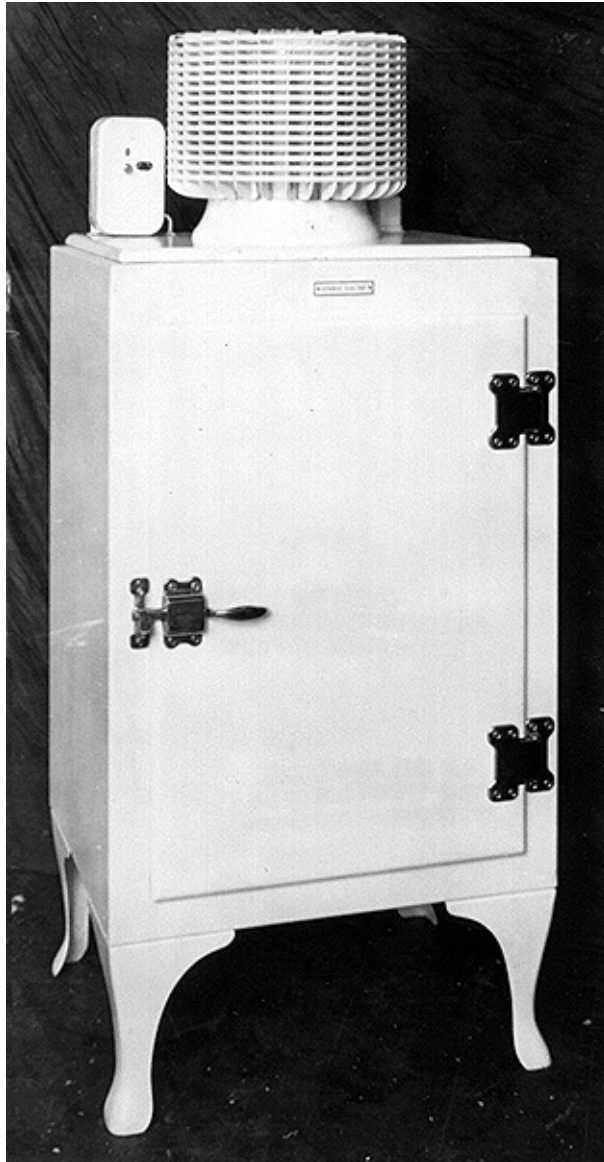


# HISTORY OF BUILDING TECHNOLOGY



ARC 386M-00915  
Spring 2003  
T 3:30-6:30, Sutton 3.112  
Instructor:  
Dr. Steven Moore

**Course Description:**

The purpose of this course is to help students better understand how artifacts, buildings, and places shape, and are in turn shaped by technology. *Historic Preservation* students will benefit by investigating the social process and technical details of innovations in building construction. This knowledge will enable students to critically interpret historic structures. *Sustainable Design* students will benefit by investigating the intended and unintended consequences of the technology choices made by society. This knowledge will enable students to critically contribute to the development of environmentally responsible architecture. *History* students will benefit from investigating architecture, not as the product of aesthetic invention, but as the product of the economic, political, and natural conditions of place. *Community and Regional Planning* students will benefit from investigating the history of urban infrastructure. Technological choices made for cities of the future are, of course, limited by those made by cities of the past. Our investigations will range from the pre-modern to the contemporary, but will not attempt to be comprehensive. Rather, cases of technology development will be selected for investigation on the basis of their relevance to contemporary issues. A sub-theme of the course will be the problem of “historic revisionism,” or how changing data might alter interpretation of technology development. Texts by Sigfried Giedion will serve as a measure of the problem.

**Enrollment:**

Enrollment will be limited to 15 graduate students. Undergraduates may be admitted with the approval of the instructor. School of Architecture MSAS and Post Professional students will be given priority.

**Writing requirements:**

Students are encouraged to bring continuing interests to the course. Two principal papers of 10-15 pages will be required. Paper no.1 should investigate *issues* in a specific area of technology development. For example, you might investigate material processes such as the wood, concrete, or steel frame; or, you might investigate social processes that concern labor and/or space relations effected by technology development. Paper no.2 should investigate a specific case of architecture, urbanism, or landscape in which technology plays a significant role. This investigation should rely upon the interpretation of primary source materials available at the Alexander Drawing Collection [see, <http://www.lib.utexas.edu/Libs/APL/coll.html>] or the Austin History Center.

Paper No. 1 will be submitted in three stages: as a one-page abstract, fully developed first draft, and final submission. Paper No.2 will be submitted as an abstract and final submission. Each student will present an oral summary of their final papers to the class.

**Format:**

The class will meet once weekly. Class sessions will commence with a summary of the reading required for that session by a selected student. Each student in the class will be required to summarize and lead discussion once during the term. Although written notes or media may be used to facilitate the presentation, the summary may NOT be read. Following the summary a lecture of approx. 1 hr. will expand upon the reading and will be followed by seminar discussion.

**Books:**

These titles are available at the Co-op, and will also be on reserve in the Architecture and Planning Library.

**Required Book List:**

- Briggs, Lindy. *The Rational Factory: Architecture, Technology, and Work in America's Age of Mass Production*. (Baltimore: Johns-Hopkins University Press, 1996).
- Cooper, Gail. *Air Conditioning America: Engineers and the Control of the Environment* (Baltimore: Johns Hopkins University Press, 1998).
- Dillon, David. *The Architecture of O'Neil Ford: celebrating place* (Austin: University of Texas Press, 1999.)
- Fathy, Hassan. *Architecture for the Poor: An Experiment in Rural Egypt* (Chicago: Chicago University Press, 1973).
- Frampton, Kenneth. *Studies in Tectonic Culture* (Cambridge, MA: MIT Press, 1995).
- Nye, David. *Electrifying America* (Cambridge, MA: MIT Press, 1990).

**Reserve book list:**

- Cowan, Ruth Schwartz. *More Work for Mother: The Ironies of Household Technology From the Open Hearth to the Microwave* (New York: Basic Books, 1983).
- Cummings, Abbott Lowell. *The Framed Houses of Massachusetts Bay* (Cambridge, MA: Harvard University Press, 1979).
- Daniels, Klaus. *The Technology of Ecological Building* (Basel, Switzerland: Birkhauser, 1994).
- Elliott, Cecil D. *Technics and Architecture* (Cambridge, MA: MIT Press).
- Fitchen, John. *Building Construction Before Mechanization* (Cambridge, MA: MIT Press, 1986).
- Herbert, Gilbert. *The Dream of the Factory-Made House: Walter Gropius and Conrad Wachsmann* (Cambridge, MA: MIT Press, 1984).

- Jandl, H. Ward, et. al. *Yesterday's Houses of Tomorrow: Innovative American Homes, 1850-1950* (Washington, DC: Preservation Press, 1991).
- Jester, Thomas C., Ed., *Twentieth Century Building Materials: History and Conservation* (New York: McGraw-Hill, 1995).
- Melosi, Martin V. *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 2000.)
- Nye, David. *Narratives and Spaces: Technology and the Construction of American Culture* (Exeter: University of Exeter Press, 1997).
- Peters, Tom. *Building the Nineteenth Century* (Cambridge, MA: MIT Press, 1996).
- Pursell, Carroll W. *The Machine in America* (Baltimore: Johns Hopkins University Press, 1995).
- Schwitzer, Robert and Michael W.R. Davis, *America's Favorite Homes: Mail-Order Catalogues as a Guide to Popular 20<sup>th</sup>-Century Houses* (Detroit: Wayne State University Press, 1990).
- Stevenson, Katherine Cole and H. Ward Jandl, *Houses by Mail: A guide to Houses by Sears, Roebuck & Co.* (Washington: Preservation Press, 1986).
- Tobey, Ronald. *Technology as Freedom* (Berkeley, CA: University of California Press, 1996).

**Blackboard reading:**

Additional reading in the form of book excerpts or articles will be posted on the course *Black Board* site.

**Topic 1: Course Introduction**

The disciplines of philosophy, geography, sociology, and history interpret technology through differing and sometimes conflicting methodologies. We will examine the philosophical assumptions and research methods implicit in each discipline and propose an interdisciplinary mode of interpreting technological objects.

Required reading:

Harries, Karsten. "Introduction," in *The Ethical Function of Architecture* (Cambridge, MA: MIT Press, 1997), pp. 2-13.

**Topic 2: Technology Development and Space**

Technology is commonly understood to be "invented" by a particular person at a particular place at a particular time—it then, we imagine, spreads equally through space. Not really.

Required reading:

Fitchen, John. *Building Construction Before Mechanization* (Cambridge, MA: MIT Press, 1986), p. 169-188.

Peters, Tom. *Building the Nineteenth Century* (Cambridge, MA: MIT

Press, 1996), p. 3-34.  
 Latour, Bruno. *Science in Action* (Cambridge, MA: Harvard University Press, 1987), p. 215-257.

Additional reading:

Nye, David. *Narratives and Spaces: Technology and the Construction of American Culture* (Exeter: University of Exeter Press, 1997).  
 Pursell, Carroll W. *The Machine in America* (Baltimore: Johns Hopkins University Press, 1995), p. 1-87, 155-203.

### **Topic 3: Arches and Vaults**

The technology of arches and vaults is an archaic yet primary mode of construction that is, some moderns argue, irrelevant to contemporary economic conditions. The work of Hassan Fathy in Egypt and New Mexico provides an opportunity to examine modernist assumptions, the problem of technology transfer, and the technologies themselves.

Required reading:

Fathy, Hassan. *Architecture for the Poor: An Experiment in Rural Egypt* (Chicago: Chicago University Press, 1973).  
 Dillon, Dave. "A Mosque for Abiquiu," in *Progressive Architecture* (June 1983): 90-92.

Additional reading:

Susan Sachs, "Honoring a Visionary If Not His Vision," in *The New York Times* (Tuesday, April 4, 2000, B1).  
 Mark, Robert. *Architectural Technology up to the Scientific Revolution: The Art and Structure of Large-Scale Buildings* (Cambridge, MA: MIT Press, 1995), p. 138-181.  
 Fitchen, John. *Building Construction Before Mechanization* (Cambridge, MA: MIT Press, 1986), p. 3-38, 85-114.

### **Topic 4: Development of the Wood Frame**

Assignment: Paper no. 1 abstract due.

Required reading:

Cummings, Abbott Lowell. *The Framed Houses of Massachusetts Bay* (Cambridge, MA: Harvard University Press, 1979), p. 1-94.  
 Giedion, Sigfried. "The Balloon Frame and Industrialization," in *Space, Time, and Architecture* (Cambridge, MA: Harvard University Press, 1963), p.345-352.  
 Cavanaugh, Ted. "Balloon Houses: The Original Aspects of Conventional Wood-frame Construction Re-visited," in *JAE* 51:1 (September 1997): p. 5-15.

Additional reading:

Fitchen, John. *Building Construction Before Mechanization*

(Cambridge, MA: MIT Press, 1986), p.131-154.  
 Sprague, Paul E. "Chicago's Balloon Frame," in *The Technology of Historic American Buildings*, J. Ward Jandl, Ed. (Ottawa: The Association for Preservation Technology, 1983). [rd]

### **Topic 5: Mail-Order and Systems Houses in the United States,**

Required reading:

Schwitzer, Robert and Michael W.R. Davis, *America's Favorite Homes: Mail-Order Catalogues as a Guide to Popular 20<sup>th</sup>-Century Houses* (Detroit: Wayne State University Press, 1990), p. 21-80, 99-115, 125-137, 239-244.

Jandl, H. Ward, et. al. *Yesterday's Houses of Tomorrow: Innovative American Homes, 1850-1950* (Washington, DC: Preservation Press, 1991), p. 157-168.

Peters, Tom. "An American Culture of Construction," in *Perspecta* 25 (1989):142-161.

Additional reading:

Herbert, Gilbert. *The Dream of the Factory-Made House: Walter Gropius and Conrad Wachsmann* (Cambridge, MA: MIT Press, 1984).

Stevenson, Katherine Cole and H. Ward Jandl, *Houses by Mail: A Guide to Houses by Sears, Roebuck & Co.* (Washington: Preservation Press, 1986).

### **Topic 6: Technology Development and Style in Early Modern Architecture**

Required reading:

Frampton, Kenneth. *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture* (Cambridge, MA: MIT Press, 1995): 1-159.

Meyer, Hannes. "Building," in *Programs and Manifestoes on 20<sup>th</sup>-Century Architecture*, Ulrich Conrads, ed. (Cambridge, MA: MIT Press, 1990): 117-120.

Neuman, Deitrich. "The Century's Triumph in Lighting," in *JSAH* 54:1 (March 1995): 24-53.

### **Topic 7: Plumbing and Water Systems in the US**

Assignment: Paper No.1 draft due

Required reading:

Ogle, Mauree. *All the Modern Conveniences: American Household Plumbing, 1840-1890* (Baltimore, MD: Johns Hopkins University Press, 1996).

Additional reading:

Loos, Adolf. "Plumbing," translated by Harry Francis Malgrave, in

*Plumbing: Sounding Modern Architecture*, Nadir Lahiji and D.S.Friedman, Eds. (New York: Princeton Architectural Press, 1997), pp. 15-19. [rd]

Braham, William W. "Sigfried Giedion and the Fascination of the Tub," in *Plumbing: Sounding Modern Architecture*, Nadir Lahiji and D.S.Friedman, Eds. (New York: Princeton Architectural Press, 1997), pp.201-224. [rd]

### **Topic 8: Gendered Space and Technology Development**

Required reading:

Joy Paar, "Modern Kitchen, Good home, Strong Nation," in *Technology and Culture*, Vol. 43 No. 4 (October 2002): 657-667.

Van Slyck, Abigail. Kitchen Technologies and Mealtime Rituals: Interpreting the Food Axis at American Summer Camps, 1890-1950," in *Technology and Culture*, Vol. 43 No. 4 (October 2002): 668-692.

Nickles, Shelley. "Preserving Women," in *Technology and Culture*, Vol. 43 No. 4 (October 2002): 693-727.

Bix, Amy Sue. "Equipped for Life: Gendered Technical training and Consumerism in Home Economics, 1920-1980," in *Technology and Culture*, Vol. 43 No. 4 (October 2002): 728-754.

Additional reading:

Cowan, Ruth Schwartz. *More Work for Mother: The Ironies of Household Technology From the Open Hearth to the Microwave* (New York: Basic Books, 1983).

### **Topic 9: Developments in Environmental Control**

Assignment: Final draft of paper no. 1 due.

Required reading:

Cooper, Gail. *Air Conditioning America: Engineers and the Control of the Environment* (Baltimore: Johns Hopkins University Press, 1998).

Additional reading:

Cowan, Ruth Schwartz. "How the Refrigerator Got its Hum," in *The Social Shaping of Technology*, Donald MacKenzie and Judith Wajcman, Eds., (Philadelphia: Open University Press, 1985), pp. 202-218.

### **Topic 10: The Developments of Electricity in the US**

Assignment: Paper No. 2 abstract due

Required reading:

Hughes, Thomas P., "Edison and Electric Light," in *The Social*

*Shaping of Technology*, Donald MacKenzie and Judith Wajcman, eds., (Philadelphia: Open University Press, 1985), pp. 39-52.

Nye, David. *Electrifying America* (Cambridge, MA: MIT Press, 1990).

Additional reading:

Tobey, Ronald. *Technology as Freedom* (Berkeley, CA: University of California Press, 1996).

### **Topic 11: The Master Machine and Labor Practices**

Required reading:

Briggs, Lindy. *The Rational Factory: Architecture, Technology, and Work in America's Age of Mass Production*. (Baltimore: Johns-Hopkins University Press, 1996).

Peter Davey, "High Expectations: Commerzbank," in *Architectural Review* (July 1997): 26-39.

"Ford Rouge to get \$2 billion face-lift, at:  
<http://detnews.com/2000/autos/0011/01/a01-142597.htm>

Additional reading:

Bucci, Frederico. *Albert Kahn: Architect of Ford* (New York: Princeton Architectural Press, 1993).

M. Pepchinski, "Commerzbank," in *Architectural Record* (January 1998): 69-80.

State of Michigan Historic Preservation office:  
<http://www.sos.state.mi.us/history/preserve/phissite/riverrou.html>

### **Topic 12: On the Brief History of Low Entropy Architecture**

Required reading:

Moore, Steven. "Energy Efficient Design," in *The Encyclopedia of Twentieth Century Architecture*, R. Stephen Sennott, ed. (Chicago: Fitzroy Dearborn Publishers, forthcoming).

Moore, Steven. "Environmental Issues," in *The Encyclopedia of Twentieth Century Architecture*, R. Stephen Sennott, ed. (Chicago: Fitzroy Dearborn Publishers, forthcoming).

Ingersoll, Richard. "Second Nature: On the Social Bond of Ecology and Architecture," in *Reconstructing Architecture*, Tomas A. Dutton and Lian Hurst Mann, Ed. (Minneapolis: University of Minnesota Press, 1996). p., 119-157. [rd]

Additional reading:

Moore, Steven. "Sustainability in History and at UT," in *Platform* (Fall 2002): 4-5, 14.

<http://www.oberlin.edu/envs/ajlc/Default.html>, The Oberlin College Lewis Center for Environmental studies.

**Topic 13: O'Neil Ford and Structural Innovation in the 1950's**

Required reading:

Dillon, David. *The Architecture of O'Neil Ford: celebrating place*  
(Austin, TX: University of Texas Press, 1999.)

Additional reading:

Frampton, Kenneth. *Studies in Tectonic Culture: The Poetics of  
Construction in Nineteenth and Twentieth Century  
Architecture* (Cambridge, MA: MIT Press, 1995): 209-376.

**Topic 14: Field trip**

Trinity University, San Antonio

**Topic 15: Paper Presentations**

**Assignment: Paper no. 2 due**

### Performance Evaluation

Work for the semester will be based upon the scale outlined below. If any student wishes to protest a grade, a request for review must be made within one week of its issuance, after which no grade revision will be considered. It is up to the student to request interim evaluations from the instructor if you are concerned about your progress. Individual writing assignments will be evaluated on a numerical basis as follows:

3.5-4.5 A: Students work is original and of exceptional intellectual quality, is very well written, is supported by wide textual documentation, is structurally inventive, and is complete.

2.5-3.5 B: Students work is of high intellectual quality, is well written, is supported by textual documentation, progresses logically, and is complete.

1.5-2.5 C: Students work is of average intellectual quality, is written intelligibly, is supported by some textual documentation, progresses logically, and is complete.

0.5-1.5 D: Students work is of below average intellectual quality, is written poorly, is not adequately supported by textual documentation, progresses illogically, and/or is incomplete.

0.0-0.5 F: Students work is of unacceptable intellectual quality, badly written, unsupported, illogical, and/or incomplete.

#### Assignment weight:

Reading review(s)	10%
Paper No. 1:	
Abstract	10%
Draft	20%
Final	10%
Paper No. 2:	
Abstract	10%
Final	30%
Discussion participation	10%

### Office Hours

Goldsmith Hall 4.134, Tuesday and Thursday 2:00-3:30 PM, or by appointment.  
Office telephone: 471-0184. Email [samoore@mail.utexas.edu](mailto:samoore@mail.utexas.edu)

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641.