HSSC 550: The Information Sciences
Spring 2005

Nathan L. Ensmenger
History & Sociology of Science • University of Pennsylvania
nathanen@sas.upenn.edu

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This course will explore the emergence and widespread adoption in the early Cold War-period of a set of interrelated tools, techniques, and discourses organized around the concept of "information." These emerging information science included not only new disciplines such as cybernetics, information theory, operations research, and ecology, but also some traditional physical sciences – such as biology and chemistry – as well as a broad range of social sciences, including economics, political science, sociology, and urban planning. The focus of the course will be on tracing the important structural changes in post-war science that encouraged the adoption of the rhetoric of information (if not its substance), as well as on extending the relevance of these developments to a wide range of topics in the history of science, medicine, and technology.

The seminar will meet weekly on Wednesday afternoons from 2-5 pm. In addition to doing the readings and preparing for discussions, each participant will, over the course of the semester, be asked to provide a list of discussion points/questions with which to open the seminar. Students can work in small groups to prepare these discussion agendas, and they must be distributed to the group on the evening *before* the seminar. In addition, each student will select two supplementary readings to review. These short (800 word) reviews will also be distributed to all of the seminar members. A final 10-15 page essay will also required. The type/scope of the final essay will be discussed and negotiated over the course of the semester.

Course Schedule:

I Introduction to the Cyborg Sciences

Michael Mahoney, Cybernetics and Information Technology, chap. 34 in: R.C. Olby et al., editors, Companion to the History of Modern Science Routledge, 1989

Donna Haraway, *Simians, cyborgs, and women : the reinvention of nature* New York: Routledge, 1991

Peter Louis Galison, The Ontology of the Enemy: Norbert Wiener and the Cybernetic Vision, Critical Inquiry 21 1994

Stanislaw Lem, *The Sixth Sally, or How Trurl and Klapaucius Created a Demon of the Second Kind to Defeat the Pirate Pugg* Continuum Publishing Corporation, 1974

II Reading the Book of Life

Lily Kay, *Who wrote the book of life? : a history of the genetic code* Stanford, Calif: Stanford University Press, 2000

Supplementary Readings/Report Topics: Shroedinger (1944); Keller (2002)

III The Cybernetics Group

Steve J Heims, *The Cybernetics Group, 1946-1953: Constructing a Social Science for Postwar America* Cambridge, Mass: MIT Press, 1991

Supplementary Readings/Report Topics: Mindell (2002); McCulloch/Pitts (1943); Bowker (1993)

IV The Theory of Games

Philip Mirowski, *Machine dreams : economics becomes a cyborg science* Cambridge University Press, 2002 [1]

Supplementary Readings/Report Topics: Von Neumann/Morgenstern (1944); Weintraub (1992); Ghamari-Tabrizi (2000); Nasar (1998)

V Cybernetics and the Cold War

Paul Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* The MIT Press Cambridge MA, 1996

Supplementary Readings/Report Topics: Hounshell (1997); Owens (1989)

[1] There is an excellent website on "The History of Economic Thought" that provides a useful glossary of all of the economic terminology used in the Mirowski and other readings: History of Economic Thought ⟨URL: `http://cepa.newschool.edu/het/schools/lausanne.htm`⟩

VI Science, Technology and Ideology

Slava Gerovitch, *From newspeak to cyberspeak : a history of Soviet cybernetics* Cambridge, Mass: MIT Press, 2002a

Supplementary Readings/Report Topics: Walker (2003); Kolman (1978)

VII From Think Tanks to Social Science

S. M Amadae, *Rationalizing capitalist democracy : the Cold War origins of rational choice liberalism* Chicago: University of Chicago Press, 2003

David Jardini, Out of the Blue Yonder: The Transfer of Systems Thinking from the Pentagon to the Great Society, 1961-1965, in: Thomas Hughes/Agatha Hughes, editors, Systems, Experts, and Computers MIT University Press, 2000

Supplementary Readings/Report Topics: Hollinger (1996); Jardini (1996)

VIII A Space Program for the Inner City

Jennifer Light, *From warfare to welfare : defense intellectuals and urban problems in Cold War America* Baltimore: Johns Hopkins University Press, 2003

Supplementary Readings/Report Topics: Jardini (1996)

IX Spring Break

X The Sciences of the Artificial

Hunter Crowther-Heyck, *Herbert A. Simon : the bounds of reason in modern America* Baltimore: Johns Hopkins University Press, 2005

Peter Louis Galison, *Image and logic : a material culture of microphysics* Chicago: University of Chicago Press, 1997. Chapter 8.

Supplementary Readings/Report Topics: Simon (1969); Aspray (1985); Pagels (1988)

XI The Systems Men

Brian Bloomfield, *Modelling the world: the social construction of systems analysts* Blackwell, 1986

Ida Russakoff Hoos, *Systems Analysis in Public Policy: A Critique* University of California Press Berkeley, 1972

Thomas Haigh, Inventing Information Systems: The Systems Men and the Computer, 1950-1968, Business History Review 75 2001

Supplementary Readings/Report Topics: Hammond (1997); Johnson (2002)

XII Biomedicine as Information Science

Timothy Lenoir, *Shaping Biomedicine as an Information Science*, in: Mary Ellen Bowden/Trudi Bellardo Hahn/Robert V. Williams, editors, Proceedings of the 1998 Conference on the History and Heritage of Science Information Systems Information Today, 1999

N. Katherine Hayles, *How we became posthuman: Virtual bodies in cybernetics, literature, and informatics* University of Chicago Press, 1999

Supplementary Readings/Report Topics: Thurtle (2002); Boyle (1996); Berg (1997); Gerovitch (2002b); Gibson (1995)

XIII Systemizing Nature

Sharon Kingsland, Designing nature reserves: adapting ecology to real-world problems, Endeavor 26, Nr. 1 2002

Paul Edwards, The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models, in: Thomas Hughes/Agatha Hughes, editors, Systems, Experts, and Computers MIT University Press, 2000

Supplementary Readings/Report Topics: Edwards (2005); Botkin (1990); Taylor (1988); Hesse et al. (1993)

XIV Darwin Revisited: Information & Intelligent Design

Reading TBD

Supplementary Readings/Report Topics: Leff/Rex (1990)

XV Big Finish

In which all is made clear.

Supplementary Readings/References

History of Economic Thought ⟨URL:
`http://cepa.newschool.edu/het/schools/lausanne.htm`⟩

Agar, Jon: British Scientists and the Cold War: The Defence Research Policy Committee and information networks, 1947-1963, Historical Studies in the Physical and Biological Sciences 28 1998, 209–252

Amadae, S. M: Rationalizing capitalist democracy : the Cold War origins of rational choice liberalism Chicago: University of Chicago Press, 2003

Arrow, Kenneth: Social Choice and Individual Values Wiley, 1951

Aspray, William: The Scientific Conceptualization of Information: A Survey, IEEE Annals of the History of Computing 7, Nr. 2 1985, 117–140

Bell, David/Raiffa, Howard/Tversky, Amos, editors: Decision Making: Descriptive, Normative, and Prescriptive Interactions Cambridge University Press, 1988

Berg, Marc: Rationalizing Medical Work: Decision Support Techniques and Medical Practices MIT University Press, 1997

Bloomfield, Brian: Modelling the world: the social construction of systems analysts Blackwell, 1986

Botkin, Daniel: Discordant Harmonies: A New Ecology for the 20th Century Oxford University Press, 1990

Bowker, Geoffrey: How to be universal: some cybernetic strategies, 1943-1970, Social Studies of Science 23 1993, 107–127

Bowles, Mark: Crisis in the Information Age, Ph. D thesis, Case Western Reserve 1999

Boyle, James: Shamans, software, and spleens : law and the construction of the information society Cambridge, Mass: Harvard University Press, 1996

Buchanan, James/Tullock, Gordon: The Calculus of Consent University of Michigan, 1961

Buck, Peter: Adjusting to Military Life: The Social Sciences Go to War, in: **Smith, Merrit Rowe, editor**, Military Enterprise and Technological Change MIT University Press, 1985, 203–252

Capshew, James: Psychologists on the March Cambridge University Press, 1999

Cellerier, Guy: The historical genesis of cybernetics: is teleonomy a category of understanding, Nature and System 5 1983, 21–225

Collins, Harry: Artificial Experts: Social Knowledge and Intelligent Machines MIT University Press, 1990

Collins, Harry/Kusch, Martin: The Shape of Action: What Humans and Machines Can Do MIT University Press, 1998

Conway, Flo/Siegelman, Jim: Dark hero of the information age : in search of Norbert Wiener, the father of cybernetics New York: Basic Books, 2004

Crowther-Heyck, Hunter: Herbert A. Simon : the bounds of reason in modern America Baltimore: Johns Hopkins University Press, 2005

Davis, Martin: Mathematical Logic and the Origin of Modern Computers, in: **Phillips, Esther, editor**, Studies in the History of Mathematics Mathematical Association of America, 1987, 137–165

Dawkins, Richard: The Selfish Gene Oxford University Press, 1976

Deutsch, Karl: Nerves of Government Free Press, 1967

Edwards, Paul: The Closed World: Computers and the Politics of Discourse in Cold War America The MIT Press Cambridge MA, 1996

Edwards, Paul: The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models, in: **Hughes, Thomas/Hughes, Agatha, editors**, Systems, Experts, and Computers MIT University Press, 2000, 221–254

Edwards, Paul: The World in a Machine: Computer Models, Data Networks, and Global Atmospheric Politics MIT University Press, 2005, ⟨URL: `http://www.si.umich.edu/~pne/models.data.htm`⟩

Eglash, Ron: Cybernetics and American Youth Subculture, Cultural Studies 12, Nr. 3 1998, 382–409

Fox Keller, Evelyn: Refiguring Life: Metaphors of Twentieth-Century Biology Columbia University Press, 1995

Galison, Peter: Computer Simulations in the Trading Zone, in: **Galison, Peter/Stump, David, editors**, The Disunity of Science Stanford University Press, 1996, 118–157

Galison, Peter Louis: The Ontology of the Enemy: Norbert Wiener and the Cybernetic Vision, Critical Inquiry 21 1994, 228–266

Galison, Peter Louis: Image and logic : a material culture of microphysics Chicago: University of Chicago Press, 1997

Gerovitch, Slava: From newspeak to cyberspeak : a history of Soviet cybernetics Cambridge, Mass: MIT Press, 2002a

Gerovitch, Slava: Love-Hate for Man-Machine Metaphors in Soviet Physiology: From Pavlov to 'Physiological Cybernetics', Science in Context 15 2002b, 339–374

Ghamari-Tabrizi, Sharon: Simulating the Unthinkable: Gaming Future War in the 1950s and 1960s, Social Studies of Science 30, Nr. 2 2000, 163–223

Gibson, William: Neuromancer Ace Books, 1995

Haigh, Thomas: Inventing Information Systems: The Systems Men and the Computer, 1950-1968, Business History Review 75 2001, 15–61

Hammond, Deborah: Toward a science of synthesis: the heritage of general systems theory, Ph. D thesis, University of California, Berkeley 1997

Haraway, Donna: Simians, cyborgs, and women : the reinvention of nature New York: Routledge, 1991

Hayles, Katharine: Chaos Bound: Orderly Disorder in Contemporary Literatur and Science Cornell University Press, 1990a

Hayles, Katharine: Designs on the Body: Wiener, Cybernetics, and the Play of Metaphor, History of the Human Sciences 3 1990b, 211–228

Hayles, Katharine: Boundary Disputes: Homeostasis, Reflexivity and the Boundaries of Cybernetics, Configurations 2 1994, 441–448

Hayles, Katharine: Simulated Nature and Natural Simulations, in: **Conon, William, editor**, Uncommon Ground Norton, 1995, 409–425

Hayles, N. Katherine: Chaos and order : complex dynamics in literature and science Chicago: University of Chicago Press, 1991

Hayles, N. Katherine: How we became posthuman: Virtual bodies in cybernetics, literature, and informatics University of Chicago Press, 1999

Hayles, N. Katherine: Nanoculture : implications of the new technoscience Bristol, UK ; Portland, Oregon: Intellect Books, 2004

Headrick, Daniel: When Information Came of Age: Technologies of Knowledge in the Age of Reason and Revolution, 1700-1850 Oxford University Press, 2000

Heims, Steve J: John Von Neumann and Norbert Wiener : from mathematics to the technologies of life and death Cambridge, Mass: MIT Press, 1980

Heims, Steve J: The Cybernetics Group, 1946-1953: Constructing a Social Science for Postwar America Cambridge, Mass: MIT Press, 1991

Hesse, Bradford et al.: Returns to Science: Computer Networks in Oceanography, jCACM 36 1993, 90–101

Hollinger, David: Science, Jews, and Secular Culture: Studies in Mid-Twentieth-Century American Intellectual History Princeton University Press, 1996, chap. The Defense of Democracy and Robert K. Merton's Formulation of Scientific Ethos

Holloway, David: Innovation in science: the case of cybernetics in the Soviet Union, Science Studies 4 1974, 299–337

Hoos, Ida Russakoff: Systems Analysis in Public Policy: A Critique University of California Press Berkeley, 1972

Hounshell, David: The Cold War, RAND, and the Generation of Knowledge, 1946-1962, Historical Studies in the Physical and Biological Sciences 27, Nr. 2 1997, 237–267

Hughes, Thomas/Hughes, Agatha, editors: Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After MIT University Press, 2000

Huxley, Thomas: On the Hypothesis that Animals are Automata, Fortnightly Review 22 1874, 556–589, Found in Mirowski

Jardini, David: Out of the Blue Yonder: The RAND Corporation's Diversivification into Social Welfare Research, 1946-1968, Ph. D thesis, Carnegie Mellon University 1996

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Johnson, Stephen: Insuring the Future: The development and diffusion of systems management in the American and European space programs, Ph. D thesis, University of Minnesota 1997a, Norberg student

Johnson, Stephen: Three Approaches to Big Technology: Operations Research, Systems Engineering, and Project Management, Technology & Culture 38 1997b, 891–919

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Kay, Lily: Who Wrote the Book of Life? Information and the Transformation of Molecular Biology, Science in Context 8 1995, 609–634

Kay, Lily: Cybernetics, Information, Life: The Emergence of Scriptural Representations of Heredity, Configurations 5, Nr. 23–91 1997

Kay, Lily: Who wrote the book of life? : a history of the genetic code Stanford, Calif: Stanford University Press, 2000

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