Bibliography I

Books

Aitken, Hugh G. *Syntony and Spark, The Origins of Radio*. Princeton: Princeton University Press, 1985.

___. *The Continuous Wave: Technology and American Radio, 1900-1932*. Princeton: Princeton University Press, 1985.

Alexander, Alison, James Owers, and Rod Carveth, eds. *Media Economics: Theory and Practice*, 2d ed. Mahwah, N.J.: Lawrence Erlbaum Associates: 1998.

Anderson, Benedict. *Imagined Communities: Reflections on the Origin and Spread of Nationalism.* London: Verso, 1983.

Archer, Gleason L. *History of Radio to 1926*. New York: The American Historical Society, Inc., 1938.

___. *Big Business and Radio*. New York: The American Historical Company, Inc., 1939.

Baker, W.J. *A History of the Marconi Company*. New York: St. Martin's Press, 1971.

Barnouw, Erik. *A Tower in Babel: A History of Broadcasting in the United States to 1933*. New York: Oxford University Press, 1966.

___. *The Golden Web: A History of Broadcasting in the United States 1933-1953*. New York: Oxford University Press, 1968.

___. *The Image Empire: A History of Broadcasting in the United States from 1953*.New York: Oxford University Press, 1970.

Barrett, Marvin, ed. *Moments of Truth?* New York: Thomas Y. Crowell Company, 1975.

Barron, Jerome A. *Freedom of the Press for Whom? The Right of Access to Mass Media*. Bloomington, In.: Indiana University Press, 1973.

Benjamin, Stuart Minor, Douglas Gary Lichtman, and Howard A. Shelanski. *Telecommunications Law and Policy*. Durham, N. C.: Carolina Academic Press, 2001.

Bensman, Marvin. *The Beginning of Broadcast Regulation in the Twentieth Century*. Jefferson, North Carolina: McFarland and Company, Inc., 2000.

Bergreen, Laurence. *Look Now, Pay Later: The Rise of Network Broadcasting*. Garden City, NY: Doubleday and Company, Inc., 1980.

Blakely, Robert J. *The Peoples Instrument: A Philosophy of Programming for Public Television*. Washington, D.C.: Public Affairs Press, 1971.

Boorstin, Daniel J. *The Americans: The Democratic Experience*. New York: Vintage Books, 1974.

Brinkley, Joel. *Defining Vision: The Battle for the Future of Television*. Sand Diego: Harcout Brace, 1997.

Brock, Gerald W. *The Telecommunications Industry: The Dynamics of Market Structure*. Cambridge: Harvard University Press, 1981.

___. *Telecommunication Policy for the Information Age: From Monopoly to Competition.* Cambridge: Harvard University Press, 1994.

Burnham, David. *The Rise of the Computer State: The Threat to Our Freedoms, Our Ethics, and Our Democratic Process*. New York: Random House, 1980.

Carosso, Vincent P. *The Morgans: Private International Bankers 1854-1913*. Cambridge: Harvard University Press, 1987.

Case, Josephine Young, and Everett Needham Case. *Owen D. Young and American enterprise: A Biography*. Boston: David R. Godine, 1982.

Chandler Jr., Alfred D. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge: Harvard University Press, Belknap Press, 1977.

___. *Inventing the Electronic Century: The Epic Story of the Consumer Electronics and Computer Industries*. New York: The Free Press, 2001.

Chandler Jr., Alfred D. and James W. Cortada, eds. *A Nation Transformed by Information: How Information Has Shaped the United States From Colonial Times to the Present*. Oxford: Oxford University Press, 2000.

Chernow, Ron. *The House of Morgan: An American Banking Dynasty and the Rise of Modern Finance*. New York: A Touchstone Book, 1990.

Coll, Steve. *The Deal of the Century: The Breakup of AT&T*. New York: Simon and Schuster, Inc., 1986.

Coon, Horace. *American Tel and Tel: The Story of a Great Monopoly*. Plainview, New York: Books for Libraries Press, 1976.

Cowen, Tyler. *In Praise of Commercial Culture*. Cambridge: Harvard University Press, 1998.

Danielian, N.R. *A.T. & T.: The Story of Industrial Conquest*. New York: The Vanguard Press, 1939.

de Sola Pool, Ithiel. *Technologies of Freedom: On Free Speech in an Electronic Age*. Cambridge: Harvard University Press, Belknap Press, 1983.

___, ed. *The Social Impact of the Telephone*. Cambridge: The MIT Press, 1977.

DeSoto, Clinton B. *Two Hundred Meters and Down: The Story of Amateur Radio*. West Hartford, Ct.: The American Radio Relay League, Inc., 1936.

Dill, Clarence. *Where Water Falls*. Spokane, Wa.: Clarence C. Dill, 1970.

Douglas, Alan. *Radio Manufacturing of the 1920s*. 3 vols. Chandler, Arizona: Sonoran Publishing, 1988-91.

Douglas, George H. *The Early Days of Radio Broadcasting*. Jefferson, N.C.: McFarland and Company, Inc., 1987.

Douglas, Susan J. *Inventing American Broadcasting, 1899-1922*. Baltimore: Johns Hopkins University Press, 1987.

Dunlap, Orrin E. *Marconi: The Man and His Wireless*. New York: The MacMillan Company, 1937.

Evans, David S., ed. *Breaking Up Bell: Essays on Industrial Organization and Regulation*. New York: North-Holland, 1983.

Fischer, Claude S. *America Calling: A Social History of the Telephone to 1940*. Berkeley: University of California Press, 1992.

Frantzich, Stephen and John Sullivan. *The C-SPAN Revolution*. Norman, Ok.: University of Oklahoma Press, 1996.

Friedlander, Amy. *Natural Monopoly and Universal Service*: *Telephones and Telegraphs in the U.S. Communications Infrastructure, 1837-1940*. Reston, Va.: Corporation for National Research Initiatives, 1995.

___. *Power and Light; Electricity in the U.S. Energy Infrastructure, 1870-1940*. Reston, Va.: Corporation for National Research Initiatives, 1996.

___. *Communications and Content: Radio Technologies in the U.S. Infrastructure, 1865-1976*. Reston, Va.: Corporation for National Research Initiatives, 2005.

Gabel, Richard. *Development of Separations Principles in the Telephone Industry*. East Lansing, Mich.: Michigan State University, Institute of Public Utilities, 1967.

Garnet, Robert W. *The Telephone Enterprise: The Evolution of the Bell System's Horizontal Structure, 1876-1909.* Baltimore: The Johns Hopkins University Press, 1985.

Gordon, John Steele. *A Thread Across the Ocean: The Heroic Story of the Transatlantic Cable*. New York: Walker and Company, 2002.

Gurstein, Rochelle. *The Repeal of Reticence: A History of America's Cultural and Legal Struggles Over Free Speech, Obscenity, Sexual Liberation, and Modern Art*. New York: Hill and Wang, 1996.

Harlow, Alvin F. *Old Wires and New Waves: The History of the Telegraph, Telephone and Wireless*. New York: D. Appleton-Century Co., 1936.

Henck, Fred W. and Bernard Strassburg. *A Slippery Slope: The Long Road to the Breakup of AT&T*. New York: Greenwood Press, 1988.

Henslow, Miles. *The Miracle of Radio: The Story of Radio's Decisive Contribution to Victory*. London: Evans Brothers Limited, 1946.

Hilmes, Michele. *Hollywood and Broadcasting: From Radio to Cable*. Urbana, Il.: University of Illinois Press, 1990.

___. *Radio Voices: American Broadcasting, 1922-1952*. Minneapolis: University of Minnesota Press, 1997.

___, ed. *NBC: America's Network*. Berkeley: University of California Press, 2007.

Howeth, Captain Linwood S. *History of Communications-Electronics in the United States Navy*. (1963). http://earlyradiohistory.us/1963hw02.htm.

Huurdeman, Anton A. *The Worldwide History of Telecommunications*. Hoboken, N.J.: Wiley-Interscience, A John Wiley and Sons, Inc., Publication, 2003.

Irwin, Manley R. *The Telecommunications Industry: Integration vs. Competition*. New York: Praeger Special Studies in U.S. Economic and Social Development, 1971.

Johnson, Leland L. *Toward Competition in Cable Television*. Cambridge: The MIT Press, 1994.

Jome, Hiram. *Economics of the Radio Industry*. New York: Arno Press, 1971.

Kennedy, Gail. *Democracy and the Gospel of Wealth*, *Problems in American Civilization*. Boston: D.C. Heath and Co., 1949.

Kern, Stephen. *The Culture of Time and Space, 1880-1918*. Cambridge: Harvard University Press, 1983.

Kingsbury, John E. *The Telephone and Telephone Exchanges: Their Invention and Development*. London: Longmans, Green and Co., 1915.

Kittross, John M., ed. *Documents in American Telecommunications Policy*. 2 vols. New York: Arno Press, 1977.

Kleinfield, Sonny. *The Biggest Company on Earth: A Profile of AT&T*. New York: Holt, Rinehart and Winston, 1981.

Krasnow, Erwin G., Lawrence D. Longley, and Herbert A. Terry. *The Politics of Broadcast Regulation*, 3d Ed., New York: St. Martin's Press, Inc., 1982.

Krattenmaker, Thomas G., and Lucas A. Powe, Jr. *Regulating Broadcast Programming*. Cambridge: The MIT Press; Washington, D.C.: The AEI Press, 1994.

Lewis, Tom. *Empire of the Air: The Men Who Made Radio*. New York: Harper Perennial, 1991.

Lichty, Lawrence W. and Malachi C. Topping, eds. *American Broadcasting: A Source Book on the History of Radio and Television*. New York: Hastings House Publishers, 1976.

Lynd, Robert S. and Helen Merrell Lynd. *Middletown: A Study in Contemporary American Culture*. London: Constable and Co. LTD, 1929.

___. *Middletown in Transition: A Study in Cultural Conflicts*. New York: Harcourt, Brace and Company, 1937.

MacAvoy, Paul W., ed. *Deregulation of Cable Television: Ford Administration Papers on Regulatory Reform.* Washington, D.C.: American Enterprise Institute for Public Policy Research, 1977.

MacMeal, Harry B. *The Story of Independent Telephony*. Chicago: John F. Cuneo Company, 1934.

Marchand, Roland. *Advertising the American Dream: Making Way for Modernity, 1920-1940*. Berkeley: University of California Press, 1985.

Marvin, Carolyn. *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century*. New York: Oxford University Press, 1988.

McChesney, Robert W. *Telecommunications, Mass Media, and Democracy: The Battle for the Control of U.S. Broadcasting, 1928-1935*. New York: Oxford University Press, 1993.

McClure, Rusty with David Stern and Michael A. Banks. *Crosley: Two Brothers and a Business Empire That Transformed the Nation*. Cincinnati, Oh: Clerisy Press, 2006.

Moody, John. *The Masters of Capital: A Chronicle of Wall Street.* New Haven: Yale University Press, 1919.

Mueller, Jr., Milton. *Universal Service: Competition, Interconnection, and Monopoly in the Making of the American Telephone System*. Cambridge: The MIT Press, 1997.

Oslin, George P. *The Story of Telecommunications*. Macon, Ga.: Mercer University Press, 1992.

Owen, Bruce M. *Economics and Freedom of Expression: Media Structure and the First Amendment*. Cambridge, Mass.: Ballinger Publishing Company, 1975.

Owen, Bruce M., Jack H. Beebe, and Willard G. Manning, Jr. *Television Economics*. Lexington, Ma.: Lexington Books, D.C. Heath and Company, 1974.

Owen, Bruce M. and Steven S. Wildman. *Video Economics*. Cambridge: Harvard University Press, 1992.

Page, Arthur W. *The Bell Telephone System*. New York: Harper and Brothers Publishers, 1941.

Paglin, Max D., ed. *A Legislative History of the Communications Act of 1934*. Oxford: Oxford University Press, 1989.

Paine, Albert Bigelow. *In one Man's Life: Being Chapters from the Personal and Business Career of Theodore N. Vail*. New York: Harper and Brothers, 1921.

Park, Rolla Edward. *Role of Analysis in Regulatory Decisionmaking*. Lexington, MA: D.C. Heath and Co., 1973.

Peters, John Durham. *Speaking into the Air: A History of the Idea of Communication*. Chicago: The University of Chicago Press, 1999.

Pitsch, Peter K. *The Innovation Age: A New Perspective on the Telecom Revolution*. Hudson Institute, The Progress and Freedom Foundation, 1996.

Robinson, Thomas Porter. *Radio Networks and the Federal Government*. New York: Columbia University Press, 1943.

Rosen, Philip T. *The Modern Stentors: Radio Broadcasters and the Federal Government, 1920-1934*. Westport, Ct.: Greenwood Press, 1980.

Rozwenc, Edwin C., ed. *Roosevelt, Wilson and the Trusts, Problems in American Civilization*. Boston: D.C. Heath and Company, 1950.

Rucker, Bryce W., *The First Freedom*. Carbondale, Il.: Southern Illinois University Press, 1968.

Rydell, Robert W. *All the World's a Fair*. Chicago: The University of Chicago Press, 1984.

___. *World of Fairs: The Century-of-Progress Expositions*. Chicago: The University of Chicago Press, 1993.

Sarnoff, David. *Looking Ahead: The Papers of David Sarnoff*. New York: McGraw-Hill Book Company 1968.

Schubert, Paul. *The Electric Word: The Rise of Radio*. New York: The MacMillan Company, 1928.

Shooshan III, Harry M., ed. *Disconnecting Bell: The Impact of the AT&T Divestiture*. New York: Pergamon Press, 1984.

Smulyan, Susan. *Selling Radio: The Commercialization of American Broadcasting 1920-1934*. Washington, D.C.: Smithsonian Institution Press, 1994.

Sobel, Robert. *RCA*. New York: Stein and Day, 1986.

Spigel, Lynn. *Make Room for TV*. Chicago: The University of Chicago Press, 1992.

Starr, Paul. *The Creation of the Media: Political Origins of Modern Communications*. New York: Basic Books, 2004.

Stehman, J. Warren. *The Financial History of the American Telephone and Telegraph Company*. New York: Augustus M. Kelley Publishers, 1967.

Sterling, Christopher H. and John Michael Kittross. *Stay Tuned: A History of American Broadcasting*, 3d ed. Mahwah, N. J.: Lawrence Erlbaum Associates, 2002.

Sterling, Christopher H., ed. *Communication Booknotes Quarterly* (all volumes published between 2004-08). Philadelphia: Taylor and Francis Group, LLC, 2004-08.

Susman, Warren I. *Culture as History: The Transformation of American Society in the Twentieth Century*. Washington, D.C.: Smithsonian Institution Press, 2003.

Temin, Peter with Louis Galambos. *The Fall of the Bell System: A Study in Prices and Politics*. Cambridge: Cambridge University Press, 1987.

Trachtenberg, Alan. *The Incorporation of America: Culture and Society in the Gilded Age*. New York: Hill and Wang, 1982.

Tunstall, Jeremy. *Communications Deregulation: The Unleashing of America's Communications Industry*. Oxford: Basil Blackwell, 1986.

Vietor, Richard H.K. *Contrived Competition: Regulation and Deregulation in America*. Cambridge: Harvard University Press, The Belknap Press, 1994.

Vogelsang, Ingo and Bridger M. Mitchell. *Telecommunications Competition: The Last Ten Miles.* Cambridge: The MIT Press, 1997.

Weightman, Gavin. *Signor Marconi's Magic Box: The Most Remarkable Invention of the 19th Century and the Amateur Inventor Whose Genius Sparked a Revolution*. Cambridge, Mass.: Da Capo Press, 2003.

Weinhaus, Carol L. and Anthony G. Oettinger. *Behind the Telephone Debates*. Norwood, N. J.: Ablex Publishing Corp., 1988.

Wenaas, Eric P. *Radiola: The Golden Age of RCA, 1919-1929*. Chandler, Az.: Sonoran Publishing, 2007.

Williams, Raymond. *Television: Technology and Cultural Form.* London: Routledge Classics, 2003.

Zunz, Olivier. *Making America Corporate, 1870-1920*. Chicago: The University of Chicago Press, 1990.

Articles

1928 Fed. Radio Comm'n 2d Ann. Rep. 11. http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

Aitken, Hugh G. J. "Allocating the Spectrum: The Origins of Radio Regulation." *Technology and Culture* 35:686 (1994).

"The Bell is Ringing." *Time* (Friday, May 29, 1964) at http://www.time.com/time/magazine/article/0,9171,940463,00.html

Boudreaux, Donald J. and Thomas J. DiLorenzo. "The Protectionist Roots of Antitrust." *The Review of Austrian Economics* 6:2 (1993): 81-96.

Cohen, Jeffrey E. "The Telephone Problem and the Road to Telephone Regulation in the United States, 1876-1917." *Journal of Policy History* 3:1 (1991): 42-69.

Crawford, Amy Graban. "A Universal Speaking Service: The Role of Westinghouse Electric and Manufacturing Company in the Development of National Network Broadcasting, 1922-1926." *Journal of Broadcasting & Electronic Media* (Sept. 2007).

"Federal Control of Radio Broadcasting." *Yale Law Journal* 39 (Dec. 1929): 245.

Gabel, David. "Competition in a Network Industry: The Telephone Industry, 1894-1910." *Journal of Economic History* 54 (1994): 543-572.

Galambos, Louis. "Theodore N. Vail and the Role of Innovation in the Modern Bell System." *Business History Review* 66:1 (1992): 95-126.

Goodman, Mark and Mark Gring. "The Ideological Fight Over Creation of the Federal Radio Commission in 1927." *Journalism History* 26:3 (Autumn 2000): 117-124.

Hausman, Jerry A., J. Gregory Sidak, and Timothy J. Tardiff. "Are Regulators Forward-Looking? Copper Prices and Telecommunications Networks." *Federal Communications Law Journal* 61:1 (2008): 1-17.

Hazlett, Thomas W. "The Rationality of U.S. Regulation of the Broadcast System," *Journal of Law and Economics.*33: 133 (1990).

___. "Physical Scarcity, Rent Seeking, and the First Amendment." *Columbia Law Review* 97:4 (May 1997): 905-44.

Hoover, Herbert. "Radio Gets a Policeman." *American Heritage* (Aug. 1955): 73-76.

Jackson, Donny. "Universal Concerns." *Telephony* (Dec. 13, 2004): 33-35.

John, Richard. "Theodore N. Vail and the Civic Origins of Universal Service," *Business and Economic History* 28:2 (Winter 1999) 71-81.

Jolis, Anne. "EU Telecom Plan Draws Fire: Effort Could Lead to Lower Costs; Industry Resists," *The Wall Street Journal* (Nov. 12, 2007) at A9.

MacDougall, Robert. "Long Lines: AT&T's Long-Distance Network as an Organizational and Political Strategy." *Business History Review* 80:2 (Summer 2006): 297-328.

Mueller, Milton Lawrence. "The Switchboard Problem: Scale, Signaling, and Organization in Manual Telephone Switching, 1877-1897." *Technology and Culture* 30:3 (Jul. 1989): 534-560.

Navin, Thomas R. and Marian V. Sears. "The Rise of a Market for Industrial Securities, 1887-1902." *The Business History Review* 29:2 (Jun. 1955): 105-138.

"History of the Radio Club of America, Inc. 1909-1984," *Radio Club of America* 54:3 (Fall 1984).

Simons, R. W. "Guglielmo Marconi and Early Systems of Wireless Communication." *GEC Review* 11:1 (1996): 37-55.

Stewart, Irwin. "The International Radiotelegraph Conference of Washington." *The American Journal of International Law* 22:1 (Jan. 1928): 28-49.

Thierer, Adam D. "Unnatural Monopoly: Critical Moments in the Development of the Bell System Monopoly." *The Cato Journal* 14:2 (Fall 1994).

"WABC (AM)," *Wikipedia*. http://en.wikipedia.org/wiki/WABC_(AM).

"Warren G. Harding," *Wikipedia*. http://en.wikipedia.org/wiki/Warren_G._Harding.

"WBZ (AM)," *Wikipedia*. http://en.wikipedia.org/wiki/WBZ_(AM).

Whitehead, Clay T. "Media Chic – Minow, Martin and Mitchell: Presidential Television." *The Yale Law Journal* 83:8 (July 1974): 1751-65.

Dissertations

Mueller, Milton Lawrence. "The Telephone War: Interconnection, Competition, and Monopoly in the Making of Universal Telephone Service, 1894-1920." Ph.D. diss., University of Pennsylvania, 1989.

Other

Hoover v. Intercity Radio Co., 286 Fed. 1003 (Ct. App. D.C. 1923).

Mindell, David A. Bodies, "Ideas, And Dynamics: Historical Perspectives on Systems Thinking in Engineering," ESD-MIT Engineering Systems Division working paper (Jan. 23, 2003).

Rosen, Harold, "Syncom" with photos, whether published and date written unknown.

U.S. v. Zenith Radio Corp., Docket No. 14257 (Dist. Ct. N.D. Ill. April 16, 1926). www.fcc.gov/mb/audio/decodoc/misc/US_v_Zenith_Radio_Corporation.html.

Vail, Theodore N. *1907 Report of the Directors of American Telephone and Telegraph Company*, New York: March 10, 1908.

____. *1908 Report of the Directors of American Telephone and Telegraph Company*, New York: Dec. 31, 1908.

Whitehead, Clay T. *Remarks at George Mason University* (speech delivered at George Mason University School of Law March 23, 2004) Whitehead Archive, McLean, Va.

Government Documents

Cabinet Committee on Cable Communications, *Cable Report to the President*. Washington, D.C.: GPO, 1974.

President's Task Force on Communications Policy. *Final Report*. Washington, D.C.: GPO: December 7, 1968.

House Committee on Government Operations, *Hearings on Satellite Communications-1964 (Part 2),* 88th Cong., 2d sess., 6, 10 and 11 August, 1964.

Federal Communications Commission, *Investigation of the Telephone Industry in the United States, Made Pursuant to Public Resolution No. 8, 74th Cong.*, Washington, D.C.: GPO, 1939.

Online Sources

Early Radio History: http://earlyradiohistory.us

University of Maryland Library of American Broadcasting: http://www.lib.umd.edu/LAB/

The Cable Center: http://www.cablecenter.org/

Webb & Associates Telecommunciations History Timeline: http://www.webbconsult.com/hist-time.html

Privateline.com Telephone History:
http://www.privateline.com/TelephoneHistory3A/TeleHistory3A.htm

Bibliography II

Books

Abramson, Albert. *The History of Television, 1880 to 1941*. Jefferson, N.C.: McFarland and Company, Inc., 1987.

Adler, Richard P., Drew Clark and Kathleen Wallman. *Media and Valutes: Issues of Content, Community and Intellectual Property*. Washington, D.C.: The Aspen Institute, 2007.

Baer, Walter S. *Cable Television: A Handbook for Decisionmaking*. New York: Crane, Russak & Co., 1974.

Bagdikian, Ben H. *The Information Machines: Their Impact on Men and the Media*. New York: Harper and Row, 1971.

Brock, Gerald W. *The Second Information Revolution*. Cambridge: Harvard University Press, 2003.

Calhoun, George. *Digital Cellular Radio*. Norwood, Ma.: Artech House, 1988.

Cantelon, Philip L. *The History of MCI: The Early Years 1968-1988*. Dallas, Tx.: Heritage Press, 1993.

Cohen, Linda R. and Roger G. Noll. *The Technology Pork Barrel*. Washington, D.C.: The Brookings Institution, 1991.

Cohen, Lizabeth. *A Consumers' Republic: The Politics of Mass Consumption in Postwar America*. New York: Alfred A. Knopf, 2003.

Corn, Joseph J., ed. *Imagining Tomorrow: History, Technology, and the American Future*. Cambridge: MIT Press, 1986.

Dolan, Edward V. *TV or CATV? A Struggle for Power*. Port Washington, N.Y.: National University Publications Associated Faculty Press, Inc., 1984.

Downes, Peter and Peter Harcourt. *Voices in the Air: Radio Broadcasting in New Zealand: A Documentary*. Wellington, N.Z.: Metheun, 1976.

Eickelman, Dale F. and Jon W. Anderson, eds. *New Media in the Muslim World: The Emerging Public Sphere*. Bloomington: Indiana University Press, 1999.

Freeman, Chris and Francisco Louca. *As Time Goes By: From the Industrial Revolutions to the Information Revolution*. Oxford: Oxford University Press, 2001.

Gavaghan, Helen. *Something New Under the Sun: Satellites and the Beginning of the Space Age*. New York: Springer-Verlag, Copernicus, 1998.

Gilder, George. *Life After Television: The Coming Transformation of Media and American Life*. New York: W.W. Norton and Co., 1992.

Grossman, Lawrence K. *The Electronic Republic: Reshaping Democracy in the Information Age*. New York: Penguin Books, 1995.

Hagel, III, John and Arthur G. Armstrong. *Net Gain: Expanding Markets Through Virtual Communities*. Boston: Harvard Business School Press, 1997.

Hawkins, Richard and Robin Mansell, Jim Skea. *Standards, Innovation and Competitiveness: The Politics and Economics of Standards in Natural and Technical Environments*. Aldershot, UK: Edward Elgar Publishing, Ltd., 1995.

Henslow, Miles. *The Miracle of Radio*. London: Evans Brothers Limited, 1946.

Hunter, James Davison. *Culture Wars: The Struggle to Define America*. New York: Harper Collins, Basic Books, 1991.

Inglis, Andrew F. and Arch C. Luther. *Satellite Technology: An Introduction*. 2d ed. Boston: Focal Press, 1997.

Jarvik, Laurence. *PBS: Behind the Screen*. Rocklin, Ca.: Forum, 1997.

Kang, Jerry. *Communications Law and Policy*. Gaithersburg, N.Y.: Aspen Law and Business, 2001.

Kennedy, Charles H. *An Introduction to U.S. Telecommunications Law*. Boston: Artech House, 1994.

Larson, Erik. *Thunderstruck*. New York: Three Rivers Press, 2006.

Leroy, David J. and Christopher H. Sterling, eds. *Mass News: Practices, Controversies, and Alternatives.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc. 1973.

Lloyd, Mark. *Media, Creativity and the Public Good*. Washington, D.C.: The Aspen Institute, 2007.

Macy, Jr., John. *To Irrigate a Wasteland: The Struggle to Shape a Public Television System in the United States*. Berkeley: University of California Press, 1974.

Martin, Dick. *Tough Calls: AT&T and the Hard Lessons Learned from the Telecom Wars*. New York: AMACOM, 2005.

Mayer, Martin. *About Television*. New York: Harper and Row, 1972.

McDougal, Dennis. *The Last Mogul: Lew Wasserman, MCA, and the Hidden History of Hollywood*. Cambridge, Mass.: De Capo Press, 2001.

Mitnick, Barry M. *The Political Economy of Regulation: Creating, Designing, and Removing Regulatory Forms*. New York: Columbia University Press, 1980.

Musolf, Lloyd D., ed., *Communications Satellites in Political Orbit.* San Francisco: Chandler Publishing Co., 1968.

Noam, Eli. *Television in Europe*. New York: Oxford University Press, 1991.

___. *Interconnecting the Network of Networks*. Cambridge: MIT Press, 2001.

Noll, Roger G., Merton J. Peck, and John J. McGowan. *Economic Aspects of Television Regulation*. Washington, D.C.: The Brookings Institution, 1973.

Nuechterlein, Jonathan E. and Philip J. Weiser. *Digital Crossroads: American Telecommunications Policy in the Internet Age*. Cambridge: MIT Press, 2005.

Parsons, Patrick R. and Robert M. Frieden. *The Cable and Satellite Television Industries.* Boston: Allyn and Bacon, 1998.

Pelton, Joseph N., Robert J. Oslund, and Peter Marshall, eds. *Communications Satellites: Global Change Agents*. Mahwah, N.J.: Lawrence Erlbaum Associates, 2004.

Pelton, Joseph N. and Marcellus S. Snow. *Economic and Policy Problems in Satellite Communications*. New York: Praeger Publishers, 1977.

Posner, Richard A. *Natural Monopoly and its Regulation*. Washington, D.C.: Cato Institute, 1999.

Postman, Neil. *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*. New York: Penguin Books, 1985.

___. *Technopoly*. New York: Vintage Books, 1992.

Powe, Jr., Lucas A. *American Broadcasting and the First Amendment*. Berkeley: University of California Press, 1987.

Price, Monroe E. *Media and Sovereignty, The Global Information Revolution and Its Challenge to State Power*. Cambridge: The MIT Press, 2002.

Redlich, Fritz. *The Molding of American Banking: Men and Ideas*. New York: Johnson Reprint Corp., 1968.

Seiden, Martin H. *Cable Television U.S.A.: An Analysis of Government Policy.* New York: Praeger Publishers, 1972.

Silverman, Kenneth. *Lightning Man: The Accursed Life of Samuel F. B. Morse*. New York: Alfred A. Knopf, 2003.

Stone, David M. *Nixon and the Politics of Public Television*. New York, Garland Publishing, Inc.: 1985.

Sullivan, Mark. *Our Times, 1900-1925,* 6 vols. New York: Charles Scribner's Sons, 1971.

Tyler, Michael and Carol Joy. *1.1.98 - Telecommunications in the New Era: Competing in the Single Market*. London: Multiplex Press, 1997.

Thorelli, Hans B. *The Federal Antitrust Policy: Origination of an American Tradition*. Baltimore: The Johns Hopkins Press, 1955.

Tunstall, Jeremy and David Walker. *Media Made in California: Hollywood, Politics and the News.* New York: Oxford University Press, 1981.

Waldrop, Frank C. and Joseph Borkin. *Television: A Struggle for Power.* New York: Arno Press and The New York Times, 1971.

Will, Thomas W. *Telecommunications Structure and Management in the Executive Branch of Government, 1900-1970*. Boulder, Co.: Westview Press, 1978.

Articles

Bazelon, David L. "FCC Regulation of the Telecommunications Press," *Duke Law Journal* 1975:2 (May 1975) 213-251.

Barnett, Harold J. "Perspectives on CATV Regulation," *Center for the Study of American Business* 7 (Nov. 1975).

"Conversation with Clay Whitehead: The Director of the White House Office of Telecommunications Policy during the Nixon years remembers the pressures of Watergate politics and prognosticates the future of television." *Videography* (June 1976) 24-26, 38-41.

Hausman, William J. and John L. Neufeld. "The Structure and Profitability of the U.S. Electric Utility Industry at the Turn of the Century," *Business History* 32:2 (April 1990) 225-243.

Hazlett, Thomas W. and David W. Sosa. "Chilling the Internet? Lessons from FCC Regulation of Radio Broadcasting," The Cato Institute Policy Analysis No. 270 (March 19, 1997).

Hudson, David L. "Indecency Regulation: Beyond Broadcast?" (Dec. 5, 2007) at www.firstamendmentcenter.org

Murphy, Thomas P. "Federal Regulatory Policy and Communications Satellites: Investing the Social Dividend," *American Journal of Economics and Sociology* 31:4 (Oct. 1972) 337-51.

Nelson, Richard W. "Domestic Satellites, the FCC, and Competition in Domestic Telecommunication," *Land Economics* 51:3 (Aug. 1975) 235-246.

Shelanski, Howard A. and J. Gregory Sidak. "Antitrust Divestiture in Network Industries." *The University of Chicago Law Review* 68:1 (Winter 2001) 1-99.

Snowball, T. "The Malvern Tape Recorder," *Practical Wireless* (July 1963).

"The 'Video Shopping Center': Hughes Plans Cable Bird." *CableVision* (May 25, 1981) 34-37.

Weiser, Philip J. *A Framework for a National Broadband Policy*. Washington, D.C.: The Aspen Institute, 2008.

Wise, Andrew S. and Kiran Duwadi. "Competition between Cable Television and Direct Broadcast Satellite – It's More Complicated than You Think." Federal Communications Commission Media Bureau Staff Research Paper (Jan. 2005).

Creation
Consolidation
Competition
Innovation/Ubiquity
Epilogue

wired	wireless
broadcast	private
innovation	standards
unregulated	regulated
novelty	invisibility
cost	price

resources: spectrum, right of way, switches
politics: public airwaves, uses of monopoly

- Competition expanding telephones, independents vital & growing
- Fish (?) sees need for capital, need to acquire major independents, compete in all markets nationally. A man, a plan, a system, …
- Enter NY banks, Vail: A man, a plan, a system
- Vail strategy: One system…
- Finance & management
- Regulation, states, DoJ, Congress; the "scam"(?)
- WW I, the monopoly

Chapter 1

*Chapter 1 tells the story of the **creation** of the electronic communications industries from 1900 to the early 1930s - the formation of the AT&T monopoly to eliminate telephone competition, and the birth of broadcasting in a competitive flurry that quickly settled into a monopoly of three radio broadcast networks.*

Theodore Vail and the Creation of the Bell System

As the Twentieth Century began, there were three national network industries in the United States – railroad, telegraph, and telephone – all built on strands of steel. [1] [2] The railroads were by far the largest with XXXX miles of track, dwarfing the XXXX miles of telegraph lines, and XXXX miles of telephone lines.[3] Western Union had tried but given up on competing in the telephone business, but the two electric communications industries were still seen – by bankers at least – as candidates for consolidation.

The well-established telegraph industry was dominated by two large telegraph companies in 1900, Western Union and Postal Telegraph. In the telephone industry, however, Alexander Graham Bell's telephone patents that had once given the old Bell Company[4] a nationwide monopoly had expired in 1894[5],, and the telephone industry of the new century had become vibrantly – and chaotically[6] and doggedly - competitive. Bell remade itself into the new American Telephone & Telegraph[7] company to deal with the new competitive era of the Twentieth Century.

The telegraph was still [by far?] the largest electrical communications business, with $XXX million in revenue, while the telephone industry had revenues of only $XX million[8]. But competition was changing the telephone from a service for business

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[1] Need footnote to doc steel?

[2] Need footnote that acknowledges water and gas, but dismisses as local utilities. Also that electricity was also regulated by state commissions, with minimal intercity lines. Is this accurate? See Water and Power pp 81-82. Also note that electric lines were primarily copper – see *Water & Power* p33 and refs starred in footnote 45 there.

[3] Miles may not be applicable in all three cases.

[4] Is this the correct name? it changed names several times. We should pick a representative name (like "the Bell Company") to use prior to 1900 when it becomes AT&T. maybe we should list the prominent colloquial names – Bell, American company, ... See FCC 1939 Section 1.

[5] It was actually 1893-94 for a series of patents.

[6] This is a key word – is there a better one to describe competition in 1900 and 2000???

[7] Need to explain, probably in a footnote, where the "Telegraph" came from.

[8] AT&T revenue in 1900 was $41 million: Walker Report page 56. table 1885-1935. Need$ for independents.

executives and elites into an everyday reality in a more and more American homes and businesses. Entrepreneurs and business groups had started hundreds of new "independent" telephone companies, providing service in the smaller towns Bell had ignored and competing head-to-head in larger towns and cities where Bell's high prices had kept penetration low.[9] New manufacturing companies made and sold improved telephones and switching equipment. The number of telephones in the country had quadrupled in the first six[10] years of competition to over a million, customer growth was accelerating, and the independent companies were catching up with Bell.[11]

[1,2,3 paragraphs on role of phone in US business and social life at turn of century.]

While it was growing rapidly, the telephone "industry" was anything but what we would today characterize as an industry. Until its patents expired, the Bell Company had been a small Boston-based company that manufactured telephones and leased them to affiliated regional operating companies owned by local investors.[12]

This section is too boring for here. Where does it go? Is there a two-sentence version for here? Is it needed?

Bell: [had it been profitable?] [Brief description of Board, management, Boston culture, …]

[Brief paragraph on regional operating companies, ownership, financial ties to Bell, own finance, management,]

[Brief paragraph on standards, Western Electric, toll, long distance.]

[Brief paragraph on independents, finance, suppliers, farmers, company-ops, …]

With the advent of competition, Bell – and later AT&T - continued that basic business model, allowing its regional service companies to use only Bell-manufactured telephones and switching equipment on their wires.[13] Thus was born the business model for most of the Twentieth Century, that AT&T's telephone service was an end-to-end package provided over the "Bell System" that included the basic black Bell telephone on both ends of every telephone call.[14] It was not until [19XX that AT&T offered a telephone with a handset and cradle instead of the separate microphone and earpiece, and not until] 19XX that AT&T offered its customers any choice even in the color of the

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[9] I want as often as possible to put sentences in the active voice. People did things, things didn't just "happen". So maybe we can rewrite this sentence, or maybe it is one of those that is better the way it is.

[10] ?

[11] Quantify this. Some sources (FCC seem to say 40% ±) some say almost equal. Look in Mueller or some other book for table with my calculations showing how % accelerated.

[12] Is this true as of 1900?? Bell had some minority investments; maybe this could be a footnote.

[13] Bell also refused to sell its phones to other telcos.

[14] Bell contracted with Western Electric and other manufacturers to actually build its phones, and later bought Western Electric and concentrated all its manufacturing in that subsidiary.

telephones. [15]

Because of this policy, Bell's competitors had to build their own networks of wires and switchboards and buy telephones from non-Bell manufacturers, and many companies, large and small, sprang up to do just that. Bell had built most of its business in cities where affluent residents and large companies that could afford Bell's prices were concentrated, but by 1900, the independents had built systems and brought service to many mid-size and small towns not served by Bell [16] and were stringing their own wires alongside Bell's wires to compete in the larger towns to compete head to head with Bell. Farmers formed cooperatives to build their own systems. Larger independents built toll[17] lines to connect larger towns with surrounding smaller towns that made up regional trading centers. Public pay phones spread rapidly, so that many more people were telephone users than the number of homes connected would suggest.

Faced with being left behind in a competitive flurry, the staid Boston company had struggled to find ways to maintain its dominance in the industry. Reflecting its origins as a patent licensing business,[18] Bell had filed numerous [Thierer says 600] patent infringement suits that imposed heavy costs on many small independent phone companies and equipment manufacturers and put some out of business altogether.[19] But Bell's chief tools for competing with its rivals, or preferably putting them out of business, were economic –expanding into markets it had previously ignored either to discourage entry by an independent or to undercut an established independent with predatory price reductions[20].[21] Both of these tactics required construction of extensive new facilities, and the price wars took a major toll on revenues and profits. By the time Bell became AT&T in 1900, it was losing the battle with the independents[22] and in need of rapidly escalating capital infusions.

Bell had tried various ways of dealing with competition in the years leading up to 1900There was more innovation and growth in independents because in some ways they had better access to capital, but small amounts of capital for small company needs. AT&T was woefully undercapitalized to compete with them. It was set up at that time as a national entity that raised its capital for its entire industry in Massachusetts.

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[15] It could be argued that the country would have been better off if they had been required to license the patents to others to encourage technical and entrepreneurial growth as happened after the patents expired. But it could be counter-argued that this could have fragmented the telephone service industry into incompatible patterns.

[16] Put a note here, or later, about mutual companies serving small towns and farms.

[17] As a rule, "toll" lines were considered to connect towns up to 50 miles, while "long distance" lines were longer than 50 miles. This terminology arose in part because the independents had the technology for the shorter lines whereas AT&T had superior quality for the longer lines. While the "toll" and "long distance" distinction persisted for decades, it has little meaning in the larger sweep of the telephone business, and this book will not dwell on the distinctions.

[18] Bell licensed manufacturers, leased phones to regional affiliates.

[19] Ref?

[20] Need a footnote to deal briefly with definition "predatory" and to cite.

[21] Same tools rivals used to enter the market.

[22] Data

Massachusetts governor vetoed bill to allow Bell to raise capital. Massachusetts law prohibited majority ownership of operating companies. Bell needed reliable sources of accelerating capital needs and needed organization.

Bell needed much more capital to keep from losing its predominant position in the American telephone business.

Massachusetts state restrictions on raising capital, control of operating companies[23] Consideration of move to NY as early as 1896[24] fewer restrictions, larger amounts of capital.

Decision and announcement consolidate incorporation in NY[25]. Change from a Boston based company to a New York City based company with better access to the much larger and more open New York capital markets. Bell is no longer Bell, but AT&T[26]. This recognition of the company's capital needs and reorganization to remain the predominant national telephone company marked the beginning of the telephone business as a true industry.[27]

As it happened, John Hudson[28], the president of AT&T who led the company through the first years of competition, died in 1900[29], and the job was offered to Theodore Vail[30]. Vail had turned 65[31] in 1900. He knew the company well, having been the first General Manager of the old Bell Company from 1878 to 1885[32], [33] and he kept his home in Boston and kept up his contacts inside the company. Vail resigned in part because he had not been made President[34] had hoped to return one day as President of the company[35], and although he was financially well off from the Bell shares he had acquired in his early years at the company, he elected to decline the offer and continue the business ventures he had started in the US and South America.[36] [37]

Vail continued to follow the company. He kept his home in Boston, where the company still maintained its headquarters. Some of his key people from his days as GM

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[23] Stehman 40-41,59-63

[24] Garnet 106. based on memos by EJ Hall

[25] The Bell system reorganized itself Dec. 31, 1899 with AT&T as the parent company and … details…

[26] Where did the "Telegraph" come from? Must go back to original 1883(?) formation. Was that part of Vail's idea of a combined telephone/telegraph electric communications company?

[27] Can we add some weight to this statement? Do we want to put this flag here or on Vail's arrival?

[28] Could introduce Hudson earlier, let him lead the fight against competition.

[29] Garnet, p 91

[30]

[31] ??

[32] Garnet 31

[33] Vail apparently worked in NYC july-dec 1878 and then moved to Boston. Paine 146 & preceding.

[34] Did someone else get the job around this time?

[35] Paine 227

[36] Cite Paine, other?

[37] Do I have the timing right on the business ventures? Maybe they were not profitable until 1906.

of the old Bell company were now in important positions – Hall, Hibbing(?)[38]. others. He knew important bankers in Boston and New York because of the business stature gained in his years at the old Bell Company and in pursuing his business projects[39]. Fish was brought in to be President [40]as competition intensified.[41] As AT&T struggled to deal with the increasing competition it became clear that the move to the NY capital markets had been wise – the company would need increasingly large amounts of capital every year. The expansion into the many cities and towns where the independents were growing required capital to build many new phone systems. The large price cuts to cripple or force independents out of business drained revenue and profits, requiring still more capital infusions. Competition was not only thriving, but accelerating[42]. More and more businesses and homes were getting phone service at lower prices, but the competition was painful for the executives AT&T who hoped to reverse the tide.

As was his wont, Vail took the long run view. A few months[43] after turning down the presidency he had wanted 16 years earlier, Vail wrote a detailed memo to Senator W. M. Crane[44] in July, 1901 laying out his views on the policy that should govern the company at this critical time.

Vail sent his 1901 memo to W. M. Crane and to XXX Coolidge. Not clear if memo was intended to guide him if he accepted the presidency or it was aimed at Fish. Crane had been a long-time investor in AT&T[45]. His was on the board when AT&T was formed in 1899(?). Coolidge was president (chairman?) of Old Colony Trust Company. Coolidge and Old Colony had been early(?) investors in the Bell Company and were major shareholders of AT&T(?).

Vail's view of AT&T in 1901 was not good, particularly in the financial realm. After recounting a general assessment of the policies that were needed, he concluded:

> The existing hand-to-mouth policy results wholly from a dread that the mgrs of the company had of acknowledging either to themselves or to the public, the full requirements of the business, and the responsibilities of the company for these requirements. … Many things that are important and necessary have been and are postponed until further postponement is absolutely impossible, or are abandoned, to the real detriment of the company's interest, for fear of some unfavourable[46] temporary results. All this is wrong.

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[38] Hall was at first AT&T. Hibbing? Who else?

[39] Cite? Paine?

[40] From where?

[41] Somewhere I annotated a table to quantify the "velocity" of the competition growth.

[42] See footnote 39.

[4343] Date of refusal is unclear – try Paine. Date of memo to Crane July 1, 1901 FCC exhibit xxx footnote 305

[44] Who he then? Need more on him in text?

[45] Document.

[46] sic

The thrust of Vail's view of what the company needed in '01 was "control." AT&T should stop the independents, achieve as much control of the telephone business as possible, consolidate the regional operating companies and the Western Electric manufacturing operation into a single, centrally managed company, and establish a solid financial plan that would for provide stable sources of capital to fund the strategy.

> *Monopoly*: "The Company, having a tendency toward and desire for a monopoly should be abundantly prepared to assume the obligations, and discharge the responsibilities of its position.[47]
>
> *Control*: "In all these cases [of dealing with the competition from the independents], care should be take that a maximum of control be obtained by a minimum of concession.
>
> *Consolidation*: "All the Bell Telephone interest should be as soon as possible consolidated into [a single] operating company."
>
> *Planning for capital needs*: "The worst of the opposition (i.e. competition) has come from the lack of facilities afforded by our companies, -- that is, either no service, or poor service. … To meet these increasing demands, increasing amounts of money will be needed each year. A low estimate for the next five years would be $200,000,000 – every probability points to a larger sum."
>
> *Predictability*: "The knowledge that $250,000,000 would be required in the natural development of our business in the next five years … would not affect the shares of the company half so unfavourably[48] as an unexpected issue of $10,000,000 each year."

This 1901 memo would hold up well for his strategy when he later did become the President of AT&T in 1907. After Vail turned down the presidency in 1901, he directly involved himself in the strategy and financial control of the company.

The years 1901-1903 (check these dates) were pivotal for AT&T. The independents continued to expand rapidly and to reduce AT&T's share of the telephone market.

The Rockefeller and Morgan financial groups joined in 1901 to form TTCC to compete with AT&T in Boston and NY, to acquire independent telephone companies in the northeast and midwest, and to establish a long distance company to help independent companies compete with AT&T. But the Morgan interests withdraw[49], AT&T acquires control of Erie, the major independent in the TTCC plan, causing stalemate because Morgan interests control stock of Erie subsidiaries. Morgan interests and AT&T negotiate deal 1902 whereby AT&T gets control of Erie, the proposed competition in

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[47] Memo to Crane op.cit.

[48] sic

[49] Why?

Boston and NY exchanges disappears as does the proposed long distance company[50].

Vail worked with Coolidge, Baker(?), and ??? on the financing needs of AT&T. He no doubt worked with executives he knew, some of whom he hired in his earlier tenure as general manager of Bell. Especially Hall, Hibbard(?), and Carty(?). Dates of contacts 1896-1902. involvement in strategizing to move incorporation from Mass to NY.

In 1902, Morgan… AT&T…

Immediately thereafter, Waterbury, Baker, and Vail[51] were elected to the AT&T board.[52] Waterbury and Baker are allowed to buy 50,000 shares of AT&T stock worth $9 million.[53] This is the first[54] time bankers are on board and first non-Boston members.[55]

Morgan interests[56] pursue a consolidation of the electric telecommunications businesses telephone and telegraph businesses. This may have been Morgan's idea stemming from his experience in railroads to achieve economies by weeding out "wasteful competition", but it also was a Vail idea, stemming from his views when he was at Bell that Bell and Western Union should be merged.[57]??? [Need more drama in confluence of Morgan and Vail ideas and their coming together.]

At the same time they were moving to get control of AT&T, the Morgan interests began negotiating with Postal Telegraph about a merger[58] of AT&T and Postal to gain control of electric telecommunications businesses[59]. This effort falls apart, but presages later, 1909, AT&T takeover of Western Union.

****

Competition intensifies. Independents thrive. AT&T struggles to keep up. As predicted by Vail, needs more and more capital. Various financing arrangements 1902-

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[50] Did the Rockefeller Stillman group continue to pursue the long distance company idea?

[51] There must be SOME evidence that Vail came on as part of an arrangement between AT&T and Morgan interests. Or maybe it was to get him involved after he declined the presidency. Fish had not been president very long – maybe HE wanted Vail's involvement.

[52] Need a lot of fact checking and documentation here.

[53] What % of the company was this? Stock price based on Stehman avg for 1902 p 326

[54] ?

[55] ?

[56] I probably use "Morgan" and "Morgan interests" interchangeably, but at some point we will need to be more precise. It would be good to have a footnote that lays out who the bankers are in the Boston and Morgan camps. Is Coolidge of Old Colony a bridge?

[57] Or that Bell should acquire WU?

[58] Was it really a merger they sought or something else? Probably a merger between Postal and AT&T that they would control, regardless of whether Postal or AT&T took over the other? Maybe they wanted Vail on the AT&T board to run the combined telephone/telegraph company.

[59] Why not Western Union? Gould?

1906.[60] Major bond offering planned in 1906. AT&T board faces question of how to place this major issue. Should it be a competitive bidding process between the Boston and New York bankers? Should the bonds be convertible into common stock? Convertibility potentially would give bankers control or near-control of company.

Major decision: Bond placement is given to Morgan interests without competition and the bonds are convertible.[61]

Bankers have difficulty placing bonds. Price is cut, but almost no takers[62]. Why? Seems like they could/should have priced them at market. AT&T needs the money. 1907 financial panic. Bankers got what they wished for, now needed Vail to come in to rescue them.[63] Fish resigns or is forced out.[64] Vail becomes President of AT&T date, 1907, the job he had wanted for two decades. He is 67 years old.[65] The independents as many phone customers as AT&T.[66]

Theodore Vail

The telephone business in the first 20 years of the century is mostly about Theodore Vail. Until 1907 he worked behind the scene with AT&T executives and bankers. Then as president of AT&T, he began an incredibly shrewd and effective strategy of business, political, and public relations tactics [changes] that killed off competition, reestablished the telephone as a monopoly service with AT&T controlling most of the country and all the long distance service.

Brief bio of Vail.[67]

Born in 1845 and retiring from AT&T in 1919 at the age of 74, Vail's life and career spanned two centuries, life in the rural midwest and in the power centers of the east, and four major transformations of American business Vail not only saw these business transformations of the 19th and 20th centuries, he helped shape and integrate them.

National operating companies: railroads, telegraph, steel (or was this local/regional?), oil, other?

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[60] What were they?

[61] What documentation do we have for why this decision was reached? Who, besides Baker and Waterbury on board would have favored this? Vail?

[62] Date?

[63] Need to make sure this is a supportable assertion.

[64] Somewhere there is the suggestion that he was under a lot of stress – understandable – and/or had health problems.

[65] Born July 16, 1845 paine 7.

[66] Need to document this. Census seems to be best source.

[67] Will have to draw from various sources to get the key points for us.

Capital intensive industry: railroads, telegraph, oil(?), electricity, water, gas, (weren't public utilities mostly local?) other?

Systematic management: Express mail, railroads(?),Taylor, where else applied?

Monopoly, antitrust, and regulation: Need a concise timeline and summary of monopolistic industries and emergence of "trusts", public concern, antitrust legislation and enforcement. Then the implementation of regulation by federal and state legislation and ICC and state commissions.

Vail saw the emergence of national operating companies in the spread of the railroads and the link of the east and west coasts in 1869. His experience as telegraph operator and director of ??? at the headquarters of the Post Office Department in Washington gave him a first hand knowledge of national operations and the need for systematic management. He no doubt read the works of the scientific management writers like Frederick Taylor. In his work as General Manager of the Bell Company, he installed there and improved upon many of these principles of national organization and systematic management he had earlier learned. (Was capital an issue in his years there?) He probably participated with Forbes and Hall and ???" beginning in 1896[68] in setting the stage for the reincorporation in NY under AT&T, and certainly in 1901 saw the necessity of capital. He undoubtedly followed the antitrust movement in the 18?? – 19?? years[69] He was a major shaper (if not the major shaper) of regulation as the balance to monopoly.[70]

Business Vail was a systematizer. He believed in tight organization. Every regional operating company should use the same kind of facilities, equipment and operating practices. Every engineer should have the same training and use the same standards everywhere across the country. [Other examples of tight organization would be useful] Decisions to expand were done in light of consistency. [What does this sentence mean?] Long distance connections should work the same way between all cities and regions. Equipment manufacturing should be standardized and centralized nationally in one AT&T subsidiary – Western Electric. Hubbard had been moving the company in this direction, often against the practices and desire for independence among the regional operating companies, but Vail forcefully completed the transformation of the company and its facilities into the Bell System.[71]

Vail created the Bell system and made it a bureaucracy run by bureaucrats and enabled the company to deliver good service very well and become a very powerful entity. [How did his reorganization allow AT&T to become powerful? One doesn't necessarily flow from the other] AT&T basically provided better telephone service.

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[68] We have a reference to this somewhere.

[69] Do the seminal or dramatic years match up with Vail before 1907? Surely.

[70] Was there someone earlier? Any academic or political precursors?

[71] Note that the expression *Bell system* had been used much earlier.

They used that position to get the government to grant it preferential powers [such as?], which lead to the consolidation of their monopoly. So the telephone business is for the first 20 years substantially T. Vail.

Vail built AT&T into the Bell system, turning the company into a national organization that was centrally managed. He was able to buy and build equipment with large economies of scale and build uniform practices, pay schedules and rates on a national basis.

Vail also created the regulatory framework,[72] first in the states and then nationally and ultimately at the FCC. This was a really successful political and intellectual scam. When encouraging and arguing for a regulatory scheme in a state, Vail insisted that the telephone business was inherently a monopoly business. It was naturally a monopoly and as such it had to be regulated because competition really wasn't feasible in the phone business and you had to have regulation to serve the public interest. That line he began articulating in the annual reports of AT&T in about '07 / '08. In the 20s, while Vail is building AT&T on this monopoly framework, the independent phone companies became more forceful, and Vail began arguing that the monopoly of the phone company was a good thing for society. Because of the good things that AT&T did and could do because of its monopoly, Vail asserted, regulation was needed to protect AT&T from competition. But those two ideas are fundamentally incompatible. A natural monopoly is an industry where competition isn't feasible. If you're a natural monopoly, why do you need protection from competitors?[73] Nonetheless, this idea continued until the 70s when the Nixon Administration's Office of Telecommunications Policy worked to undermine that rationale.

Vail's mantra – one system, one policy, universal service – was aimed at the switchboard problem. When Vail coined the term "universal service," he meant that everyone should be on the same system, a nice word for monopoly. The phrase later came to mean that everyone in the country should have a telephone.[74] Vail thought that there should be one monopoly phone company because he believed that was the best way to develop a robust phone system in US.

Vail concern with capital 1901. worse in 1907. Monopoly as alternative to capital demands of competition. Regulation as publicly acceptable way to sanction monopoly over competition. AT&T could not overtake the competition to "save" the "Bell System" as the predominant telephone company under the dual service competition that was thriving. So, he switched gears. It was

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[72] Did he also coin public interest, convenience, and necessity?

[73] Bruce Owen's recollection was different -- Tom doesn't remember exactly, but it had to do with the time Vail said something.

[74] This happened around time of 34 Communications Act.

masterful and successful.

Now go to buying of Western Union, his earlier interest in that, possible earlier common cause with Morgan, carrying the intercommunicating idea to all electrical communications.

Need to develop the original AT&T long distance mission, reference to it in the 1901 memo, reliance on it after 1907 in argument for nationwide intercommunicating monopoly dictated by technology and nation's needs and customer service. Short-haul (or "toll") vs long-haul (or "long lines").[75]

Now buying up of independents. Independents fight. Antitrust suits all over.[76] Burleson proposal for Post Office ownership. Vail adds argument that monopoly must be protected from competition.

The shift to regulation as partner to monopoly and not "wasteful competition. >> This is important to get dates and arguments right. Start with annual reports, look for other primary source references in books we have. <<

Antitrust suit – which administration? Which AG? Kingsbury Commitment – negotiating parties, independents.

Kingsbury Commitment substance. 50 miles. Other – be careful of exact provisions vis-a-vis subsequent interpretations and enforcement agreement. Why a win for AT&T. Subsequent interpretations to allow killing off dual service.[77] Success of Vail's drive to eliminate competition by substituting regulation. A BIG deal to pull off in such a short time, especially in the climate against trusts.[78] Competition worked! Vail killed it. AT&T now "the largest corporation in the world?

Technology policy. Carty. Patent rights. Vacuum tube rights for long distance repeaters. Importance to coast-coast long distance circuits. Interest in, or lack of interest in, wireless. "Bell System"[79]

Concerns about government ownership, Burleson again, ww1, government takeover. Impact of demands on system, long distance, capital. Raising of rates to provide capital and make stock more saleable.

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[75] See McDougall paper on long distance. Need to adopt a terminology here. Maybe "short-haul toll" vs "long distance".

[76] See McDougall paper on long distance.

[77] Need an earlier description of dual service competition.

[78] See McDougall long distance paper for material on this, on picture with Rockefeller and Morgan, on meetings with Morgan and Rockefeller and others regarding hostile climate against big business, on Rockefeller praise for Vail success in PR campaign.

[79] McDougall again?

Need somewhere to refer to government ownership model for telephone systems in other parts of the world. Footnote on Canada as hybrid.

This should take us to ww1.

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And then after WWI, Vail's successor Gifford consolidates the natural monopoly structure that Vail had promulgated and makes some peace with the independents.

Quotes from *Bodies, Ideas, And Dynamics: Historical Perspectives On Systems Thinking In Engineering* by David A. Mindell, emphasis added by CTW for use in book.

Edison and electric power

Echoing the pattern of the railroads, electric power grew up on a similar model, though more consciously planned as systems. **Thomas Edison is hailed as a genius inventor for creating the light bulb, and indeed the light bulb has become a symbol for invention. But Edison's electric light succeeded because he designed not only light bulbs, but also a system that included generators and transmission lines.** When developing his system in the late 1870s, Edison explicitly compared it to the competitor he intended to replace: gas lighting. Edison designed light fixtures to resemble gaslights. An economic analysis of the cost basis of electric versus gas lighting led him to concentrate on a high-resistance filament, which required less current and hence smaller transmission lines than the lower resistance model his rivals were pursuing. **Edison described his invention in the physiological sense, as connected elements with current flowing between them. It was, in his words, "a system based on different inventions or discoveries, some of which have been made years before the others." 14** Edison also organized invention in the philosophical sense, initiating many of the features of a modern industrial R&D laboratory, especially an organization devoted to a "systematic" attack on technical problems. During design, Edison clearly understood how the components of his electric lighting system interacted with each other. He was less clear, however, on the dynamics of the system, or how those relationships affected each other during operations.[15] Indeed, Edison's early systems had stability problems, which his engineers solved with cut and try methods, not according to any overall model of their dynamics. For example, when the generators at the Pearl Street Station began to oscillate, the only solution was to replace them with newer ones, not to detune the system to avoid the resonance.[16] **This approach worked well when the systems were simple, and even up to moderate size, and up through the 1920s,**

engineers conceptualized electric power systems in the physiological sense, as sets of interconnected elements like generators, motors, traction loads, or transmission lines, each of which could be designed and analyzed independently and then combined. As local networks, engineers could treat them as hierarchical and centrally controlled, with all power emanating from a central station. [Chap 2?]

14 Edison to Butler, February 1879, quoted in Paul Israel, 1998. *Edison: A Life of Invention* (New York: Wiley), 189.
15 Hughes, *Networks of Power*, 31.
16 Nathan Cohen, "Recollections of the Evolution of Realtime Control Applications to Electric Power Systems," *Automatica* 20 (2, 1984), 145-62.

In the 1920s, local or regional power networks connected into national "grids" or "superpower" systems. Hughes has pointed out the importance of "load factor," as electric power systems expanded to equalize their average and peak demand.[18] No longer could individual systems be considered only as the power emanating from the station in the center of town. Now a system might incorporate a varied residential and industrial loads, coal- fired plant, and a hydroelectric station miles away – and connect to similar networks over a long transmission and tie lines. These new networks began to exhibit behaviors that could only be understood by looking at the system as a whole.[19] Stability problems with large, interregional electric power networks drove engineers to study the characteristics of large-scale power networks as complete entities, and to conceptualize them as systems in the dynamic sense.

This new approach was exemplified by a young electrical engineering professor at MIT, Vannevar Bush, who sought to bring a variety of systems under a single quantitative model. In his 1929 book, *Operational Circuit Analysis* Bush applied Heaviside's operational calculus to model systems of varying types. Bush noted that across fields in engineering like hydraulics,

17 Ronald Kline, *Steinmetz: Engineer and Socialist* (Baltimore: Johns Hopkins University Press, 1992). ughes, *American Genesis*, 161-175. While Steinmetz had the vision, G.E.'s research laboratory was headed by Ilis R. Whitney, a chemist, and focused primarily on physical chemical problems related to electric lighting.
18 Hughes, *Networks of Power*, 218-21.
19 See Committee on Power Transmission and Distribution, "Annual Report," *Trans. A.I.E.E.* 46 (June, 1927). For a general review of the subject of power system stability, see C.L. Fortescue, "Transmission Stability: Analytical Discussion of Some Factors Entering into the Problem," *Trans. A.I.E.E.* 26 (February, 1927), 984-994 and discussion 994-1003. Frederick Terman, "The Characteristics and Stability of Transmis sion Systems" (Sc.D. diss., MIT, 1924). Vannevar Bush, "Power System Transients," *AIEE Trans.* 44 (1925), 229-30. C. L. Fortescue, discussion of Bush and Booth, "Power System Transients," *Trans. AIEE* 44 (February, 1925), 97-103. This discussion, from six commentators, provides a good overview of the state of the stability problem in 1925.

In the other new large technical system of the early twentieth century, the telephone network, engineers used the language of systems more explicitly than in electric power. AT&T chief Theodore Vail's famous motto "One policy, one system, universal service," captured the company's totalizing view, though its network was composed of vast numbers of small, interconnected units. Within AT&T, engineers referred to their national network as "the System," and beginning in the 1920s the company had job titles for "System Engineers" and a "Systems Development" department. Yet these were not systems engineers in the modern sense; they did not have an abstract view of the system, nor did they manage a variety of subsystems. Rather, system engineers at AT&T concentrated on the concrete manifestations of the networks: the equipment layouts, power systems, and wiring diagrams for local substations.[23] The system was physiological, a thing, emanating from central switching stations.

[20] Vannevar Bush *Operational Circuit Analysis* (New York: J. Wiley & Sons Inc.: 1929), 1-2. John Carson, *Electric Circuit Theory and the Operational Calculus* (New York: McGraw-Hill: 1926).
[21] For more detail, see David Mindell, *Between Human and Machine: Feedback, Control, and Computing Before Cybernetics* (Baltimore: Johns Hopkins: 2002), Chapter 5.
[22] Bernard Carlson, "Academic Entrepreneurship and Engineering Education," and Alex Soojunk-Kim Pang, "Edward Bowles and radio engineering at MIT, 1920-1940," *Hist. Stud. Phys. Bio. Sciences* 20 (no. 2, 199), 313- 337. Christian Lecuyer, "The making of a science based technological university: Karl Compton, James Killian, and the Reform of MIT, 1930-1957," *Historical Studies in the Physical* Sciences 23 (1), 1992, 153-80. Larry Owens, "MIT and the Federal 'Angel:' Academic R&D and Federal-Private Cooperation Before World War II," *Isis* 81

As Bell Labs founder Frank Jewett told the National Academy of Sciences in 1935, **"We are prone to think and, what is worse, to act in terms of telegraphy, telephony, radio broadcasting, telephotography, or television, as though they were things apart. When they are merely variant parts of a common applied science. One and all, they depend for the functioning and utility on the transmission to a distance of some form of electrical energy whose proper manipulation makes possible substantially instantaneous transfer of intelligence."[26]**

[26] Frank B. Jewett, "Electrical Communication, Past, Present, and Future," Speech to the National Academy of Sciences April, 1935, reprinted in *Bell Telephone Quarterly* 14 (July, 1935): 167-99.

Chapter 1

*(Note to Reader: Chapter 1 tells the story of the **creation** of the electronic communications industries from 1900 to the early 1930s - the formation of the AT&T monopoly to eliminate telephone competition, and the birth of broadcasting in a competitive flurry that quickly settled into a monopoly of three radio broadcast networks.)*

Theodore Vail and the Creation of the Bell System

Despite early competition in the phone industry, Vail used economics, policy, and public relations to transform the phone industry into a protected monopoly, which laid the foundation for telecommunications' monopoly structure for 60 – 70 years.

A. Competition

When the Alexander Graham Bell's telephone patents expired in 1894,[1] the telephone industry of the new century became vibrantly – and chaotically[2] and doggedly - competitive.

Competition brought about several important developments in the phone industry. It changed the telephone from a service for business executives and elites into an everyday reality in more and more American homes and businesses. Hundreds of new "independent" telephone companies began providing service in the smaller towns Bell had ignored and competing head-to-head in larger towns and cities where Bell's high prices had kept penetration low. New manufacturing companies made and sold improved telephones and switching equipment. In the first six[3] years of competition, the number of telephones in the country grew by more than eight times to over two million, customer growth was accelerating, and the independent companies were catching up with Bell.[4]

With the advent of competition, Bell – and later AT&T - continued its basic business model of allowing its regional service companies to use only Bell-manufactured telephones and switching equipment on their wires.[5] Because of this policy, Bell's competitors had to build their own networks of wires and switchboards and buy telephones from non-Bell manufacturers, and many companies, large and small, sprang

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[1] [CTW:] It was actually 1893-94 for a series of patents.
[2] [CTW:] This is a key word – is there a better one to describe competition in 1900 and 2000???
[3] Milton Mueller, Jr., *Universal Service: Competition, Interconnection, and Monopoly in the Making of the American Telephone System* (Cambridge: The MIT Press, 1997) at 61.
[4] Mueller, *Universal Service*, 60 ("By 1902 there were 1.3 million Bell telephone subscribers . . . but there were nearly a million users of independent telephones."). [CTW:] FCC seem to say 40%. [Burgess: What is the source for this?]
[5] [CTW:] Bell also refused to sell its phones to other telcos.

up to do just that. Bell had built most of its business in cities where affluent residents and large companies that could afford Bell's prices were concentrated, but by 1900, the independents had built systems and brought service to many mid-size and small towns not served by Bell[6] and were stringing their own wires alongside Bell's wires to compete in the larger towns to compete head to head with Bell. Farmers formed cooperatives to build their own systems. Larger independents built toll[7] lines to connect larger towns with surrounding smaller towns that made up regional trading centers. Public pay phones spread rapidly, so that many more people were telephone users than the number of homes connected would suggest.

Faced with being left behind in a competitive flurry, the staid Boston company struggled to find ways to maintain its dominance in the industry. Reflecting its origins as a patent licensing business,[8] Bell filed numerous patent infringement suits that imposed costs on many small independent phone companies and equipment manufacturers.[9] But Bell's chief tools for competing with its rivals, or preferably putting them out of business, were economic – expanding into markets it had previously ignored either to discourage entry by an independent or to undercut an established independent with predatory price reductions.[10] Both of these tactics required construction of extensive new facilities, and the price wars took a major toll on revenues and profits. By the time Bell became AT&T in 1900, its earnings suffered due to battles with the independents.[11] Independents experienced more innovation and growth because in some ways they had better access to capital. AT&T was woefully undercapitalized to compete with them and in need of rapidly escalating capital infusions.

Bell needed to raise capital to keep from losing its predominant position in the American telephone business, but the laws of Massachusetts, where it was incorporated, prohibited majority ownership of operating companies and had restrictions on raising capital.[12] Thus, Bell looked elsewhere for reliable sources of its accelerating capital

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[6] Farmers also began creating their own telephone systems, creating farmer lines and rural mutual systems that accounted for about 11 percent of all U.S. phones in 1902. Mueller, *Universal Service,* 68.

[7] As a rule, "toll" lines were considered to connect towns up to 50 miles, while "long distance" lines were longer than 50 miles. This terminology arose in part because the independents had the technology for the shorter lines whereas AT&T had superior quality for the longer lines. While the "toll" and "long distance" distinction persisted for decades, it has little meaning in the larger sweep of the telephone business, and this book will not dwell on the distinctions.

[8] Bell licensed manufacturers, leased phones to regional affiliates.

[9] Danielian, *A.T.&T.,* 95-98.

[10] [CTW:] Need a footnote to deal briefly with definition "predatory" and to cite; Same tools rivals used to enter the market.

[11] Robert W. Garnet, *The Telephone Enterprise: The Evolution of the Bell System's Horizontal Structure, 1876-1909* (Baltimore: The Johns Hopkins University Press, 1985) at 108 (Though Bell's subscribers expanded rapidly from 1894-1900, profit margins fell dramatically).

[12] J. Warren Stehman, *The Financial History of the American Telephone and Telegraph*

needs.

Bell decided to incorporate in New York,[13] which it had been considering as early as 1896[14] due to the city's fewer restrictions and larger amounts of capital. With the move, Bell became AT&T[15] and was transformed from a Boston to New York City-based company with better access to the much larger and more open New York capital markets.

As competition intensified,[16] Fish was brought in to be President,[17] and it became clear that the move to New York had been wise. The company would need increasingly large amounts of capital every year to expand into the many cities and towns where the independents were growing. The large price cuts to cripple or force independents out of business drained revenue and profits, requiring still more capital infusions. Competition was thriving.[18] More and more businesses and homes were getting phone service at lower prices, but the competition was painful for the AT&T executives who hoped to reverse the tide.

B. Vail and Morgan work to establish AT&T as a telephone monopoly

Through behind-the-scenes maneuvering by Vail and Morgan, AT&T lays the foundation for the monopoly structure that persisted for 60-70 years.

Despite leaving the company in 1887 and declining its Presidency in 1901,[19] Vail exercised considerable influence over Bell before becoming a director in 1902 and accepting the Presidency in 1907. He knew the company well, having been the first General Manager of the old Bell Company from 1878 to 1885,[20] serving on the board of

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Company (New York: Augustus M. Kelley Publishers, 1967) at 40-41, 59-63; David S. Evans, ed., *Breaking Up Bell: Essays on Industrial Organization and Regulation* (New York: North-Holland, 1983) at 11; Garnet, *The Telephone Enterprise*, 104-05.

[13] The Bell system reorganized itself Dec. 31, 1899 with AT&T, its New York subsidiary, as the parent company. Evans, *Breaking Up Bell,* 11; Garnet, *The Telephone Enterprise*, 107.

[14] Garnet, *The Telephone Enterprise*, 106. based on memos by EJ Hall

[15] [Burgess:] Sources don't indicate where the "Telegraph" came from. Have emailed AT&T archives.

[16] [CTW:] Somewhere I annotated a table to quantify the "velocity" of the competition growth. [Burgess to CTW: unless you mean Mueller, *Universal Service*, 61, I can't find this.]

[17] Fish had been a prominent patent lawyer in Boston and New York. Garnet, *The Telephone Enterprise*, 110.

[18] Garnet, *The Telephone Enterprise*, 108-09. Evans, *Breaking Up Bell,* 13 ("By 1902, the independent telephone companies operated 51% of all telephones."). [Burgess: Check with CTW to confirm that these sources support his thoughts and the time frame he's referring to.]

[19] Danielian, *A.T.&T.,* 71.

[20] Garnet, *The Telephone Enterprise*, 31. Vail apparently worked in NYC july-dec 1878 and then moved to Boston. Albert Bigelow Paine, *In one Man's Life: Being Chapters*

directors until May 7, 1892.[21] He kept his home in Boston and kept up his contacts inside the company.

By the late 1880s, some of Vail's key colleagues from his days as general manager of the old Bell company held important positions.[22] From pursuinig his business projects, he had earned a reputation among important business men as a competent leader with powerful international connections.[23]

During his first tenure with Bell, Vail did not ascend to the positions he believed he was due considering the degree of input and impact he had on the company's success. The Boston financiers placed many of their friends in plum positions. Vail did not fit in with the Boston aristocrats, whom did not appreciate his forthright personality.[24] When he was passed over for the presidency of Bell in 1887, Vail resigned his presidency of the subsidiary company, AT&T.[25] Vail spent the next twenty years traveling, and spent some time in London where he associated with members of Baring Brothers and Company, associates of Kidder, Peabody and Company, who had connections with New York banking interests, including J.P. Morgan.[26]

A few months[27] after turning down the presidency he had wanted 16 years earlier, Vail wrote a detailed memo to Senator W. M. Crane in July, 1901 laying out his views on the policy that should govern the company at this critical time.

Vail's view of AT&T in 1901 was not good, particularly in the financial realm. After recounting a general assessment of needed policies, he concluded:

> The existing hand-to-mouth policy results wholly from a dread that the mgrs of the company had of acknowledging either to themselves or to the

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from the Personal and Business Career of Theodore N. Vail (New York: Harper & Brothers, 1921) at 146.

[21] Garnet, *The Telephone Enterprise*, 31.

[22] Edward Hall, whom Vail helped recruit, served as vice president of AT&T between 1887 and 1914. Garnet *The Telephone Enterprise*, 75. Two months after becoming president, Vail installed John J. Carty as chief executive of technical activities on July 2, 1907. Vail was an old associate of Carty's in the early '80s when Vail was general manager. Danielian at 102. "Robert W. Devonshire ("Dev") still remained, a pillar of reliability, and the names of Thomas Sanders and Francis Blake appeared on the list of directors." Paine, *In one Man's Life,* 237. [Burgess: check Thayer; Frank B. Jewett; Walter S. Gifford]

[23] Paine, *In one Man's Life,* 229.

[24] Danielian, *A.T.&T.,* 70.

[25] Ibid.

[26] Ibid. at 71.

[27] Vail refused the presidency in spring 1901, though the exact date is unclear. Paine, *In one Man's Life,* 227. It was certainly before July, when Frederick Fish was appointed and Vail drafted his memo to Senator Crane. Garnet, *The Telephone Enterprise*, 107; FCC exhibit No. 2096F.

> public, the full requirements of the business, and the responsibilities of the company for these requirements. . . . Many things that are important and necessary have been and are postponed until further postponement is absolutely impossible, or are abandoned, to the real detriment of the company's interest, for fear of some unfavourable temporary results. All this is wrong.

The thrust of Vail's view of what the company needed in '01 was "control." AT&T should stop the independents,[28] achieve as much control[29] of the telephone business as possible, consolidate[30] the regional operating companies and the Western Electric manufacturing operation into a single, centrally managed company, and establish a solid financial plan[31] that would provide stable sources of capital[32] to fund the strategy. This 1901 memo foreshadows the strategy Vail implemented when he later became the President of AT&T in 1907.

Between 1897-1904, the independents continued to expand rapidly[33] and reduce AT&T's share of the telephone market.

Through Morgan's influence, AT&T acquired control of Erie, an independent phone company that posed a threat to AT&T's dominance. In November 1899, two financier groups organized a phone company – Telephone, Telegraph and Cable Company – with the purpose of providing a long distance phone service competitive with AT&T.[34] One group was Rockefeller-Stillman, the other was Widener-Elkins. The Cable Company acquired a controlling interest in Erie Telegraph & Telephone. In December 1899, three directors, Dolan, Widener and Elkins, withdrew from the Cable

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[28] *Monopoly*: "The Company, having a tendency toward and desire for a monopoly should be abundantly prepared to assume the obligations, and discharge the responsibilities of its position." Vail memo to Senator Crane op. cit.

[29] *Control*: "In all these cases [of dealing with the competition from the independents], care should be take that a maximum of control be obtained by a minimum of concession.

[30] *Consolidation*: "All the Bell Telephone interest should be as soon as possible consolidated into [a single] operating company."

[31] *Planning for capital needs*: "The worst of the opposition (i.e. competition) has come from the lack of facilities afforded by our companies, -- that is, either no service, or poor service. … To meet these increasing demands, increasing amounts of money will be needed each year. A low estimate for the next five years would be $200,000,000 – every probability points to a larger sum."

[32] *Predictability*: "The knowledge that $250,000,000 would be required in the natural development of our business in the next five years … would not affect the shares of the company half so unfavourably[32] as an unexpected issue of $10,000,000 each year."

[33] Mueller, *Universal Service,* 60, 62, 81. But competition "reached its zenith" in 1907. Mueller, *Universal Service,* 95; Evans, *Breaking Up Bell,* 1, 15, and 16 (by 1902, the independents operated 44% of all telephones and they controlled 51% by 1907).

[34] Danielian, *A.T.&T.,* 47; Federal Communications Commission, *Investigation of the Telephone Industry in the United States, Made Pursuant to Public Resolution No. 8, 74th Cong.*, Washington, D.C.: GPO, 1939, Exh. No. 2096F at 59, 68-69.

Company "because of their association with certain other New York interests."[35] Some suspect that the "certain interests" were J.P. Morgan, who helped one of Elkins and Widener's business associates in a fight he and Morgan were waging against Rockefeller for control of the gas-distributing industry in New York.[36] The gas fight was won within a week of the directors' withdrawal.[37]

Having lost several key financiers, the Cable Company struggled to find financing, and ultimately Old Colony Trust Company took out one-year notes on the company.[38] T. Jefferson Coolidge, Chairman of Old Colony, was a Director at Bell and associated with J.P. Morgan.[39] Meanwhile, AT&T acquired a controlling interest in the company and worked out a reorganization plan with Coolidge.[40] Under the reorganization plan, AT&T acquired complete control over Erie, eliminating a significant long distance competitor.

Again, J.P. Morgan appeared to enter the picture when, within two months, AT&T, needing cash, sold 50,000 shares[41] of stock to a group of Morgan financiers on the condition that J. Waterbury and G. Baker would become directors.[42] At the same time, Vail[43] was also elected to the AT&T board.[44] These appointments marked the first time that the board included Morgan bankers or non-Boston[45] members.

While J.P. Morgan was moving to get control of AT&T, several AT&T directors who had previously worked in alignment with Morgan worked to acquire control of AT&T and merge it with Postal Telegraph to gain control of electric telecommunications

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[35] Danielian, *A.T.&T.,* 48 citing Dec. 2, 1899 *Commercial and Financial Chronicle* article.
[36] Danielian, *A.T.&T.,* 48 citing Exh. 2096F at 66.
[37] Ibid.
[38] Evans, *Breaking Up Bell,* 11-12; Danielian at 49.
[39] Evans, *Breaking Up Bell,* 11-12.
[40] Ibid; Danielian, *A.T.&T.,* 50.
[41] [CTW:] What % of the company was this? Stock price based on Stehman avg for 1902 p 326
[42] Ibid.
[43] Vail admitted that he represented Mackay shares on the Board. Danielian, *A.T.&T.,* 66. No sources definitively show that the Morgan interests were involved in Vail's appointment, but former Morgan collaborators Coolidge and Waterbury's relationship with Mackay suggests that Morgan's influence may have played a part. When Clarence Mackay sought to replace Vail on the board as the Mackay representative, Fish refused, suggesting that some powerful forces kept him involved. In a letter to Mackay, Fish wrote, "There are some reasons why it is more difficult than you can imagine to comply with your request at the present time. I will, however, consider the matter and talk it over with my people." Ibid.
[44] Danielian, *A.T.&T.,* 50; Exh. 2096F.
[45] [Burgess:] Emailed AT&T archives for list of AT&T board and states of residence through 1902.

businesses.[46] This effort fell apart, but presaged AT&T's 1909 takeover of Western Union.[47] In 1902, Coolidge and John Waterbury expressed their interest in combining Bell and Postal, initially seeking to do so through the Mackay companies. Waterbury approached John Mackay with the idea before he died in July 1902.[48] In 1903, John Mackay, Jr. formed an organization of "The Mackay Companies, the purpose of which was to acquire "interests in any telegraph, cable and telephone companies."[49] The new organization placed the affairs of several Mackay companies under four trustees including Coolidge, Waterbury, Clarence Mackay and William Cook.[50] Cook was general counsel of the Postal Companies.[51]

Shares of The Mackay Companies were exchanged for stock in the Postal Telegraph System until eventually The Mackay Companies became its owner.[52] Then, in 1905, the Mackay Companies began acquiring AT&T stock.[53] All the Bell stock was secured by selling between one and one-half and two shares of Mackay Companies preferred stock for one share of AT&T.[54] By 1907, Mackay Companies had acquired 70,434 shares in AT&T, making it the largest single stock holder.[55]

Coolidge and Waterbury's relationship with Mackay, however, gradually weakened as Mackay rejected their proposal to acquire a further interest in AT&T.[56] Mackay refused to underwrite the purchase of 50,000 shares of Bell stock, which the Baker-Morgan group acquired several months after Fish was asked to salvage Erie.[57] Ultimately, in mid-1905 Coolidge and Waterbury resigned as trustees, frustrated that the group had failed in its goal of acquiring control of AT&T.[58]

Theodore Vail also believed that Bell should be merged with a telegraph company.[59] As early as April 14, 1906, he suggested to President Fish that AT&T should absorb Postal Telegraph.[60] When Vail became president, he accomplished the merging of

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[46] Exh. 2096F; Danielian, *A.T.&T.,* 50-57; 74.
[47] The Morgan bankers' soured relationship with Mackay contributed to AT&T ultimately eschewing Postal Telegraph for Western Union, despite that Vail initially urged the absorption of Postal. Exhibit at 77-85; Danielian, *A.T.&T.,* 56.
[48] Exh. 2096 at 77.
[49] Ibid. at 78.
[50] Ibid. at 77.
[51] Ibid.
[52] Ibid. at 78.
[53] Ibid. at 79.
[54] Ibid.
[55] Ibid. at 79, 91.
[56] Ibid. at 82.
[57] Ibid. at 82-83.
[58] Ibid. at 84-85.
[59] Vail "advocated [for combining telephone and telegraph] all his life." Danielian, *A.T.&T.,* 168.
[60] Danielian, *A.T.&T.,* 56.

AT&T and Western Union in 1909.[61] By then, Vail had determined that it would be better for AT&T to join Western Union than Postal Telegraph, probably in part due to soured relationships the companies' directors.[62] In 1909 AT&T purchased about $25,000,000 Western Union stock through a subsidiary.[63] Ownership of 30 percent of Western Union stock gave AT&T working control.

Meanwhile, competition had intensified and the independents thrived. AT&T struggled to keep up and, as predicted by Vail, needed more and more capital. The company considered various financing arrangements between 1902 and 1906[64] and planned a major bond offering in 1906. How to place the offering posed a major issue for the AT&T board. They questioned whether it should it be a competitive bidding process between the Boston and New York bankers and whether the bonds should be convertible into common stock, which the New York bankers urged.[65] The company's attorneys noted that convertibility potentially would give the New York bankers control or near-control of company,[66] and stockholders protested the risk of putting a vast sum into the hands of individuals "whose wisdom and integrity we can at this time have no knowledge."[67] In February 1905, Fish rejected the plan.[68] But ultimately, on February 8, 1906, the board sold $150,000 million bonds to the Morgan interests without

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[61] Ibid.

[62] Ibid. at 74 (in a July 14, 1908 letter to John Waterbury, Vail writes "There are a great many statistics and reasons why it would be advantageous to this company to acquire the Western Union Telegraph Company which I think would be rather unwise just at the present to put on paper.").

[63] Ibid.; Danielian reports that Vail acquired Western Union stock at Morgan's request, but doesn't cite any sources. Ibid. at 71.

[64] In 1902, it floated $13,000,000 bonds using an underwriting company that included Wall Street's Kidder, Peabody and Company and also T. Jefferson Coolidge of Old Colony Trust, a traditional Bell broker. Garnet, *The Telephone Enterprise*, 117-18. In 1904, it sold $20,000,000 in bonds to Lee Higginson and Company and Speyer and Company, a group that J.P. Morgan was opposed to. Danielian, *A.T.&T.,* 59, 63.

[65] Danielian, *A.T.&T.,* 60 citing Exh. 2096A, Appendix 9, sheets 3-4 citing a Feb. 15, 1905 letter from Sen. Crane to Fish saying, "I am beginning to think that we ought to raise the necessary money by the sale of four per cent collateral bonds without the conversion clause . . . . The other proposition is intricate and uncertain, and might lead to a great deal of trouble . . . ."

[66] Danielian, *A.T.&T.,* 60 citing a Feb. 16, 1905 report from Attorney Leverett, Vice-President Sherwin, and Treasurer Driver to Fish saying "[T]here is another risk in the proposed plan which should be had in mind. If a banker's syndicate should be formed under the proposed plan, who should pool their bonds or place them in trust, the trust so formed, by exercising the option given for the conversion of bonds, would have the power to acquire so near an absolute controlling interest in this company as practically to control the whole assets of the company, which they could use for any schemes of financing that they saw fit."

[67] Danielian, *A.T.&T.,* 62 citing FCC Exh. 2096A, Appendix 6 citing a letter from stockholder Francis Goodwin to Fish.

[68] Danielian, *A.T.&T.,* 61.

competition and made the bonds convertible.[69]

Acquiring the bonds was one step in Morgan's strategy to move the company's business from Boston to New York, as AT&T sold the convertible bonds to Morgan and associates, rather than Boston bankers. Morgan also required that a New York company rather than the Boston company that Bell typically worked with, Old Colony Trust, be granted trusteeship of the convertible bonds.[70] As one of the J.P. Morgan Co. partners explained:

"One of the principal things to be accomplished, as I understood it, was to broaden the market for the Company's securities and to remove the impression very generally prevailing that it was merely a local company in New England and nt a company whose operations extended all over the country. I cannot avoid the feeling that it would help the issue of the bonds and the company generally if being a New York corporation it should avail of a New York trust company."[71]

In a declining bond market, the bankers had difficulty placing the bonds. Even after cutting the bonds' price in January 1907, there were few takers.[72] Both AT&T and its bankers suffered losses, causing AT&T a financial panic. Now having control of the company, the New York bankers chose Vail to rescue them.[73] They forced Fish out[74] and in May 1907, Vail became President of AT&T, the job he had wanted for two decades.[75] He was 61 years old.[76]

C. As President, Vail takes steps to perpetuate AT&T's monopoly

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[69] Ibid. at 63. [Burgess:] No documentation reveals the reason for Fish's change of heart to reach this decision. Board members Vail, Baker, Waterbury, and Coolidge – "a strong coherent group on the directorate" – would've supported the sale. Ibid at 59. T. Jefferson Coolidge, Chairman of Old Colony Trust and a Bell Director, and Waterbury initially urged AT&T to consider financing with convertible bonds. Ibid. Coolidge's company, however, was not one of the four to be included in the 1905 convertible bonds sale. Ibid. at 63; Exh. 2096F at 130.

[70] Exh. 2096F at 156-58.

[71] Exh. 2096F at 157. Robert MacDougall, "Long Lines: AT&T's Long-Distance Network as an Organizational and Political Strategy." *Business History Review* 80:2 (Summer 2006) 297-328 at 307-08.

[72] Vincent P. Carosso, *The Morgans: Private International Bankers 1854-1913* (Cambridge: Harvard University Press, 1987) at 495.

[73] Garnet, *The Telephone Enterprise*, 128.

[74] See Paine, *In one Man's Life,* 229; Danielian, *A.T.&T.,* 66 (Fish resigned the presidency within 4 weeks of his reelection). There is also some suggestion that Fish was eager to retire because his health was declining from understandable work-related stress. Paine, *In one Man's Life,* 229.

[75] Garnet, *The Telephone Enterprise*, 128; Danielian, *A.T.&T.,* 70.

[76] Born July 16, 1845. Paine, *In one Man's Life,* 7; Garnet, *The Telephone Enterprise*, 128.

As president of AT&T, Vail began an incredibly shrewd and effective strategy of business, political, and public relations tactics that killed off competition and reestablished the telephone as a monopoly service with AT&T controlling most of the country and all the long distance service.

Business

Vail was a systematizer.[77] He believed in tight organization, thinking that every regional operating company should use the same kind of facilities, equipment and operating practices, and every engineer should have the same training and use the same standards everywhere across the country. He wanted long distance connections to work the same way between all cities and regions and equipment manufacturing to be standardized and centralized nationally in one AT&T subsidiary – Western Electric. He imposed uniform practices, pay schedules and rates on a national basis. Though a previous president, Gardiner Hubbard had sought to move the company in this direction, often against the practices and desire for independence among the regional operating companies, Vail forcefully completed the transformation of the company and its facilities into the Bell System.[78]

By creating the Bell system and requiring standard, high-quality service methods throughout the country, Vail enabled the company to deliver consistently good service very well and become a very powerful entity. AT&T used its position of providing better telephone service than its competitors to get the government to grant it preferential powers, which lead to the consolidation of their monopoly.

As president, Vail worked to integrate all electrical communications by purchasing controlling stock in Western Union in 1909. From early on, Vail believed it would be beneficial to merge AT&T with a telegraph company, writing to President Fish on April 14, 1906 that AT&T should absorb Postal Telegraph.[79] But by 1909, Vail had determined that it would be better for AT&T to join Western Union than Postal Telegraph, which may have been in part at Morgan's request.[80] Vail became president of Western Union, and there were seven directors who were also AT&T directors – Vail, Baker (First National Bank), H.P. Davison (Morgan), H.S. Howe (Old Colony Trust), Waterbury (Manhattan Trust), and Winsor (Kidder Peabody).[81] The alliance between Bell and Western Union lasted 5 years.[82]

Before Bell's patents were to expire in 1894, Vail vigorously sought to standardize telephone equipment and wires, foreseeing that a stronger long-distance

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[77] Vail advocated for and implemented efficient systems from early in his career, devising many plans to improve the U.S. Mail Service's operations where he worked until joining Bell in 1878. Garnet, *The Telephone Enterprise*, 30.
[78] Note that the expression *Bell system* had been used much earlier.
[79] Danielian, *A.T.&T.,* 56.
[80] Ibid. at 71, 74.
[81] Ibid. at 75.
[82] Ibid.

service was needed to protect against impending competition.[83] Bell's focus on long distance service was a risky strategy as it arguably weakened its competitive position, at least in the short term, forcing subscribers to pay for more expensive long distance instruments while independent companies could offer less expensive service.[84] Independent companies left Bell on its own to deal with coast-to-coast service, instead advocating for regional long-distance service, reasoning that a market existed for calls across up to 100 miles, with ninety percent of all calls across 50 miles.[85] [Burgess: Clarify what CTW is looking for here]

Recognizing that the independents were gaining a competitive foothold, AT&T began buying them or entering sublicensing agreements with them.[86] By sublicensing, Bell allowed noncompeting independent companies to connect to it.[87] Their sublicensing agreements required the interconnecting companies to lease Bell phones, which was both consistent with Bell's earlier argument against interconnection that non-Bell equipment was inferior and was more profitable than selling the phones outright.[88] Sublicensing added connections to small locations and eliminated competition from those markets.[89]

Meanwhile, Vail made a significant impact on AT&T's technology policy. Two months after becoming president, on July 2, 1907, he installed John J. Carty as chief executive of technical activities.[90] Carty was a pivotal figure who advocated for trained technicians to follow uniform engineering practices and procedures set by unified management.[91] Early in his tenure, he greatly reduced engineering personnel and expenses and moved the company's lab work from Boston and Chicago to New York.[92] Recognizing the importance of wireless, Carty encouraged research into the vacuum-tube amplifier, foreseeing that "[w]hoever can supply and control the necessary telephone [vacuum-tube amplifier] will exert a dominating influence in the art of wireless telephony when it is developed."[93] Meanwhile, the company bought important patent rights that it didn't create, including De Forest's three-element vacuum tube and other inventions.[94]

Political

Vail's primary political achievement was successfully recognizing that AT&T

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[83] Louis Galambos, "Theodore N. Vail and the Role of Innovation in the Modern Bell System." *Business History Review* 66:1 (1992): 95-126; MacDougall, "Long Lines."
[84] MacDougall, "Long Lines" at 314.
[85] Ibid.
[86] Mueller, *Universal Service*, 77-78.
[87] Ibid. at 77.
[88] Ibid.
[89] Ibid. at 78.
[90] Danielian, *A.T.&T.,* 102.
[91] Garnet, *The Telephone Enterprise*, 89.
[92] Danielian, *A.T.&T.,* 102.
[93] Ibid. at 104.
[94] Ibid. at 105.

could not overtake the competition to "save" the "Bell System" as the predominant telephone company under the thriving dual service competition.[95] In 1907, he began pushing for state regulation as a publicly acceptable way to sanction monopoly over competition.[96] Regulation of a monopoly, he argued, paralleled treatment of other utilities[97] and would spare the public from "wasteful competition."[98]

Convincing the public of this was a successful political and intellectual scam. When encouraging and arguing for a regulatory scheme in a state, Vail insisted that the telephone business was inherently a monopoly. As a natural monopoly, Vail claimed, it had to be regulated because competition wasn't feasible and regulation was needed to serve the public interest.[99] Vail began articulating this theory in the annual reports of AT&T in about '07 / '08.

Vail argued that the monopoly of the phone company was a good thing for society.[100] Because of the good things that AT&T did and could do because of its monopoly, Vail asserted, regulation was needed to protect AT&T from competition.[101]

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[95] Theodore N. Vail, *1907 Report of the Directors of American Telephone and Telegraph Company*, New York: March 10, 1908; Theodore N. Vail, *1908 Report of the Directors of American Telephone and Telegraph Company*, New York: Dec. 31, 1908.

[96] 1907 AT&T Annual Report at 18 ("It is not believed that there is any serious objection to such public control, provided it is independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return, and good management or enterprise to its reward."). 1908 Annual Report at 24; Galambos, "Theodore N. Vail and the Role of Innovation in the Modern Bell System."

[97] Mueller, *Universal Service*, 100.

[98] 1907 AT&T Annual Report at 17-18 ("Duplication of plant [was] a waste to the investor. Duplication of charges [was] a waste to the user.").

[99] In the 1915 Annual Report, Vail explains that [state regulatory commissions] should be responsible for "protecting the individual member of the public against corporate aggression or distortion, and the corporate member of the community against public extortion and aggression." Danielian, *A.T.&T.,* 324, Bell Legislation and lobbying; Peter Temin with Louis Galambos, *The Fall of the Bell System: A Study in Prices and Politics* (Cambridge: Cambridge University Press, 1987) at 16, 33, 344; Evans, *Breaking Up Bell,* 41-42.

[100] 1907 AT&T Annual Report, "A combination of like activities under proper control and regulation, the service to the public would be better, more progressive, efficient, and economical than competitive systems."

[101] In the 1910 Annual Report, Vail argues "A public utility giving good service at fair rates should not be subject to competition at unfair rates. It is not that all competition should be suppressed but that all competition should be regulated and controlled. That competition should be suppressed which arises out of the promotion of unnecessary duplication, which gives no additional facilities or service, which is in no sense either extension or improvement, which without initiative or enterprise tries to take advantage of the initiative and enterprise of others by sharing the profitable without assuming any of

But those two ideas are fundamentally incompatible. A natural monopoly is an industry where competition isn't feasible. A natural monopoly does not need protection from competitors.[102] Nonetheless, this idea continued until the 70s when the Nixon Administration's Office of Telecommunications Policy worked to undermine that rationale.

Vail also recognized that regulation could save AT&T from government takeover, which seemed a real threat considering that most European countries owned their phone systems and the U.S. government controlled the postal service.[103] By the turn of the century, people had been pushing for the postal system to control the telegraph, and in 1913, Postmaster General Albert Burleson called for nationalization of both the telegraph and telephone.[104]

Meanwhile, in the 1900's states began regulating the telephone.[105] By 1915 most states had regulatory commissions overseeing telephone rates and practices and by 1920, all but three states did.[106]

[Burgess: transition needed]

By 1920, AT&T was a regulated monopoly.[107] Vail's short and successful drive to eliminate competition by substituting regulation was remarkable, especially considering the climate against trusts.[108] Competition worked, and Vail killed it.

One of the obstacles that Vail overcame in his drive to eliminate competition by substituting regulation was an antitrust suit brought under the William Taft administration in 1912 concerning AT&T's acquisition of an Oregon independent company.[109] Charged with violating the Sherman Act, AT&T resolved the conflict out of

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the burden of the unprofitable parts or which has only the selfishly speculative object of forcing a consolidation or purchase."

[102] [CTW:] Bruce Owen's recollection was different -- CTW doesn't remember exactly, but it had to do with the time Vail said something.

[103] MacDougall, "Long Lines" at 318-19; Adam D. Thierer, "Unnatural Monopoly: Critical Moments in the Development of the Bell System Monopoly." *The Cato Journal* 14:2 (Fall 1994) at 6-7. Evans, *Breaking Up Bell,* 41 ("The British government nationalized the British telephone system in 1912.").

[104] MacDougall, "Long Lines" at 319; Evans, *Breaking Up Bell,* 41-42.

[105] MacDougall, "Long Lines" at 319.

[106] Evans, *Breaking Up Bell,* 41-42.

[107] Evans, *Breaking Up Bell,* 42.

[108] See MacDougall, "Long Lines" for material on this, on picture with Rockefeller and Morgan, on meetings with Morgan and Rockefeller and others regarding hostile climate against big business, on Rockefeller praise for Vail success in PR campaign.

[109] There was an administration change in 1913, when Woodrow Wilson became president. [Burgess: check Garnet, *The Telephone Enterprise*, 152-153 re this graf.]

court with a consent decree and a letter now known as the Kingsbury Commitment.[110] In a December 1913 letter from Nathan Kingsbury to Attorney General James C. McReynolds, AT&T agreed to sell its holdings in Western Union, to refrain from buying competing phone companies and to connect them to its long distance lines.[111]

On the surface, these terms appeared to be reasonable concessions, but they had the practical effect of giving AT&T significant advantages over competitors. Opening up lines to competitors made it impossible for other long distance companies to enter the market. Permitting independent subscribers to call into Bell exchanges, but not the other way around, deprived independents exclusive access to their customers.[112] The agreement permitting independent subscribers to call into Bell exchanges applied only to exchanges that were more than 50 miles apart.[113] Since 95% of all phone calls at that time were to points within fifty-mile radii,[114] this term benefited few independent phone calls. A journalist characterized this lopsided provision as Bell's final step "to deprive the independents of their exclusive control of portions of the telephone business" by "opening up a significant number of independent exchanges to Bell connections without allowing competing independents access to Bell exchanges."[115] [Be careful of exact provisions of agreement vis-a-vis subsequent interpretations.] [CTW inserted these brackets.]

Public Relations[116]

One tool Vail used to change the political climate was an aggressive public relations strategy. Business leaders of his day lauded Vail's effective public relations campaigning to establish and protect AT&T's monopoly. Within months of the break-up of Standard Oil, John D. Rockefeller wrote, "Mr. Vail, as president of the Telephone Company, has done this kind of work . . . for many years with great success. He has made it a regular business . . . [and] he constantly and persistently kept up a campaign of education. The fact that his Company, one of the greatest, if not the greatest single monopoly in the country, is allowed to continue unmolested . . . is indication enough of his success."[117]

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[110] Temin, *The Fall of the Bell System,* 9-10.
[111] Ibid. at 10.
[112] Mueller, *Universal Service.*
[113] Mueller, *Universal Service*, 130.
[114] Ibid. at 131.
[115] Ibid. at 132.
[116] Richard John, "Theodore N. Vail and the Civic Origins of Universal Service," *Business and Economic History*. 28:2 (Winter 1999) 71-81; MacDougall, "Long Lines" at 318-26.
[117] MacDougall, "Long Lines" at 321 citing Rockefeller letter to Frederick T. Gates, July 27, 1912, reprinted in John M. Jordan, "'To Educate Public Opinion': John D. Rockefeller, Jr. and the Origins of Social Scientific Fact-Finding," *New England Quarterly* 64 (June 1991): 292-97.

Through annual reports, news articles and ads, Vail spread several messages that eased the way to public acceptance of Bell as the primary telephone provider and regulation rather than competition as an acceptable industry structure.

Scholars note that by the 1920s legislators referred to competition using the same language as Vail – "duplicative," "destructive," and "wasteful."[118] "A Senate Commerce committee hearing in 1921 stated that 'telephoning is a natural monopoly.' And a House of Representatives committee report noted, 'There is nothing to be gained by local competition in the telephone business.'"[119] When Congress passed the Willis Graham Act in ___, permitting consolidations of dual telephone services with approval of the Interstate Commerce Commission, it eliminated competition.[120] In introducing the Act, Senator Graham explained that it's passage was required because it is "better policy to have one telephone system in a community that serves all the people, even though it may be at an advanced rate, properly regulated by State boards or commissions, than it is to have two competing telephone systems, so that he must have in his house and in his office two telephones, on neither one of which he can get all the people he wants to be in connection with."[121]

In 1907, Vail first used his mantra – one system, one policy, universal service – aimed at the switchboard problem.[122] When Vail coined the term "universal service," he meant that everyone should be on the same system, a nice word for monopoly.[123] Vail thought that there should be one monopoly phone company because he believed that was the best way to develop a robust phone system in US.[124]

Importance to coast-coast long distance circuits. "Bell System"[125]

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[118] Thierer, "Unnatural Monopoly."
[119] Ibid.
[120] Milton Lawrence Mueller, "The Telephone War: Interconnection, Competition, and Monopoly in the Making of Universal Telephone Service, 1894-1920" (Ph.D. diss., University of Pennsylvania, 1989), 346.
[121] Ibid. citing Congressional Record, June 1, 1921, p. 1966.
[122] Mueller, *Universal Service,* 92.
[123] Mueller, *Universal Service*, 92. Only later did the phrase come to mean that everyone in the country should have a telephone. This happened around time of 34 Communications Act.
[124] Mueller, *Universal Service*; Danielian, *A.T.&T.,* 271, 291; Temin, *The Fall of the Bell System*, 6, 16, 72, 77, 168, 344.
[125] [Burgess: MacDougall?] **[**Where did the term come from and how was it applied?]

10. The Breakup of AT&T (OTP)

This section deals with MCI, Datran, cellular, etc, and the failure of the FCC model leading to the breakup of AT&T. key points are: Carterphone, fax, etc; MCI & McGowan with Topol and Milken; Datran and Wiley; domestic satellite competition as model for competition coexisting with monopoly; failure of FCC specialized carrier policy; OTP & DoJ join forces; the long proceeding; the breakup; the explosion of fiber & digital electronics; Arpanet and internet; 1996 Telecommunications Act & failed FCC policy for enforced competition.

A New Century

11. Pipes and Wires

This is a short chapter on how fiber pipes, satellites, cables, wires, and wireless spectrtum have become the basis for a competitive infrastructure where all kinds of content (telephone, TV, video, audio, text, internet) rides.

12. The Internet

This is a short chapter on the emergence of the internet as a content vehicle. Key points are: multiple paths for content from multiple sources to multiple users, so control of wires no longer confers power over content; electronic media content now no different economically than print from First Amendment perspective.

CTW Chapter 1A notes:

Vail rationale for Western Electric 1910 Report p 14.

Good relations with state commissions 1910 Report p 19.

Vail on competition 1910 Report 21ff

"universal, interdependent and intercommunicating" 1910 Report p 22

Need to improve local exchanges to accommodate toll and long distance. 1910 Report p 24.

Origin of Bell System 1910 Report p 24

"talking limits" 1910 Report p 24

Bell System vs fractionalized competition – great loaded comparison 1910 Report p 26

Rationale for permanent quasi-judicial regulatory commissions 1910 Report p 32

Right respective roles for management vs regulation 1910 Report p32

*** Need to protect the monopoly 1910 Report p 32 argument is on scope, not scale. Did this appear earlier??

Argument against state ownership 1910 Report p 34

***Effective competition and regulation inconsistent. Regulation means deliberation, the opposite of competition which means "*strife*" 1910 Report p 36

Competing exchanges and scope arguments 1910 Report p 37

Customers on competing systems cannot connect 1910 Report p 38

*** Necessity of universal service. 1910 Report p 39

*** Interconnection objection 1910 Report p 41 ff

1910 Annual Report summary, 1910 Report p 58

Questionnaire on com 1906(?) 1300 business leaders overwhelmingly favorable MacMeal 168-169

Talks between AT&T/Vail and independents 1911 MacMeal 184ff

Impact of long distance on railroad travel & inventory management MacMeal 61-62

State independent associations call for government to enforce antitrust laws 1910 MacMeal 180

Morgan purchase of independents MacMeal 179

MacKay sells AT&T stock 1910 MacMeal 179

Bell stock prices 1890-99 Stehman 73

AT&T stock prices 1901-1923 Stehman 326

Gabel – dual service economics

Need to add stuff from Fisher, Pool, social and business impact of telephone

Need to add stuff from Marvin, telephone broadcasting, Hungary, US, telediffusion,