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Long Lines: AT&T, Long Distance Telephony, and Corporate Control

Robert MacDougall

In this paper I argue that the importance of long distance telephone service to the American Telephone and Telegraph (AT&T) Company in the 1900s and 1910s was not commercial, but political and cultural. Long distance service played a key role in justifying the centralization of corporate control in the telephone industry and the nation at large. The so-called Bell System was not a single firm before the 1910s, but rather an association of regional operating companies with considerable autonomy. As AT&T's leaders fought to curtail that autonomy, long distance service offered a powerful technological justification. Outside the Bell System, the transcontinental network also served as a symbol of interconnection and integration. It became central to AT&T's campaign to convince Americans not only of its own legitimacy, but also of that of nation-spanning corporations in general.

On January 25, 1915, the American Telephone and Telegraph Company held a lavish ceremony to commemorate the United States' first coast-to-coast telephone call (see Figure 1).[1] Alexander Graham Bell in New York spoke by telephone to his old assistant Thomas A. Watson in San Francisco. "Mr. Watson, come here, I want you," Bell said, repeating the words he had spoken in the very first telephone call, nearly 40 years before. Watson got to deliver the punch line, such as it was: "Why, Mr. Bell," he replied, "it would take me a week to do that now!"[2] Bell's words traveled 3,500 miles from New York to San Francisco, across thirteen states and over 130,000 telephone poles supporting nearly 3,000 tons of

[1] It is somewhat anachronistic to use the abbreviation "AT&T" for the American Telephone and Telegraph Company in this era; I do so only for brevity. Some documents in this era did refer to "the A.T. & T. Co.," but the familiar acronym "AT&T" only came into general use in the 1930s or after.

[2] Numerous company publications included descriptions of the inauguration of the transcontinental line. See for example *The Story of a Great Achievement: Telephone Communication from Coast to Coast*, (New York, 1915); "Coordinating the Nation," *Telephone Review* (January 1915), 24; and Arthur Pound, *The Telephone Idea: Fifty Years After* (New York, 1926).

Robert MacDougall is a visiting scholar at the American Academy of Arts and Sciences in Cambridge, Mass.; email: **rob.macdougall@gmail.com.**

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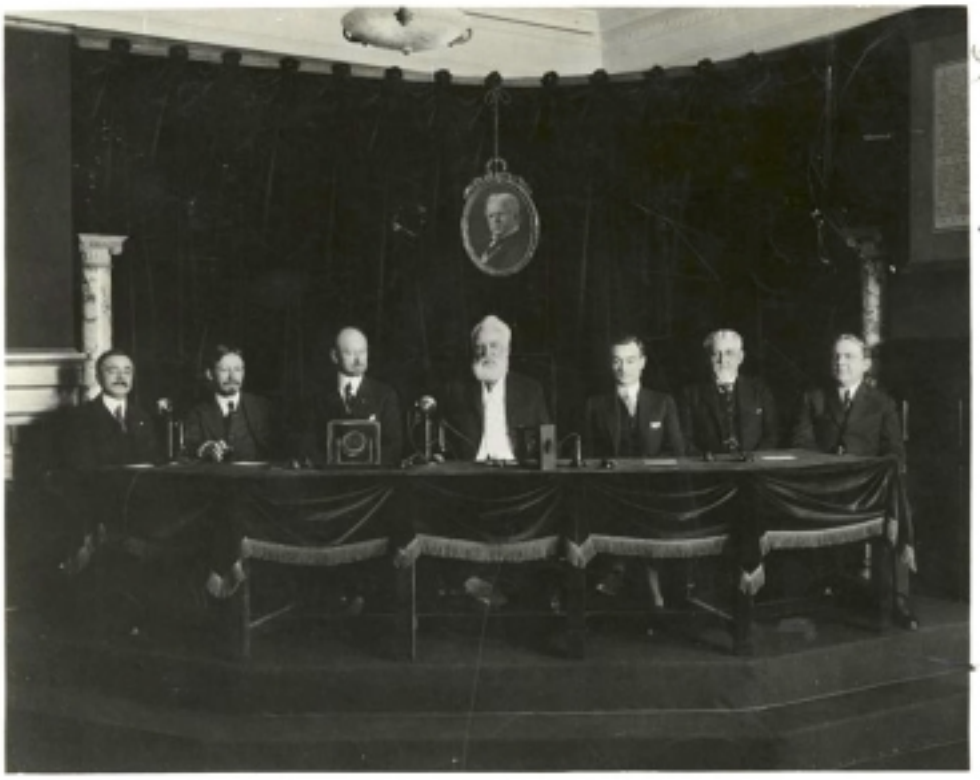

FIGURE 1

Alexander Graham Bell (center), and Mayor John Purroy Mitchell of New York (at Bell's right) with other dignitaries and company officials, at the official opening of transcontinental telephone service, New York, 25 Jan. 1915. Above Bell is a portrait of AT&T president Theodore Vail.
Source: *The Pageant of America* Photograph Archive, vol. 4, "The March of Commerce," New York Public Library, plate number 4.644.

copper wire. Another circuit connected President Woodrow Wilson in Wash Washington and AT&T President Theodore Vail in Georgia.[3] The real spectacle, as AT&T executives were quick to point out, was not simply this call but the system in its entirety, a now truly national long distance network that connected more than nine million telephones from coast to coast (see Figure 2).

The ceremony coincided with the Panama-Pacific Exhibition in San Francisco celebrating the completion of the Panama Canal. The telephone company's boosters compared this other spectacle of technology to their transcontinental network, and judged the Canal wanting. The U.S. government had spent $310 million constructing the Canal, one AT&T

[3] Vail was at Jekyll Island, Georgia, reportedly recuperating from a bad fall.

FIGURE 2

The Merger of East and West

"But there is neither East nor West, Border, nor Breed, nor Birth,
When two strong men stand face to face, tho' they come from the ends of the earth!"
—KIPLING.

In the "Ballad of East and West," Kipling tells the story of an Indian border bandit pursued to his hiding place in the hills by an English colonel's son.

These men were of different races and represented widely different ideas of life. But, as they came face to face, each found in the other elements of character which made them friends.

In this country, before the days of the telephone, infrequent and indirect communication tended to keep the people of the various sections separated and apart.

The telephone, by making communication quick and direct, has been a great cementing force. It has broken down the barriers of distance. It has made us a homogeneous people.

The Bell System, with its 7,500,000 telephones connecting the east and the west, the north and the south, makes one great neighborhood of the whole country.

It brings us together 27,000,000 times a day, and thus develops our common interests, facilitates our commercial dealings and promotes the patriotism of the people.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

One Policy *One System* *Universal Service*

AT&T sang the praises of the transcontinental telephone system
Source: *Telephone Review* (Aug. 1913).

pamphlet reported; the telephone company spent twice that amount constructing "this other canal, this even more intimate connection between the two seaboards." The transcontinental telephone network was "the highest achievement of practical science up to today," AT&T's publicists declared. "No other nation has produced anything like it, nor could any other nation. It is *sui generis*, it is gigantic—and it is entirely American."[4]

In public and in private, AT&T executives in the 1910s sang the praises of long distance communication and the utopia of peace and prosperity it might one day achieve. Theodore Vail, a prime mover behind the construction of the transcontinental line, was always ready to wax rhapsodic on the subject. He declared "intercommunication" to be "the

[4] *The Story of a Great Achievement*, 11-16.

basis of all civilization." "Prosperity is in direct relation to its completeness and perfection," he told one audience in February 1913. Once the universal telephone network was completed, he told another, "distance will be annihilated, and the whole world will be united in common interests, common thought, [and] common traditions."[5]

The fanfare surrounding the transcontinental call, however, and the emphasis AT&T placed on its long distance service in general, appear out of proportion to the commercial importance of the long distance telephone at this time. There seems to have been no great clamor for coast-to-coast telephone service before or even some time after 1915. As late as 1935, AT&T would estimate that less than 10 percent of the Bell System's revenues came from interstate traffic and that less than 1.5 percent of telephone calls crossed even one state line.[6] Vail's successor Walter Gifford admitted in 1928 that the long distance network was still "a seventh day wonder" to most Americans, rather than a real part of their everyday lives.[7]

The high cost of long distance telephony was obviously a factor. The charge for a three-minute call from New York to San Francisco in 1915 was $20.70—roughly equivalent to $375 today.[8] Such service was prohibitively expensive for the vast majority of telephone users. However, demand would have been uncertain even at a lower price. "No one pretends that the New York—San Francisco line will immediately 'pay'," reported a *McClure's* magazine article published on the eve of the coast-to-coast call. "The public will have to acquire the habit of talking transcontinentally, just as it had to learn to use the telephone at all."[9] The public acquired this habit only slowly. The New York to San Francisco circuit did not pay for itself right away, nor would it for many years.[10]

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[5] Theodore N. Vail, *Views on Public Questions: A Collection of Papers and Addresses* (New York, 1917), 99, 313.

[6] James M. Herring and Gerald C. Gross, *Telecommunications: Economics and Regulation* (New York, 1936), 213.

[7] Conference of Publicity and Personnel Representatives of the American Telephone and Telegraph Company, *Proceedings*, 11-13 April 1928, Historical Collections, Baker Library, Harvard Business School [hereafter, HBS], 89.

[8] M. D. Fagen, ed., *A History of Engineering and Science in the Bell System*, vol. 1: *The Early Years, 1875-1925* (Warren, N.J., 1975). Adjusted for inflation, $20.70 in 1915 had the same purchasing power as $376.47 in 2003. John J. McCusker, *Comparing the Purchasing Power of Money in the United States (or Colonies) from 1665 to Any Other Year Including the Present* (Economic History Services, 2004), URL: **http://www.eh.net/hmit/ppowerusd/** (accessed 8 May 2005).

[9] "Telephones for the Millions," *McClure's* (Nov. 1914): 45-55.

[10] AT&T's major commercial reward for its coast-to-coast lines came with the rise of network radio broadcasting in the 1920s and 1930s—not from person-to-person calls but from the use of the lines to transmit radio programming between network affiliates. Many Americans had their first occasion to use the long

Histories of the telephone written in the heroic mode celebrate Theodore Vail's determination to build a national long distance network as evidence of his foresight and commanding vision. However, Vail had other reasons for leading his company in that direction. The importance of long distance to Vail and to AT&T was not commercial, but political and cultural. First, the transcontinental telephone circuit played a key role in justifying a reorganization of the Bell System, which curbed the autonomy of local and regional operating companies and centralized power at AT&T. More broadly, AT&T's long distance triumph served as an immense and compelling symbol of interconnection and economic integration at a time when Americans remained highly ambivalent about such trends. Long distance proved central to a seminal public relations campaign through which AT&T not only polished its own corporate image, but also worked to convince Americans of the legitimacy of nation-spanning corporations in general.

In celebrating its long distance network, AT&T repeatedly blurred distinctions between the actual physical system of phones and wires and the corporate structure of companies and people around it. Ideas about how the technology of long distance worked or should work were extrapolated to the organization of human systems. Thus, questions of corporate control powerfully shaped technological choices at AT&T—and vice-versa. The transcontinental telephone network came to embody an argument about corporate organization and, ultimately, about the organization of society and the economy as a whole.

Long Distance and the Local Operating Companies

To understand the significance of long distance to AT&T and the larger Bell System, it is first necessary to recognize the distinction between the two. For much of the twentieth century, it was fair to regard AT&T and the Bell System as virtually the same. Between the 1910s and the 1980s, the American Telephone and Telegraph Company was the parent and head of a single corporate system, its management famous for loyalty, uniformity, and homogeneity. It was, for a time, the single largest corporation in the world. In the nineteenth century, however, it was neither the parent nor the largest part of the Bell System. It is not, in fact, strictly correct to refer to the Bell telephone interests of the 1900s as the "Bell System" at all.

In the 1880s and 1890s, the American Bell Telephone Company of Boston owned Alexander Graham Bell's original patents on the telephone. However, American Bell did not have the capital or the personnel to bring telephone service to the whole country. In each part of the country, local agents and entrepreneurs established their own operating companies and then contracted with Bell in Boston for an exclusive right to lease its

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distance telephone during World War II. Long distance traffic in the United States increased by approximately 350% between 1941 and 1945.

telephones and offer telephone service in the respective local areas. In 1880, four years after the telephone's invention, there were over one hundred such companies, offering telephone service in 998 American cities and towns. American Bell owned stock in several of these undertakings—particularly the largest and most profitable exchanges like New York and Chicago—but many more were the product of local capital and local enterprise alone.[11]

The so-called Bell System was thus not a single entity before the 1910s, but rather an association of affiliated operating companies, each with considerable autonomy. Before the turn of the century, executives at American Bell and the local operating companies rarely spoke of a single "Bell System." Only their competitors and enemies, who accused Bell of being a monolithic and monopolistic trust, used that sort of language. Bell executives spoke instead about "American Bell and its associated companies," carefully emphasizing the independence of the regional operating firms.

When first organized in the late 1870s and early 1880s, the various Bell operating companies were quite limited in size and scope. Many served only one city or town. As the decade continued, a wave of mergers and consolidations reduced the total number of Bell licensees while increasing the size of the territory each served. In 1880, the operating companies' national association counted eighty-six companies among its members; by 1887, that number had dropped to thirty-four.[12]

The American Bell Telephone Company's annual report for 1882 noted this trend and warned that it "should not be encouraged" if it meant shifting control of telephone operations out of local hands. But the same report the next year praised the consolidation of local operating companies and predicted that the trend would continue. "The tendency toward consolidation of telephone companies . . . has continued," read the 1883 report, "and is . . . in the interest of economical and convenient handling of the business." The reason for this change of heart was the dawning emergence of long distance telephone service: "The connection of many towns together . . . made it of importance to bring as large areas as possible under one management," American Bell's directors reported. "As methods are devised for making the telephone commercially useful over

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[11] Theodore N. Vail, "Report on the Operations of the Telephone Business," 19 March 1880, box 1080, AT&T Historical Archives [hereafter, ATTA]; Robert W. Garnet, *The Telephone Enterprise: The Evolution of the Bell System's Horizontal Structure, 1876-1909* (Baltimore, Md., 1985).

[12] National Telephone Exchange Association, *Report of the Proceedings of the National Telephone Exchange Association,* HBS, 1880, 1887. Membership in the NTEA was voluntary, so these numbers do not necessarily include every operating company in the country, but a majority of the Bell-affiliated operating companies certainly belonged; the trend of growth in size and reduction in numbers is noted by the members of the NTEA and borne out by other evidence.

long lines, the advantages of this centralization of management will be still more apparent."[13]

That 1883 report bore the signature of American Bell's president William Forbes, but it is likely these were really the words of the company's general manager, Theodore Vail. Vail was in those years American Bell's most active and energetic executive, and the argument that long distance communication required the consolidation and centralization of management would remain the central theme of his long and spectacular career. A telegraph operator in his youth, Theodore Vail first made his name in the 1870s as a manager for the U.S. Postal Service, where he centralized procedures and oversaw initiatives like Fast Mail and Railway Mail, two examples of systems integration in the service of long distance communication.[14] Vail left the Postal Service in 1878 to become American Bell's first general manager.[15] There he became the company's and probably the nation's first and most influential advocate of long distance telephony, and there he championed the idea of uniting all of the nation's telephone exchanges in one universal system.[16]

"The Bell System was founded on the broad lines of 'One System, One Policy, Universal Service,'" Vail declared in 1910. This meant, he said, "the idea that no aggregation of isolated independent systems, not under common control . . . could give the public the service that the interdependent, intercommunicating, universal system could give." Although that slogan appeared only in 1908, Vail claimed the idea was not new. "In

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[13] *Annual Report of the Directors of the American Bell Telephone Company to the Stockholders*, HBS, 1882, 3; 1883, 4.

[14] Richard R. John, "Theodore N. Vail and the Civic Origins of Universal Service," *Business and Economic History* 28 (Winter 1999): 71-81. For Vail's life, see Richard R. John, "Vail, Theodore Newton," *American National Biography Online* (Feb. 2000): **http://www.anb.org/articles/10/10-01671.html** (accessed 8 May 2005); and Albert Bigelow Paine, *Theodore N. Vail: A Biography* (New York, 1929). For a broad sample of his writing and ideas, see Vail, *Views on Public Questions*.

[15] Technically, the company Vail joined in 1878 was the Bell Telephone Company, not American Bell. The original Bell Telephone Company, founded in 1877, reorganized as the National Bell Telephone Company in 1879 and as the American Bell Telephone Company in 1880.

[16] It is not clear when this vision was first born in Vail's mind. Sometimes he said it was "co-existent with the business." At other times, he said he could not say with any certainty when the idea of "one great big general system" first came to him, but it was certainly implied by the expansive language in AT&T's founding charter, written in 1885. See *Annual Report of the Directors of the American Telephone and Telegraph Company to the Stockholders*, HBS, 1909, 18-19; New York State, Joint Committee of the Senate and Assembly Appointed to Investigate Telephone and Telegraph Companies, *Report* (Albany, N.Y., 1910). The AT&T charter is reprinted in Frederick L. Rhodes, *Beginnings of Telephony* (New York, 1929), 196-97.

fact," he said, "the theory was evolved and developed before the business, and the business has been developed on that theory."[17]

This version of history would have been a surprise to the many managers of Bell's local operating companies in the 1880s. They valued their independence highly and resisted efforts by Vail and others to bring the industry under one common control. Morris Tyler of New Haven, the first president of the National Telephone Exchange Association, scolded American Bell for trying to standardize the operations of its many licensees. "While treating everybody alike, the fact has been overlooked that everybody is *not* just alike," he complained in 1885. "Questions of most grave importance connected with this matter of the relation of licensor and licensees are now staring us suddenly in the face."[18]

Nor did the operating company managers share Vail's enthusiasm for the long distance telephone. The technology needed for long distance transmission remained uncertain in the 1880s and 1890s, as did the public demand. Local managers, in the business of providing local telephone service, showed little enthusiasm for constructing expensive long distance lines. "Will it pay?" they asked.[19] The answer was far from clear. Doubters in the company gave an unprofitable line from Boston to New York City the name "Vail's Folly."[20] Though "fondly regarded" by some, long distance service had "always been a source of actual loss to the company," Morris Tyler declared in 1886.[21] Tyler's fellow managers scoffed at the sort of pronouncements on the bright future of long distance to which Vail was so often given: "It was almost suggested that the life of the average American would be incomplete were he to omit from his daily routine the pleasure of telephoning to his friends in Japan," said one.[22]

The American Telephone and Telegraph Company was established in 1885 as a subsidiary of American Bell with special responsibility for the construction and operation of long distance telephone lines. Vail left American Bell in Boston to become president of the new company. Its founding charter, drafted by Vail and his lieutenant Edward Hall, suggested the scope of his ambition:

> The lines of this association . . . will connect one or more points in each and every city, town or place in the State of New York with one or more points in each and every other city, town or place in said state, and in each and every other of the United States, and in Canada and Mexico; and each and every other of said cities, towns and places is to be connected with each and every other city, town

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[17] *AT&T Annual Report* (1909), 18-19.
[18] NTEA, *Proceedings* (1885), 14-15; emphasis in original.
[19] Ibid., 62.
[20] Herbert N. Casson, *The History of the Telephone* (Chicago, 1910), 172.
[21] *Annual Report of the Directors of the Southern New England Telephone Company to the Stockholders*, HBS, 1886.
[22] NTEA, *Proceedings* (1885), 61.

> or place . . . and also by cable and other appropriate means with the rest of the known world.[23]

But AT&T in the 1880s had no authority over the management of the various telephone operating companies, and Vail could never force the Bell licensees to cooperate with his plans for long distance service. One of AT&T's first major undertakings, for example, was a long distance circuit from New York to Philadelphia. On completion of the line in 1886, neither of the local companies on either end had made the technical adjustments necessary to connect their systems to AT&T's long distance lines. The Philadelphia company, in particular, did not show "any disposition . . . to cooperate," reported Edward Hall, and "the purpose for which the line was intended [was] practically defeated."[24]

Calling his position in the company "embarrassing and unpleasant," Vail resigned the presidency of AT&T in 1887, but the struggle over long distance telephony continued without him.[25] The technology of the telephone and the long distance telephone in particular changed considerably in the next twenty years, but positions in the debate over long distance remained remarkably consistent. Advocates of centralization like Vail and Edward Hall were also boosters of long distance telephony, while defenders of local management like Tyler—and later, the Bell System's many independent competitors—remained very skeptical about the commercial importance of long distance. Those on both sides of this debate repeatedly combined and intertwined arguments about the physical shape of America's telephone networks and arguments about the proper organization of telephone management. The technical debate and the organizational debate were essentially the same.

In 1889, telephone engineer John J. Carty presented a paper at the annual meeting of the National Telephone Exchange Association called "The New Era in Telephony." Carty and co-authors Angus Hibbard and Frank Pickernell of AT&T began by asserting the importance of long distance telephone service and praising the work of the American Telephone and Telegraph Company in bringing such service about. Rising demand for a "perfected" long distance system "may be said to have created a new era in telephony," Carty and his co-authors declared. This

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[23] Rhodes, *Beginnings of Telephony*, 196-97.

[24] Edward J. Hall to John E. Hudson, 21 Jan. 1888, box 1011, ATTA. See also Garnet, *The Telephone Enterprise*, 79-81.

[25] Quoted in John Brooks, *Telephone: The First Hundred Years* (New York, 1976), 85. Vail stayed on as president of New York's Metropolitan Telephone Company until 1889 and remained around the periphery of the industry thereafter, consulting from time to time, offering advice, and always promoting long distance. "The time is coming when the [local] exchanges will do little more than pay the expense of operations. The toll line [long distance] revenue will make the dividends," he told AT&T management in 1901. Theodore N. Vail, "Policy and Plans for Expansion of Business," 1901, box 1080, ATTA.

new era, they argued, had three major elements, all intertwined: long distance service, interconnection among operating companies, and uniform technical standards across the system. "During the past, very much has been lost by a lack of uniformity," Carty said. "The methods of the east and the west have differed widely. . . . In this 'new era' in which a perfected service is to be given, such engineering cannot possibly be successful." Local management must begin "adhering to uniform practices," he insisted, and "remedy . . . the loose methods of past years."[26]

The "New Era" paper, dubbed "seminal" in later years, proved highly controversial at the time. It amounted to an attack, in the name of long distance service, on the autonomy of local operating companies and their ability to set technical standards on their own. Appreciating the negative reaction he might receive from an audience of local managers, Carty did not read his paper to the entire membership of the NTEA, but only to a special closed-door executive session—a first for the association. Local managers attending the session demanded to know if Carty's paper was officially "backed" by AT&T or "simply the opinion of three of their experts." No answer to this question was forthcoming. They held a vote on whether or not to publish Carty's paper in the minutes of the NTEA conference—another first. The motion to publish carried by a close vote of 11 to 9, followed immediately by passage of a resolution that the NTEA took no responsibility for any papers presented at its meetings.[27]

At the NTEA's annual meeting the following year, AT&T's Edward Hall extrapolated from the "New Era" paper, arguing for standardizing the human organization of the telephone industry along with its technical operations. Hall began by calling the Bell corporate system an "artificial person," but the metaphor at the heart of his paper was that of the corporation as "mechanism" or machine. "I do not see why we should not go at this [organizing the corporation] just as we would at the construction of any piece of mechanism," Hall said. "Surely [our corporation] is more complicated and more delicate than any of our electrical apparatus, and at the same time, its motions are attended with such consequences that we cannot afford to make any mistake." Hall criticized the "tangled . . . old-fashioned 'rule of thumb' method" in practice at most local operating companies and displayed organizational charts—a novelty in 1890, the first some present had ever seen—that made explicit his analogy between telephone circuits and lines of managerial communication and control.[28] Hall's view of the "new era" was a simple extrapolation of Carty and Vail's. The connection of wires across the country, Hall argued, required the connection of telephone companies across the country, and that required the centralization of authority and power. "As all the parts [of the Bell

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[26] NTEA, *Proceedings* (1887), 34-43.
[27] Ibid. (1889), 44-45.
[28] Ibid., (1890), 43-56.

corporate system] are inter-related," Hall said, "it is evident that there must be somewhere a single central authority, or division means chaos."

Debate was lively, but few of the regional operating companies rushed to adopt Hall's new scheme. "Will it not always be true that the parent Company must vitally depend on men who are in charge locally?" E. B. Field, president of the Colorado Bell Telephone Company, asked in later years. Field challenged Hall's machine metaphor directly, saying, "I would rather be building an organization that makes *man* supreme and not the Company, that is, all round intelligence, which administers the Company's affairs, and not a machine."[29]

Financial control, not clever metaphor, would drag reluctant managers into the "New Era" of long distance telephony and centralized control. In 1900 New York-based AT&T replaced Boston-based American Bell as the parent company of the Bell organization. This was not a hostile takeover, but a voluntary stock swap designed to take advantage of New York's more liberal regulatory environment. However, transforming the long distance subsidiary into the parent company of the entire organization proved to be a more than symbolic change. With capital obtained from a circle of New York financiers led by John Pierpont Morgan, AT&T began to increase its ownership of the various regional operating companies, while the New York bankers increased their control of AT&T. At the turn of the century, AT&T controlled just 45 percent of the total voting stock of all the local and regional licensees. By 1910, that figure was more than 80 percent. Eventually, distinctions between the parent company and its subsidiaries would be almost meaningless; by 1934, AT&T owned at least 99 percent of the stock in sixteen of the twenty-one operating companies.[30]

Carty's "New Era" truly arrived in 1907, when the Morgan-led syndicate completed its takeover of AT&T. The New York financiers then forced the resignation of the Bostonian owners and directors who had led the Bell companies since 1880. As the new president of AT&T, Morgan installed Theodore Vail, returning him to the office from which he had resigned twenty years before.[31] This alliance made sense. Like Theodore Vail, J. P. Morgan was a builder of systems. Both men believed in stability and profit through corporate consolidation and centralized control. It was Morgan's investment firm more than any other that imposed order and oligopoly on the American railroad industry in the 1880s and 1890s,

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[29] E. B. Field to John J. Carty, 8 Sept. 1909, box 2029, ATTA; emphasis in original.

[30] Federal Communications Commission, *Proposed Report, Telephone Investigation* (Washington, D.C., 1938), 26-28.

[31] J. Warren Stehman, *The Financial History of the American Telephone and Telegraph Company* (Boston, Mass., 1925); N. R. Danielian, *A.T.&.T.: The Story of Industrial Conquest* (New York, 1939), 57-66.

combining dozens of regional railroads into a few giant systems.[32] In the 1890s and early 1900s, there were frequent rumors that Morgan was planning to take over the independent telephone movement in the same way, merging thousands of local systems into one great telephone network. In the end, however, it was the Bell companies that the House of Morgan would consolidate and control.[33]

With the blessing of their new owners, Vail and his lieutenants moved to turn the associated Bell companies into one single, centrally controlled "Bell System." Vail named John Carty to be AT&T's chief engineer and expanded the power of Carty's department over the engineering practices of the other Bell companies. Carty centralized research and development in New York, shutting down laboratories in Boston and Chicago, and he ordered Western Electric, the manufacturing arm of the system, to stop taking orders for equipment from regional offices. In order to eliminate what Carty called "excessive and uneconomic diversity," the central engineering department of AT&T would thereafter make all decisions regarding equipment and operations.[34]

Taking a cue from the engineering department, Vail and Edward Hall, now vice-president of AT&T, worked to systematize and centralize the human organization of the Bell System. All problems "must be dealt with on broad lines," Hall wrote, "and by methods which are applicable to the whole territory."[35] In the spring of 1908, Vail and Hall restructured AT&T's management completely, beginning with long distance operations, in order to centralize decision making and to standardize procedures.[36] Reorganization of the regional operating companies followed. These changes faced "pockets of resistance on the part of local management," in

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[32] Alfred D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977), 158-75, 195-203; Charles Perrow, *Organizing America: Wealth, Power, and the Origins of Corporate Capitalism* (Princeton, N.J., 2002), 200-201.

[33] See for example "Consolidation Talk," *New York Times*, 30 Dec. 1899, p. 11. See also Stehman, *Financial History of AT&T*, 56-59; Harry B. MacMeal, *The Story of Independent Telephony* (Chicago, 1934), 112. In histories of the telephone critical of the Bell System (for example, Danielian's *AT&T*), Morgan often makes a brief appearance as a mustachioed villain, pulling the levers of finance to discourage investment in independent telephone firms. In histories of the telephone friendlier to Bell, Morgan rarely appears at all. Few historians have highlighted Morgan's role in cementing a national telephone monopoly in America, or noted how natural it was that Morgan and Theodore Vail should be allies in this project.

[34] John J. Carty to Edward J. Hall, 17 July 1907, box 6, ATTA; Neil H. Wasserman, *From Invention to Innovation: Long-Distance Telephone Transmission at the Turn of the Century* (Baltimore, Md., 1985), 110.

[35] Edward J. Hall to Frederick Fish, 30 Oct. 1902, ATTA.

[36] "Application of Some General Principles of Organization," Oct. 1909, box 2029, ATTA; Garnet, *The Telephone Enterprise*, 135-38.

the words of one internal company history, but such resistance was broken by the steady extension of AT&T's financial control.[37] "When we acquire the ownership of all the stock of any company, we are in a position for the first time to say just how it should be handled," Hall wrote in 1909 with evident satisfaction.[38]

While making these changes to the Bell System, Vail also made the extension of long distance service one of the system's top priorities. In 1908, Vail and Carty vowed that AT&T would inaugurate transcontinental telephone service before the completion of the Panama Canal. Company histories praise Vail's boldness in making such a promise, for in 1908 the technology to transmit an intelligible conversation 3,000 miles did not yet exist.[39] However, such histories do not mention how long distance, and the transcontinental project in particular, served AT&T in both curtailing the autonomy of local operating companies and justifying that change. AT&T's growing holdings of operating company stock gave Vail the power to centralize control of the Bell System, and the transcontinental network gave him a reason to do so.

"A nationwide intercommunicating system . . . requires uniformity in operating methods and instrumentalities," Vail wrote in 1914 as the transcontinental network neared completion (see Figure 3). "It requires coordination of effort and co-operation in the highest degree, which can be obtained only through one system, one policy, one centralized administration." In local telephone service, he conceded, a variety of methods might be adequate, but in long distance service there could be only "one best way." No aggregation or loose affiliation of smaller systems, Vail argued, could have achieved a coast-to-coast telephone call. "For interconnecting service and distant communication, uniformity in methods of operation and apparatus is necessary, in fact, imperative." The transcontinental telephone call was thus the "supreme test" of the Bell System, perhaps the only application that truly demanded the kind of integration and centralized control Vail worked so hard to attain. Whether or not anyone would actually pay to use it was almost beside the point.[40]

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[37] "The Central Union Telephone Company/Chicago Telephone Company," [1980?], ATTA, 1.

[38] Edward J. Hall to Theodore N. Vail, 27 Sept. 1909, box 1010, ATTA.

[39] On the technical history of the transcontinental line see Fagen, ed., *Engineering and Science in the Bell System*, 195-348; Hugh Aitken, *The Continuous Wave: Technology and American Radio, 1900-1932* (Princeton, N.J., 1985), 233-45; John Mills, Frank Jewett, et al., "A Quarter Century of Transcontinental Telephone Service," *Bell Telephone Quarterly* (Jan. 1940): 3-58.

[40] *AT&T Annual Report* (1914), 42.

FIGURE 3
Completing the transcontinental telephone line: a hole digging crew near the Nevada-Utah state border, May 1914.
Source: *The Pageant of America* Photograph Archive, vol. 4, "The March of Commerce," New York Public Library, unpublished photographs.

AT&T publicity returned repeatedly to the need for centralization, not only in material meant for the general public, but in internal publications as well. Bell employees received a steady diet of speeches and memoranda explaining and justifying the system's corporate reorganization. They were even led in songs at company gatherings that extolled the virtues of centralization and standard operating procedures.[41] For the trans-continental telephone system to succeed, Bell employees were told, local management had to surrender its old autonomy and authority. Embedded in the great project of the transcontinental telephone system was the technological justification for this otherwise unpopular organizational change.

The success of the rhetorical offensive can be read in the archives of the Cumberland Telephone and Telegraph Company, a Bell licensee based in Nashville that served a territory stretching from Indiana to Louisiana

[41] *Everybody Join In: The Blue Bell Songbook* (New York, [1920?]), Donald McNicol Collection, Queen's University Special Collections. The "Blue Bell Song," one melodious example out of many, laid out the three-branch reorganization of the company (Contract, Plant, and Traffic) to the tune of "America (My Country 'Tis of Thee)": "Blue Bell, it is of thee / Symbol of unity / Of thee we sing / Let's all cooperate / In each United State / to make our service great / Let Blue Bells ring . . . 'Contract' quote proper rate / 'Plant' keep the wires straight / 'Traffic' all woes abate / Ring clear the Bell."

between 1880 and 1911. Cumberland's executives prided themselves on their independence and autonomy from the parent company, and resisted attempts by American Bell to take control of their operations in the 1880s and 1890s. "The American Bell Telephone Company does not own a dollar stock in our company," boasted one of Cumberland's directors in 1885. "Our company is the only one [of the Bell licensees], or at least one of the very few, of which this statement may be truthfully made."[42] There was a regional element to Cumberland's prized independence; its managers strove to keep it "a company that is controlled by Southern men, financed with Southern money, and its affairs directed by Southern brains."[43] However, there were also differences in policy and outlook between Nashville and New York. Leland Hume, a Cumberland manager, questioned AT&T's insistence on state-of-the-art equipment and scientific management. "I sometimes get afraid that when we are studying so much about the higher classics of the telephone business we will sorter (*sic*) forget the business itself," he said in 1903. Cumberland president James Caldwell resisted the cost of long distance construction while urging the extension of low-cost telephone service to middle and working-class homes.[44]

When AT&T finally did acquire a controlling interest in the Cumberland company in 1911, however, James Caldwell conceded to the takeover in language that seemed to come directly from Theodore Vail. In a letter explaining the purchase to his shareholders, Caldwell specifically cited the alleged imperatives of the transcontinental network. "The absorption of your Company into the national system was both logical and inevitable," Caldwell wrote:

> [T]he very nature of the art and the public convenience compelled it, for the telephone on the desk must be in contact with, and in speaking reach of every other telephone throughout the continent, and this can only be done through one unbroken homogenous system where every hand that touches has an incentive to push in the same direction. . . . [P]ractically and psychologically that one universal system can only be the American Telephone and Telegraph Company.[45]

It is remarkable how thoroughly Caldwell capitulated here to Vail's determinist argument. There must be a national long distance network,

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[42] "The Telephone in Indiana," *Electrical World* (26 Sept. 1885), 132.
[43] *Cumberland Telephone Journal* (15 May 1903), 12.
[44] Hume in *Cumberland Telephone Journal* (15 May 1903), 15. For Caldwell, see the *Annual Report of the Directors of the Cumberland Telephone and Telegraph Company*, HBS, various years.
[45] James E. Caldwell to Cumberland Telephone and Telegraph Company Stockholders, 27 Dec. 1911, HBS. Caldwell retired after writing this letter, and AT&T moved the headquarters of Cumberland Telephone and Telegraph from Nashville to Atlanta.

the argument went; the technology demands that it be organized in a certain way. Therefore, the Bell System—this term crucially eliding any distinction between the physical telephone network and the corporate system that operated it—must also be organized in this fashion. "The very nature of the art," Caldwell said, ". . . compelled it."

Much as the assembly line and scientific management shifted the balance of power between worker and employer in the late nineteenth-century American factory, long distance service and the technical and organizational integration it was deemed to require shifted the balance of power in the telephone industry for nearly a century.[46] For AT&T, of course, it was not the power of the factory worker that had to be curbed, but, rather, men like James Caldwell, the small-to-middling entrepreneurs who operated America's local and regional telephone networks, both inside and outside the Bell System.

For decades, historians of technology have both argued against simplistic theories of technological determinism and marveled at the persistence of such ideas. Why are arguments asserting the imperatives of technology so common and so resilient? It is in part because they are so useful. We know that decisions about technology are made to promote various social, cultural, or political arrangements, but if such arrangements can be ascribed to technological imperatives, it removes them from the realm of social, cultural, and political debate.

Long Distance and the Independents

In 1894, after the expiration of Alexander Graham Bell's original patents on the telephone, the Bell telephone companies suffered several years of furious competition from thousands of smaller telephone systems, known collectively as the independent telephone movement. The independents reached their zenith in 1907, when they controlled more than half of the six million telephones then operating in the United States. In some areas, notably the Midwest, independent telephones outnumbered Bell telephones by a factor of five or six to one (see Figure 4).[47]

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[46] There was candid assertion of this goal in the literature of scientific and systematic management. See, for example, Frederick Winslow Taylor, *The Principles of Scientific Management* (New York, 1911); Robert F. Hoxie, *Scientific Management and Labor* (New York, 1915). On the balance of power in the American workplace, see James Livingston, "The Social Analysis of Economic History and Theory: Conjectures on Late Nineteenth-Century American Development," *American Historical Review* 92 (Feb. 1987): 69-95; David Montgomery, *The Fall of the House of Labor: The Workplace, the State, and American Labor Activism, 1865-1925* (New York, 1987).

[47] Historians have not studied independent competition in American telephony particularly well. Many recent histories of the telephone, based on the corporate archives of AT&T, pay little or no attention to independent competition. Earlier works typically describe independent competition only to lament it as an error or

Vail and other AT&T executives argued that the independents must be defeated in the American marketplace because of their inability to offer long distance service on a truly national scale. "It is extremely important that we should control the whole toll line system of intercommunication throughout the country," AT&T executive George Leverett wrote in 1901. "We need not fear the opposition in a single place provided we control the means of communication with other places." "Without long distance

FIGURE 4
Map showing lines of the Bell Telephone Companies in the United States and Canada, 1904

Source: Map Collection, Widener Library, Harvard University.

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aberration. Claude S. Fischer, "The Revolution in Rural Telephony, 1900-1920," *Journal of Social History* 21 (Fall 1987): 5-26, and Milton L. Mueller, *Universal Service: Competition, Interconnection, and Monopoly in the Making of the American Telephone System* (Cambridge, Mass., 1997), are both useful. The only really detailed histories of independent telephony, however, are celebratory works by self-interested participants: Paul A. Latzke, *A Fight with an Octopus* (Chicago, 1906); MacMeal, *The Story of Independent Telephony*; Charles A. Pleasance, *The Spirit of Independent Telephony* (Johnson City, Tenn., 1989). See also Robert MacDougall, "The People's Telephone: The Political Culture of Independent Telephony, 1894-1913" ***Business and Economic History On-Line*** 1 (2003).

connections the telephone is of restricted value today," agreed a 1906 publication of Bell's New England Telephone Company.[48]

The independent telephone movement never succeeded in building a long distance network on the scale of AT&T's. Some independent companies did make efforts to interconnect with one another and offer long distance service across their territories, but those efforts never truly rivaled AT&T's transcontinental lines. It is not clear, however, that this was the fatal weakness AT&T publicity held it to be.[49] Many independent telephone executives disavowed any interest in offering long distance service. Their customers were happy without it, they said. "Ninety-eight percent of all telephoning is local, and of long distance telephoning, ninety-eight percent is to points within a radius of one hundred miles," said Frederick Dickson, the president of Cleveland's Cuyahoga Telephone Company, in 1905. "The Bell argument is that if we would connect with them, we could talk to Boston, New York, etc.," said William Crownover, the director of a small telephone system in rural Iowa. "True, we can if we have money enough to pay the bill," he continued, "but telephone service is not valued by the number of miles of naked wire we have at our disposal, but by the number of patrons in our immediate vicinity."[50]

Given the high cost of long distance construction, the low revenues, and the limited demand, one could argue that the independents' failure to construct a transcontinental network actually gave them a competitive advantage over the Bell System.[51] Long lines were expensive, both for the customers who used them and for the companies that built them. The decision to emphasize long distance service imposed or at least implied other technical choices: more powerful transmitters in each telephone, higher quality wires, measured pay-by-the-call service rather than flat monthly rates, and sacrifice of local coverage for long distance construction. While the Bell companies were building long expensive lines to connect the nation's urban centers, Bell's independent rivals built up cheaper middle-distance networks, particularly connections between

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[48] George Leverett to Frederick Fish, 17 Oct. 1901, box 1375, ATTA; *The Telephone: A Description of the Bell System*, 19.

[49] If long distance service was not the reason for the Bell System's eventual success against the independents, what was? A complete answer would go beyond the scope of this paper, but must surely include a number of key patents, dominance in the country's most lucrative urban markets, a canny public relations campaign, and a general preponderance of both economic and political clout. For more on all of these topics, see my dissertation: Robert MacDougall, "The People's Telephone: The Politics of Telephony in the United States and Canada, 1876-1926" (Ph.D. diss., Harvard University, 2004).

[50] William Crownover, "Should Independent and Mutual Companies Co-Operate," *Telephony* (May 1907), 309; Frederick S. Dickson, "Telephone Investments—and Others" (Cleveland, Ohio, 1905), HBS, 40.

[51] This argument is suggested in Kenneth Lipartito, *The Bell System and Regional Business: The Telephone in the South, 1877-1920* (Baltimore, Md., 1989), 116.

medium-sized towns and their nearby rural areas. By 1907, independent leaders in the United States declared it an "undisputed fact" that these rural connections were "the potent weapon in the hands of the independents."[52] Successful independent telephone systems found a market niche by offering cheaper service and a different kind of coverage than the Bell companies.

For telephone users, choosing between the regional telephone networks of the independents and the national network of the Bell companies became both a personal and a political choice. Of what kind of network did Americans want to be a part? Where did their friends, their livelihood, and their future lie? The choice between AT&T's national network and the regional clusters of the independents amounted to a referendum on alternate visions of America's economic life. The local and regional lines of the independents represented one of the final defenses of an old economic order that was regionally oriented and locally controlled. AT&T's transcontinental system, by contrast, both represented and facilitated an increasingly integrated national economy.

Long Distance and the Public

The threat that independent competition posed to the Bell System was already fading by the early 1910s. In absolute terms, the number of independent telephones in the United States would continue to rise until the 1920s, but independent market share declined precipitously after 1907.[53] Vail and other executives at AT&T did not feel secure, however. More frightening to them than independent competition was the specter of antitrust action or even nationalization. Most European states had taken over their national telephone systems by the turn of the century. Canada came close to doing so in 1905, and three Canadian provinces acquired the telephone networks built by Bell Telephone Company of Canada. The American Populist Party platforms of 1892 and 1896 called for the nationalization of telephone and telegraph. The next decade saw a flurry of new state regulation and movement toward national regulation by both major parties. In 1913, Woodrow Wilson's Postmaster General wrote a major report calling for the government to take over the telephone industry. Internal memos at AT&T reported that at least 20 senators and 44 congressional representatives approved the plan. The company took seriously the threat of hostile political action.[54]

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[52] G. F. Wonbacher, "Proper Development of the Rural Telephone," *Western Telephone Journal* (July 1908), 242.

[53] U.S. Bureau of the Census, *Historical Statistics of the United States*, vol. 2 (Washington, D.C., 1975).

[54] Postmaster General, *Government Ownership of Electrical Means of Communication* (Washington, D.C., 1914). The AT&T memo is Chester I. Barnard, "Review of the Government Ownership Situation," 6 March 1917, box 1364, ATTA.

Top executives at AT&T also worried about a more general crisis of corporate legitimacy. The size and power of America's leading corporations had grown immensely in this era. Between 1898 and 1902, mergers and combinations absorbed more than 2,600 American companies. The one hundred largest corporations in the United States increased their aggregate size four-fold in those four years and gained control of more than 40 percent of the nation's industrial capital.[55] Such rapid growth provoked a powerful political and cultural backlash. Agrarian populism, urban progressivism, a militant labor movement, an antimonopoly movement, and municipal home rule all were, in various ways, reactions to the growth of giant nation-spanning corporations and assaults on what Supreme Court Justice Louis Brandeis famously called "the curse of bigness."[56]

"It is a dangerous thing to be a monopoly at the present time," AT&T vice-president Nathan Kingsbury told an audience of telephone executives in February 1914. "Business is uncertain, harassed, worried." What worried Kingsbury were muckraking journalists, crusading politicians, and a public inclined to see large corporations like AT&T as greedy, swollen trusts. Men like Kingsbury and Vail considered public hostility to big business frightening and very real. "Many predict panic and disaster . . . the old barriers seem to be forced aside by the spirit of universal discontent and universal unrest," Kingsbury said. "Already the results of this new movement . . . [have] been economically and socially greater than the results of the French Revolution."[57]

Two years earlier, the leaders of some of the largest industrial and financial concerns in the country had met to confront the very crisis Kingsbury described. Among those present were the financier J. P. Morgan and Standard Oil heir John D. Rockefeller, Jr. These men discussed plans to develop a bureau of investigation and publicity that would promote the legitimacy of the great business interests and counter public hostility to the consolidation of corporate power. Nothing came of their meetings directly, but those present praised one among their number for already doing just the sort of work they all believed was required. "Mr. Vail, as president of the Telephone Company, has done this kind of work . . . for many years with great success," Rockefeller said. "He has made it a regular business . . . he constantly and persistently kept up a campaign of education." Only months after the breakup of Standard Oil, Rockefeller was envious of Vail's achievements. "The fact that his Company, one of the greatest, if not the greatest single monopoly in the country, is allowed to

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[55] William G. Roy, *Socializing Capital: The Rise of the Large Industrial Corporation in America* (Princeton, N.J., 1997).

[56] Louis D. Brandeis, *Other People's Money and How the Bankers Use It* (1914; Boston, 1995).

[57] Nathan C. Kingsbury, Address before Telephone Society of New York, 17 Feb. 1914, Telephone Pamphlets, Widener Library, Harvard University, 3-6.

continue unmolested . . . is indication enough of his success," Rockefeller said.[58]

What had Vail done that so impressed Rockefeller? He had embarked on a seminal public relations campaign for AT&T and the Bell System, what Roland Marchand called "the first, the most persistent, and the most celebrated of the large-scale institutional advertising campaigns of the early twentieth century."[59] The AT&T publicity bureau not only ran advertisements; it also courted reporters, authors, politicians, libraries, and schools. It planted press releases with friendly editors, subsidized flattering books about the company and the telephone, and produced a flood of "educational" pamphlets, booklets, and films.[60]

Much has been written about this justly famous campaign. What is interesting for our purposes is the role that long distance and the spectacle of the transcontinental telephone network played in AT&T's publicity. Bell's opponents saw the continent-spanning network of which Theodore Vail was so proud as a sinister concentration of power. There was a strong regional component to anti-Bell sentiment. Commercial and political opposition to the Bell System was most powerful in the Midwest, where farmers and businesspeople were anxious about their increasing dependence on, and vulnerability to, Northeastern capital. The railroads were of course the great symbol of this increasing interdependence, but the telephone could also be cast in that role. Midwestern populists and muckrakers called the telephone network "an octopus," or "a wire spider, stretching his deadly tentacles [*sic*]" across the plains (see Figure 5).[61]

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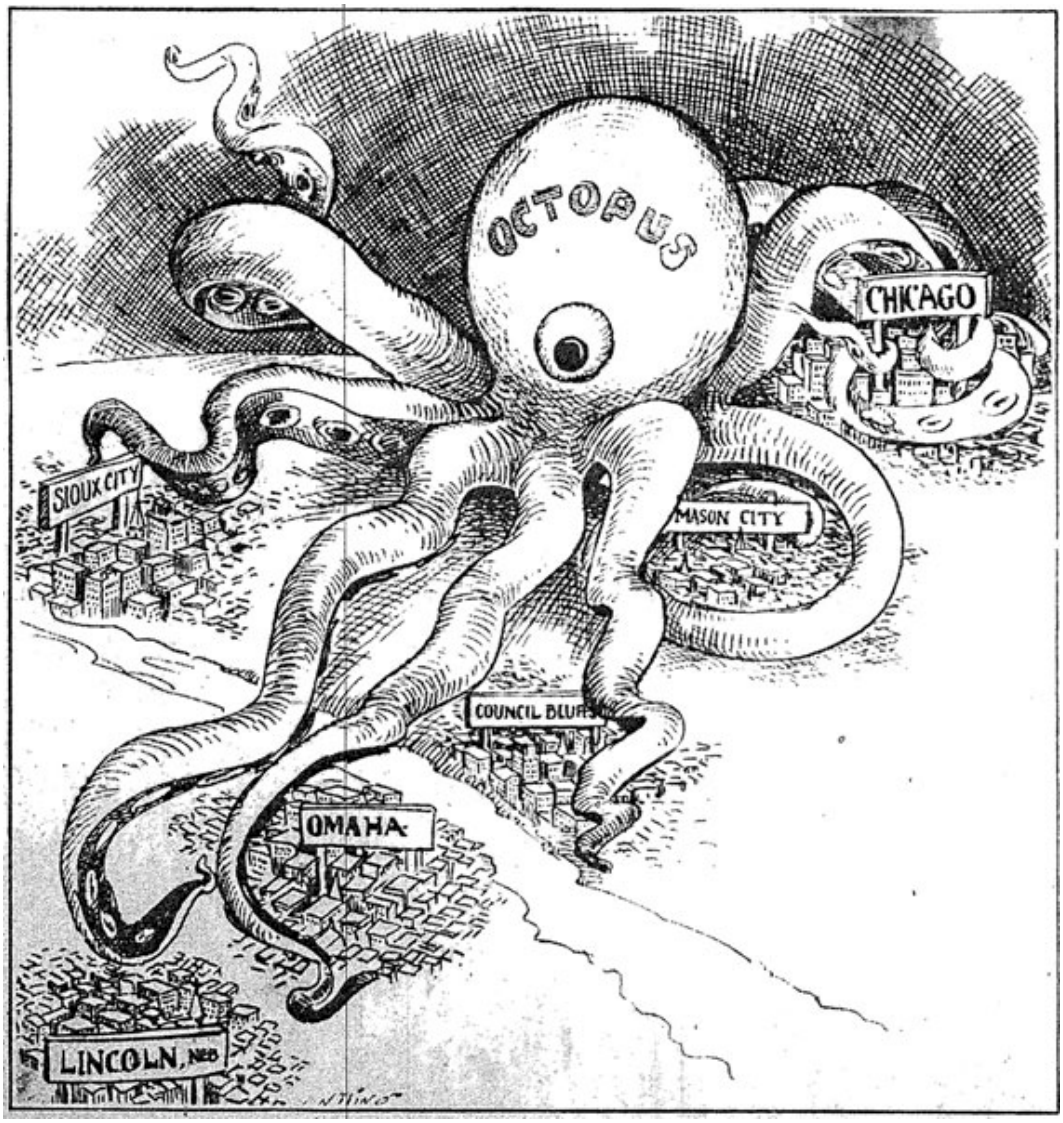
[58] The quotations come from a letter Rockefeller wrote to a family adviser one week after the meeting; see John D. Rockefeller Jr. to Frederick T. Gates, 27 July 1912, reprinted in John M. Jordan, " 'To Educate Public Opinion': John D. Rockefeller, Jr. and the Origins of Social Scientific Fact-Finding," *New England Quarterly* 64 (June 1991): 292-97. Vail's proposals are described in Theodore Vail, "Memorandum Concerning a Proposed Economic Bureau," Rockefeller Foundation Draft Report, April 1914, quoted in David M. Grossman, "American Foundations and the Support of Economic Research," *Minerva* 20 (Spring-Summer 1982): 59-82. Discussions apparently trailed off because Rockefeller wanted to create a research institute, while Vail and Morgan wanted only a public relations bureau. See also John Ensor Harr and Peter J. Johnson, *The Rockefeller Century* (New York, 1988), 127.

[59] Roland Marchand, *Creating the Corporate Soul: The Rise of Public Relations and Corporate Imagery in American Big Business* (Berkeley, Calif., 1998), 48.

[60] Marchand, *Creating the Corporate Soul.* See also James D. Ellsworth, "The Start of General Magazine Advertising," Jan. 1931, box 1066, ATTA. A nearly complete collection of AT&T's early institutional advertisements exists in the N. W. Ayer Collection, National Museum of American History, Smithsonian Institution, Washington, D.C.

[61] For example, "Wiggins's Great Discovery," *New York Times*, 21 June 1891, p. 17; Latzke, *A Fight with an Octopus*.

FIGURE 5



Independent publicity portrayed the Bell companies as a monstrous octopus.

Source: "The Octopus Releasing Its Grasp," *Telephony* (April 1907), 235.

Given public anxiety about corporate "bigness," one might have expected AT&T's publicity to de-emphasize the size and the unity of the Bell System. Given the regional basis of much anti-Bell sentiment, one might have expected a retreat from arguments about the way long distance was shrinking and unifying the nation. However, the publicity around AT&T's transcontinental network did neither. It offered instead a positive defense—indeed, a celebration—of economic integration and corporate consolidation. "American business men have been made neighbors through contacts over the wires of a nation-wide telephone system,"

proclaimed one typical advertisement. "Drawn together by bonds of communication [,] . . . America's industries operate not as individual and isolated enterprises, but as closely coordinated parts of a gigantic mechanism that ministers to the nation's needs." Such publicity emphasized not the power of the telephone company itself but the power the company and its long distance network might provide to its subscribers. "The multiplication of power in a businessman . . . depends upon the increased number of people whom he can, by personal contact, interest in his purposes. He does this by the telephone," said an advertisement from 1914. "Your line is connected with the great Bell highways, reaching every state in the union," another advertisement read. "You have the use of switchboards costing upwards of $100,000,000 . . . the benefits of countless inventions. . . . You command at all times the prompt attention of one or more operators."[62]

As visual answers to images of a monstrous Bell octopus, AT&T offered the friendly handmaiden of Science and a series of giant businesspeople, looming over a nation the telephone made small (see Figure 6). AT&T publicity asked Americans, in particular the white-collar Americans who were the market for long distance service, to imagine themselves as that colossal telephone user, empowered rather than threatened by the network's size.

The very term "Bell System," as used in AT&T publicity, actually dates from this era. As already noted, Bell executives before 1907 were reluctant to describe the Bell companies as a single system. After 1908, however, Vail and his publicity bureau were not shy about proclaiming the unity of the parent company and its subsidiaries. Every AT&T advertisement after 1908 bore the new slogan: "One System, One Policy, Universal Service."[63]

Another slogan appeared in AT&T advertisements at this time: "Every Bell Telephone is the Center of the System." Such a statement might seem to contradict the drive at Bell towards more centralized authority. However, this slogan demonstrates the nuance of the AT&T campaign, and the multiple audiences AT&T imagined for the spectacle of the transcontinental call. Even as long distance service was employed within the Bell System to justify greater standardization and centralized con-

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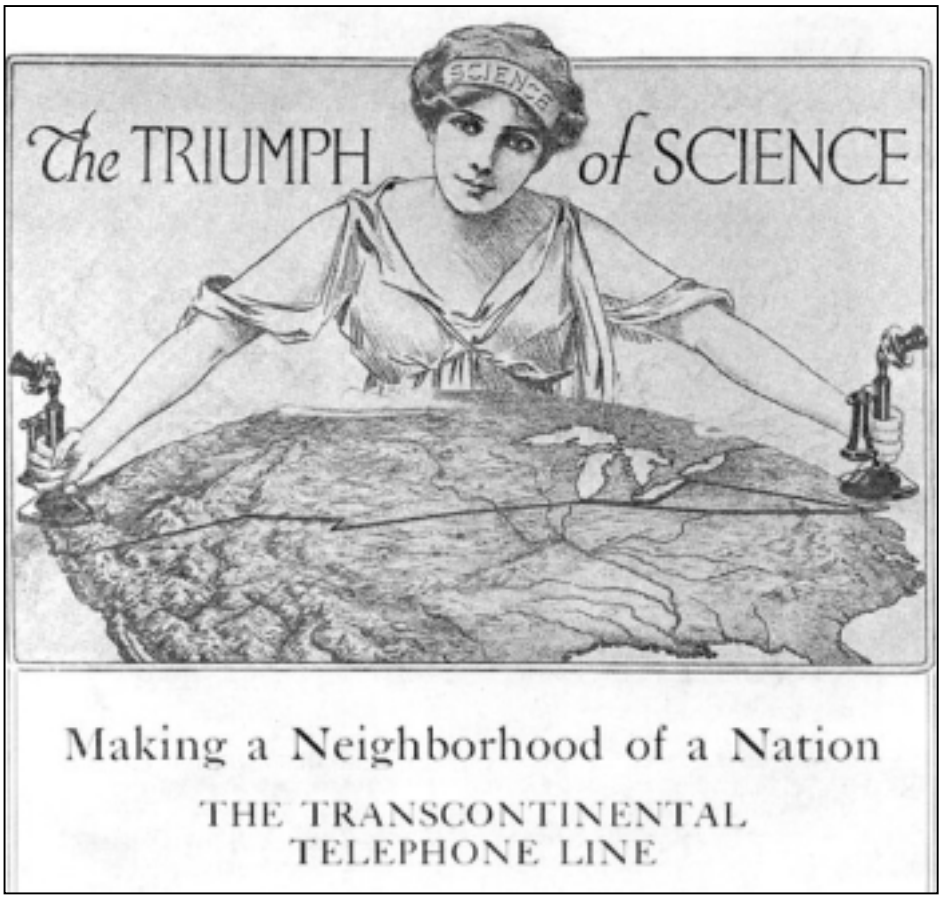
[62] AT&T Advertisements, *Life* (15 Jan. 1914), 91; *Life* (17 Dec. 1914), 1137; *Telephone Almanac* (New York, 1928), n.p.

[63] AT&T's advertising agency actually balked at introducing Vail's slogan, "One System, One Policy, Universal Service," in 1908. It was an election year, and the advertising bureau feared that open advocacy of monopoly would provoke antitrust sentiment and political attacks. Nevertheless, Vail insisted; see Robertson T. Barrett, "The Beginnings of Institutional Advertising in the Bell System," 1931, box 1198, ATTA; George Griswold, Jr., "How AT&T Public Relations Policies Developed," *Public Relations Quarterly* (Fall 1967), 8.

FIGURE 6
AT&T publicity answered the visual trope of the monstrous octopus with friendlier images like this handmaiden of science.



Source: *Telephone Almanac* (New York, 1928), n.p.

trol, it was also celebrated outside the Bell System as a model of a dynamic, flexible, interdependent system. Vail took to calling the long distance network "an ever-living organism," even "a living conscious being."[64] "The Bell Telephone System. . . is more than the vast machinery of communication, covering the country from ocean to ocean," said another advertisement of the day. "Every part is alive, and each gives additional usefulness to every other part."[65]

Vail liked to tell reporters of a time he saw "something new" in a telephone exchange. "I asked Mr. Carty to explain it . . . but he did not

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[64] *AT&T Annual Report* (1914), 18-20; Casson, *The History of the Telephone*, 140.

[65] The advertisement appears in Milton Mueller, "The Telephone War: Interconnection, Competition, and Monopoly in the Making of Universal Telephone Service, 1894-1920" (Ph.D. diss., University of Pennsylvania, 1989), 276.

understand it," Vail would say, referring to his chief engineer. "We called the manager. He didn't know, and called his assistant. He didn't know, and called the local engineer, who was able to tell us what it was," Vail concluded.[66] Why did Vail repeat this anecdote? It appears to be a denial of centralized, hierarchical control. Yet, in this story, the telephone itself was the means by which Vail's dilemma was resolved. Vail called Carty on the telephone. Carty called his assistant. His assistant called the local engineer, and there an answer was found. The telephone, in other words, allowed information and ideas to travel through a giant corporation, from lowly workers to middle managers to chief executives and back again. The telephone was the instrument that made possible a vision of a corporation that was large but flexible, united but dynamic.

This was the ultimate message of AT&T's seminal public relations campaign. Giant corporations like AT&T need not be feared by the American people, or thought dangerous to democracy, for the telephone itself would transform them, replacing monstrous trusts with dynamic industrial democracies. Because anyone could call anyone else, it was argued, the telephone broke down undemocratic hierarchies and made static chains of command obsolete.[67] The telephone could resolve the very dangers that AT&T as a giant monopoly seemed to represent. The spectacle of long distance extended this idea outward to encompass the whole country. "The nation became an organized body as it increased its use of the telephone," said commemorative publicity for the trans-continental call, "and there was no loss of the spirit of self-help and democracy that was its birthright." "Drawn together by bonds of communication," another ad proclaimed, "America's industries operate not as individual and isolated enterprises, but as closely coordinated parts of a gigantic mechanism that ministers to the nation's needs."[68]

A remarkable book called *Romance of the Machine*, by the physicist Michael Pupin, one of the fathers of the transcontinental telephone network, took this rhetoric to its millennial extreme. In 1899, Pupin invented the loading coils that helped make truly long distance telephony possible. Three decades later, he portrayed the telephone network he had helped to build as a model for American democracy and indeed the world. "I wish to describe the romance of the telephone," he wrote. AT&T's

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[66] Quoted in a number of locations, for instance Herbert N. Casson, *The History of the Telephone* (Chicago, 1910), 167.

[67] Fifty years later, Marshall McLuhan would reiterate this idea. "The pyramidal structure . . . cannot withstand the speed of the phone to bypass all hierarchical arrangements," he wrote. See Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York, 1964), 238. The fact that McLuhan would argue this half a century after Vail is not proof that the idea was true—AT&T in McLuhan's era had certainly never abandoned organizational hierarchies or chains of command—but it may be proof that the idea stuck.

[68] "Coordinating the Nation," 24; *Telephone Almanac*, n.p.

transcontinental telephone network was the largest and most delicate machine ever built, he said, and the company that owned it was the "most perfectly co-ordinated industrial organization in the world." The United States was pioneering a new kind of "economic democracy," and the telephone was the heart of that transformation. It "consolidated" the nation without controlling it, "harmonized interests" without reducing freedom. From Pupin's vantage point in 1929, the future of a networked nation remade in the image of the transcontinental telephone network was bright indeed. "Who can contemplate . . . the industrial democracy inaugurated by our telephone industry," Pupin asked, "without being assured that it is a joyful message of an approaching civilization which will be more just and generous to the worker than any which the world has ever seen?"[69]

Conclusion

In the years around the completion of the transcontinental circuit, AT&T beat back the challenge of independent competition, escaped government antitrust action, and avoided all but the most congenial regulation. A large part of this success must be attributed to the company's canny and persistent public relations efforts. If one compares the literature of the telephone industry in the 1930s or 1940s to the public debate around the telephone in 1900 or 1910, it is very striking how successful AT&T was in defining or redefining the terms with which people talked about the telephone. In many ways, the arguments AT&T made about the telephone still form our default rhetoric for discussing new communication technologies: The telephone was not an instrument of giant corporate trusts; it was the instrument that transformed those trusts into dynamic, democratic institutions. The telephone would not threaten the autonomy of middling entrepreneurs; it would magnify their power. The long distance network would not erase local communities; it would turn the entire nation into one close-knit neighborhood.

Historians typically turn to the story of the railroad to explain how the large managerial corporation emerged in North America, but it is the history of the telephone that tells us how that new corporate order gained wide popular support. At a moment in American history when an economy once populated exclusively by small, local firms was giving way to one dominated by nation-spanning corporations, the universal telephone network served the advocates and architects of the new order as a heroic spectacle of integration and consolidation. The ideal of the single,

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[69] Michael Pupin, *Romance of the Machine* (New York, 1930), esp. 77-81. The engineer and quasi-socialist Charles Proteus Steinmetz made similar arguments in this era about his employer, General Electric: "The industrial corporation is far from the inflexible, rigid machine which it appears to the outsider. . . . It is this flexibility which gives it economic power and strength." See Charles P. Steinmetz, *America and the New Epoch* (New York, 1916), 175.

universal telephone system was "sent forth," according to one public relations executive at AT&T, "to do battle with the slogans of the 'curse of Bigness'."[70] It is clear in retrospect which slogans won. AT&T in these years not only sold the United States on the telephone and the transcontinental telephone system. The spectacle of the long distance network was also instrumental in convincing Americans of the virtues of interdependence over independence, of big corporations over small, and of the promise of living in a networked nation.

[70] Quoted in Marchand, *Creating the Corporate Soul*, 86.