

**WORLD-BUILDING:
FROM INDUSTRY TO THE DIGITAL TO THE ANTHROPOCENE**

**HSCI 8950, Fall 2015
Mondays, 3:35 – 5:30 p.m.
127 Shepherd Labs**

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SYLLABUS

Overview: This graduate seminar examines the technologies that built the modern industrial world, and analyzes their relationship to the world we are currently building – a world described as revolutionary, digital, and post-industrial, but also increasingly called an anthropocene: a world built by humans. This course surveys the history of technology from the industrial through the digital worlds and on to the anthropocene, by examining significant and on-going issues including invention and innovation; relationships between technology, science, and business; the impact of technology on the worlds of work and the world of war; and the impact of technology on the environment. We will examine the relationship between philosophy, history, and criticisms of technology, and in the end turn to the idea of the anthropocene, which grows out of work on human-nature relations in ecology and environmental studies. Three themes are key throughout: how older technological paradigms persist within new technological frameworks, the relationship between a technology's intended and unintended consequences, and the human relationship to a world increasingly of its own making.

Graduate students from any field are welcome. There is no prerequisite for this course. This course also serves as an introduction to the history of technology for students in the field.

Format: The seminar is a readings and discussion course, and includes both weekly in-person discussion meetings (Mondays, 3:35-5:30) and weekly contributions to the on-line discussion forum. Students are expected to attend and participate in the weekly discussions in person and on-line. In-class discussion is worth 40% of the course grade, and on-line participation is worth 40% of the course grade (20% for on-going weekly forum posts, 20% for assigned readings evaluation posts). An analytical final paper is required, focusing on one of the themes of the course; it is worth 20% of the final course grade.

Discussion: Students are required to participate in discussion at weekly seminar meetings. Discussion participation is worth 40% of the course grade.

Readings evaluations: Each student will prepare and post two readings evaluations during the course. A readings evaluation should give an overview of the readings for the week, pose

possible discussion questions, and take an evaluative position on the readings. We will assign weeks at the first seminar meeting. Readings evaluations are worth 20% of the course grade.

Forum posts: In addition to posting two readings evaluations during the course, students must post a substantial response to the readings evaluation for each week that they do not post a readings evaluation. This post must respond to the readings evaluation. It should also respond to other comments already posted, and in fact a good forum response may require two more additional postings. The response can be critical. It can also open a new avenue for discussion, connect the readings or postings to other issues and readings, etc. We will determine a timeline for postings at the first seminar meeting. Forum posts are worth 20% of the course grade. You will be asked to collect and submit them as a single document at the end of the term. We will begin forum posts the third week of the term (with our second class meeting, in other words).

Analytical final paper: Each student must turn in an original paper analyzing a theme taken up during the course. Students will also prepare and present a short précis of their analytical paper during finals week. The written paper is due to the instructor by Friday, Dec. 18.

Grading: Grading will be based on participation in in-person discussion (40%), on-line forum posts (20%), readings evaluations (20%), and a final analytical paper (20%). Please note that students may not pass the course without completing all assignments, and that a grade of incomplete (I) will be given only if a student has already satisfactorily completed the majority of the coursework and can demonstrate a compelling reason.

Books:

Most of the books we are using will be placed on reserve in Wilson Library. Almost all of the journal articles are available on-line; those that are not will be scanned and made available digitally. You may wish to purchase some of these books, which are available at a substantial discount from on-line sources. I've listed here the ones that you might find most useful to own. Please note that we will not read all of these books in their entirety.

Robert Rosenberg, et al, eds., *Postphenomenological Investigations: Essays on Human-Technology Relations* (Lanham, MD: Lexington Books, 2015)

See especially contributions from Albert Borgmann and Andrew Feenberg

Martin Heidegger, "The Question Concerning Technology," in *The Question Concerning Technology and Other Essays* (Harper Perennial Modern Classics, 2013)

Angela Lakwete, *Inventing the Cotton Gin: Machine and Myth in Antebellum America* (Johns Hopkins University Press, 2003)

Thomas Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm* (Viking, 1989)

John Dos Passos, *Big Money* (Houghton Mifflin, 1933 -)

Martin Campbell-Kelly, William Aspray, Nathan Ensmenger, and Jeffrey R. Yost, *Computer: A History of the Information Machine*, Westview Press, 3rd ed., 2013

David Landes, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*, 2nd ed. (Cambridge University Press, 2003)

Allan Isaacman, *Cotton is the Mother of Poverty: Peasants, Work, and Rural Struggle in Colonial Mozambique, 1938-1961* (Heineman, 1995)

Peter Marsh, *The New Industrial Revolution: Consumers, Globalization and the End of Mass Production* (New Haven, CT: Yale University Press, 2012)

Paul Virilio, *The Administration of Fear* (Los Angeles: Semiotext(e), 2012)

Schedule of discussions and readings:

Sept 7: Labor Day, no meeting, classes do not begin until Tuesday, Sept. 8

Sept. 14: Welcome and introduction, and our first discussion, on historical contingency

Please look over John K. Brown's "Not the Eads Bridge: An exploration of counterfactual history of technology," *Technology and Culture* 55 (2014): 521-559, especially through page 527, and come prepared to discuss the idea of means and ends in history, and counterfactual historical arguments. At issue for our discussion will be the idea of historical contingency, and how central assumptions of such contingency are to the developing field of history of technology.

Sept. 21: History over the long-term: a dispute

Jo Guldi and David Armitage, *The History Manifesto* (Cambridge University Press, 2014) updated 2015 on-line at <http://historymanifesto.cambridge.org/>

An argument that historians should take up longer-range and less specialized approaches.

"AHR Exchange on *The History Manifesto*," Apr. 2015, *American Historical Review*, pp. 527-554. Includes:

Deborah Cohen and Peter Mandler, "*The History Manifesto: A Critique*," *American Historical Review* 120 (2015): 530-542

Jo Guldi and David Armitage, "*The History Manifesto: A Reply to Deborah Cohen and Peter Mandler*," *American Historical Review* 120 (2015): 543-554

Ferdinand Braudel, *Civilization and Capitalism, 15th – 18th Century*, Vol I: *The Structure of Everday Life* (University of California Press, 1992)

An early and highly influential attempt to look at the *longue durée*, from one of the founders of the Annales school, which advocated long-range history. Basically, Braudel looks at things that didn't change.

Sept. 28 **Introducing philosophy and criticism of technology**

Now that we have a number of empirical studies in mind, we turn to philosophy and criticism of technology.

Martin Heidegger, "The Question Concerning Technology," in *The Question Concerning Technology and Other Essays* (Harper Perennial Modern Classics, 2013)

This is a difficult to read piece, but it is essential to know, because it serves as the backdrop for the work of many later thinkers.

Herbert Marcuse, *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society*, 2nd ed. (Beacon Press, 1991)

Marcuse was a student of Heidegger, and is one of the most influential critics of technology in the American context. This piece was influential in the "do not fold, spindle, or mutilate" movement of the 1970s.

For further reading:

See also John MacQuarrie, *Heidegger and Christianity: The Hensely Hensen Lectures 1993-1994* (Continuum International Publishing Group 1994). Despite the title, this little book has little to do with Christianity, but is instead the clearest introduction to Heidegger, and especially to his thinking on technology.

Oct. 5: **Technology and the human-created world**

Don Ihde, *Technology and the Lifeworld: From garden to earth* (Bloomington: Indiana University Press, 1990), selections.

Robert Rosenberg, et al, eds., *Postphenomenological Investigations: Essays on Human-Technology Relations* (Lanham, MD: Lexington Books, 2015)

We will read the introduction, and pieces by Borgmann and Feenberg. Please also select two other chapters that are of interest to you.

For further reading:

Paul Virilio, *The Information Bomb* (Verso, 2006)

This is the work that brought Virilio to the attention of American scholars.

Paul Virilio, *The Administration of Fear* (Los Angeles: Semiotext(e), 2012)

An easy-to-read interview with Virilio, taking up issues of technology, administration, and the speed of technological effects.

Oct. 12: Governments, technology, politics

Criticisms of technology often turn on the role of technology in promoting and perpetuating power. This week, we turn to two empirical studies to prepare us for another round of technology's critics next week.

Eden Medina, *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile* (MIT Press, 2011)

Medina's work complicates the image of cybernetics as necessarily centrally administered, and introduces the concept of governmentality at a variety of levels.

William Kelleher Storey, *Guns, Race, and Power in Colonial South Africa* (Cambridge University Press, 2008).

A fascinating study of the relationship of guns to racism, raising the question whether technologies are indeed neutral with regard to race.

Oct. 19: Invention, computing, and digitality

Martin Campbell-Kelly, William Aspray, Nathan Ensmenger, and Jeffrey R. Yost, *Computer: A History of the Information Machine*, Westview Press, 3rd ed., 2013.

Pay particular attention to parts two and three describing how computers became business technologies, and how innovation in computing both occurred historically and how people conceived of it intellectually.

William J. Turkel, et al, "Grounding Digital History in the History of Computing," *IEEE Annals of the History of Computing*, 36 (Apr-June 2014): 72-75.

This piece asks whether computing history adequately deals with digitality in its larger sense, and suggests ways to use computing history to incorporate more contemporary concerns.

For further reading:

Michael Sean Mahoney, *Histories of Computing*, ed. and introduction by Thomas Haigh, Harvard University Press, 2011.

This is also an excellent resource for history of computing, and is especially good on software and on computing's connection to mathematics. Haigh's introduction is also an introduction to computing history, and the early essays in the volume discuss the significant intellectual questions raised by history in the field.

Oct. 26: Industrialization/Industrial Revolution

David Landes, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*, 2nd ed. (Cambridge University Press, 2003)

This is the classic study of technology and the industrial revolution. See if you can find people in it, among the statistics.

Jeff Horn and Merritt Roe Smith, eds. *Reconceptualizing the Industrial Revolution* (Cambridge, Mass.: MIT Press, 2010).

We will read the introduction, and Joel Mokyr's piece on European Enlightenment, science, and industrialization. We will choose together a couple of other pieces to read, as this volume is particularly strong in industrialization in non-European contexts. We will also read something from it for next week, on labor.

William J. Ashworth, "The British industrial revolution and the ideological revolution: Science, Neoliberalism and History," *History of Science* 52 (2014): 178-199.

For further reading:

Margaret Jacob, *Scientific Culture and the Making of the Industrial West* (Oxford University Press, 1997).

This is a good introduction to the argument that science presaged industrialization. It is useful when thinking about the role of science in technology today, when we still think of technologies as applied science although the evidence is mounting that technologies grow more on their own.

Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca, NY: Cornell University Press, 1992).

This is a path-breaking study of how Western cultural views of Africans, Indians, and Chinese changed as a result of European industrialization.

Joel Mokyr, *The Enlightened Economy: An Economic History of Britain, 1700-1850* (New Haven, CT: Yale University Press, 2012).

Mokyr here argues that industrialization can only be understood as a broad new approach to the world, an enlightened one, and cannot be adequately described as an assemblage of a variety of independent movements.

Joel Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress* (Oxford and New York: Oxford University Press, 1992).

Mokyr's study of technological innovation as the foundation for economic growth is widely known and cited, and centers on industrialization.

Nov. 2: A new category of workers and industrialization: industriousness

Jan de Vries, “The Industrial Revolution and the Industrious Revolution,” *Journal of Economic History* 54 (1994): 249-70

De Vries, in this piece, made labor truly central, in its embodied human form, to questions of industrialization.

Clare Crowston, “An Industrious Revolution in Late Seventeenth- and Eighteenth-Century Paris: New Vocational Training for Adolescent Girls and the Creation of Female Labor Markets,” in M.J. Maynes et al, eds., *Secret Gardens, Satanic Mills: Placing Girls in European History, 1750-1960* (Indiana University Press, 2004)

Here the fruit of de Vries’s intervention is borne out. Crowston (and other contributors to this volume) demonstrates that early industrial labor was not unskilled and untrained, and that the labor of girls was necessary.

Jeff Horn and Merritt Roe Smith, eds., *Reconceptualizing the Industrial Revolution* (Cambridge, Mass.: MIT Press, 2010).

We will read Marta Vincente’s chapter on artisan families, and Jeff Horn’s on industrialization in France, which develops themes from Crowston on a larger scale.

For further reading:

I am not sure it belongs here with industriousness, but it should appear somewhere: E.P. Thompson, *The Making of The English Working Class* (Vintage, 1966), the classic study of how industrialization shaped people into workers, written by an unconventional and occasional academic.

Merritt Roe Smith, *Harper’s Ferry Armory and the New Technology: The Challenge of Change* (Ithaca, NY: Cornell University Press, 1980).

This is an eye-opening look at the transition of gunsmiths from independent craftsmen to machine tenders, on what was the American frontier, at Harper’s Ferry.

Phil Scranton has also done significant work on labor and technology, and innovation. In the introduction to *Endless Novelty* (Princeton University Press, 2000), Scranton describes a variety of ways to characterize innovation, in technological, inventive, and managerial contexts. His article “None too porous boundaries: Labor history and the history of technology” (*Technology and Culture* 29 (1988)) calls for historians of technology to look more explicitly at labor. His suggestion has only partially been taken up.

Nov. 9: Colonialism, globalization

Peter Marsh, *The New Industrial Revolution: Consumers, Globalization and the End of Mass Production* (New Haven, CT: Yale University Press, 2012).

With Marsh, we entertain the question of whether our current historical understanding of mass production equips us to understand contemporary and global developments in production.

Allan Isaacman, *Cotton is the Mother of Poverty: Peasants, Work, and Rural Struggle in Colonial Mozambique, 1938-1961* (Heineman, 1995).

From Marsh's broad view of technology and the globe we move to a closely focused study of the rural experience of industrial production and globalization.

For further reading:

Roland Wenzlhuemer, *Connecting the Nineteenth-Century World: The Telegraph and Globalization* (New York: Cambridge University Press, 2013).

This is a historical argument that globalization is necessarily tied to technology and is also much older than we might think.

David Hounshell, *From the American System to Mass Production, 1800-1932: The Development of Manufacturing Technology in the United States* (Baltimore: Johns Hopkins University Press, 1985).

You should be aware of this fine and often-cited study detailing different systems of manufacturing things in quantity, and what is truly significant about mass production.

Nov. 16: Invention and national character

Thomas Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm* (Viking, 1989).

Hughes's was one of the leading figures in the history of technology. *American Genesis* is his overview of technology as a distinctive feature of American life.

John Dos Passos, *Big Money* (Houghton Mifflin, 1933).

Big Money is volume three of Dos Passos's *USA Trilogy*, his critique of American society of the 1920s and 1930s. It was very influential stylistically, and has been described as an early form of hyper-text. Reading it takes a big of time, because so many themes are introduced. It ends up making a counter-argument to Hughes's in *American Genesis*.

Nov. 23: Myths of invention

Angela Lakwete, *Inventing the Cotton Gin: Machine and Myth in Antebellum America* (Johns Hopkins University Press, 2003)

With Lakwete we continue with the theme of innovation, here taking up a very important myth in American history, that reflects both the international myth

of American inventiveness, and the myth of the American south as a unique culture.

For further reading:

Paul Israel, *Edison, A Life of Invention* (New York: John Wiley, 1998). People often believe that invention is the work of lone geniuses. Israel's study of Edison is a corrective to that view, and gives good insight into how ideas of invention and inventiveness have changed with time.

You may also want to see Judith A. McGaw, *Most Wonderful Machine: Mechanization and Social Change in Berkshire Paper Making, 1801-1885* (Princeton University Press, 1987), which examines the role of machines in remaking a community.

A similar theme but quite different approach is Anthony F.C. Wallace's *Rockdale: The Growth of an American Village in the Early Industrial Revolution* (University of Nebraska Press, 2005). Both McGaw and Wallace are considered classics within the history of technology.

Ruth Schwartz Cowan's *More Work For Mother* (New York: Basic Books, 1985) is a sustained critique of the myth that inventions have been labor-saving. It is a foundational study in the field, and an early serious investigation of gender and technology.

If you are interested in the invention of technical concepts, see Donald Mackenzie, *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (Cambridge, Mass: MIT Press, 1990)

Nov. 30: Technology and environment

William Cronon, *Nature's Metropolis: Chicago and the Great West* (W.W. Norton 1992)

This is the classic work of environmental history.

Alfred W. Crosby, *Ecological imperialism: the biological expansion of Europe, 900-1900*, 2nd ed (Cambridge Cambridgeshire ; New York : Cambridge University Press, 2004)

Crosby argues that European influence spread for biological and ecological reasons, rather than for military ones.

For further reading:

William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (rev. ed.) (Hill and Wang, 2003), forward by John Demos

This is a lovely read, bringing together colonial history and environmental history, and was Cronon's first book.

James R. Fleming, *Fixing the Sky: The Checkered History of Weather and Climate Control* (Columbia University Press, 2010)

A historian of geology looks at human attempts to create and contain climate.

Nathan Ensmenger, "Computation, Materiality, and the Global Environment," *IEEE Annals of Computing* 35 (July-Sept. 2013): 78-80

A reminder that even wireless technologies carry global consequences, from a historian of computing.

Joachim Radkau. *The Age of Ecology: A Global History* (Cambridge:Polity Press, 2014).

A wide-ranging survey of the history of environmental movements from the romantic era through the present.

Dec. 7: Deep history and the roots of the anthropocene

Clive Hamilton, et al, *The Anthropocene and the Global Environmental Crisis: Rethinking modernity in a new epoch* (Routledge, 2015)

A provocative statement of human responsibility for the making of what has become a human world, using concepts from the history of geology.

Robert V. Davis, "Inventing the Present: Historical Roots of the Anthropocene" *Earth Sciences History* 30 (2011): 63-84.

Dec. 14: Critiques of the concept of the anthropocene

Jedediah Purdy, "Should we be suspicious of the anthropocene?" *Aeon Magazine* <http://aeon.co/magazine/science/should-we-be-suspicious-of-the-anthropocene/>

Libby Robin, "Histories for Changing Times: Entering the Anthropocene?" *Australian Historical Studies*, Sept. 2013, pp. 329-340

Lydia Barnett "The Theology of Climate Change: Sin as Agency in the Enlightenment's Anthropocene," *Environmental History* 20(2015):217-237

For further reading:

Jedediah Purdy, *After Nature: A Politics for the Anthropocene* (Harvard University Press, forthcoming Sept. 2015)

Dec. 18: Analytical papers are due. Please note that this is a Friday. Please send them to me by midnight.

Finals week: We will choose a common time for a final meeting, for a meal and to hear presentations of analytical papers.