



Smithsonian
National Museum of American History

Lemelson Center for the Study of Invention and Innovation

APPENDIX 1

Report on

Places of Invention: The First Lemelson Institute

Organized by the Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation
Lemelson Archives, Incline Village, Nevada
16–18 August 2007

Jennifer Light, Northwestern University, oriented the group to current thinking, across disciplines, about the connections between place and invention. She presented a review of recent research in the form of a syllabus for a new course she would teach, aptly named “Places of Invention.”

SYLLABUS

Places of Invention

Professor Jennifer Light
Winter Quarter 2009

The relationship between place and invention, past and present, is a subject of growing interest to scholars in communication, architecture, history, anthropology, psychology, planning, economics, geography, sociology, management, and law. **Places of Invention** introduces students to this multidisciplinary field with a focus on spaces of scientific and technological innovation in the United States since 1900. To facilitate comparisons with other countries, each week students will be assigned to present weekly case studies of related phenomena from abroad.

Part I: Defining Our Terms

Week 1

What Is Invention? How Does Place Matter? Why Take a Historical Approach?

Nigel Thrift, “Reinventing Invention: The Generalization of Outsourcing and Other New Forms of Efficacy under Globalization.” Unpublished paper available at
<http://www.goldsmiths.ac.uk/csisp/papers/tarde/thrift.pdf>

David Livingstone, *Putting Science in its Place: Geographies of Scientific Knowledge*. (Chicago: University of Chicago Press, 2003).

Stephen Barley, “What Can we Learn from the History of Technology?” *Journal of Engineering and Technology Management* 15:4 (1998), 237–255.

Part II: What Makes a Place of Invention?

Week 2

Individual Inventors

William Pretzer, ed., *Working at Inventing: Thomas Edison and the Menlo Park Experience*. (Baltimore: Johns Hopkins University Press, 2002).

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

C. Stewart Gilmor, *Fred Terman at Stanford: Building a Discipline, a University, and Silicon Valley*. (Stanford: Stanford University Press, 2004).

Lynne G. Zucker, Michael R. Darby, and Marilyn B. Brewer, "Intellectual Human Capital and the Birth of U.S. Biotechnology Enterprises." *American Economic Review* 88:1 (1998), 290–306.
Mihaly Csikszentmihalyi, "Creative Surroundings." In *Creativity: Flow and the Psychology of Discovery and Invention*. (New York: Harper Collins, 1996).

Week 3

Networks of Innovation and Invention

Andrew Hargadon, *How Breakthroughs Happen: The Surprising Truth about How Companies Innovate*. (Cambridge: Harvard Business School Press, 2003).
Emilio Castilla, Hoky Hwang, Ellen Granovetter, and Mark Granovetter, "Social Networks in Silicon Valley." In Chong-Moon Lee, William F. Miller, Marguerite Gong Hancock, and Henry S. Rowen, eds., *The Silicon Valley Edge*. (Stanford: Stanford University Press, 2005).
Jorge Niosi and Tomas Bas, "Biotechnology Megacentres: Montreal and Toronto Regional Systems of Innovation." *European Planning Studies* 11:7 (2003), 789-804.
Pino Audia and Christopher Rider, "A Garage and an Idea: What More Does an Entrepreneur Need?" *California Management Review* 48:1 (2005), 6-28.
Peter Meyer, "Episodes of Collective Invention." *US Bureau of Labor Statistics Working Paper 368* (2003).

Week 4

Community Codes

Andre Millard, "Machine Shop Culture and Menlo Park." In William Pretzer, ed., *Working at Inventing: Thomas Edison and the Menlo Park Experience*. (Baltimore: Johns Hopkins University Press, 2002).
Sharon Traweek, *Beamtimes and Lifetimes: The World of High Energy Physicists*. (Cambridge: Harvard University Press, 1988).
Alan Penn, Jake Desyllas, and Laura Vaughan, "The Space of Innovation: Interaction and Communication in the Work Environment." *Environment and Planning B: Planning and Design* 26:2 (1999), 193–218.
Ronald Gilson, "The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128 and Covenants Not to Compete." *Stanford Law School John M. Olin Program in Law and Economics, Working Paper 163* (1998).
Mark Webbink, "Is Intellectual Property Killing the US Software Industry?" Unpublished paper available at <http://jolt.law.harvard.edu/articles/pdf/webbink.pdf>

Part III: Lessons from Past Successes and Failures

Weeks 5 and 6

What Can Architects, Managers, Universities, Federal Policy Makers and Local Governments Do to Foster Places of Invention?

Thomas Allen and Gunter Henn, *The Organization and Architecture of Innovation: Managing the Flow of Technology*. (Boston: Butterworth-Heinemann, 2007).
Thomas Gieryn, "What Buildings Do." *Theory and Society* 31:1 (2002), 35–74.
Michael Mumford and others, "Leading Creative People: Orchestrating Expertise and Relationships." *Leadership Quarterly* 12 (2002), 705–750.
Margaret O'Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley*. (Princeton: Princeton University Press, 2004).
Richard Nelson and Richard Langlois, "Industrial Innovation Policy: Lessons from American History." *Science* 219:4586 (1983), 814–818.
Anna Lee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. (Cambridge: Harvard University Press, 1994).
Clayton Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. (Cambridge: Harvard Business School Press, 1997).

Week 7

What Can We Learn from Studies of Social, Artistic, and Political Innovation?

- Dale Gyure, "The Transformation of the Schoolhouse: American Secondary School Architecture and Educational Reform, 1880–1920," PhD Dissertation, University of Virginia, 2001.
- Michael Mumford and Peter Moertl, "Cases of Social Innovation: Lessons From Two Innovations in the 20th Century." *Creativity Research Journal* 15:2/3 (2003), 261–266.
- Roger Stump, "Place and Innovation in Popular Music: The Bebop Revolution in Jazz." *Journal of Cultural Geography* 18:1 (1998), 11–34.
- John Case and Rosemary C. R. Taylor, *Co-Ops, Communes & Collectives: Experiments in Social Change in the 1960s and 1970s*. (New York: Pantheon, 1979).
- Richard Florida, "Bohemia and Economic Geography." *Journal of Economic Geography* 2:1 (2002), 55–71.

Part IV: Places of Invention in the Era of the Internet

Weeks 8 and 9

Communities of Inventors

- Lawrence Lessig, "Lecture: The Architecture of Innovation." *Duke Law Journal* 51 (2002), 1783–1801.
- Stefan Helmreich, *Silicon Second Nature: Culturing Artificial Life in a Digital World*. (Berkeley: University of California Press, 1998).
- Harmeet Sawhney and Seungwhan Lee, "Arenas of Innovation: Understanding New Configurational Potentialities of Communication Technologies." *Media, Culture & Society*, 27:3 (2005), 391–414.
- Eric von Hippel, *Democratizing Innovation*. (Cambridge: MIT Press, 2005).
- Gina Neff and David Stark, "Permanently Beta: Responsive Organization in the Internet Era." In Philip Howard and Steve Jones, eds., *Society Online: The Internet in Context*. (Thousand Oaks: Sage, 2003).
- Siobhan O'Mahoney, "Developing Community Software in a Commodity World." In Melissa Fisher and Gregory Downey, eds., *Frontiers of Capital: Ethnographic Reflections on the New Economy*. (Durham: Duke University Press, 2006).
- Reijo Miettinen, "The Sources of Novelty: A Cultural and Systemic View of Distributed Creativity." *Creativity and Innovation Management* 15:2 (2006), 173–181.
- Kathleen Franz, *Tinkering: Consumers Reinvent the Early Automobile*. (Philadelphia: University of Pennsylvania Press, 2005).
- Kristen Haring, *Ham Radio's Technical Culture*. (Cambridge: MIT Press, 2006).