Cybernetics and the human sciences

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Abstract

Cybernetics saturates the humanities. Norbert Wiener's movement gave vocabulary and hardware to developments all across the early digital era, and still does so today to those who seek to interpret it. Even while the Macy Conferences were still taking place in the early 1950s, talk of *feedback* and *information* and *pattern* had spread to popular culture – and to Europe. The new science created a shared language and culture for surpassing political and intellectual ideas that could be relegated to a pre-computing tradition, and it refracted or channelled currents developing in fields from manufacturing to human physiology. It produced conceptions of the political world, as well as new forms of historical consciousness. It offered frameworks for structuralist thought, but also for policies regarding manufacturing and technology, international relations, and governmental decision-making. But the rising sense of the breadth, importance, and even shock of cybernetics long remained understudied, even as its intellectual assemblages continued to, well, relay. In devices and the so-called 'digital humanities', a refracted legacy of cybernetics is also visible. From mainframes to category-frameworks, cybernetics is everywhere in our material and intellectual worlds, even as the name and its meaning have faded. To the extent that cybernetics permeates the human sciences and our culture at large, it remains opaque – an only partially visible legacy often deemed too complex to form a simple object of historical narrative. This special issue on cybernetics in the human sciences outlines the history and stakes of cybernetics, as well as the possibilities of returning to it today.

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Cybernetics saturates the humanities. Yet too often humanists misread the ciphers of
its presence and the meaning of that shared history. Norbert Wiener's movement gave
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oping in fields from manufacturing to human physiology. Participants in the famous
Macy Conferences (1946–53) included John von Neumann, after whom the standard
architecture of the computer is named; Claude Shannon, who first defined bandwidth
mathematically; and J. C. R. Licklider, to whom we owe the networking of computers.
But other voices held forth there too, in heady exchanges about the nature of the new
'automata', the concept of the 'digital', and the comparison of the computer to the
brain. These others included structural linguist Roman Jakobson, and eminent anthro-
pologists Gregory Bateson and Margaret Mead. From the start, feedback, information,
and the theory of automata included conceptual flights between not just disciplines, but
divisions.
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mental decision-making. But the rising sense of the breadth, importance, and even shock
of cybernetics long remained understudied, even as its intellectual assemblages contin-
ued to, well, relay. The turn to media in Germany and the USA (with Friedrich Kittler,
Wendy Chun, and others) has sometimes thematized cybernetics, but is itself historically
cybernetic to the core (Chun, 2011; Kittler, 1990). In devices and the so-called 'digital
humanities', a refracted legacy of cybernetics is also visible (Liu, 2004). From main-
frames to category-frameworks, cybernetics is everywhere in our material and intellec-
tual worlds, even as the name and its meaning have faded. And this is no longer a purely
American story, nor a mere appendage to the story of the advent of computing, nor even
an account of the emergence of an ostensibly new governmentality particular to the
mechanisms and technologies that took over in the postwar vacuum. To the extent that
cybernetics permeates the human sciences and our culture at large, it remains opaque –
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historical narrative.
    And yet, a recent wave of publications – take *pars pro toto* Ronald Kline's *The
Cybernetics Moment*, Mathieu Triclot's *Le moment cybernetique*, and Thomas Rid's
Rise of the Machines, the first three monographic histories of cybernetics (Kline,
2015; Rid, 2016; Triclot, 2008) – confirms that the legacy of the interdisciplinary

movement that Norbert Wiener dubbed 'cybernetics' is being re-evaluated: A whole realm has opened up at the historiographical checkpoint of Wiener's conceptual invention. The consensus in recent biographies of the movement and attempts to situate it across disciplines like philosophy and biology, the paradigm of 'embodiment', and the digital humanities is that the various groups associated with early computing, cognitive science, and management strategies form an essential 'history of the present'.

Twin studies by N. Katherine Hayles and Jean-Pierre Dupuy reintroduced cybernetics to the humanities two decades ago (Dupuy, 1994; Hayles, 1999). Both took the philosophical elements of cybernetics seriously, but on balance the judgement was negative. Hayles saw cybernetics as extracting 'pattern' from body and reducing the latter to the former. Dupuy argued that neither computer science nor artificial intelligence could trace its roots to the movement, the legacy of which was instead the philosophically suspect 'mechanization of the mind' in cognitive science. Recent studies have started to shift these narratives. Orit Halpern's *Beautiful Data* argues that cybernetics saw in its machines a nonlinear and potent world filled with digital machines and other bodies in potentially fruitful interaction. Although we do not live in that world, the vision, for Halpern, was an important one for postwar aesthetics, and cannot be reduced to an 'ontology of the enemy', as Peter Galison has called it (Galison, 1994; Halpern, 2015; see also Edwards, 1996). Seb Franklin's (2015) *Control* characterizes the movement in darker terms, but offers an intellectual-historical vision of it that widens the parameters for future scholarship, extending backward to Marx and forward into the present. Andrew Pickering's (2010) *Cybernetic Brain* shifts the narrative to Britain and includes farther-flung voices as central to the narrative. In her recent *The Power of Systems: How Policy Sciences Opened Up the Cold War World*, Eglė Rindzevičiūtė has studied the 'system-cybernetic governance' pursued by 'conscious makers of a new world' at the International Institute of Applied Systems Analysis (IIASA) from the international rise of the 'technical experts' and 'systems analysts' in the 1970s through the fall of the Soviet Union (Rindzevičiūtė, 2016). David Mindell and Mara Mills have looked at cognate concepts and industrial practices in the 1930s that tilled the ground for cybernetic follow-up (Mindell, 2004). Our own work has made some peripheral contributions, too, in its exploration of cybernetics' reliance on physiological theories and their social extrapolation in the 1930s, Jacques Derrida's relationship to the movement, and the role played by German Idealism and transclassical logics (Geroulanos, 2017; Geroulanos and Meyers, 2018: Chapter 8; Weatherby, 2018a, 2018b).

As we can see, the re-evaluation reaches far beyond a general intellectual history of the movement. But this presence is not only a matter of 'media' and its theory: cybernetics returns as a kind of intellectual and material substrate, not just technology but a quasi-philosophy embedded in that technology. We can no longer think of cybernetics as attached only to the strict structure that surrounded it as a movement – a way of thinking and handling proto-computing. It is rather a story that breaks into attempts to render 'more efficient' bureaucracy and the welfare state; a web of concepts that led the transition away from traditional mechanism and later itself became the quarry for new engagements with indeterminism that eventually overtook and denounced it as too rigid; a series of images and metaphors that influenced policy, economic thought, and literature

in different ways. As a result, the 20th century was a cybernetic century, and the 21st must cope with its legacy. This cluster of articles seeks to bring together many of the scholars responsible for the renewed historiographical and philosophical presence of cybernetics, and to provide a forum for exploring the significant intersections between cybernetics and the human sciences. Collectively, we propose to break with the tendency to treat cybernetics only as an object of critique, and instead throw light on its history in such a way as to cast cybernetics as a theoretical resource in the present. The articles that follow seek to broaden the horizons of the history of cybernetics, remaining neither national, computer-historical, nor even bound to the emergence of an ostensibly new governmentality particular to the mechanisms and technologies that took over in the postwar vacuum.

The story thus extends far beyond the borders of the history of science and technology. The engagement of structuralism and poststructuralism with cybernetics has also been well documented (Geoghegan, 2011; Geroulanos, 2017; Johnson, 2008, 2015; Johnston, 2008; Liu, 2011), and the continuing influence of Bernard Stiegler continues in this tradition (Stiegler, 2016). Wiener and Grey Walter wrote novels. Gregory Bateson, not satisfied with his attempts to transform psychiatry in cybernetics' early years (Ruesch and Bateson, 1951), compiled his work into counterculture classics, most famously *Steps to an Ecology of Mind* (Bateson, 1972). More recently, from David Porush's (1985) *The Soft Machine*, through Espen J. Aarseth's (1997) *Cybertext*, to Hayles' (2008) *Electronic Literature*, theoretical attempts to understand digitally mediated literature have taken inspiration from and issue with cybernetics, and even located their origin in the discipline.

The immediate aftermath of the 'moment' is filled with similar ones. The German cybernetician Max Bense formed the Stuttgart School to explore the possibility of a stochastic poetry. Indeed, science fiction was so closely associated with the pop culture fad that cybernetics became that it contributed to its discrediting, as Ronald Kline has argued. Stafford Beer's experiments with governmental design in the name of Allende's socialism – a history brilliantly recounted by Eden Medina – might be compared to what Benjamin Peters has called the Soviet Union's failure to create an Internet (Medina, 2011; Peters, 2016; cf. Gerovitch, 2002). In the 1960s, French prehistorian and anthropologist André Leroi-Gourhan articulated a detailed evolutionary theory based on the adaptation of cybernetic concepts. In his magnum opus *Gesture and Speech* (1964–5), Leroi-Gourhan reorganized human prehistory in a cybernetic language of 'operational memory', 'human technical behavior', and 'mechanical operational sequences', influentially arguing that humanity had arisen thanks to the feedback effects of organism–environment and society–environment relations; to undercut concepts of mind or consciousness, he even advocated a 'feedback effect of reflection' (Leroi-Gourhan, 1993[1964–5]; see also Geroulanos, 2017: 316–28). His direct influence on Gilbert Simondon, Jacques Derrida, Gilles Deleuze and Félix Guattari, and the Groupe des dix parallels what in the United States was simply a more diffuse intellectual interaction, and a very similar space to that occupied internationally by systems theory.

Even thinkers traditionally seen as keeping cybernetics at arm's length – such as Hannah Arendt – engaged with cybernetics in a highly creative fashion essential to the

critique of industrial society and the possibility of rethinking freedom (see Carr, this issue; Simbirski, 2016; Yaqoob, 2014). Moreover, as David Bates has argued here and elsewhere, the demand for rethinking political bodies, for a new conglomerate of science and politics largely free of a religious and secularizing past, emerged from the 1920s onward and became quietly dominant with the work of Karl Deutsch, Douglas Engelbart, Ludwig von Bertalanffy, and others.

The conversation in the following pages takes a three-pronged approach to cybernetics. First, it reconsiders the unfolding and normalization of the language of cybernetics as the technological realities it produced came to fulfil its mission. Second, it asks about the effects of cybernetics on governance and politics – the ways in which the human sciences mediated the promise, implicit in the very name of cybernetics as a science, of a reorganization of the political. Part of the story here is to go *around* cybernetics, so to speak – less to locate it in context than to see it spiralling into and out of other domains. Third, it asks what cybernetics can do for the humanities today, especially in the reformulation of the conjuncture of media, philosophy, history, and metaphysics in the 21st century.

Ronald Kline shows how the fundamental disunity of the movement itself allowed it to permeate popular culture and put questions to the humanities, even as it failed to gain academic legitimacy. This disunity and questioning was central, he argues, to the emergence of second-order cybernetics in the 1970s and to the popular and scholarly perceptions of cybernetic meaningfulness.

Diana Kurkovsky West shows that, after the Soviet ban on cybernetics as a 'bourgeois science' was lifted, its reception gradually changed and it played a crucial role in urban planning, setting the binaries of economics and political design on a crash course with one another. Her focus is on 'new cities' devoted to science and on the way in which efforts to create vast networks across the USSR created both new possibilities for this science and new headaches of modernization and computerization.

Bernard Dionysius Geoghegan considers the French reception of cybernetic ideas by focusing on four stages of the export and adaptation of French technical approaches to the human sciences: Marcel Mauss' failed efforts to establish a large-scale centre for social scientific research with support from the Rockefeller Foundation; the selective experimentation with and interpretation of technical communications in the 1950s by Claude Lévi-Strauss; the at times ironic application of cybernetics and information theory in the early 1960s by Roland Barthes; and the critique and partial overcoming of cybernetics and information theory in the late 1960s and early 1970s, in particular by Barthes, sociologist Jean Baudrillard, and philosopher-psychoanalyst team Gilles Deleuze and Félix Guattari.

Henning Schmidgen follows Norbert Wiener's 1955 suggestion of a sociological model according to which all forms of culture ultimately depended on the temporal coordination of human activities, in particular their synchronization. The basis for Wiener's model was provided by his insights into the temporal structures of cerebral processes. Schmidgen reconstructs the historical context of Wiener's 'brain clock' hypotheses, in particular his dialogue with John Stroud and other scholars working at the intersection of neurophysiology and electrical engineering. He argues that the innovativeness of Wiener's model relied largely on his productive rephrasing of

physiological and psychological findings that had been established long before the Second World War.

David Bates offers a set of theses on a 'political theology of entropy'. Beginning from Schmitt's post-Second World War conception of the katechon in the contemporary juridico-political landscape (and of himself as that katechon), he inquires about the manner in which definitions of the political in numerous contributions on cybernetic politics (from Wiener through Deutsch and von Bertalanffy) redeployed a logic that interwove Schmitt with models and anxieties of a control society (see also Bates, 2015). 'Crucial to the cybernetic dimension of Schmitt's katechontic moment', Bates argues here, 'was the preservation of the political as such – the preservation of the political against its threatened neutralization *by* the escalation of automatized technicity itself' (emphasis in original).

Extending his work on cybernetics in international relations theory (Guilhot, 2011), Nicolas Guilhot shows how cybernetics was the foil against which political science developed in the postwar period, particularly the field of international relations, where cybernetics, especially in the 1970s and 1980s, came to contribute to a critique of 'rational choice' theory. Bates' and Guilhot's articles confront and complement one another, showcasing the breadth of political possibilities that emerged out of cybernetic thought and the spectrum of our hermeneutic options with regard to them. Whereas for Bates, Schmittian concepts such as decision and the katechon structure cybernetic politics, Guilhot interprets the cybernetic political – and the influence of cybernetics on international relations theory – as involved in an effort to overcome all decisionist pressure.

Danielle Carr resituates Hannah Arendt's postwar work by examining its relations to Kantian liberalism, behaviourism, cybernetics, and cognitivism. Beginning with the postwar resistance to behaviourism, Carr shows Arendt sharing the suspicion that behaviourist control amounted to totalitarianism. As an application of science to politics, behaviourism was criticized by Arendt in *The Origins of Totalitarianism* for mechanizing the human and undercutting the possibility of spontaneity. But Arendt's target was not science itself; her theory of language makes clear cybernetics' promise of renewal and its dismantling of the machine/spontaneity opposition. By working with cognitive liberalism toward a renewal of Kantian freedom, however, the cybernetic moment worked to overcome the behaviourist picture of the human: Cybernetics first 'played an instigator's role' in the move toward cognitivism and then became a significant 'casualty' of that move. Thanks to her own unorthodox Kantianism, Carr shows, Arendt became a barometer of the problems (and a force in the dialectical overcoming) of the behaviourist world.

Christina Vagt argues that the automation of education was a continuation of the project that Jacques Rancière, citing Friedrich Schiller, calls 'aesthetic education'. Examining programmes for the inclusion of computing in education against the background of B. F. Skinner's behaviourism, Vagt shows how Cold War projects converging around programming in educational theory gave rise to attempts to control the environments that produced educational outcomes in the first place, contributing to what Michel Foucault called 'biopolitics'.

Jacob Krell tells the story of the Groupe des Dix (1969–76), a para-political meeting of cybernetics-influenced, quasi-poststructuralist French intellectuals, which developed criteria for understanding the technical priorities, policies, and necessary contestations in the French 1970s scene – from scientists and theorists like André Leroi-Gourhan, Michel Serres, and Henri Atlan, through political thinkers like Michel Rocard and economists like René Passet, leading to the establishment of the Centre d'études des systèmes et des technologies avancées (CESTA) in the early 1980s.

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