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History of Information

This course is designed to put information into historical perspective. Graduates of the course should be able to see in what ways the present "information age" is distinct from the past and in what ways, whether distinct or not, the past can help us to understand the present. Towards these ends, we will look back across the broad stream of history at particular moments and developments that make information "visible," sometimes to the inhabitants of the moment at issue and sometimes to us today. For an overview of this history, see the "timeline" assembled by the late Professor Geoffrey Nunberg, who helped to create this course.

For this course, we will look in particular at first-hand accounts by historical actors as they wrestle with the confrontations, innovations, and challenges of their day, much as we do now. While it is hard to escape a Western focus in such a history, the course will attempt to address the topic of information from a global perspective as best it can. And while such histories tend to be told by white men, it will work hard to support the campus goal of inclusivity, both in its subject matter and in the classroom.

WEEK 1

17 Jan: Introduction: Why "History of Information"?

This class will provide an overview of the coming semester, asking why a course like this might be appropriate today. We will also discuss the requirements of the course.

Required Reading:

There is no required reading for this class.

19 Jan: The "Age of Information"

Ours, it is often said, is the "age of information." In this class we will examine what that might mean and to what extent ours is the first age in history with the right to make such a claim.

Required Reading:

There is no required reading for this class.

WEEK 2

24 Jan: Technological Revolutions & Determinism

In this class we will look at arguments that suggest or contest the idea that technologies (and particularly information technologies) are capable of changing the world. The generation of McLuhan and Williams bore much the same relationship to the dramatic transformations brought about by television as you do to the transformations following the commercial internet. They try to understand television's effects on their society much as

we try to understand the effects of the internet on ours.

Required Reading

McLuhan, Marshall. 2013 [1964]. *Understanding Media: The Extensions of Man*. New York: Ginko Press.

Read: "Introduction to the First Edition," "Introduction to the Second Edition" & "1: The Medium is the Message" (chapter 1).

Williams, Raymond. 1974. *Television and Cultural Form.* New York: Schocken Books.

Read: Chapter 1, introduction and sections A ("Versions of Cause and Effect in Technology and Society") & B ("The Social History of Television as a Technology") (pp. 1-12) & chapter 5, section C ("The Technology as a Cause") (pp. 129-132).

26 Jan: Early Information Technologies: Letters

Writing was “the first information technology,” but it roots go even deeper to the appearance of signs and symbols in neolithic times. We’ll look at how the idea of writing with letters, still one of the great intellectual achievement of the species, slowly emerged over millennia.

Required Reading

Astle, Thomas. 1876 [1784]. *The Origin and Progress of Writing, As Well Hieroglyphic as Elementary.* London: Chatto & Windus.

Read Chapter II: "The Origin of Letters," from page 10 to the last full paragraph on p. 13 and Chapter IV "General Account of Alphabets," from page 48 to the diagram on page 51.

Defoe, Daniel. 1726. *An Essay upon Literature or An Enquiry into the Antiquity and Original of Letters Proving that the two Tables, written by the Finger of God on Mount Sinai, was the first Writing in the World; and that all other Alphabets derive from the Hebrew …* London: Thomas Bowles.

Read pp. 1-15, stopping after the second paragraph, which ends "their pretended Knowledge of Letters must be so too."

Chŏng Inji. 1446. Excerpts from "Postscript to the Hunmin Chŏngŭm."

WEEK 3

31 Jan: Early Information Technologies: Numbers

Like letters, numbers have a long history. For this class we will explore the early history of numbers and the eventual convergence on "Arabic" numbers. We will also look at the development of early calculating systems, in particular the development of "logarithms."

Required Reading

Al-Khwarizmi, Muhammad ibn Müsa. 1915 [c. 840]. *The Book of Algebra and Almucabola: Containing Demonstrations of the Rules of Equations of Algebra* (trans from the Latin by Robert of Chester). New York: Macmillan.

Read Khwarizmi's introduction (p. 67-69) and chapters 1-4 (page 69-75), then skip to final chapter "Mercantile Transactions" (121-125).

Napier, John. 1889 [1619]. *A Description of the Admirable Table of Logarithmes: With a Declaration of the most Plentifull, Easie, and Speedy Use Thereof.* London.

Read "To the Right Honourable and Right Worshipful Company of Merchants" by Samuel Wright [only in the transcription], Napier's dedication to Prince Charles, the "Author's Preface," by Napier, "Preface to the Reader" by Henry Brigges and Napier's "Conclusion" and “Admonition."

2 Feb: Manuscript "Revolution" and the Authority of Text

Although printing is often credited as the technology that brought about the first "information revolution," to make such a claim it is important to understand (and not diminish) what came before. In this class, we will look at book technologies "before Gutenberg."

*Required Reading*s

Plato. 1961 [c. 360 bce]. "Phaedrus" from *The Collected Dialogues of Plato* (trans Lane Cooper). Princeton: Princeton University Press.

Read: from the beginning, p. 476, to "Here you are then," p. 479; then from ""But there remains the question of propriety and impropriety in writing," at the bottom of p. 519, to the end, p. 525.

Trithemius, Johannes. 1974 [1492]. *In Praise of Scribes.* R. Behrendt (ed.). Lawrence, KA: Coronado Press. *Read* Chapters I-III, V-VII, XIV.

ibn-Khaldun, Abd Ar Rahman bin Muhammed. 1968 [c. 1375]. "The Craft of Book Production," chapter V section 30 (p. 536) in *The Muquaddimah* (trans. Rosenthall).

WEEK 4

7 Feb: Print "Revolution"

As we have seen, many scholars have argued that printing brought about the first great technological revolution, giving rise to the religious reformation, democracy, science, and modern society. Indeed, today, people often herald the significance of a technology with the lead "not since the invention of the printing press …." As part of our attempt to discover what people thought at the time of such "revolutions," this class will look the attitudes of people writing at the dawn of European printing, the great Dutch scholar Erasmus and William Caxton, the British merchant credited with bringing printing to England.

Required Readings

Erasmus, Desiderius. 2001 [1506]. "Festina Lente," adage II, 1.

Caxton, William. 1475. Printer's Prologue and Epilogies to Raoul Lefevre, *Recuyell of the Histories of Troy* pp 5-9 in *Prefaces and Prologues to Famous Books.* New York: Collier and Son, 1910.

A "recuyell" is a collection or compilation. We have made a list of other unfamiliar words.

9 Feb: Communications "Revolutions": By Land and By Sea

Encounters with people from different cultures can make us aware of aspects of information that we otherwise tend to take for granted. In this class we will look at two particularly famous travellers in search of new sources of commodities and explore how encounters with different societies and markets challenged their preconceptions.

Required Readings

Columbus, Christopher. 2017 [1492] "The First Voyage of Columbus: A Letter Addressed to the Most Noble Lord Raphael Sanchez," pp. 1-17, in *Selected Letters of Christopher Columbus.* Surrey UK: Hakluyt Society/Ashgate.

Columbus, Christopher. 2010 [1492] "Journal of the First Voyage," [15-18].
and
"Tuesday, 6th of November," pp 69-72 in *Journal of Christopher Columbus (During His First* Voyage, 1492-93), (Markham, ed.) Surrey, UK: Ashgate.

Polo, Marco. 1903 [c 1310]. "Description of the Great City of Kinsay, which is the Capital of the Whole Country of Manzi," Chapter LXXVI (pp. 185-193) in *The Book of Ser Marco Polo, the Venetian, Concerning the Kingdoms and Marvels of the East* volume 2 (trans, Henry Yule). New. York: Scribner.

WEEK 5

14 Feb: Introducing the Ledger: Information, Markets and Money

Cryptocurrency has made us all aware of the "ledger." This has a surprisingly long history and early accounts endured for centuries. In this class we will look at the development of accounting as a key mechanism for international exchange of both information and goods.

Required Reading

Paciolo, 1963 [1494]. *Paciolo on Accounting. New York: McGraw Hill*.

Read chapters 1, 5, 6, 10, 11, 13, 27, & 36. This may seem like a lot but these are all either one or two pages each, with the exception of ch. 36, which has 3 pages. [Chapter 1 starts on p. 25 of this edition.]

Fisher, George, 1748. *The American Instructor: Or Young Man's Best Companion*.

Philadelphia.

Read the title page, the first two pages of “Bookkeeping” and the concluding section, “Advice to a young tradesman, written by an old one"

16 Feb: Scientific "Revolution"

Though, as we have seen, science is sometimes portrayed as the result of the "print revolution," it is also credited with bringing about its own revolution. We will explore this topic through the writings of Thomas Sprat's history of the path-breaking Royal Society, which gained its royal title 360 years ago) and of Jonathan Swift, who took a very different view of scientists and their work.

Required Reading

Sprat, Thomas. 1667. *The History of the Royal Society of London for the Improving of Natural Knowledge.* London.

Swift, Johnathan. 1912 [1726]. "The Author Permitted To See the Grand Academy of Lagado," Book 3, Chapter V (pp. 165-173 in *Gulliver's Travels*. London: J.M. Dent.

WEEK 6

21 Feb: The Emergence of the Public Sphere

With the rise of print and popular literacy, there arose a new sphere of communication in which the new force of public opinion took form out of a mix of oral and written encounters, which some see as the model for modern networked communication. Looking at early issues of early newspapers we'll consider early assumptions and reactions to "new media."

Required Reading

[Mallett, Elizabeth.] 1702. *Daily Courant* 1 (March 11): 1.

[Defoe, Daniel.] 1704. *A Weekly Review of the Affairs of France*. 1(1 Feb 19): 1-6.

Bickerstaff, Isaac [Richard Steele]. [1709] [Introduction] *The Tatler* 1 (1 April 12): 11-14 and "St. James's Coffee-house, April 11, pp. 19-21.

23 Feb: Advertising

As newspapers became a key component of society's information infrastructure and the related public sphere, so too did advertising, which was used to support that infrastructure. This combination, we shall see, raised for the Eighteenth Century many of the questions we still confront today given that many of our key informational resources also serve as advertising platforms.

Required Reading

[Steele, Richard], 1714. "Essay against Quacks," *The Spectator* 572 (Monday, July 26): 56-60.

Johnson, Samuel. 1759. "The Art of Advertising." *The Idler* 41 (Jan 20): 121-123.

WEEK 7

28 Feb: Unnoticed Revolutions? Time & Space

We have looked at early travellers and their struggles to know where they were. In this class, we'll look at the challenges of global travel, the tools developed to make it manageable, and the challenges of developing those tools.

Required Reading

"An Act for Providing a Publick Reward for Such Person or Persons as Shall Discover the Longitude at Sea." 1714.

Maskelyne, Nevil. 1767. *The Original Observations of the Going of the Watch from Day to Day.* London.

Read "Introduction," pages iii-vi and flip ahead to scan some of the evidence Maskelyne presents.

Harrison, John. 1767. *Remarks on a Pamphlet Lately Published by the Rev. Mr. Maskelyne, Under the Authority of the Board of Longitude.* London.

2 March: Work and Information

The institutions and tools whose developments we have traced in earlier classes spread mechanisms that transformed production and labor. In this class, we will look at first-hand accounts of the changing character of labor and what they can tell us about industry, work, and both class and gender relations then and now.

Required Reading

Duck, Stephen. 1731. "The Thresher's Labour," pp. 11-27 in *Poems on Several Occasions,* London.

Collier, Mary. 1762 [1733?] "Woman's Labour: An Epistle to Mr. Stephen Duck," pp. 5-15 in *Poems on Several Occasions.* Winchester.

The Sadler Commission. 1832. *Report on Child Labour*

WEEK 8

7 March: Statistics and Society

It has been argued that the 18th and 19th century saw an "avalanche of printed numbers." In this class we shall investigate some of early work that promoted this avalanche and at techniques devised to deal with it.

Required Reading

Sinclair, John. 1798. "History of the Origin and Progress of the Statistical Account of Scotland". pp. ix - xxii in *The Statistical Account of Scotland: Drawn Up From the Communications of the Ministers of the Different Parishes.* Vol 20. Edinburgh: William Creech.

Playfair, William. 1785-6. *The Commercial and Political Atlas: Representing by Means of Stained Copperplate Charts, the Exports, Imports, and General Trade of England, at a Single View*. London.

Read: "Preface" (pp. i-ii), "Explanation of the Charts," and then pp. 3-11 (following the numbers in the original--not every page has a number on it).

9 March: Information as Property

Information, it has famously been claimed, "wants to be free." Nevertheless, people have long sought to control it. One way they have tried to do this is by making it into property, in particular "intellectual property" [IP]. The readings for this class cover laws that introduced fundamental types of IP to the English-speaking world. As you read them, consider the extent to which we are still subject to these particular laws.

Required Reading

"An Act for the Encouragement of Learning by vesting the Copies of Printed Books in the Authors or Purchasers of Such Copies, during the Times therein mentioned," 1710.

Constitution of the United States, Article 1, Section 8 [1789].

U.S Copyright Act, 1790.

An Act to Amend the Several Acts for the Encouragement of Learning [54 Geo III 156], 1814.

"An Act Concerning Trade Marks and Names," 1863.

"An Act to Revise, Consolidate, and Amend the Statutes Relating to Patents and Copyrights," 1870.

WEEK 9

14 March: Reference Books and the Organization of Knowledge

Western notions of “knowledge” developed in the eighteenth century around the emergence of the encyclopedia, modern libraries and museums, and academic disciplines

—all of whose traces are still evident today in everything from Wikipedia to a college course catalogue. All of these sources rely on ideas about classification that were shaped in the 18th and 19th centuries. We will look at two of the most influential texts in that area from each century.

Required Reading

Diderot, Denis. [1751-1765] "Detailed Explanation of the System of Human Knowledge." pp. xlvii-li in the Introduction to volume 1 of *The Encyclopedia of Diderot & d'Alembert* published in the Collaborative *Translation Project.* Translated by Richard N. Schwab and Walter E. Rex. Ann Arbor: Michigan Publishing, University of Michigan Library, 2009.

Darwin, Charles. 1936 [1859]. "Classification, " in chapter XIV, The Origin of Species. New York: Modern Library.

WEEK 10

21 March: Another Communications Revolution?

This week we turn to widely acknowledged early "information technologies": the telegraph and the telephone. Once again we shall consider the claims that were made for them at the time. The class brings us into California with Henry George's essay and also brings us closer to the present with his concerns about technology monopolies.

Required Reading

George, Henry. 1869. “The Western Union Telegraph Company and the California Press,” *New York Herald* April 25.

Green, Norvin. 1883. "The Government and the Telegraph," *North American Review* 137: 422-434.

Hubbard, Gardiner G. 1883. "Government Control of the Telegraph, " *North American Review* 137: 521-534.

23 March: Information and Democracy

With the nineteenth-century rise of universal schooling and the appearance of the modern postal system and mass-circulation daily newspaper, we see the beginnings of our notion of mass literacy, and of the debates people have about it (even now, when talking about technology): is literacy a tool for social control or does it enable subversive thinking?

Required Reading

Franklin, Benjamin. 1906 (1791). *The Autobiography of Benjamin Franklin*. New York: Houghton, Mifflin & Company.

Douglass, Frederick. 1849. *Narrative of the Life of Frederick Douglass, an American Slave.* Boston. Anti-Slavery Office. *Read* Chapters VI, VII (pp. 32-44).

X, Malcolm, & Alex Haley. 1964. *The Autobiography of Malcolm X*. New York: Ballantine.

Read selection from Chapter X, “A Homemade Education.”

WEEK 12

4 April: Capturing Information: Photography and Phonography

The invention of photography played a central role in nineteenth-century thought, not just as an intriguing new technology, but also as a model for the “objective” view of the world sought after by journalists and scientists as a means of documenting social life. We shall consider related questions through the eyes of a poet, an inventor, and a photographer.

Required Reading

Baudelaire, Charles. 1859. "On Photography" from *The Salon,* June-July.

Edison, Thomas. 1888. "The Perfected Phonograph. *North American Review*, 146: 641-650.

Steichen, Eduard. 1903. "Ye Fakers." *Camera Work*, 1: 48.

6 April: Broadcast

The shaping of radio and television in the twentieth century was a product of complex interactions between the developers of the technology, the military, the state, commercial interests, and public institutions, which led to broadcast media taking different forms in different nations. These issues are still with us as “broadcast” moves to a new technological base.

Required Reading

J.H.M. 1922. "Radio Currents: An Editorial Interpretation". *Radio Broadcast* 1(1): 1-5.

Wilhelm, Donald. 1922. "Wanted: An American Radio Policy: The Problem Confronting Our Interest, Amateur, Commercial and Governmental." *Radio Broadcast* 1(1): 29-33

Paulu, Burton. 1961. "The British Broadcasting Corporation" pp. 7-30 in *British Broadcasting In Transition*. Minneapolis: University of Minnesota Press.

WEEK 13

11 April: Computer "Revolution"

We often see ourselves as beneficiaries of a twentieth-century revolution introduced by the computer and thereby find it easy to accept the computer as the machine that "changed the world." In this class we will discuss the nineteenth-century origins of the modern computer, looking through the eyes of its early designers, and contemplate why it took so long for the world to change.

Required Reading

Babbage, Charles. 1822. *A Letter to Sir Humphrey Davy, Bart, President of The Royal Society ... On the Application of Machinery to the Purpose of Calculating and Printing Mathematical Tables*. London: B & A Taylor.

Lardner, Dionysius. 1834. [Review of Babbage's Writings], *Edinburgh Review*, July: 263-327. *Read:* "Introduction."

Lovelace, Ada. 1852. "Notes by the Translator" to L.F. Menabrea, "On Babbage's Analytic Engine."

Optional Viewing

Graham-Cumming, John. 2012 "The Greatest Machine That Never Was," TEDx (video). This twelve-minute video will introduce you to Babbage and Lovelace. Meanwhile, you can think of Lardner as the Graham-Cumming of his day.

Engelbart, Douglas. 1968. "The Mother of All Demos." ACM/IEEE, December 9.

13 Apr: Storage and Search

We tend to associate storage and search with digital technologies and such things as "the cloud," but in this class we will look back at earlier history and consider in what ways modern search technologies have and have not changed things for the better.

Required Reading

Bush, Vannevar. 1945. As We May Think, *The Atlantic Monthly.* 176 (1): 101-108.

Schmidt. Eric. 2014. “A Chance for Growth.” *Frankfurter Allgemeine*, April 4.

Döpfner, Matthias. 2014."Why We Fear Google" *Frankfurter Allgemeine*, April 17.

Zuboff, Shoshana. 2014. “Dark Google." *Frankfurter Allgemeine*, April 30.

WEEK 14

18 April: Advent of the Internet

This week we will look at research that led to the Internet and the Web, and, as in previous classes consider to what extent the ideas of early pioneers are still relevant to what we experience now.

Required Reading

Berners-Lee, Tim, Robert Cailliau, Ari Luotonen, Henrik Frystyk Nielsen, and Arthur Secret. 1994. "The World-Wide Web." *Communications of the ACM* 37(8): 76-82.

Baran, Paul. 1971. "Summary of Forecasts" and "Detailed Description of New Services, " chapters II and III in Potential Market Demand for Two-Way Information Services to the Home 1970-1990. Menlo Park, CA: Institute for the Future IFF-R-7.

Davies, Donald W. 2001. Annexes (pp. 158-162) in "An Historical Study of the Beginnings of Packet Switching." *The Computer Journal* 44(3): 152-162.

Optional Listening

National Physical Laboratory. 2009. "The Story of Podcasting." This 20-minute podcast contains interviews with Davies's colleagues who worked with him on the development of packet switching at the NPL.

20 April: Social Implications of the Internet: The Death of Distance

The internet, we are told, has made interconnection instantaneous, finally annihilating time and space. But, as COVID19 drove us apart, some people began to see previously unappreciated value in collocation. In this class, we shall consider to what extent predictions of the "annihilation of space and time" and the "death of distance" have been fulfilled.

Required Reading

Marshall, Alfred. 1920 [1890]. "Industrial Organization, Continued: The Concentration of Industries in Particular Localities," Book IV chapter X (pp. 222-231) in *Principles of Economics*. London: Macmillan & Co.

Saxenian, Annalee. 1996. "Conclusion," pp. 161-171 in *Regional Advantage: Culture and Competition in Silicon Valley and Route 128.* Cambridge, MA: Harvard University Press.

WEEK 15

25 April: Information and Markets

Information and Markets

Markets exert such a ubiquitous force on our daily lives that it can be easy to disregard it - as a fish does water. Yet, we depend on markets to manage information in all sorts of ways, both on a daily basis and on a global scale. We first read two authors who argue for the role markets play in managing information. As economic interaction increasingly occurs in technology-mediated marketplaces managed by for-profit companies, do these assumptions about how markets manage information change? Can we depend on marketplaces operated by technology companies to manage information in the same ways today?

Required Reading

Hayek, F. A. (1945). The use of knowledge in society. *The American Economic Review*, 35(4), 519-530.

Read, L. E. (1958). "I, pencil." *Freeman*, 8 (12): 32-37.

Hwang, T. & Elish, M. C. (2015). The Mirage of the Marketplace: The Disingenuous Ways

Uber Hides behind its Algorithm.

27 April: Debate

In the final class we will look back over the course by holding a debate to consider whether a "continuum" or a "revolution" best describes the relationship of the current "Information Age" to the past.