties” (Rosenblueth et al., 1943: 18).

<sup>26</sup> Wiener quoted in Galison, 1994: 242.

<sup>27</sup> Galison, 1994: 242.

<sup>28</sup> Rosenblueth et al., 1943.

<sup>29</sup> Rosenblueth et al., 1943: 21.

<sup>30</sup> *ibid*: 20; c.f. Galison, 1994: 236-237.

The computational metaphor was soon proposed as a way to connect a wide range of scientific disciplines. At the famous Macy conferences devoted to multidisciplinary discussions of feedback mechanisms and circular causal systems took place from 1946 to 1953, Wiener's ideas were exposed to researchers from physiology, anthropology and psychology, among other fields.<sup>31</sup> This variety conformed to the inaugural conference's central aim of "identify[ing] in a behaviorist spirit some of those aspects of what organisms do that can be analyzed in terms of what certain analogous machines do."<sup>32</sup> As Heims notes, what transpired in fact departed significantly from behaviorism, in that the participants were interested in goal-directed action (as opposed to mechanistic behavior) and in circular causality (as opposed to stimulus-response).<sup>33</sup> And as Edwards argues, this meant moving from models and metaphors that emphasized comparisons between humans and animals to those that considered the human as an information processing machine; before long the goal would be "to understand the processes of perception, memory, and language in terms of formalizable transformations of information and feedback circuits or control loops."<sup>34</sup> The tone was set from the first session of the first conference in 1946, when John von Neumann spoke about the advantages of digital over analog computing and "made semi-quantitative comparisons between vacuum tubes and neurons, the overall size of brains and computers, their speed of operation and other characteristics."<sup>35</sup> The human-computer analogy was also central to the second presentation, in which Lorente de Nó discussed the "firing of an impulse from a nerve cell [...] as a digital, binary process."<sup>36</sup> The 1946 conference was initially set up so that scientists from the human and social sciences could discuss informally whether the new concepts and models might be useful in their own fields, and participants speculated on possible applications. Some of the psychologists and social scientists present, including the sociologist and pioneer of survey research Paul Lazarsfeld, saw this primarily as an opportunity to bring the rigor they perceived in the work of 'hard' science to their own fields.<sup>37</sup> Others however saw more potential for overlap: the anthropologist Gregory Bateson, for instance, compared the role of certain rituals in the

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<sup>31</sup> "Cybernetics" was only attached to the conferences after Wiener coined it in 1948 to "embrace the whole field in a single term." Wiener, Norbert. 1954. *The Human Use of Human Beings*. New York, Doubleday: 15.

<sup>32</sup> Heims, 1991: 15.

<sup>33</sup> *ibid.*

<sup>34</sup> Edwards, 1996: 179-180.

<sup>35</sup> Heims, 1991: 20.

<sup>36</sup> *ibid.*

<sup>37</sup> Heims, 1991: 192.

latmul culture to negative feedback and homeostasis.<sup>38</sup> The success of subsequent conferences in this regard was even greater, and cybernetics deeply influenced other social scientists, including Talcott Parsons, who hoped it could bridge the gap between the social and physical sciences.<sup>39</sup>

The success of the computational metaphor and cybernetics more generally was made possible in part by a sophisticated theory of information, one that abstracted it from both matter (or medium) and meaning (or context), and seemed to afford use across disciplines.<sup>40</sup> Together with an influential theory of the neural net as a formal logical system developed by two other core cyberneticians, Warren McCulloch and Walter Pitts, information theory provided a foundation for analyzing machines, animals and humans together, and gave models of the human as computer (and of the computer as capable of displaying human intelligence) more scientific weight. Working independently, Wiener and engineer Claude Shannon both arrived at a definition of information as a probability function, as a choice or decision made relative to a set of possible messages - from this perspective, the actual meaning is irrelevant. The reason for this was pragmatic: from the engineer's perspective, what matters is the efficient transmission of a signal, not the complexities of intent, context and interpretation. As a signal, information is abstracted from its material instantiation, or channel, and becomes subject to general theorems about, say, the redundancy needed to insure a signal is transmitted despite the presence of a certain level of noise.<sup>41</sup> Although Wiener would later point out the limits of such a technical definition, in 1946 he was sure that a general theory of communication could unify disciplines. After the first meeting, he wrote that the objects to be analyzed under such a theory ranged from the control mechanism (which was essentially a communication device even though "the machine may not be watched by any human agent") to "the neuromuscular mechanism" as well as the "community or any sort of being" studied by social scientists.<sup>42</sup> The conferences created room for what Hayles calls "slippage" between mechanisms, models and metaphors, and many of the social scientists at the conferences adopted the notion of free-flowing, quantifiable information in their own work.<sup>43</sup>

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<sup>38</sup> Heims, 1991: 24.

<sup>39</sup> Heims, 1991: 184.

<sup>40</sup> Hayles, 1999: 7.

<sup>41</sup> Shannon, Claude. [1948]2001. "A Mathematical Theory of Communication." *Mobile Computing and Communications Review*. 5 (1) (January): 3-55.

<sup>42</sup> Wiener, Norber. 1948b. "Time, Communication, and the Nervous System." *Annals of the New York Academy of Sciences*, 50 (October).

<sup>43</sup> Hayles, 1999: 57.

The legacy of cybernetics, in terms of the power and significance of the computational metaphor, can be grasped with the help of two related concepts - Edwards's "cyborg discourse" and Hayles's "condition of virtuality." As Edwards argues, cyberneticians together with scientists heavily influenced by cybernetics created disciplines in which distinctions between the human mind and the computer were progressively blurred. So even though enthusiasm for cybernetics waned toward the end of the Macy conferences in the 1950s, its conflation of human and machine found new homes in the twin sciences of cognitive psychology and artificial intelligence (AI). In the former, Edwards writes, psychologists fully rejected behaviorism's insistence on studying only observable behavior, and instead offered models of the mind as an information-processing machine, with the computer eventually becoming the central metaphor.<sup>44</sup> In the latter, scientists looked to exploit the potential of computers as general symbolic processors (rather than just powerful calculators) to create high-level programming languages and eventually mimic human intelligence, as in the imitation game famously proposed by Alan Turing in one of the founding texts of AI, "Computing Machinery and Intelligence."<sup>45</sup> Edwards also notes that AI differed from cybernetics in a key respect: where cybernetic models of the brain centered around learning through interaction with the environment, early AI looked to create a model of formalized knowledge, and thus "rejected a model of mind as inherently embodied."<sup>46</sup> Together, cognitivism and AI created a situation in which "[p]sychology, cognitive simulation, and artificial intelligence seemed increasingly to be parts of a single whole, united through the abstraction of symbolic processing," thus envisioning the human as a cyborg subject.<sup>47</sup> Cyborg discourse, Edwards argues, is now found just as easily in everyday contexts, and is "primarily concerned with the psychological and cultural changes in self-imagining brought on by the computer metaphor."<sup>48</sup> Closely related to cyborg discourse is what Hayles calls "the condition of virtuality," or "the cultural perception that information and materiality are conceptually distinct and that information is in some sense more essential, more important, and more fundamental than materiality."<sup>49</sup> For Hayles, this includes the extreme beliefs that the universe is a computer (cellular automata theory) and that one day the human mind will be downloadable like data to computer memory, but it also offers distinct insight

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<sup>44</sup> Edwards, 1996: 236.

<sup>45</sup> Turing, Alan. 1950. "Computing Machinery and Intelligence." *Mind*, 59: 433-460.

<sup>46</sup> *ibid.*

<sup>47</sup> Edwards, 1996: 255.

<sup>48</sup> *ibid.*: 21.

<sup>49</sup> Hayles, 1999: 18.

into how the notion of the virtual became so powerful in the 1990s - when information is perceived as more important than materiality, then it is not a stretch to privilege identities, communities and worlds made of bits over their material counterparts. Similar to Edwards's account, she traces the grounds for this widespread assumption to cybernetics and cybernetics-inspired thought. And like the cyborg discourse, the condition of virtuality produces a powerful vision of subjectivity, which Hayles calls the posthuman, in which the line between organic matter and intelligent machine is unclear.<sup>50</sup>

For Edwards and Hayles, the computational metaphor is intimately tied to its military origins and contemporary modes of power. Computing technology developed in "mutual orientation" with military strategy - as the Cold War fueled the funding of research into computing and its applications, information technology also helped shape military strategy, with one striking example being the pursuit of an "electronic battlefield," which suggested a clean, contained form of warfare and the exclusion of casualties (at least for one side).<sup>51</sup> The same kind of relationship existed between military strategy and the sciences that fostered the use of computational metaphors to describe the human subject: cybernetics, artificial intelligence and cognitive psychology were to various degrees born out of military concerns.<sup>52</sup> Hayles agrees that virtuality is in many respects a legacy of Cold War research, and writes that:

In other circumstances, [information theory] might have become a dead end, a victim of its own excessive formalization and decontextualization. But not in the post-World War II era. The time was ripe for theories that reified information into a free-floating, decontextualized, quantifiable entity that could serve as the master key unlocking secrets of life and death.<sup>53</sup>

Although the authors describe how the expansion of the computational metaphor was attractive to those committed to the military and political goals of the U.S. during and after World War II, what is not addressed is how, in the 1990s, information technology (and with it the computational metaphor) had become linked to visions of individual freedom and a rejection of bureaucratic and hierarchical forms of organization. For many working in and around the computer and new media industries in the 1990s, networked computing seemed to promise progressive social and political

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<sup>50</sup> *ibid.*

<sup>51</sup> Edwards, 1996: 81-81; Hayles, 1999: 142.

<sup>52</sup> Edwards, 1996. For example, in his discussion of the development of cognitivism at Harvard's Psycho-Acoustic Laboratory, Edwards emphasizes the "socially constructed character of scientific theory" and its entanglements with the needs of war: "Social networks developed to solve the war's practical problems helped convey new ideas, such as those of cybernetics and information theory, among disciplines. Engineering projects founded in wartime technological strategies channeled experimentation in particular directions, forced psychologists to face the implications of their theories for design, and led them into finely detailed studies of relationships between people and machines" (*ibid.*: 236).

<sup>53</sup> Hayles, 1999: 19.

change alongside unlimited economic growth. Drawing on the work of Fred Turner and others, the following section shows that such a utopian vision was not a sudden transformation in the cultural meaning of computing, but rather the outcome of an important twist in the history of cybernetics sketched so far, one that follows the adoption of the ideas and practices of cybernetics researchers by members of the Bay Area counterculture, and corresponding re-conceptualization of the relation between computers, self and society. As Galison writes, the cultural meaning of concepts and practices are never simply dissolved or exchanged for others, and what is of interest “is not the mere identification of associations, but the cultural historical account of their assembly, persistence, and deconstruction.”<sup>54</sup>

## 1.2 Reversing the cultural meanings of computing, or “Counterculture, 2.0”

By the 1990s, many of the technologies and concepts that developed in cybernetics research and military contexts had become associated with progressive values, often with connotations that recalled the bohemian lifestyle of the 1960s counterculture. As microprocessors enabled computing to expand beyond the workplace and into the home, the pc began to be popularly portrayed as a force against bureaucracy and hierarchy, as clearly seen in the famous *1984* advertisement (by *Blade Runner* director Ridley Scott) that aligned Apple users with a flamboyant rebel disrupting a grey, Orwellian society. Arguably no more than an attempt to separate Apple’s brand from competitors like IBM, the advertisement nonetheless vividly narrates a break from the old cultural meanings of computing with rationalism and soulless state and corporate administration.<sup>55</sup> By 1993, new technologies like Virtual Reality (VR) and the World Wide Web were explicitly attached to a revival of 1960s countercultural lifestyle: Time magazine’s “Cyberpunk” issue (from February of that year) depicted a virtual reality user with and headline “*Virtual Sex, Smart Drugs and Synthetic Rock ‘n Roll.*” The cultural perception of computing, it appeared, had fully reversed.

In the wake of such depictions of new media as embodiments of countercultural values and lifestyle, a number of commentators and critics began noting the strong material and ideological connections among the hippies of the 1960s and the increasingly influential group of bay-area technology entrepreneurs and thinkers behind initiatives such as the TED conferences, the bulletin-board system the WELL (an acronym for the Whole Earth ‘Lectronic Link) and Wired. Howard Rheingold, introducing the WELL as a prototypical virtual community, pointed out that its “core

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<sup>54</sup> Galison, 1994: 265.

<sup>55</sup> Lubar, 1992.

population,” including the founders, had come of age in the 1960s.<sup>56</sup> The persons most responsible for the success and influence of the bulletin board system were recognizable as a “computerized counterculture,” and included “the granola-eating utopians, the solar-power enthusiasts, the space station crowd, immortalists, futurists, gadgeteers, commune graduates, environmentalists [and] social activists” that had led a previous cultural revolution, and were now poised to do so again.<sup>57</sup> Other important subcultures on the WELL, Rheingold wrote, included entrepreneurial hackers such as Mitch Kapor, and a large group of Grateful Dead followers.<sup>58</sup> There was a similar mix of countercultural and subcultural figures present in the pages of the Berkeley-based, “avant-garde” technoculture magazine *Mondo 2000*, which began publishing in 1989. Its first issue, for instance, included a feature on countercultural icons Timothy Leary and William S. Burroughs alongside an interview with Free Software activist Richard Stallman. As *Wired* would do in a different tone later on, *Mondo 2000* wove together technological concepts and themes with those from art and popular culture to the point that, for instance, it was common sense to conflate hacking and sampling in rap music as similar methods performed on different objects (see the analysis of *Mondo 2000* in chapter 2).

The combination of countercultural ideas and values with seemingly unrestrained enthusiasm for computing technology also became an object of scholarly study and critique. Vivian Sobchack took aim at *Mondo 2000*, arguing that the fascination with a disembodied virtuality was ultimately a form of escaping the problems of the real world.<sup>59</sup> Similar criticisms were aimed at *Wired*: Langdon Winner wrote that it was an example of “cyber-libertarianism,” showing a “consistent disregard of social questions [other than] individual privacy and data security,” and even in those exceptional cases a lack of “any sense of responsibility to local, national or global communities.”<sup>60</sup> Another characterization that stuck was the “Californian Ideology,” from the essay of the same name by Richard Barbrook and Andy Cameron.<sup>61</sup> There, the authors sought to put on display the distance between the rhetoric of “digital utopia” and the economic and social realities it actively disregards. Despite the gloss of the hippies’ cultural style and progressive values, Barbrook and Cameron wrote, the Californian ideology actually ignores the accompanying politics of the

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<sup>56</sup> Rheingold, 1993: 48.

<sup>57</sup> *ibid.*

<sup>58</sup> *ibid.*

<sup>59</sup> Sobchack, Vivian. 1994. “Reading *Mondo 2000*.” In *Flame Wars: The Discourse of Cyberculture*, ed. Mark Dery. Durham, Duke University Press: 11–28.

<sup>60</sup> Winner, Langdon. 1995. “Peter Pan in Cyberspace: *Wired* Magazine’s Political Vision.” *Educom Review* 30 (3) (June). <http://net.educause.edu/apps/er/review/reviewArticles/30318.html>.

<sup>61</sup> Barbrook, Richard, and Andy Cameron. 1996. “The Californian Ideology.” *Science as Culture* 26 (6): 1.

New Left. It replaces a commitment to social justice with a blind faith in markets driven by self-interest and devoid of government regulation. For Barbrook and Cameron, this contradicts the actual historical conditions underlying the so-called 'digital revolution' - from the U.S. Defense Department contracts that funded the projects that would eventually lead to the public Internet to the likely persistence of a digital divide without state intervention.

As Fred Turner has shown in *From Counterculture to Cyberculture*, however, the presence of 1960s values in 1990s cyberculture should not be understood simply as the pursuit of countercultural ideals by technological means, as Rheingold suggested, nor a co-optation of those ideals for the benefit of what Barbrook and Cameron called the "virtual class".<sup>62</sup> Instead, Turner chronicles a series of historical ties between the ideas, practices and technologies that originated with Norbert Wiener and other cybernetics researchers in the 1940s and 1950s, and a faction of the counterculture - who Turner calls the New Communalists and distinguishes from the New Left - who embraced technology as a means to achieve personal fulfillment and social cohesion outside of the traditional institutions and perceived constraints of mainstream society. Where the New Left, in the form of groups like the Students for a Democratic Society, used established methods of oppositional politics to advocate civil rights and protest the Vietnam War, the New Communalists turned "inward" and advocated a general rejection of social order and set out "to build self-sufficient retreats in which they might rediscover what they imagined to be pre-industrial forms of intimacy and egalitarian rule."<sup>63</sup> Some of the resources they drew on to plan and maintain such neo-tribal communes, though, were clearly products of the military and industry-driven society they hoped to leave behind: significantly, these included the theories of Wiener, Gregory Bateson and others who analyzed physical and social phenomena as systems of communication. If cybernetics and the computational metaphor offered a way of modeling the world in terms of the exchange of information among heterogeneous entities - that is, as "nodes of communication [that] interact by the exchange of orders or commands," and the maintenance of equilibrium or homeostasis through feedback - did it not also provide a means for constructing the world differently?<sup>64</sup> In addition to borrowing these concepts, the forms of non-hierarchical organization and non-bureaucratic collaboration pursued by the New Communalists echoed the interdisciplinary research practices and

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<sup>62</sup> Turner, 2006; Barbrook and Cameron, 1996.

<sup>63</sup> Turner, 2006: 37.

<sup>64</sup> Galison, 1994: 255; Turner 2006. The idea that the science of cybernetics would be deployed not only to understand the world but also to influence originated with the cyberneticists themselves. Norbert Wiener distinguished between messages sent to explore the universe and those sent to control it - what he called the indicative and imperative "moods" of cybernetics (quoted in Galison, 1994: 256).

attitudes of many of those who led cybernetics and cybernetics-related research.<sup>65</sup> What appeared to be a strange and sudden marriage of technology and countercultural values in the 1990s was in fact the outcome of an intricate history that stretched back to the ideas and practices of cybernetics researchers in the 1940s and 1950s, and their subsequent adoption and adaptation by the communalist strand of the 1960s counterculture.

For the New Communalists, the computational metaphor became a key resource for articulating communal alternatives to mainstream society. Turner attributes this process largely to the actions of Stewart Brand and others who founded the various “network forums” - most notably, the *Whole Earth Catalog*, published quarterly from 1968 - in which cybernetics theory and small-scale information technology were portrayed as means to achieving autonomy, and were given a cultural legitimacy not found in their ostensibly grey, bureaucratic origins.<sup>66</sup> Brand’s efforts brought together diverse groups of artists, hippies, scientists and computer professionals and, Turner argues, made it possible for them to see each other’s activities as consistent with their own. From the influential New York art group USCO to Ken Kesey’s Merry Pranksters, Brand was involved in a number of avant-garde projects that, in various ways, aligned artistic practice and the countercultural ideal of harmonious cohabitation to cybernetics, systems-theory and technology (from USCO’s theorization of art as a collaborative, interactive system to the Prankster’s use of LSD). Within these contexts Brand was exposed to the ideas of Wiener, Buckminster Fuller and Marshall McLuhan, and began to envision an approach to communal living that would draw on cybernetics and cybernetics-inspired approaches to ecology so as to understand communities as systems of interlocking parts that influenced one another through communication and feedback - that is, as “whole systems.”<sup>67</sup>

The appropriation of cybernetics thinking and the computational metaphor by Brand and others may be seen as part of a larger Whole Earth project, which combined the technological optimism of high modernism with the “pastoralism,” or longing “to withdraw to a simpler environment ‘closer to nature,’” that became associated with the counterculture and the New Left in the 1960s.<sup>68</sup> In 1968, Brand began publishing the *Whole Earth Catalog*, intended for those

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<sup>65</sup> In a reference to Edwards’s (1996) analysis of computing as part of the “closed world” discourse in Cold War politics, Turner calls the ad-hoc, interdisciplinary research style that was at the base of advances in cybernetics the “forgotten openness of the closed world” (2006: p. 16).

<sup>66</sup> Turner, 2006.

<sup>67</sup> *ibid*: 41-68.

<sup>68</sup> Marx, Leo. 1988. *The Pilot and the Passenger: Essays on Literature, Technology, and Culture in the United States*. Oxford, Oxford University Press: 291-314.

interested, to lesser and greater degrees, in the lifestyle pursued by the back-to-the-land movement and at communes like Drop City. Subtitled “access to tools,” the catalog was a guide to products as diverse as maps, garden tools, metalworking equipment and tabletop calculators. These tools seemed to offer autonomy, and represented what Jodi Dean has summarized as “a frontier fantasy of do-it-yourself American freedom.”<sup>69</sup> They were also symbols of the New Communalists’ desire to use technology to revive a pre-industrial connection to the natural world - a vision epitomized by Fuller’s “less is more” design for the geodesic dome. They thus also represented an attempt to appropriate tools and concepts from products of mainstream society and give them new meanings against the grain of their origins, a process of which the catalog seemed to provide an overview. The position of the New Communalists and the Catalog in relation to mainstream society was epitomized by the figure of the Comprehensive Designer, the ideal subject of the ecology movement proposed by Buckminster Fuller:

Constantly poring over the population surveys, resource analyses, and technical reports produced by states and industries, but never letting himself become a full-time employee of any of these, the Comprehensive Designer would finally see what the bureaucrat could not: the whole picture [...] the Comprehensive designer would be intellectually and emotionally whole. Neither engineer nor artist, but always both simultaneously, he would achieve psychological integration even while working with the products of technocracy.<sup>70</sup>

Fuller’s designer and the Whole Earth Catalog’s “users” would survey the products of bureaucratic, technocratic America, observing and internalizing the field in order to achieve an overarching vision. What is significant in Turner’s argument, though, is that the very same “intellectual frameworks and social ideals” the New Communalists promoted were extensions of those developed in cybernetics and related disciplines during and after World War II, where, for example, an interdisciplinary outlook similar to that of the Comprehensive Designer had been championed by the likes of Norbert Wiener and had a significant influence on the post-war social and behavioral sciences, not least through the Macy conferences.<sup>71</sup>

After experiments in communal living faltered in the 1970s, however, Brand and others began to retreat from the idea that a non-hierarchical, cybernetic alternative to society could be created from scratch, and instead began to consider the ways that the dominant institutions in society might be altered from within. Although cybernetics and the computational metaphor

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<sup>69</sup> Dean, Jodi. 2010. *Blog Theory: Feedback and Capture in the Circuits of Drive*. Cambridge, Polity: 20.

<sup>70</sup> Turner, 2006: 56-7.

<sup>71</sup> *ibid*: 57-58. For further discussion of the interdisciplinary style of work that marked the development of cybernetics, see Heims, 1991 and Galison, 1994.

continued to play a central role, this was a turn away from “self-sufficiency” and towards “coevolution” with mainstream society - the idea that, as systems of information and feedback, the institutions of mainstream society might be altered from within.<sup>72</sup> In 1987, Brand co-founded the Global Business Network, a consultancy group that organized corporate workshops on scenario-planning and complexity theory, and drew on the groups of journalists, researchers, science-fiction authors and technology experts that populated the WELL. The New Communalists’ belief in the ability of technology to correct society’s ills and their strong anti-bureaucratic sentiment had been coupled to a new sense that the corporation could be a site of positive social change.<sup>73</sup> In doing so, the Whole Earth network was not so much being co-opted by capital as continuing down the path of the New Communalists by rejecting political struggle as a means of bringing about change, and embracing technology, systems thinking and an anti-bureaucratic, libertarian outlook in its place.

In sum, the Whole Earth network helped transform the meaning of information technology, establishing a context in which it made sense to think of computers as intimate tools that completed or extended the self and enabled forms organic, non-hierarchical community (as opposed to instruments of control). Nowhere was this more apparent than in the positive connotations given to the conflation of the human and information technology. Cyborg or posthuman subjectivity was argued to be a form of freedom, not control. Concluding his McLuhan-esque speculations on the positive transformations individuals and societies would undergo as bits gained mastery over atoms, Nicholas Negroponte wrote that “more than anything, my optimism comes from the empowering nature of being digital. The access, the mobility, and the ability to effect change are what will make the future so different from the present.”<sup>74</sup>

Given this trajectory of the computational metaphor - from the laboratories in which enemy pilots were imagined as servomechanisms, to blurred boundaries between humans and machines, and between the mind and the computer, and from there the embrace of cybernetics by the New Communalists - the seeming contradiction of cyberculture’s conflation of information technology with countercultural values makes more sense. Likewise, it explains how, in the 1990s, systems-thinking more generally became linked to visions of social, political and economic liberty. The belief in a technologically-enabled organic wholeness was not new, as Turner writes, since the history of the Whole Earth network shows that “information networks and social networks,

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<sup>72</sup> Turner, 2006: 118.

<sup>73</sup> *ibid*: 176.

<sup>74</sup> Negroponte, 1995: 231.

biological systems and economic systems [...] had all been ‘one,’ so to speak, for some time.”<sup>75</sup> As I’ll show in the next section, the principal features of cyberculture and a corresponding articulation of new media as exceptional depended on these equivalences between technological and biological systems.

### 1.3 Cyberculture and new media exceptionalism

Having reviewed the computational metaphor’s origins in wartime science and its adoption by the New Communalists, here I discuss how it featured in articulations of new media as exceptional in the senses I use in this dissertation - that is, as the displacement of prior media and as exhibiting unique characteristics - during the 1990s. Within cyberculture, I argue, new media were considered exceptional because they were perceived to conflate nature and technology, much like cybernetics had made it possible to blur the distinctions between human and machine. These confluences were largely considered positive, as they were assumed to enable the kinds of individual liberty, collaborative spirit and collective harmony sought by the New Communalists. New media, especially the internet and the web, appeared to overthrow matter at the same time they produced a purer or more organic state. Here I discuss this dynamic in relation to the central concept in cyberculture - cyberspace - while also giving attention to how such rhetoric was inscribed in cybercultural technology and practice.

As mentioned above, cyberspace originated in science fiction, and initially denoted the kind of 3-D environments one inhabits through the motion sensing and visualization technologies of virtual reality. In 1990, the definition expanded when John Perry Barlow used the term to describe online forums like the WELL. Barlow gave it the further association of a frontier - home to the occasional outlaw but ultimately a breeding place for new kinds of freedom.<sup>76</sup> The concept soon entered popular culture, helped along by its adoption in influential independent publications like the *Whole Earth Review* and *Mondo 2000*, and by the mid-1990s was a buzzword for describing the internet and the web. This choice was curious, however, since cyberspace does a very poor job of explaining what the World Wide Web or the internet is - it’s non-sensical, for instance, to think of it as a space in, of or for cybernetics.<sup>77</sup> Instead, its success is in describing what is essentially a fantasy: a space that enables the radical transformation through technology assumed in

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<sup>75</sup> Turner, 2006: 216.

<sup>76</sup> Barlow, John Perry. 1990b. “Crime and Puzzlement.” *Electronic Frontier Foundation*. [http://w2.eff.org/Misc/Publications/John\\_Perry\\_Barlow/HTML/crime\\_and\\_puzzlement\\_1.html](http://w2.eff.org/Misc/Publications/John_Perry_Barlow/HTML/crime_and_puzzlement_1.html).

<sup>77</sup> Chun, 2006: 39-40.

cybercultural discourse, as well as the space in which that transformation takes place. Its success, as Chun argues, was due to its connotation of freedom:

Cyberspace, as a virtual nonplace, made the Internet so much more than a network of networks: it became a place in which things happened, in which users' actions separated from their bodies, and in which local standards became impossible to determine. It thus freed users from their bodies and their locations.<sup>78</sup>

The most widely cited description of the freedom supposedly inherent in cyberspace is Barlow's "A Declaration of the Independence of Cyberspace." Barlow's lofty, melodramatic prose argues against censorship, simultaneously recasting Gibson's notion of cyberspace as a solution to 20<sup>th</sup> Century problems, including arbitrary abuses of power and discrimination according to class or race:

Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather.

[...]

Cyberspace consists of transactions, relationships, and thought itself, arrayed like a standing wave in the web of our communications. Ours is a world that is both everywhere and nowhere, but it is not where bodies live. We are creating a world that all may enter without privilege or prejudice accorded by race, economic power, military force, or station of birth. We are creating a world where anyone, anywhere may express his or her beliefs, no matter how singular, without fear of being coerced into silence or conformity. Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are all based on matter, and there is no matter here.<sup>79</sup>

The belief that new technologies represented the overthrow of matter, and that this entailed new freedoms, was also central to rhetoric surrounding the new economy, the idea (as promoted by Kevin Kelly and others) that new technologies were unsettling the nature of enterprise. In *Out of Control*, Kelly had described how computers were helping to create forms of collective intelligence and decentralized organization - symbolized by the hive mind and the swarm - that followed a "biologic" and would replace rigid hierarchy with the new nature of engineered, organic complexity.<sup>80</sup> In a follow-up manifesto called *New Rules for the New Economy*, published at the height of the dot.com bubble in 1999, he used another expression of the computational metaphor to paint a picture of processes of production, distribution and consumption being driven not by the constraints of materiality but by the unfettered circulation of abstract, free-floating information: "the principles

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<sup>78</sup> Chun, 2006: 37-38.

<sup>79</sup> Barlow, 1996.

<sup>80</sup> Kelly, 1994: 1.

governing the world of the soft - the world of intangibles, of media, of software, and of services - will soon command the world of the hard - the world of reality, of atoms, of objects, of steel and oil, and the hard work done by the sweat of brows.”<sup>81</sup> In this new environment marked by such reversals as increasing returns, abundance rather than scarcity and permanent flux, the new enterprise would have to obey the logic of software, networks and information - and by extension the logic of swarms - in order to succeed.

The ontology that cyberculture implied - the separation between the real and the virtual, and the organic forms that would arise as a result of new technology - was central to how ‘life in cyberspace’ would be understood. In the case of virtual communities, for instance, communication networks were described as a space for cultural forms that were both previously unimaginable and seemed to recall lost notions of belonging. Howard Rheingold wrote that the technologies that enabled virtual communities - provided they were protected from the extremes of state and corporate control - had the potential to “revitalize the public sphere.”<sup>82</sup> Communication among peers in cyberspace would be an alternative to the corrupted public sphere offered by top-down, corporate mass media. The success of the WELL and the appearance of other virtual communities, for Rheingold, suggested a “hunger for community [...] as more and more informal public spaces disappear from our real lives.”<sup>83</sup>

As with Barlow’s cyberspace and Kelly’s new economy, Rheingold’s descriptions of virtual community paradoxically equated the denial of matter with new states of nature. Recalling the cybernetic vision that drew equivalences among a variety of technological, biological and social systems, Rheingold theorized the natural order of cyberspace, the Net and virtual communities with the analogy of the petri dish:

Although spatial imagery and a sense of place help convey the experience of dwelling in a virtual community, biological imagery is often more appropriate to describe the way cyberculture changes. In terms of the way the whole system is propagating and evolving, think of cyberspace as a social petri dish, the Net as the agar medium, and virtual communities, in all their diversity, as the colonies of microorganisms that grow in petri dishes. Each of the small colonies of microorganisms--the communities on the Net--is a social experiment that nobody planned but that is happening nevertheless.<sup>84</sup>

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<sup>81</sup> Kelly, 1999: 2.

<sup>82</sup> Rheingold, 1993: 14.

<sup>83</sup> *ibid*: 6.

<sup>84</sup> Rheingold, 1993: 5-6.

Virtual communities, in this way, were emergent, self-organizing phenomena that were evolved rather than centrally planned. The conflation of technology and nature not only supported the vision of a harmonious, non-hierarchical community, it also gave the impression that such an outcome was unavoidable: based on ten years of direct observation, Rheingold wrote, he found that people with access to such decentralized communication networks “inevitably build virtual communities [...] just as microorganisms inevitably create colonies.”<sup>85</sup> For commentators like Rheingold, virtual community did not only confirm the exceptional status of computer-mediated communication, it showed how the nature of new technology was aligned with a natural human desire for community.

In addition to the grand proclamations of the effects of new media by Barlow and Kelly, and the descriptions of life on the WELL by Rheingold, cyberculture’s exceptionalism was arguably inscribed in cybercultural technology and practice. It was one thing to say cyberspace would remove constraints on community and identity, it was another to build networks and websites specifically geared toward the seeming utopia of disembodied interaction. As Sherry Turkle described in her 1995 book *Life on the Screen*, many popular applications at the time - including BBSs, online role-playing games, chat rooms and homepages - encouraged identity play and, in doing so, facilitated and reflected new understandings of identity as constructed, decentered and multiple. As in the famous New Yorker cartoon captioned “On the internet, nobody knows you’re a dog,” anonymity made it possible to substitute one’s identity for another.<sup>86</sup> In particular, text-based virtual worlds were a space of experimentation, where users created fantastical characters that often subverted the traditional markers of identity like gender, race, ethnicity and sexuality.<sup>87</sup> In addition to instances of separate selves, other practices and technologies were linked to identity becoming visible as “multiple but integrated,” most notably one of the key forms of virtual identity on the web, the homepage:

If we take the home page as a real estate metaphor for the self, its decor is postmodern. Its different rooms with different styles are located on computers all over the world. But through one’s efforts, they are brought together to be of a piece.<sup>88</sup>

Notions of virtual identity and community continued to inform the design of early web sites and services, from notorious spaces of identity play (including the anonymous chat rooms of “Bianca’s

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<sup>85</sup> *ibid*: 6.

<sup>86</sup> Steiner, Peter. 1993. “On the Internet, Nobody Knows You’re a Dog.” *The New Yorker* (July 5): 61.

<sup>87</sup> In addition to Turkle’s descriptions, see Dibbell, 1998.

<sup>88</sup> Turkle, 1995: 259.

Smut Shack”) to the massively popular Geocities, or “your home on the web.”<sup>89</sup> Members of the latter were called Geocitizens and “homesteaders” - recalling the ideals of Rheingold’s book *Virtual Community: Homesteading on the Electronic Frontier* - and were invited to create the kinds of personal home pages described by Turkle. Geocities, as the name itself implies, employed a heavy dose of spatial metaphors to emphasize that physical location was no longer important. Homepages were given a numbered address within the appropriate topical “neighborhood.” Confusingly, these were sometimes named after real places (“SiliconValley” for pages about technology) and sometimes not (“TelevisionCity” for Television). By emphasizing the separation of one’s physical home and one’s home on the web, Geocities and other early web spaces were aligned in subtle and not-so-subtle ways with the sense that the web was cyberspace, a frictionless space without physical and cultural constraints on identity and community. As one of Turkle’s respondents put it, why privilege the real world when the internet turned it into “just one more window.”<sup>90</sup>

Cybercultural rupture talk has often been critiqued for how it obscures continuity - for example, by downplaying the strong offline bonds needed to support ostensibly “virtual” community.<sup>91</sup> Significantly, however, rupture talk was also a source of historical continuity, in that it was grounded in and extended the computational metaphor. Cybercultural freedom implied a number of dislocations - removing the body, geography and history from cyberspace - in order to promise progressive configurations of identity, community and sociality.<sup>92</sup> This formula was made possible by the computational metaphor, positing that breaking communication down to bits is not a form of reduction but a purification. As Turkle’s work shows, such notions of rupture were not just rhetoric, but their implied ontology (epitomized by the separation between real and virtual life) was inscribed in the technologies and practices of cyberculture. At the same time, though, these notions were less a description of a radically new environment created by computers and the internet than they were products of the complex, intersecting histories of cybernetics, the counterculture and the computational metaphor. As Turner writes of Rheingold’s *Virtual Community*, cyberculture

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<sup>89</sup> See the archived pages for <http://bianca.com> and <http://www.geocities.com>, available via the Internet Archive’s Wayback Machine (<http://www.archive.org>). On Bianca’s Smut Shack, for which many archived pages are unavailable, see also Pritchard, Mark. 2001. “The World’s Biggest Online Sex Party.” *SF Gate*. Accessible via the Wayback Machine: <http://web.archive.org/web/20030217095936/http://www.sfgate.com/cgi-bin/article.cgi?file=/gate/archive/2001/03/22/bianca.DTL>.

<sup>90</sup> Turkle, 1995: 14.

<sup>91</sup> Turner, 2006: 161.

<sup>92</sup> Although, as critics Richard Barbrook and Andy Cameron point out, the notion of freedom underlying the universalist rhetoric of cyberculture is a product of the Bay Area in which it developed, revealing a libertarian focus on rights rather than duties. Alan Liu adds that it is primarily a freedom derived from negations: freedom from government, and freedom from big business - by invoking Jeffersonian democracy (as in Barlow’s “Declaration of Independence”), cyberlibertarian freedom is a matter of subtracting “latter-day notions of ‘America’ to reveal supposedly original values.” See Barbrook and Cameron, 1996; Liu, 2004: 244.

reflected both an extension and transformation of the New Communalists' desire to use technology to regain notions of community and connections with the natural world and that technology itself had destroyed.<sup>93</sup> With cyberspace and the virtual community, technology was not simply a tool, but an end in itself - the fantasies of cyberspace as a "home of Mind," the virtual community as an alternative, ideal public sphere and virtual identity as the "multiple but integrated" self were part of a larger hope in cyberculture, that information networks would produce "an all-inclusive, collaborative, emotionally and materially sustaining world."<sup>94</sup> Looking ahead, it is the form of this exceptionalism - as a complex interaction between rupture talk, metaphor, cultural and historical context, and innovations in practice and technology - that will be the focus of much of this dissertation.

#### 1.4 "Why would the web be any different?" The computational metaphor after cyberculture

In the mid-1990s, the web was considered exceptional to the extent that it realized the transformations proclaimed in utopian narratives of cyberculture. Its exceptional nature, or lack of it, was tied to its ability to deliver on the promise of a more fulfilling, virtual existence in cyberspace, and that of unrestrained enterprise and innovation in the new economy. As shown in this chapter, these ideas should be understood as outcomes of a history in which countercultural and libertarian values became linked with the computational metaphor. As Fred Turner argues, Stewart Brand and the New Communalists rejected conventional forms of politics, and instead applied systems-thinking to communes they hoped would provide alternative models of society. In doing so, they adopted the cybernetic vision in which biology, technology and society were conflated as systems of communication and feedback. They also embraced small-scale technologies and helped change the cultural meaning of computing and the computational metaphor from expressions of bureaucracy and control to intimate tools of individual empowerment, non-hierarchical organization and a reconnection to the land - a neo-tribalism that paradoxically incorporated the concepts, techniques and tools of the institutions it sought to leave behind. Brand and others in the Whole Earth Network would go on to help establish the key forums of cyberculture, as the cybernetic assumption of information's mastery over matter, or what Hayles calls the condition of virtuality, reached new heights with the promise of radical social and economic change through the expansion of cyberspace.

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<sup>93</sup> Turner, 2006: 160.

<sup>94</sup> Turner, 2006: 160.

By 1997, though, cyberculture seemed headed for a backlash. At a time when the number of internet users was estimated at 70 million - less than 0.2% of today's number - Edward Rothstein wrote in a New York Times column that the appeal of cyberspace was declining. Citing the high-water mark of "Cyborg-Millennium" - a clothing company whose key selling point was an embroidered URL on all of its apparel - Rothstein argued that while magazines like Wired had turned the web into a status symbol, such enthusiasm would wane. He suggested that the medium's "coolness" was rooted in the "utopian promises of cyberculture," but that these "have been seeming even more strained and artificial of late. Most of us know already not to expect massive revolutions in consciousness with the expansion of cyberspace, just changes in the ways in which we do things."<sup>95</sup> More and more, he went on, the web is simply being absorbed into the existing media environment. Bringing cyberspace back down to earth was a natural step, since like any other technology, it would become ubiquitous, and both its in-crowd appeal and revolutionary promise would subside. As Rothstein put it, "why would the web be any different?"<sup>96</sup> The assumption was that, as hype died down, more sober understandings of the web and its significance would prevail. I would argue that Rothstein was right and wrong: the utopian rhetoric of cyberculture and the special status of cyberspace have indeed declined, but unrealistic expectations surrounding the web continue to be formulated, and some of these are, like cyberspace, rooted in the computational metaphor.

*Table 2: The decline of "cyberspace" in Wired*

| <b>Year</b> | <b>Number of Wired magazine articles mentioning "cyberspace."</b> |
|-------------|---|
| 1993        | 20  |
| 1994        | 51  |
| 1995        | 49  |
| 1996        | 44  |
| 1997        | 46  |
| 1998        | 23  |
| 1999        | 12  |
| 2000        | 15  |

<sup>95</sup> Rothstein, 1997.

<sup>96</sup> *ibid.*

|      |   |
|------|---|
| 2001 | 4 |
| 2002 | 6 |
| 2003 | 5 |
| 2004 | 1 |
| 2005 | 2 |
| 2006 | 4 |

On the one hand, cybercultural utopianism and cyberspace have arguably been replaced by new understandings of the web’s significance and nature. Notably, Rothstein’s criticism of cyberappeal coincided with the beginning of a noticeable decline in mentions of cyberspace in *Wired*, as can be seen in table 2.<sup>97</sup> Given the magazine’s reputation as the primary source of cyberutopianism (in Rothstein’s estimation, but also more generally), this decline could reasonably be interpreted as the relative absence of utopianism around cyberspace beginning in the late 1990s. The symbolic death of cyberspace-as-utopia may also be seen, for example, in the use of IP-to-Geo-location technologies in internet censorship, giving lie to the notion of a borderless information space.<sup>98</sup> More often, though, accounts of how cyberculture got it wrong have been attached to celebrations of the web’s new identity, a move epitomized by the hype surrounding “Web 2.0” in the mid-2000s. Tim O’Reilly used the term to designate a new paradigm in web development, which focused less on providing a finished product, whether an application or publication, and more on providing a service that captured collective intelligence, turning user activity into valuable data.<sup>99</sup> O’Reilly cited Google’s collection and analysis of hyperlinks and Amazon’s recommendation features as early examples of this practice, and Flickr, del.icio.us, Wikipedia and blogging as newer examples of utilizing the “wisdom of crowds.”<sup>100</sup> Although O’Reilly also noted examples from other domains of web development, including advertising and e-commerce, it was this new group of websites devoted to user interactions with media that captured the imagination. According to Steven Levy and Brad Stone, these social media platforms and social network sites

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<sup>97</sup> This data was gathered by querying the *Wired* magazine archives (<http://www.wired.com/wired/archive/>) in March 2013, using the Google Scraper (see <http://tools.digitalmethods.net/>). *Wired* published six issues in 1993 and monthly from January 1994. Because of how *Wired*’s archives are structured, data for after 2006 was not readily accessible; however, the trend in terms of cyberspace’s decline seems to be clear.

<sup>98</sup> Rogers, Richard. 2008. “Mapping Web Space with the Issuecrawler”. Unpublished ms. [http://govcom.org/publications/full\\_list/rogers\\_politics\\_web\\_space\\_2008\\_pre.pdf](http://govcom.org/publications/full_list/rogers_politics_web_space_2008_pre.pdf).

<sup>99</sup> O’Reilly, 2005.

<sup>100</sup> *ibid.*

represented a different, more vital web experience than the “cyber-” 1990s:

Less than a decade ago, when we were first getting used to the idea of an Internet, people described the act of going online as venturing into some foreign realm called cyberspace. But that metaphor no longer applies. MySpace, Flickr and all the other newcomers aren't places to go, but things to do, ways to express yourself, means to connect with others and extend your own horizons. Cyberspace was somewhere else. The Web is where we live.<sup>101</sup>

Perhaps the clearest sign that cyberculture had been abandoned in favor of a participatory web came from Wired in 2005. In a special issue about the web and “10 years that changed the world” (beginning with Netscape’s IPO), Kevin Kelly wrote that “[w]e all missed the big story” - implying that the web’s significance had been lost on himself and others in the early 1990s.<sup>102</sup> The web’s real promise, he wrote, was now being realized as blogging, Wikipedia and other innovations in web publishing challenged traditional content-producers. Although he discussed the impact of these developments in similar neo-biological terms to those he used in *Out of Control* (calling the web an emergent “hive mind”), the actual transformations Kelly described were not so much about economics or alternative forms of community as they were a disruption of flows of information and media. And unlike the separate realm of cyberspace, this was about the subsumption of all culture under the new collaborative logic of the web:

With the steady advance of new ways to share, the Web has embedded itself into every class, occupation, and region. Indeed, people's anxiety about the Internet being out of the mainstream seems quaint now. In part because of the ease of creation and dissemination, online culture is *the culture*.<sup>103</sup>

By 2005, then, cyberculture had been replaced by the exceptional states of web 2.0 and participation - the sense, in Kelly’s piece, that online culture was “*the culture*,” and that the web offered unprecedented access to the production and dissemination of culture.

On the other hand, as much as these periodizations reveal important shifts in commercial web development, our everyday experience of the web, and perceptions of the web’s exceptional qualities, it is worth recalling the notion of rupture-talk and its relationship to continuity.<sup>104</sup> As a reductive view of history, rupture-talk may gloss over or obscure continuity, and in this sense there are clearly signs that some elements of cyberculture have survived into the web 2.0 era. The digital

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<sup>101</sup> Levy, Steven, and Brad Stone. 2006. “The New Wisdom of the Web.” *Newsweek*, April 3. <http://www.newsweek.com/id/45976>.

<sup>102</sup> Kelly, 2005.

<sup>103</sup> *ibid.*

<sup>104</sup> See the discussion of rupture-talk in the introduction. It is worth noting, anecdotally, that the ‘rebirth’ of web 2.0 was accompanied by a sense of *deja vu*. For example, as captured in the Richter Scales’s 2007 music video “Here Comes Another Bubble.”

activists of Anonymous are often theorized in terms of the novelty of their amorphous organization or their relationship to conventional political engagement, but perhaps both their organization and the actions they choose to take could be more completely understood in terms of how they sustain the notion of the web as something like cyberspace - a sovereign information space that is or should be made free of any restrictions on speech.<sup>105</sup> Meanwhile, cyberspace remains a central concept in security discourses - seen for example in its prominence within the U.S. Department of Homeland Security or in security studies.<sup>106</sup> This use of cyberspace might be seen as evidence of the removal of its utopian connotations, but it also shows how closely this dream of disembodied freedom is linked to one of perfect control.<sup>107</sup> In a sense, it returns cyberspace to its origins in the computational metaphor as deployed in military-related research, a counterpart to the computer-driven “electronic battlefield” discussed by Edwards.

As I argue in more detail in the following chapters, the computational metaphor that underlies cyberculture and the notion of cyberspace has not so much been abandoned as it has taken on new forms within expressions of web exceptionalism. On the one hand, it can be seen in Slashdot’s efforts to create a highly-automated system of news and commentary aggregation and recommendation, described in chapter four; on the other, in the articulation of the formal and generic conventions of blogging in terms of informational and technological ideals (chapter five). For now, it is worth mentioning “the social graph” as a famous and telling example of how the computational metaphor appears in contemporary notions of the web’s significance. Derived from graph theory in mathematics (and as often applied in database design), a unified social graph would be a collection of interlinked data objects that would effectively provide a complete “map” of social relationships. Various standards for building the social graph have been proposed, and proponents argue that it would free consumers to move their information frictionlessly from one service to another while enabling developers to concentrate more energy on improving their products (rather than on convincing users to once again input their information).<sup>108</sup> From the perspective of marketers and others interested in demographics, the social graph offers a simple but powerful

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<sup>105</sup> On Anonymous, see for example Coleman, Gabriella. 2011. “Anonymous — From the Lulz to Collective Action.” *The New Significance*. <http://www.thenewsignificance.com/2011/05/09/gabriella-coleman-anonymous-from-the-lulz-to-collective-action/>. For a related take on internet-based media activism, see Lievrouw, Leah. 2011. *Alternative and Activist New Media*. Cambridge: Polity.

<sup>106</sup> See e.g. “Cybersecurity.” 2013. *Homeland Security*. Accessed March 1. <http://www.dhs.gov/topic/cybersecurity>; another example is found in the program for a 2012 conference on cyberspace: “Budapest Conference on Cyberspace.” 2013. Accessed March 1. <http://www.cyberbudapest2012.hu/>.

<sup>107</sup> Chun, 2006.

<sup>108</sup> Fitzpatrick, 2007.

analytical tool - as Chun notes, the appeal of such graphs is grounded in the sense that they can reveal an invisible presence, such as hidden paths of influence or obscured relations of power.<sup>109</sup> Like cyberspace, the idea of a unified social graph relies on the computational metaphor, in that it articulates social and cultural phenomena as (essentially) discrete and quantifiable flows of information - and like cyberspace, it is an idea that is ultimately flawed because of this reduction.<sup>110</sup> What is important, here, though, is not the limits of the graph, but how it ties new notions of the web as an exceptional medium to older ones, and how it suggests that such resonances with cyberculture are not just rhetorical: as the examples of Anonymous and the social graph suggest, the legacies of cyberculture and the computational metaphor are not only rhetorical, but, like cyberspace previously, are manifested in practices and technologies.

The genealogies of web exceptionalism I present in this dissertation engage with cyberculture and the computational metaphor in various ways, each of which challenges its definition as the culture of cyberspace or the widely-held notion that it was, at its core, a confused or hyperbolic reaction to new technology - an idea expressed in Rothstein's question, "why would the web be any different?" So far, I have argued against this notion by reviewing the lineage of cybercultural rupture-talk. In chapter 2, I turn to a case study of *Mondo 2000*, a magazine that now appears as dated as Cyborg-Millennium apparel but was once the epitome of cybercultural cool, to explore how cyberculture was tied to a particular media form, i.e. the cool tech-culture magazine that was its primary mode of delivery. By showing how cybercultural rupture-talk was connected conceptually to *Mondo's* ironic style and its self-conscious positioning between subculture and mainstream, I introduce something similar to the key dynamic that defines instances of web exceptionalism studied in the following chapters, namely the interplay between rupture-talk and web-native culture.

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<sup>109</sup> Chun, Wendy Hui Kyong. 2011b. *Programmed Visions: Software and Memory*. Cambridge, MA, MIT Press: 69.

<sup>110</sup> Ceglowski, Maciej. 2011. "The Social Graph Is Neither." *Pinboard Blog*. [http://blog.pinboard.in/2011/11/the\\_social\\_graph\\_is\\_neither/](http://blog.pinboard.in/2011/11/the_social_graph_is_neither/).