The Charismatic Cultural Life of Cybernetics: Reading Norbert Wiener as Visible Scientist

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ABSTRACT

Background *Despite cybernetics' short, incandescent life as a scientific knowledge, it has had an enduring cultural legacy.*

Analysis *This article reads Norbert Wiener, the "father of cybernetics," as a visible scientist, through an analysis of his media profile, in order to explore cybernetics as a popular culture phenomenon in the United States in the late 1940s and the 1950s.*

Conclusion and implications *Cybernetics emerges in the post-WWII era as a charismatic knowledge whose aura of wonder and future possibility shapes our interpretation of computing technology to this day.*

Keywords *Cybernetics; Visible scientist; Norbert Wiener; Cold War; Computers*

RÉSUMÉ

Contexte *La cybernétique a eu un impact culturel durable, malgré sa brève vie incandescente à titre de savoir scientifique.*

Analyse *Cet article représente le « père de la cybernétique », Norbert Wiener, comme savant visible, en analysant son profil médiatique afin d'explorer la cybernétique comme phénomène de culture populaire aux États-Unis à la fin des années 40 et pendant les années 50.*

Conclusion et implications *À la suite de la Seconde Guerre mondiale, la cybernétique a émergé comme savoir charismatique dont le caractère merveilleux soulignant les possibilités de l'avenir a influencé notre interprétation de l'informatique jusqu'à aujourd'hui.*

Mots clés *Cybernétique; Savant visible; Norbert Wiener; Guerre froide; Ordinateurs*

> As for me, I am utterly confused by the success of the Cybernetics book, and feel that within a very short time I must get back from the false position of being a newspaper figure to new work on mathematical physics.
>
> —Norbert Wiener, 1949[1]

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> In one respect, Wiener's book resembles the Kinsey Report: The public response to it is at least as significant as the content of the book itself.
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> —*Business Week*, 1949[2]

The story is one familiar to many students of communication studies in North America. During World War II, a group of scientists, including a brilliant, eccentric mathematician by the name of Norbert Wiener, began to think about how to more effectively shoot down airplanes. They applied probabilistic analysis to the problem and developed the notions of information, entropy, and feedback, among others. After the war, Wiener rendered this set of ideas coherent, offering "the science of cybernetics," positing "the essential unity of one set of problems centring on communication, control and statistical mechanics, whether in machine or living tissue" (Wiener, 1948a, p. 19), thereby earning the moniker the "father of cybernetics." In this origin story, cybernetics is soon displaced by information theory and both theories are framed as foundational in the development of early modern computers, but of somewhat limited ongoing theoretical use.[3]

In fairness to teachers of communication studies, this is also the broad outline of the more detailed story told within the history of science. The rapid rise of cybernetics in the 1940s, its interdisciplinary "efflorescence,"[4] and its quick flameout by 1960 are variously explained as an apparently inevitable outcome of the strategic actions of its proponents (Bowker, 1993), its military roots (Galison, 1994), the adoption of a generalized notion of information (Kay, 1997), politics and disciplinary infighting (Bowker, 1993), and the failure of the science itself to produce "results" (Keller, 1994). Yet, as in communication studies, the scholarly focus has been on the rise, travails, and ultimate fate of cybernetics as a scientific knowledge.

What is missed in these tales is the way in which first-wave cybernetics can be productively understood as a popular cultural phenomenon. A number of researchers flirt with this prospect: David Tomas (1995) suggests that cybernetics operates as a keyword in the Williamsian sense; David Porush (1985) and David Edge (1974) claim it operates as a cultural metaphor; and Stephen Pfohl (1997) posits it as a techno-consumeristic ethos. Some identify cybernetics' public appeal: Kathleen Woodward (1983) notes that the theory of cybernetics filtered into the vocabulary of everyday life in the 1950s and 1960s; Evelyn Fox Keller recognizes that "[i]t also attracted a large and enthusiastic public following" (1994); and N. Katherine Hayles (1990, 1999) sees its wider popularity.[5] Most recently, Ronald R. Kline (2015) demonstrates that something more pronounced was going on in the late 1940s and 1950s. He coins the term the "cybernetic moment" to capture the "rise, fall, and reinvention of cybernetics that occurred alongside the rise of information theory in the United States" (p. 6). Elsewhere I use the term "cybernetic imaginary" to tell a different tale of the same phenomenon (Hamilton, 1999). Kline (2015) writes:

> The cybernetics moment began when the two fields emerged shortly after World War II, reached its peak with their adoption and modification in biology, engineering, the social sciences, and popular culture in the 1950s and 1960s, and ended when cybernetics and information theory lost their status as universal sciences in the 1970s. (p. 6)

He attends most closely to the cultural life of cybernetics in his chapter, "The Cybernetics Craze," claiming it was a "staple of science fiction and a fad among artists, musicians, and intellectuals in the 1950s and 1960s" (2015, p. 7).[6]

I argue that these scholars are correct in recognizing the fact of cybernetics' cultural life, but err in interpreting it as novelty, in not exploring in detail how it is produced, and in reading it as tangential to cybernetics' ultimate fate and ongoing relevance. Kline argues: "[T]he cybernetics craze fed off a lively public discourse about the changing relationship between humans and machines, a discourse stimulated by the invention of electronic computers in the Cold War and the fear that automation would cause mass unemployment" (2015, p. 69). The first of Kline's claims is not disputed, but the conjuncture he notes does not fully explain why or how cybernetics captured the public imagination on the scale, with the intensity, and in the particularly magnetic manner that it did.[7] This article suggests the striking popular resonance of cybernetics, its fast- and hot- burning allure, was neither accidental nor inevitable. It was due to a significant extent to the charismatic visibility of a particular scientist, "the visionary who could articulate the larger implications of the cybernetic paradigm and make clear its cosmic significance" (Hayles, 1999, p. 7): Norbert Wiener.

In the 1940s, a number of scientists were working on computing machines, information theory, and cybernetics, among them Claude E. Shannon, Warren McCulloch, John Mauchly, J. Presper Eckert, John von Neumann, William Ross Ashby, Howard Aiken, Alan Turing, and Vannevar Bush. Yet only one emerges as the media darling (McCorduck, 1979). Personal and provocative, eloquent and eccentric, Wiener became the premier visible scientist of the cybernetic imaginary. The conditions of his visibility and the particular form it takes are integral not only to cybernetics' popular profile in that era, but also to how we think about our machines and our selves even now. How and why did Wiener's visibility happen, and with what effects? To answer these questions, to understand Wiener not as scientist, genius, or man (projects taken up by his numerous biographers),[8] but as public figure—namely a figure both in, and of, public discourse—I extend the notion of the "visible scientist" first posed by Rae Goodell (1977).

My research suggests that Wiener is clearly a visible scientist in the sense that Goodell uses the notion. However, it is essential to go further and examine Wiener's public persona in its specificity, as I suggest that his persona does very particular cultural work, work that produces cybernetics as a popular knowledge, but more specifically as charismatic science. This article examines Wiener's popular and scientific writing, its reviews and reception, media coverage of him in the period 1939 to 1964, and secondary historical and biographical material. It demonstrates that he can be plausibly read as a visible scientist as that term has been developed in the scholarly literature on scientists and mass media. Next, the article examines the specific knowledge effects of his visibility. I argue that as visible scientist, Wiener plays four symbolic roles: 1) corporeality, or body to the machine mind; 2) the people's scientist—articulate and accessible; 3) humanist guide—negotiating the tensions of conscientious science in the postwar era; and 4) prophet—cosmic soothsayer of the meanings and consequences of the fascinating computing machines, not coincidentally, just beginning to develop their own public profile and popular following. Wiener's peculiar, flawed, ac-

cessible genius, his performative conscience, and his mediated volubility symbolically tie cybernetics as public knowledge to his persona and render it charismatic—unstable, mystical, and future-looking.

Visible scientists

> It is not surprising that there is a large public waiting for interpreters of science and an increasing number of people who have mastered some of the rudiments of scientific lore, so that the gifted scientist with the rare ability to translate the jargon of his profession into more or less plain English can now find it profitable to address the curious and anxious layman.
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> —Harrison Smith, 1949, writing about Wiener

Marcel C. LaFollette (1990) suggests that the visibility of scientists increased dramatically in the first half of the twentieth century as science, indebted to the two world wars, took on a higher profile and as scientists began to pay attention to their images due to their growing political and social power. War science was ready-made media fodder, with suspense, action, and resolution; scientists were the inevitable heroes of the drama. She writes, "American scientists participated actively and enthusiastically in telling the public about science in the twentieth century. … [T]hey described their own research, analyzed the work of colleagues, and gave free-wheeling interviews to journalists" (1990, p. 45).[9] The resulting visible scientist is thus an engaging figure produced at the intersection of three social formations: science, the public, and the mass media.[10] The emergence of specialized science journalism contributed to this.[11] In the postwar period, popular science periodicals—those aimed at an informed general reading public and the hobbyist—flourished: *Scientific American*, *Popular Science*, and *Popular Mechanics*, for example. Also, as the science column or beat developed into a staple element in general interest media in the 1940s and beyond, it provided a regular, broad-based forum for the presentation of scientific ideas to wider lay publics and the presentation of scientists as characters to the consuming public.

There is a small and thoughtful body of scholarship on visible scientists (see Bucchi, 2010, 2014; Fahy & Lewenstein, 2008; Goodell, 1977; LaFollette, 1990, 2008, 2012; Rödder, 2012; Rutherford, 2004; Walsh, 2013; Weingart, 1998). This work focuses on the specific ways in which popular scientific authority is constituted and circulates through the figuration of particular individuals in mass-mediated culture. A related body of literature demonstrates how the wider social relevance of science has long been rhetorically constituted in non-scientific values indebted to the encounter between science and religion (e.g., Lessl, 2012; Walsh, 2013).[12] Although this study is more directly engaged with the specific ideas of visible science and a focus on mass mediation, the ways in which scholars of rhetoric explore science's religiosity does shape, in particular, later discussion of the prophetic dimension of Wiener's visibility.

There are some key limits to the visible science scholarship. In general, the relative autonomy of journalists as actors and media as institutions is underestimated and audiences remain undifferentiated. While sometimes noted, there is little critical reflection on the gendered, racialized, and classed character of scientific visibility. Too often

the "problem" of visible scientists remains conceptualized as overcoming the challenges of the accurate transmission of expert scientific knowledge to non-expert audiences; visibility is thus framed, instrumentally, as a normative project of education and democratization. This can lead scholars to overlook the broader cultural consequences of visibility not directly connected to the transmission of scientific ideas; yet sometimes these are the most important impacts of a particular scientist's conspicuousness. Related to this, in some authors' focus on scientists' rising political capital, they see their cultural profile not as significant in its own right, but as only instrumentally relevant to the project of political influence. Finally, this research would be enhanced by understanding the visible scientist, not as the representation of a scientist who has achieved popular notoriety, but rather as a performative persona articulated as an outcome of specific public communication processes taking place in very particular social and historical contexts.

Drawing on, and hopefully adding to this work, I suggest that a visible scientist is most productively understood as the persona generated when a scientist achieves some amount of notoriety in their own field of scientific expertise and is not only widely represented in mass media, but also takes an active role in the production and circulation of that specific persona in the wider public sphere through their own interventions in mass media structures, processes, and flows. The nature of that mediation obviously changes over time with the rise, fall, and revival of mass media technologies; the emergence of social media; shifts in science journalism practices (such as the decline of specialized beats and the turn to freelancers); and the developing techniques of publicity. Despite the levels of agency involved in generating media presence, visibility can never be simply programmed. Visible scientists are inextricably of their times, emerging at the intersection of their specific social, scientific, and cultural contexts. In order for the media assemblage to take note of the scientist and for the resultant persona to hold public attention for any length of time, the particular "flavour" of the visible scientist must resonate with, and speak to, other already circulating discourses and social concerns. In this way, studying a visible scientist is also an important way of making sense of the cultural life of the particular science with which they are linked.

The nature and degree of a scientist's visibility can be measured by the recognition value their persona holds with general audiences. Colourful personal characteristics (appearance, habits, idiosyncracies, etc.) are vital resources for the visible scientist's persona; it is, in fact, these elements, rather than scientific status or expertise, that distinguish them from others in their field, humanize them, and make them mediate-able. All visible scientists play particular social roles; they become the protagonists in the stories they (and others) seek to tell.[13] Once having achieved a level of public notoriety, visible scientists are looked to by other more general and diverse media and cultural producers as general experts, sought out to comment on a wide variety of technoscientific but, more importantly, social issues, clearly outside their domains of scientific expertise. As Walsh notes, when manifesting the prophetic ethos, such scientists "recall … the polity to their covenant values" (2013, p. 5). The persona of the visible scientist enables the general expert to serve as social pundit, both personifying and personalizing

certain values and beliefs. Notable examples of visible scientists in the postwar Anglo-American mediascape include Carl Sagan, David Suzuki, Ian Wilmott, Stephen Hawking, Jane Goodall, Richard Dawkins, J. Craig Ventner, B.F. Skinner, and Jacques Cousteau.[14]

Norbert Wiener as visible scientist

In 1948, Norbert Wiener published a formulae-littered, typo-laden, mysteriously titled mass-market pocketbook—*Cybernetics: Or Control and Communication in the Animal and the Machine* (hereafter *Cybernetics*)—to explain the theory of cybernetics to his colleagues across a broad range of disciplines. In many ways, *Cybernetics* operated as an entry in the subdiscipline of scientific text that Leah Ceccarelli (2001) identifies as "interdisciplinary inspirational" (p. 4). She notes:

> A text in the interdisciplinary inspirational genre is like a catalyst—it addresses separate disciplines that are relatively inert and facilitates a reaction between them. Its main function is to encourage change, to motivate action in others. Like a catalyst this type of text might seem at first glance to be a relatively minor part of science, but it can have a surprisingly large effect. When such a book succeeds, it produces a new area of research that otherwise would not have been formed or would have taken much longer to develop. (2001, p. 4)

Although *Cybernetics* did become a foundational text in the interdisciplinary activity that was definitive of first-wave cybernetics, it also, surprisingly, became a pop culture phenomenon. Published simultaneously in France and the United States, it went through an incredible five printings in six months. Geof Bowker is correct when he claims, "When Wiener wrote his popular *Cybernetics* in 1948, the subject became a cult one for a wider audience" (1993, p. 108). *Cybernetics* was reviewed widely and positively across a range of academic disciplines, the science press, and most importantly for Wiener's visibility, across all major sources of the popular press of the day. He followed up *Cybernetics* with the more accessible book *The Human Use of Human Beings: Cybernetics and Society* (1950a) (hereafter *Human Use*), many articles and essays for popular journals, a science fiction novel, two autobiographies, and many interviews with journalists, in print and on radio and early television. Wiener thus actively participated in the production of his public profile.

This communicative work, its circulation and reception produces what Goodell identifies as the five personal and personality characteristics that serve as the markers of twentieth-century scientific visibility. The visible scientist must be intelligible as relevant, controversial, articulate, colourful, and credible. This section briefly demonstrates that Wiener meets these basic criteria of visibility (a point also made in abbreviated form by Turner and Larson [2015] in their treatment of the network celebrity of Wiener, Stewart Brand, and Tim O'Reilly).

Goodell (1977) suggests that a visible scientist must first be relevant. Relevance is both a matter of timing, the serendipity of working on a "hot" issue at the right time, and of address, the ability to make the science pertinent in a broader context. Wiener was definitely dealing with a hot topic—the science behind the new ultra-rapid computing machine. There was a veritable explosion in American print mass media in the

late 1940s and 1950s exploring early computers (see Hamilton, 1999). Framed as "giant electronic brains" and as "thinking machines," computers were clearly objects of public awe and fascination. Due to the role of cybernetic theory in serving as a model for machine "learning"; Wiener's location at MIT, one of the two major institutions working on the earliest computers; and his membership in a network of scientists all exploring similar ideas,[15] the press frequently (and incorrectly) associated him directly with the production of computing machines. Wiener contributed to the computer, according to one biographer, "haphazardly, with deep insights" (Masani, 1990, p. 241), as opposed to participating in its actual design or research. Yet *The American Mercury* was not alone in suggesting in 1953 that "Wiener's concept of feedback started an epidemic of mechanical brains'" (Fliegers, 1953, p. 59). Others recognized that Wiener was only tangentially related to the development of the computer, but it was his name that was popularly associated with it (Kuhns, 1971). The media repeatedly framed him as creator or inventor of the early computer (e.g., David, 1955; Edman, 1950; Noyes, 1950; *Time*, 1948). His views emerged as key to explaining these complex and oblique machines to a fascinated public.

Relevance can also be materially traced, in part, through the scope and variety of cultural sites through which a visible scientist and their ideas travel. Wiener's writing was reviewed in publications as diverse as *The Atlantic Monthly*, *Time*, *The Saturday Review of Literature*, *The Commonweal*, *Science*, *Scientific American*, *Science Monthly*, *The Christian Science Monitor*, *Journal of Philosophy*, *The New Yorker*, *Newsweek*, *Business Week*, *Forbes*, *Life*, the *New York Times*, *Journal of Religion*, and a variety of sociology and psychology journals. This diversity of public attention and Wiener's general interdisciplinary and intellectual appeal reinforced his visibility.

Relevance is also reproduced in the importance attributed to the ideas offered by, or associated with, the visible scientist. *Cybernetics*, much to the mutual surprise of Wiener and his publishers, was perceived by the lay public to be highly relevant. "A note on the cover states that it [*Cybernetics*] is a study of vital importance to psychologists, physiologists, electrical and radio engineers, physicists, anthropologists, and physicians. He should have added 'and to all humanity' " (Smith, 1949). John B. Thurston (1949), in *The Saturday Review of Literature,* wrote:

> It appears impossible for anyone seriously interested in our civilization to ignore this book. It is a 'must' book for those in every branch of science … in addition, economists, politicians, statesmen, and businessmen cannot afford to overlook cybernetics and its tremendous, even terrifying implications. (p. 24)

The second characteristic of the visible scientist identified by Goodell is controversy, which here is defined more in terms of drama, rather than dispute. Because of the media's emphasis on dramatic narrative and conflict, visible scientists are "those who are willing to take unqualified, dramatic stands on issues" (1977, p. 23). This means they are frequently mavericks, at odds with other scientists and staid social institutions. Goodell posits this not merely as a personal characteristic, but as an element in the scientific work produced by visible scientists: "[T]hey are revolutionaries, questioning established theory, proposing new concepts" (p. 24).

In their introduction to a preview of *Cybernetics*, the editors of *Scientific American* suggested, "Dr. Wiener's book may well be the focus of much controversy" (Wiener, 1948b, p. 14). Wiener was framed as both taking dramatic stands and being distinct from other scientists. Quoting *Time* magazine (1950a): "Many of his colleagues, while admitting that he is a great mathematician, accuse him of sensationalism. Wiener's admirers reply that such bickering is only to be expected in a field as lively as cybernetics" (p. 55). Flo Conway and Jim Siegelman (2005) note that *Cybernetics* was "peppered with provocative statements that proved prophetic in hindsight" (p. 180).

Wiener was represented as breaking new ground, having "invented" a new science. Cybernetics was constructed in its early days as a "revolutionary contribution to science" (Duncan, 1950–1951, p. 599). This linked lexicon of invention, revolution, and paternity circulated in the popular and academic press when *Cybernetics* was published, with the book receiving reviews ranging from favourable to rapturous. *The Commonweal* suggested, "It is an exceedingly interesting book—one might be tempted to call it an *important* book, if that adjective were not so overworked as to constitute damning with faint praise" (Standen, 1949, p. 176; emphasis in original). *Time* (1948) magazine wrote: "Once in a great while, a scientific book is published that sets bells jangling wildly in a dozen different sciences … [F]or those who can penetrate it (and thousands are trying), the book is intensely exciting." And from the *American Journal of Sociology*: "In the opinion of the reviewer, the value of a book is to be judged primarily by the answers to two questions: 'Does it contain new ideas?' and 'Does it suggest new lines of research?' For *Cybernetics* the answer to both is an unqualified 'yes' " (Kashevsky, 1950–1951, p. 200).

Many scientists propose new concepts or make seemingly "revolutionary" breakthroughs, however. It is in the third condition of visibility, being articulate, that Wiener excelled. Goodell (1977) argues that visible scientists are able to render complex scientific ideas in a comprehensible, media-friendly vernacular. They become experts at the sound bite, making use of catchy figures of speech and colourful language. Wiener excelled at analogy, was a skilled rhetorician, and had an evident knack for metaphor.[16] Commentators enjoyed his comparison of the "mental disorders" (e.g., Kashevsky, 1950–1951, p. 200) of computing machines and human brains, for example, and he was often linked to the increasingly common figure of "machine brains."

Visible scientists demonstrate an understanding of the media as professional practice, seeking out media attention to bring ideas to a broader public, solicit support, raise funds, and so on. Wiener made good use of the mass media for his work, publishing his books in inexpensive formats and writing often for popular journals. He regularly made himself available to journalists for interviews and was recognized by them as able to render ideas comprehensibly. He was described as notable by one journalist because of the "modesty and forthrightness with which he answers questions" (Edman, 1950, p. 140). Another stated that while it was not easy to interview Wiener because he was an "honest-to-goodness genius" (Fliegers, 1953, p. 53) who spoke six languages fluently, he could still explain complex scientific ideas clearly to the reporter.

Extending Goodell's concept, an integral part of being articulate is volubility. Wiener's written output was substantial and included short stories, essays, letters, au-

tobiographies, and even a novel. He released two autobiographies: the first when he was 58, detailing his childhood and youth, *Ex-prodigy: My Childhood and Youth* (1953), and the second, three years later, exploring his later life, *I Am a Mathematician: The Later Life of a Prodigy* (1956). Both were published as mass-market paperbacks and were also widely reviewed and promoted in the popular press. It is not incidental that these works were also read by journalists. When a reporter wanted to "inject a bit of the man" into a story about his science, the anecdotal material was readily available in the two texts penned by Wiener himself.

As a result, unlike other scientists of the day, Wiener's visible scientist persona was produced in, and evoked an archetypal set of remarkable anecdotes: his difficult early life with his demanding father; his graduation from school at age 12; his undergraduate degree at 14; and his PhD from Harvard by 18. These details consolidated—through widespread repetition and recognition—his identity as a precocious child prodigy and eventual mature genius. A *Newsweek* journalist reviewing *I Am a Mathematician* even linked the autobiographies to Wiener's accessibility to the public. "Most importantly, it reveals Wiener as one of those rare men who can give the layman an interesting colour chart of a mathematician's mind, an apparatus which is not, as popular scoffers suppose, a uniform black and gray" (1956, p. 94).

The fourth characteristic shared by visible scientists is their colourful image. Wiener offered a rich palette to the media. A biographer suggests that his "absent-mindedness, quirkishness, and idiosyncrasy, amusing and even endearing, lent themselves to easy anecdote" (Masani, 1990, p. 349). Pesi R. Masani goes on to suggest that although von Neumann was as significant a scientist and mathematician, "the words 'cranky' or 'crazy,' which might pop up half-affectionately in talking about Wiener, were never applied to von Neumann" (p. 242). Notwithstanding he was a "legend in his own lifetime" according to the editors of *The Saturday Review of Literature* (Wiener, 1954, p. 15), he was also the quirky genius who wrote fiction, read 25-cent mysteries, and belonged to a Boston Sherlock Holmes Club, The Speckled Band. Never lacking moxie, Wiener wrote to Alfred Hitchcock in 1952 suggesting the director make a film about a laboratory environment in which Wiener was working at the time (Masani, 1990, pp. 338–339). He even appeared as a character in Kurt Vonnegut's 1952 novel of cybernetics and computing machines, *Player Piano* (1988).[17]

The media accepted wholeheartedly Wiener's identity as a child prodigy and eccentric genius, to a significant extent self-fostered through the technology of autobiography, as noted above. He was the "mature prodigy" (*Newsweek*, 1953, p. 84), and one reporter stated, "It soon became clear that little Norbert was a scientific prodigy, one of the most brilliant ever to appear in the U.S." (*Time*, 1953, p. 89). Readers were asked to sympathize with the tyranny of his linguist father; his mother's anti-Semitism, despite the family's Jewish heritage; and his early social awkwardness. These very human foibles and characteristics made him both colourful and accessible.

Finally, all other conditions of personal visibility—being relevant, controversial, articulate, and colourful—are moot unless a scientist also has a credible reputation in their scientific field. It is this characteristic that legitimates their discourse, even on matters outside of their primary area of expertise. Goodell (1977) suggests that most visible

scientists have already achieved a certain notoriety in their area of research and are often associated with prestigious institutions. Wiener was Professor of Mathematics at the Massachusetts Institute of Technology—one of the high-status upstart universities of the era—from the age of 19 until the time of his death at age 69, and the credibility of that institution accrued to him through long association. His credibility was reproduced in his public presentation as genius, as discussed above, but as importantly, he was also recognized as an expert in mathematics by his peers and by the press. He was described as a "brilliant mathematical thinker" (Dillon, 1964, p. 3173); having "world-wide fame," as "a mature genius" (*Newsweek,* 1953, p. 84), and as "one of the greatest geniuses of the century" (*Newsweek*, 1964, p. 48). He was repeatedly touted as a world-class mathematician. He received international acclaim and, due to his fluency in six languages, was a popular speaker in Europe.[18] While his fellow scientists may not have always appreciated his media personality, he was, nonetheless, respected as a major figure in mathematics by his peers and awarded the National Medal of Science for his contributions in the fields of mathematics, engineering, and biological science in 1963.

From this brief treatment, Wiener clearly emerges as a visible scientist. However, we must go further than this pronouncement to interrogate the effects and affects that his particular figuration enables and enacts. Exploring the specific nature of Wiener's mediated persona allows a better understanding of the effervescent cultural life of cybernetics.

The four faces of Norbert Wiener's visibility

> With his short, rotund figure and his spade beard, Professor Norbert Wiener of MIT looked like a harmless Santa Claus. Instead he bristled with vitality. He was a top-rank mathematician who fathered a new branch of science, an enthusiastic mountain climber, and a facile writer of both fiction and philosophy. He could talk intelligently on almost any subject. … Wiener was one of a vanishing crew—a first-rate scientist whose curiosity and skills covered a variety of disciplines.
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> —*Time*, 1964, p. 53

The preceding section offered evidence for the claim that Wiener was a visible scientist. But that fact alone could not secure cybernetics' charismatic identity. To understand why cybernetics enjoyed the specific public profile that it did, we must examine the particular ways in which Wiener's visibility was articulated. I argue that Norbert Wiener's visible scientist persona performed four symbolic roles that powerfully shaped the ways in which cybernetics operated as a public knowledge. The first was that of corporeality, a very human body to counter-balance the brute, cold power of the new machine minds. The second was the people's scientist—articulate and accessible, both able and willing to make himself available to the public, to answer the questions on everyone's minds about what all of this might mean. Third, Wiener played the humanist guide, striving to negotiate the tensions inherent to practising conscientious science in the face of the postwar military-university-industrial complex. Fourth and finally, he acted as prophet, the cosmic soothsayer of the consequences of information technology, both warning and reassuring the public. Wiener's four roles as visible scientist contribute to, and shape, the *Zeitgeist* of this very particular moment of

awe, angst, and anticipation in the history of communications. They indelibly mark cybernetics as a charismatic science. In using the notion of charisma, like Walsh (2013), I am inspired by revisiting Max Weber's (1968) account of charismatic authority and its juxtaposition with traditional and legal-rational modes of authority. However, where Walsh applies the notion of charisma to the scientists themselves, here it is also productively applied to thinking through the specific form of non-rational, almost mystical pull that cybernetics exercises on various non-scientific publics.

Body to the machine mind

> The automatic digital computer is currently the highest expression of man's mechanization of the mental function.
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> —Louis Ridenour, 1949, p. 118

While Wiener was a visible scientist by virtue of his awesome, cerebral self, media portrayals of him were always liberally sprinkled with descriptors of his corporeality. This focus on his embodiment was in marked contrast to representations of his contemporaries, whose physicality, comportment, and idiosyncrasies were rarely, if ever, described. His portly stature, his beard, and his cigar emerged as anchoring physical characteristics, reproduced repeatedly in photographs and texts. *The New Yorker* described him as "small, bearded and vivacious" (Edman, 1950, p. 139); *The American Mercury* called him "ebullient" and "barrelchested," "with a handsome Vandyke beard and quick, humorous eyes" (Fliegers, 1953, p. 54). He was an "authentic human brain with a real beard and a vast knowledge of mathematics" (*The New Yorker*, 1954, p. 105; see also *Newsweek*, 1948). "Short, round, bearded and kindly, he looks like a Quiz Kid grown into a Santa Claus—and that's about what he is" (*Time,* 1948). A *Times Book Review* writer presented him as "a roly-poly little man … full of nervous energy" whose "bright-eyed eagerness for new ideas and … trigger-quick responses make it easy to see through the beard to the boy genius" (quoted in Conway and Siegelman, 2005, Chapter 9).

The effect of Wiener's bodily presence in media discourse was to humanize the genius, to render him different from other scientists and ultimately more like "us," the lay readers, while always reassuring us that we are in the good hands of the bumbling genius as we face the unknown. *Fortune* suggested that he was "unusual among professors in looking exactly like one" (Ridenour, 1949, p. 118). Perhaps suffering from the cultural stereotype of the jolly fat man, his appearance was linked to his accessibility and approachability. "Professor Wiener is a stormy petrel (he looks more like a stormy puffin) of mathematics and adjacent territory. A rarity among scientists, he is willing and able to talk intelligently on almost any subject" (*Time,* 1950a, p. 55). *Newsweek* suggested, "As progenitor of this idea [cybernetics], rotund, gray-whiskered Wiener has struck a probing finger in physiology, computing machinery, and at least a dozen other fields of applied science" (1953, p. 84).

Wiener himself was very aware of his own embodiment, self-conscious both about his weight and the physical awkwardness that resulted in such poor laboratory work that he was forced to give up his studies in biology. He even linked his processes of

thinking to physical illness, sometimes attempting to induce illness in order to resolve a particularly troublesome mathematical problem. His biographers link his severe myopia to his stunning capacity to complete complex mathematical functions in his head (e.g., Conway & Siegelman, 2005).

Wiener's body is of particular interest when considered against the larger discursive tableau in which he, as public figure, circulated. This was a moment within public discourse of extreme separation of mind and body as a result of the computing machine's widespread characterization as an electronic brain (e.g., Kline, 2015). Wiener himself pointed out that machines had already been invented to replace human bodies and their labour. For the first time, after World War II, there were machines that appeared to be able to replace human mental labour: thinking machines. In the ensuing media flurry, the focus was almost exclusively on the mind at the expense of the body. The body was elided from discourse in the celebration of the superhuman (machine) brain.[19] Wiener, too, had a superhuman brain, but was always distinguished and humanized through his location firmly within his stalwart body. The physicality reproduced repeatedly in textual representation was echoed and reinforced photographically. The sheer volume of photographs of Wiener in the popular press—short, fat, bearded, and often with his cigar—offered his body as the antidote to the uncertainty of the disembodied thinking machine with which he was so frequently linked. Wiener's rotund body and pointed beard operated to separate human from machine, so that readers did not forget the value of the human in the rush to play with the new machines.

The people's scientist

> The best we can do is to see that a large public understands … this work [*Cybernetics*].
>
> —Wiener, 1948a, p. 29

In his efforts to popularize cybernetics, Wiener became the people's scientist, willing and able to communicate his ideas to diverse audiences in a variety of media and genres. Certain material conditions contributed to this cybernetic traffic. Wiener published *Cybernetics* to explain the theory to a broad audience. Despite the book's errors and dense mathematical formulae, *The Saturday Review of Literature* concluded, "It is a beautifully written book, lucid, direct, and despite its complexity, as readable by the layman as the trained scientist, if the former is willing to forego attempts to understand the mathematical formulas" (Thurston, 1949, p. 24). Tellingly, Conway and Siegelman (2005) refer to the publication of *Cybernetics* as "the big bang" and note that after he "debuted" in *Time* and *Newsweek*, "Wiener's portly frame and prognostications were featured regularly in full-page photospreads in *Life*. … The French newspaper *Le Monde* ran an article on *Cybernetics* and response to the book was especially strong in Sweden" (2005, p. 185). Online bookseller Amazon (2016), quoting from *The Saturday Review*, still promoted the book in 2016 in the following manner:

> Acclaimed one of the "seminal books … comparable in ultimate importance to … Galileo or Malthus or Rousseau or Mill," *Cybernetics* was judged by twenty-seven historians, economists, educators, and philosophers to

> be one of those books published during the "past four decades," which may have a substantial impact on public thought and action in the years ahead. (para. 1)

Conway and Siegelman (2005) suggest that with the publication of *Cybernetics*, Wiener's name became a household word in the U.S. and elsewhere; Kline (2015) concurs, suggesting that many average Americans owned a copy because it was "touted as *the* book to read or display on one's bookshelf—in order to keep up on a noteworthy science" (p. 97).

After its publication, a number of scientist colleagues convinced Wiener to write a more easily consumed introduction to cybernetics. This resulted in the publication in 1950 of *Human Use* as another mass-market paperback, this time with Houghton Mifflin; it sold an impressive 50,000 copies by 1956. The book was considerably less mathematical and more philosophical than *Cybernetics*, and Wiener was active in promoting it to the public. *Human Use*, described as his "address to the laity" (Duncan, 1950–1951, p. 599), was very well received in the popular press. It was described as "provocative," having a "lively, positive style" (La Barre, 1950; see also Cadwallader, 1962); "exciting" (Thurston, 1949, p. 24); "important," "perfectly accessible," and as opening up "startling new vistas" (Rolo, 1950, p. 176). Thanks to Wiener, cybernetics would be "enjoyed by any lay reader" (Kashevsky, 1950–1951, p. 200). Wiener gave a series of radio interviews in fall 1950, delivered a number of public talks, and was featured in a spread in *Life* (1950) magazine, with political scientist Karl Deutsch and historian Giorgio de Santillana, offering the "Wiener Civil Defense Plan," a strategy for how the U.S. could apply cybernetic principles to the design of urban transportation in order to increase the chances of surviving nuclear attack.

Wiener used *Human Use* as a forum to offer various political and social commentaries on law, politics, ethics, religion, academia, and more. His comments on social matters, labour, chess machines, political communication, psychiatry, the second industrial revolution, and so on circulated widely, enhanced by his already existing media profile due to the public life of *Cybernetics*. At no point was it questioned in the press that he, as a mathematician, was competent or qualified to speak to any of these matters. He was, notably, recognized as a visible scientist even in his time; *The New Yorker* stated: "Everyone who reads even *Quick* [a pocket news weekly] has heard of Dr. Wiener" (quoted in Kline, 2015, Chapter 3).

Wiener was portrayed in the media as different from other scientists because he would answer the questions on everyone's mind. *Newsweek* (1948) noted that most scientists "squirm" when asked if machines can think, but he dutifully considers the question and answers. As well, part of his identity as the people's scientist was his apparent skill at so many different areas; he was a polymath, a generalist in an era of specialists. "Professor Wiener doesn't seem worried about overloading his own brain. Believing that most sciences are overspecialized, he has ranged from mathematics to biology and ballistics, radar engineering and symbolic logic" (*Newsweek*, 1948, p. 89). *Time* (1948) recognized that his varied expertise contributed to his accessibility. "If Professor Wiener were an ordinary scientist, narrowly specialized, he might have devoted the bulk of his book to detailed descriptions of control and calculating mecha-

nisms. But the professor is anything but specialized" (p. 45). *The New Yorker* suggested: "These macabre possibilities could be dismissed as the melodrama of science fiction if they were not broached by so distinguished a man and mind. Dr. Wiener, an infant prodigy who has become an adult prodigy, is distinguished because of his technical achievements and the range of his interests and sensibilities" (Edman, 1950, p. 139). He was a popularizer of science, a translator for the people (e.g., Noyes, 1950; Standen, 1950), and one with a conscience, as we see below.

The humanist guide

> The tension between Wiener's humanistic values and the cybernetics viewpoint is everywhere apparent in his writing.
>
> —Hayles, 1999, p. 85

Hayles identifies a contradiction in Wiener's work between "[e]nvisioning powerful new ways to equate humans and machines, yet speaking up strongly for liberal humanist values" (1999, p. 85). It is in the heart of this tension that Wiener played the role of humanist gadfly to the emerging powerful institutional alliances of his day. Both through his own direct interventions into, and his representations in, the media, he spoke out about the relationship between the military and science and the potential consequences of automation, annoying his colleagues and reassuring the public.

> It has long been clear to me that the modern ultra-rapid computing machine was in principle an ideal central nervous system to an apparatus for automatic control. … Long before Nagasaki and the public awareness of the atomic bomb, it had occurred to me that we were here in the presence of another social potentiality of unheard-of importance for good and for evil. (Wiener, 1948a, p. 36)

One of his most dramatic moments came when he removed himself from all military-funded research. He was not alone among scientists repudiating the use of science as a destructive force by military interests at this time, but he chose a very public communicative strategy to do so, one that shaped the remainder of his career.[20] In 1947, he was approached by a research scientist at an aircraft corporation asking him about a project; Wiener wrote back indignantly, refusing to provide the information and indicating that he would circulate his response to other scientists, exhorting them to consider their own practices. He submitted a revised version of the letter to the high-profile *Atlantic Monthly*, where it was published under the title "A Scientist Rebels." He bluntly claimed, "I do not expect to publish any future work of mine which may do damage in the hands of irresponsible militarists" (Wiener, 1947); he called upon other scientists to follow his lead. Wiener followed this up with a similar essay in *The Bulletin of the Atomic Scientists*, critiquing the close relationship between governments, industry, and the military (Conway & Siegelman, 2005). His rebellion and subsequent rejection of financial support from military-backed projects were frequently mentioned in media treatments of him; he was constructed as a moral centre of science (e.g., *Newsweek*, 1949b), a role he embraced. The very title of *Human Use* was drawn from

one of Wiener's own lines in the introduction to the book: "I wish to devote this book to a protest against this inhuman use of human beings" (1950a, p. 15).

There were other events in his campaign to humanize the machine of postwar science. He made impassioned pitches for value-driven research:

> [T]he first industrial revolution, the revolution of the "dark satanic mills," was the devaluation of the human arm by the competition of machinery. … The modern industrial revolution is similarly bound to devalue the human brain. … The answer, of course, is to have a society based on human values other than buying and selling. To arrive at this society, we need a good deal of planning and a good deal of struggle. (Wiener, 1948a, pp. 37–38)

His novel, *The Tempter* (1959), told the story of scientists caught up in industry and the temptations they face to surrender their integrity for personal success. He cancelled his participation in a high-profile computing machine conference organized by Howard Aiken in 1947, and he used *The Atlantic Monthly* again as a forum in 1950 to speak out against the proposed H-bomb (Wiener, 1950b). Questions of labour were at the heart of his humanism; in the mid-1940s, he contacted the leaders of American labour to alert them to the impending changes in work due to automation and spoke to a number of management groups in the 1950s. In 1960, Wiener wrote an article for *Science* entitled "Some Moral and Technical Consequences of Automation" (Wiener, 1960).

This profile as the conscience of the cybernetics era was recognized, cultivated, and used by the editors of *The Atlantic Monthly*.

> A mathematician and philosopher of science whose ideas played a significant part in the development of communication and control which were essential in winning the war, Norbert Wiener of the Massachusetts Institute of Technology has been outspoken in the discussion of atomic energy and the responsibilities of the scientist. (Editorial introduction to Wiener, 1950b, p. 50)

His intellectual production was both framed and read as humanist activism. A reviewer wrote of *Human Use*, "Dr. Norbert Wiener's [book] is also a broadside against every kind of thought control and pressure for conformity, a manifesto for the spirit of independence and empiricism" (Rolo, 1950, p. 176). Other activist scholars of the day appreciated this role. Lewis Mumford wrote to thank him for writing *Human Use* (Masani, 1990), and Albert Einstein was on record as supporting his stance against military research. *The Christian Science Monitor* described Wiener as a "Jeremiah with the taste and learning of a Renaissance humanist, the free-ranging gusto of a William James. He is a mathematician who sees red when he finds men reduced to soulless digits, a machine-maker who rebels against treating men as machines" (Pick, 1950, p. 7 quoted in Kline, 2015, Chapter 3).

His reputation as a humanist gadfly was an ongoing legacy. After his death in 1964, *Newsweek* remembered him: "Wiener became at once the father of cybernetics, and the watchdog of automation"; "[t]he plump, bearded figure became a center of dissent on the MIT campus—a man difficult to live with, yet inspiring to talk with" (*Newsweek*,

1964, p. 48). Even 50 years later, Pfohl recognizes that "throughout his subsequent career, Wiener operated somewhat doubly—as both a scientist and ethical commentator on the practice of science" (1997, p. 119). As the humanist guide, Wiener was one of the voices speaking repeatedly for conscience in science and encouraging the more humane deployment of computing machines. As Walsh (2013) suggests, scientific advisors rely upon their capacity to recall a polity to its covenant values, a fundamentally non-scientific function. Wiener was seen as the guardian of cybernetic society, its vocal protector from the ravages of automated destruction.[21] "If the rest of the cyberneticists are like Professor Wiener, they are a long way from being irresponsible scientists, who give the world demons without regard to the good or evil results of their work" (Standen, 1949, p. 176).

The prophet

> The scientist did not just look to the future,
> however, but was also a prophet, a fantastic Tiresias
> whose eyes were said "to see much more than you or I"
> and who could thereby identify discoveries not yet made.
>
> —LaFollette, 1990, p. 75

The fourth symbolic role Wiener's persona as visible scientist articulates is the prophet of the second industrial revolution. Like other scientists framed as seers, recognized by LaFollette (1990), Walsh (2013), and Lessl (2012), Wiener is taken to know the future and thus to have considerable power. His "visionary musings" (Keller, 2002, p. 58) inflected cybernetics as a public science with a futuristic orientation of spectacular possibility, rather than hobbling it to brute reality. But at the same time, as Walsh (2013) recognizes, the work of prophets is more than temporal; in times of change and uncertainty, when a society is seeking certain knowledge from its scientific advisors, it often receives, instead, a reminder of the values that should guide political decision-making and action.

Wiener used *Human Use* and the related media paratexts that he actively co-constructed around it as a venue for launching his prognostications on the social, economic, and political changes that he foresaw as a result of the intersecting vectors of cybernetics and computing machines. This language inflamed the press, and he was immediately cast as the "prophet" of these momentous developments. By naming what was happening concurrently with its occurrence, he was taken to have predicted it; he could not be discredited because not enough time had yet elapsed to test his prognostications. *Time* suggested in its 1950 cover story on thinking machines that Wiener had "accurately" predicted the second industrial revolution (1950a, p. 55). This language of prediction was frequently used in describing Wiener, his publications, and his pronouncements (e.g. Edman, 1950, p. 139). Any speculation he made was reported and treated as credible (e.g., Standen, 1949; *The New Scientist,* 1964; *Science News Letter,* 1964). In another *Time* (1950b) article, Wiener was framed as originally a "long-hair," but after *Cybernetics* became a classic, "Wiener is a prophet who is listened to by short-haired, hardheaded businessmen. Many of them agree wholeheartedly that the 'cybernetic revolution' he predicted is already in progress" (p. 66).

The business press was noticeably and understandably concerned with being at the forefront of computer automation, sometimes called cybernation.[22] Wiener emerged as one of the favourite technological forecasters for *Business Week*, making numerous appearances. As early as 1949, the publication looked to Wiener for the implications of the second industrial revolution that he predicted in *Cybernetics*. "[W]hat will interest the businessman most in Wiener's book is the light it throws on the likely direction of technical change" (1949, p. 42). In its multiple special issues on automation in 1955, Wiener was the only non-business expert of a number of thinkers consulted to give his thoughts on the second industrial revolution. Interestingly, his was also the only voice of caution, his responses always framed in value-laden language.

The language of prophesy that stuck everywhere to Wiener led to his casting as mystical figure, with cybernetics as the font of his magical power. "Professor Wiener, as the originator and the apostle of the theory that machines might approach some form of thought, is the central figure of the new cult of 'Cybernetics' " (Fliegers, 1953, p. 60). This mystique, this ability to gaze into society's crystal ball, cast Wiener himself as a trope to be invoked by the press as they contemplated the black box of the computing machine. Prescience continues to inform his legacy. Reviews of Conway and Siegeleman's recent biography *Dark Hero of the Information Age: In Search of Norbert Wiener, the Father of Cybernetics* (2005), quoted in the overleaf, repeatedly reference Wiener's future gaze. Dyson (2005) in the *New York Review of Books* notes, "We still have much to learn from Wiener's vision," and the Society of Industrial and Applied Mathematics calls him a "prophet" and a "seer" (Davis, 2005). The *Minneapolis Star Tribune* describes the book as a "compelling and lucid account of Wiener's prodigy and prophecy" and goes on to call Wiener "a man as necessary to our new century as he was to our last" (Cybernetics Society, 2005). The *Investors Business Daily* labels him a "visionary" (Cybernetics Society, 2005), and the College and Research Librarians note, "Wiener is relevant to us because he was a prophet, not because he was a prodigy."

The specific ways in which scientists are visible impact how the science with which they are associated circulates as public knowledge within a culture. These figures operate in the symbolic register to not only contribute to how publics make rational sense of the ideas being promulgated, but also to shape how they respond affectively to them. Wiener's role as the social-scientific prophet of what would become the information age constitutes cybernetics itself in ecstatic terms. Few members of the lay public audiences that enthusiastically embraced cybernetics could have explained it in scientific or mathematical terms. More than rational, more than a set of putative universals, cybernetics in the late 1940s and the 1950s operated less as a science and more as a mystical epistemology, a way of making sense of what we did not yet know.[23]

Conclusion

> But the promise we perceive [is] tied to the development of technologies and the juncture in their development when wonder plays a proper part. It is the promise of beginnings. As a technological vista opens for the first time, before the journey up it has really begun that will prove each step to be prosaic, one by one, the possibility of the whole line

> of development can be felt at once. Often the anticipation turns out to be inaccurate, but that knowledge has not yet been forced upon us, likely and unlikely consequences have not yet been sifted apart. For a brief moment … for that very reason, modest results of an invention and frankly utopian results can have equal likelihood in our minds, and are rolled together intoxicatingly, almost lyrically.
>
> —Francis Spufford, 1996, pp. 269–270

Spufford is writing about the Victorian grandfather of the modern computer, Charles Babbage, and the difference and analytical engines of that era, but he could just as easily be commenting on the heyday of cybernetics. Eve Kosofsky Sedgwick and Adam Frank (1995) coin the term "cybernetic fold" to capture the powerful conjuncture of cybernetic ideas and imagined machinery in the 1940s and 1950s: "the moment when scientists' understanding of the brain and other life processes was marked by the concept, the possibility, the *imminence,* of powerful computers, but the actual computational muscle of the new computers wasn't available yet" (p. 508; emphasis in original). They mark this period as a high-water moment of technological imagination, anchored in possibility rather than actuality. Kosofsky Sedgwick and Frank productively direct our attention to the affective dimension of cybernetics, the realization that cybernetics' dynamic cultural life in the 1940s and 1950s was as much due to its "feeling" as its scientific rigour. I have attempted to show here that these important affective dimensions of cybernetics in the late 1940s and the 1950s were intimately connected to the cultural play of Norbert Wiener as visible scientist.

The New Yorker wrote in 1950: "No one who has listened to him will ever forget this small, bearded, vivacious man who looks like a singularly benign, humorous, and intelligent gnome" (Edman, 1950, p. 139). And forget him we have not. Wiener, still famous as the father of cybernetics, continues to appear in public discourse around computers and information society more than 50 years after his death. Yet, if we really want to understand first-wave cybernetics as a cultural phenomenon, we need to understand Wiener as a discursive catalyst, as a media figure. Wiener circulated in media culture as an embodied, flawed being, offering a counterpoint to the cold, hard machine brains capturing the attention of governments and citizens alike. He reached out, through the media of the day, to numerous lay publics, embracing his role as the people's scientist much more than any of his peers. His own politics, albeit conflicted, were lived on the world stage, as he fell into and then embraced his role as a humanist advisor in the face of potentially dehumanizing technologies and suspect knowledge alliances. Finally, his gaze was always "way over the fence,"[24] looking to the social, political, and economic futures that he knew would inevitably be shaped in myriad ways by powerful, emerging computing technologies. Through mass media, he offered the public a language, comprehensible metaphors, and striking images of social science fictions, as mystifying machines danced with the addictive ideas and lexicon of cybernetics in the postwar era.

As Spufford notes, there are historical moments where the utopian and the unlikely blend with the possible and the actual, sometimes with intoxicating and lyrical results. *Newsweek* claimed in 1949, "The fabulous electronic brain machines have been

credited with the power to predict weather, compute salary payments, replace minor executives and produce synthetic 'emotions' " (1949a). In reality, of those four tasks, the computer of 1949 could likely only have calculated the salary payments, and even then at prohibitive expense. However, Wiener's tales of cybernetics made legible their tantalizing and terrifying possibilities—the emergence of the whole technology could be felt at once and the effect was compelling, dreamy, and maybe just a little bit scary.

Cybernetics' brief postwar flash of the fantastical future embraced a rationality of control—where subjectivity, epistemology, history, and communication were all rewritten. Subjects were made codable; information became a ubiquitous medium; history fused with futurology; and communication became a universal practice and unquestioned social value. Cybernetics as articulated by the not-so-benign gnome gave scientific licence to the equivalence of the computer and the human brain, of hard and soft wiring, of the shared ontology of animal-mineral. It was a heady moment of power and peril—a moment ripe for the rise of a charismatic prophet promoting radical and inspirational ideas, purporting to give us a road map to an uncertain future, all substantiated by the object lesson, the powerful portent, of the computing machine.

The infectious and mystical charisma of Wiener's specific persona infused the knowledge he was taken to have authored and the technology with which he was causally linked. Characteristic of the charismatic mode, faith was favoured over reason. The American public accepted that machines and biological organisms, including humans, exert their purpose in the world in the same way. The organizational homology of man and machine became logical, inevitable, perhaps most importantly, already made. As Orit Halpern notes, "Retrospectively, it appears that to make the machine, the animal, and the human compatible, so as to build a not-yet-existent sensorium through a system, necessitated a foundational transformation in points of reference" (2007, p. 301). Wiener, not as author of the science of cybernetics, but as the exemplary media figure around and through which cybernetics was articulated as a charismatic cultural form, provoked just such a foundational transformation in our points of reference. But as with most claims to charismatic authority, cybernetics' purchase on the public mind was volatile and its incandescent cultural life fleeting.

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Notes

1. Personal correspondence to poet Muriel Rukeyser in Kline (2015).

2. Review of the book *Cybernetics: Or control and communication in the animal and the machine*, *Business Week*, 1949.

3. Part of the contribution of Kline's 2015 book is a more thorough investigation of the emergence of information theory in this era; his work goes some way to recuperating Wiener's contribution to information theory, which is typically credited to Shannon (with Weaver as his popularizer).

4. Bowker (1993) suggests cybernetics "effloresced" (p. 108) in this era.

5. Some scholars even suggest that its wider popularity contributed to its scientific discrediting (Elias, 1997; Kline, 2009).

6. He draws his title from the words of writer James Baldwin, who claimed that the "cybernetics craze" was emblematic for him of the period of the 1950s and the 1960s for him.

7. I also suggest that Kline over-reads the influence of the fearful response to technology and labour compared to a reaction of fascination and mystification tied to computing machines more generally (Hamilton, 1999).

8. There are a number of biographies of Wiener, e.g., Heims (1980), Masani (1990), and Conway and Siegelman (2005). Wiener also wrote two autobiographies (1953, 1956).

9. LaFollette (1990) suggests that "the scientists became one of many professional groups using the mass media for promotion and sales" (p. 64).

10. Visible scientists emerged, necessarily, in relation to the increased and particular visibility of science as a social formation—LaFollette's work is an interesting study of the public construction of science in the 1950s. For more specific consideration of the social formations of cybernetics, see Haraway (1981–1982), Heims (1991), Galison (1994), Pickering (1994), and Kay (1997).

11. See Burkett (1986); Friedman, Dunwoody, and Rogers (1986); and Burnham (1987).

12. More specifically, Lynda Walsh (2013) suggests the authority of contemporary science advisors is constituted in a prophetic ethos that can be traced back to Bacon, and, using the dynamic tension between evolutionism as a cultural construct and evolutionary theory as a scientific theory, Thomas M. Lessl (2012) argues that theology was subsumed within science rather than eradicated.

13. LaFollette (1990) suggests that in media coverage in American popular periodicals of the first half of the century, a myth of differentness is produced, distinguishing scientists from the reading public, due to their representation as intelligent, persistent, modest, colourful, visionary, and remarkable in other ways. She identifies four cultural stereotypes of the scientist: the wizard with the magic of science at his fingertips; the expert with brilliant, specialized knowledge; the creator/destroyer with the immense power of military and other science under his control; and the hero who offers society better conditions of living for altruistic motives.

14. Prior to World War II, other visible scientists included Thomas Edison, Nikola Tesla, Guglielmo Marconi, Albert Einstein, and Marie Curie.

15. The most concrete manifestation of this network of scholars interested in cybernetics was the annual meetings of the Macy Group; see Heims (1991).

16. Walsh (2013) recognizes that "prophets favor figurative modes of communication—metaphors, fables, parables" (p. 144).

17. Interestingly, Wiener did not like the novel.

18. Wiener was even invited to the U.S.S.R. in the 1960s, at the height of the Cold War, and asked to address the philosophical section of the Soviet Academy of Sciences. The talk was then published in a Russian periodical (Masani, 1990). For a rich discussion of cybernetics in the Soviet Union, see Peters (2016).

19. Hayles (1999) also notes the disembodiment of technology at this time.

20. In this, he is a forerunner to the role that Oppenheimer played later (as detailed by Walsh, 2013).

21. Americans were afraid of automation. *Business Week* (1955) reported on a poll conducted that year, which indicated that Americans' second biggest fear, after Russia, was automation.

22. Although the term "cybernation" itself does not endure, it does herald the ongoing practice of forming cyber neologisms.

23. Interestingly, Bowker (1993) suggests cyberneticians offered "a bright theology of the new age" (p. 113), which also links the rise of cybernetics as public knowledge to Lessl's (2012) analysis.

24. The phrase is from Amar Bose, Wiener's friend, who suggests that Wiener could see further and more than others in his day (Conway & Siegelman, 2005).

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Canadian Journal of COMMUNICATION

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The objective of the Canadian Journal of Communication is to publish Canadian research and scholarship in the field of communication studies. In pursuing this objective, particular attention is paid to research that has a distinctive Canadian flavour by virtue of choice of topic or by drawing on the legacy of Canadian theory and research. The purview of the journal is the entire field of communication studies as practiced in Canada or with relevance to Canada.

The Canadian Journal of Communication seeks an editor to take over from **Michael Dorland**, whose term will expire in January 2019. Potential applicants should submit two documents (to Michael Dorland (michael.dorland@carleton.ca), chair of the succession committee. Other members are **Penelope Ironstone** (pironsto@wlu.ca) and **Ian Reilly** (i.reilly@concordia.ca):

- a formal and full letter of application with curriculum vitæ and the names of three referees;
- a letter of institutional support for the Journal indicating the exact nature and extent of that support from an authorized university official.

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