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Western Electric - A Brief History

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An old Western Electric hand once said: "I always like to think of AT&T as a manufacturing company that happens to have a few operating departments." As that manufacturing company, now called Lucent Technologies, casts loose the last of its operating departments, it arrives at an old place - that of an independent company-at a new time. More than a century ago, prior to joining the Bell System, Western Electric was the largest electrical manufacturer in the United States. Now, as an independent $20 billion company, Lucent Technologies will easily break into the ranks of the Fortune 50. Just as Western Electric of the late 1870s was both a distributor of telephone equipment for the new Bell company and a supplier to Bell's primary communications competitor (Western Union), Lucent Technologies will manufacture both for AT&T and the regional telephone companies.

To succeed as a telecommunications manufacturer today requires constant innovation, one of Western Electric's perpetual hallmarks. At its 1869 inception, the company provided parts and models for inventors, such as co-founder Elisha Gray. In the early 20th century, when a handful of companies assembled scientific researchers to expand their innovative capacities, Western Electric did so in a big way. The research branch of Western Electric's engineering department became Bell Laboratories, the greatest private research organization in the world- and an integral part of the new Lucent Technologies.

Along the way, the company made tremendous breakthroughs. In 1913, Western Electric developed the high vacuum tube, thereby ushering in the electronic age. The company subsequently invented the loudspeaker, successfully brought sound to motion pictures, and introduced systems of mobile communications which culminated in the cellular telephone.

Another requisite "core competency: for success in manufacturing is corporate concern for quality. Today's "total quality" movement can be trace to the work of three individuals- Walter Shewhart, W. Edwards Deming, and Joseph Juran-who got their start at Western Electric, then introduced their idea to the Japanese after World War II. Bonnie small then brought quality expertise to the shop floor in 1958 with the "Western Electric Statistical Quality Control Handbook," which is still the world's shop floor bible of quality. The company practiced what it preached: In 1992, AT&T Transmission Systems won a Malcolm Baldrige Quality Award, and in 1994 AT&T Power Systems became the first U.S. manufacturer to win Japan's Deming Prize for Total Quality Management.

Lucent Technologies's consumer products line renews a Western Electric tradition. In its early days, Western Electric made communications equipment and other electrical devices- including alarms. Western Electric later carried on an extensive line of household appliances, from sewing machines to vacuum cleaners, until selling off its consumer goods segment in the 1920s, After a long

absence, Western Electric returned to consumer markets in the 1970s through its offerings in Phone Center Stores. Lucent Technologies now sells phones, answering machines and other electrical devices-including alarms.

By competing in international markets, Lucent Technologies travels another path once trod by Western Electric. In 1882, the year it joined the Bell System, Western Electric subsequently manufactured in every country with significant telephone systems, until spinning off its international operations in 1925, and its Canadian manufacturing holdings after 1956. Consequently, Lucent Technologies competitors such as Alcatel N.V., Northern Telecom and NEC all share Western Electric roots.

Gray and Barton

Lucent Technologies is a manufacturing company that is actually older than its onetime "parent." Western Electric did not spring from the brow of Bell Telephone, but existed before Alexander Graham Bell made his invention. Before Bell came along, Western Electric was the principal manufacturer for Western Union, the telegraph company. Bell's subsequent acquisition of Western Electric was crucial in the establishment of a nationwide phone system, a system characterized by its early, primary emphasis on the production and distribution of hardware.

In the 1980's, Victor Kiam became one of the most recognized executives in corporate America through a series of advertisements in which he explained his purchase of the Remington Company as the act of an extremely satisfied customer. More than a century earlier, former Oberlin College physics professor Elisha Gray made a similar testimonial on behalf of a tiny Cleveland manufacturer of fire and burglar alarms, and other electrical devices, on which he relied for parts and models for his various experiments. Professor Gray had previously offered to go into business with one of the company's two owners, but George Shawk had recoiled from the proposition because "Gray would want to put every man in the shop into his darned inventions." That is just what Shawk's partner, Enos Barton--who recognized the market potential of Gray's inventions--wanted. Barton encouraged Gray to buy Shawk's interest, so the company's best customer became half-owner. Enos Barton's recognition of the value of Elisha Gray's inventions began a tradition of manufacturing innovation that characterized its subsequent life as the Western Electric Company, and is sustained in Lucent Technologies today.

Gray and Barton's company had roots in the telegraph business. In 1856, twelve years after Samuel F.B. Morse opened his first telegraph system, various scattered telegraph companies consolidated into the Western Union Company. The various manufacturing shops associated with those telegraph companies were also consolidated into two shops, one at Cleveland, Ohio, the other one in Ottawa, Illinois. George Shawk purchased the Cleveland shop, which made working models of inventions, and manufactured telegraph instruments. Enos Barton, who had been chief telegraph operator for Western Union at Rochester,

New York, became Shawk's partner for a brief period in 1869, until Gray bought out Shawk.

Later that year, Western Union general superintendent General Anson Stager became a third partner with Gray and Barton, and convinced them to move the shop to Chicago. Stager's career in telegraph had already spanned more than two decades, beginning in 1846 as a telegraph operator in Philadelphia. In the early 1850's, he helped organize some telegraph lines, which later became part of Western Union. During the Civil War, Stager served General George McClellan as Chief of United States Military Telegraph.

In 1872, Stager convinced his boss, Western Union president William Orton, to invest in the Chicago manufacturing enterprise. Gray and Barton reorganized as the Western Electric Manufacturing Company, a company with strong ties to Western Union. Three of the company's five directors were also directors of Western Union. Furthermore, one-third of the capital for the newly named Western Electric Company came from Western Union's William Orton; one-third came from Western Union's Anson Stager; and the remainder came from Gray, Barton and their employees. Western Union further demonstrated its commitment to Western Electric by closing its Ottawa plant in the expectation that Western's Chicago plant would meet most of its needs for telegraph equipment.

The mid-1870's were a heady time for Western Union. The well capitalized giant had established a network of wires and offices connecting every city or town of consequence from coast to coast. Even before the 1869 completion of the transcontinental railroad, Western Union had emerged as America's only truly nationwide company, and was poised to reap the fruits of a monopoly on transmission of news to America's newspapers. As Western Union's principal supplier, Western Electric also seemed positioned to capitalize on the telegraph's position on the cutting edge of communications--until 1876.

Western Electric gained prestige at the Centennial Exposition in Philadelphia, when its products won five gold medals. In addition to telegraph equipment, the company offered a variety of electrical products, including various forms of alarms and mimeograph pens. The most significant product to the company's future, however, was one unveiled at the Exposition in June by Alexander Graham Bell: the telephone. On February 14, Bell had sent one of his financial backers, Boston lawyer Gardiner Hubbard, to file a patent for his new telephonic device. Hubbard arrived at the U.S. patent office only hours before Bell's closest competitor: Elisha Gray, who had sold his interest in Western Electric in 1875 and retired from the business.

Less than a year after the cash-strapped Bell's patent was approved, Hubbard offered to sell the telephone patent to Western Union for one hundred thousand dollars--and Orton turned him down because he saw little future for the telephone. A year later, Orton changed his mind, and Western Union established the American Speaking Telephone Co., and Western Electric agreed to manufacture telephones for the new company. Western Electric brought divided

allegiances to that arrangement because they had already become a distributor of telephone equipment for Bell. For some time, Western Electric straddled the fence, acting as distributor for Bell and as captive supplier to its only competitor. Western Union finally won undivided allegiance--just as a battle for control of the telephone erupted between the deep pockets of Western Union and the thinly capitalized Bell.

The battle lasted just over a year. Its brief duration was not a surprise; the outcome, however, was. The upstart Bell won. How did David slay Goliath this time? Bell's principal ammunition was his 1876 patent. In September 1878, Bell Telephone Co. sued to protect Alexander Graham Bell's patents from infringement by Western Union; by June 1879, testimony in the patent suit was complete, and it did not look good for Western Union. Five months later, Western Union abandoned the field. Western Union also faced attack from another front.

In the late nineteenth century, a laissez-faire environment nurtured industrial concentration in the United States. The result was the rise of a few powerful captains of industry, whose Olympian battles shaped the economic landscape below. One such battle pitted Titan against Titan for control of Bell's antagonist. Angling to take over Western Union from William Vanderbilt, Jay Gould started the American Union Telegraph Company, in the hopes that the competition would reduce the value of Western Union stock. At the same time, Gould approached Bell general manager Theodore Vail with the intent of combining interests. Months later came what the Federal Communications Commission later called the "surprising capitulation of the powerful Western Union to the diminutive Bell Company."

Although Western Union was frightened by the proposed Gould/Bell alliance, its greatest concern was threats to its core telegraph business. Western Union abandoned telephone rights and patents to Bell. In exchange, Bell agreed to transfer all telegraph messages to Western Union, to pay a 20 percent royalty on any telephone rental income they received in the United States for the next seventeen years, and not to use the telephone business for "transmission of general business messages, market quotations, or news for sale or publication in competition with the business of Western Union." Gould finally wrested control of Western Union from Vanderbilt in 1882; by then, Western Union's onetime supplier/owner had entered into an agreement to manufacture for the American Bell Telephone Company.

Key moment

When individuals such as Victor Kiam and Elisha Gray purchase a company of which they are loyal customers, it is considered a testimonial. When a corporation purchases a supplier, it is called backward integration--and that is what Bell Telephone did with Western Electric. The company Western Electric hooked up with in 1881 was already substantially different from the original Bell Telephone Company. None of the four men responsible for the company's founding-- Alexander Graham Bell, Thomas Watson, Gardiner Hubbard, and Thomas Sanders-- played any technical or administrative role in the American Bell Telephone Company.

Western Electric joined the Bell system in 1881, when Bell purchased a controlling interest in its stock. Prior to that time, manufacture of telephones for the Bell system had undergone two phases. Beginning in 1877, it had been done in Charles Williams, Jr's Boston shop, which had been the site of Bell's early experiments. Within two years, increasing volume overwhelmed the Williams shop, and Bell had licensed additional manufacturers in Baltimore, Chicago, and Cincinnati. This interim arrangement solved Bell's difficulties in meeting demand promptly, but the licensees were difficult to control. That led Bell to search for a single manufacturer with the resources to handle large volume. Bell found it in Western Electric, which by then was the largest electrical manufacturer in the United States.

In 1882, Western Electric and Bell signed an agreement that made Western Electric Bell's exclusive manufacturer of telephones in the United States, while Western agreed to sell only to the American Bell Telephone Company (which in 1899 became AT&T), which then leased the phones to regional "operating" companies, who in turn leased the phones to end users. Those two contracts combined with AT&T's agreements with its licensees to form the three pillars of the nascent Bell System, and provided the system's organizing principle for the next century: long distance service--inaugurated in 1881 between Boston and Providence--was handled by the parent company, local service by the operating companies, and manufacture by Western Electric.

Key structure

Research and the Bell System

The three contracts alone would have meant little without a source of innovation for the development of new products and the improvement of existing ones--especially after Bell's patent expired. There were two directions Bell could go for technical innovation after 1894: to depend on outside inventors for innovation by purchasing their patents, or establish an in-house research organization to cultivate invention. A 1906 memo from AT&T's chief engineer to the president of the company shows the direction in which Bell initially moved: "Every effort in the Department is being executed toward perfecting the engineering methods. No one is employed who, as an inventor, is capable of originating new apparatus of novel design. In consequence of this it will be necessary in many cases to depend on the acquisition of inventions of outside men." One such man was a Columbia University electrical engineering professor named Michael Pupin.

Pupin was the archetypal independent inventor, even down to the eureka moment he experienced mountain climbing in Switzerland. Pupin had envisioned the loading coil, a method of amplifying the voice by long-distance telephone. Pupin's idea became the single most important telephone-related invention between 1876 and 1913. Pupin sold the patent to AT&T in 1900. Meanwhile, the Western Electric engineering department concentrated on improvement and adaptation rather than creation.

Morgan/T. Vail

That changed in 1907 when, during a financial panic, a syndicate of bankers took over AT&T and convinced Theodore Vail--company president in the mid-1880's--to return. Vail, in turn, chose John J. Carty as chief engineer. Carty had been one of Bell's original operators in the late 1870's, before women replaced the teenaged boys. In 1881, Carty had demonstrated the advantage of two-wire telephone circuits, and subsequently acquired two dozen telephone patents. Carty became head of Western Electric's Cable Department, and chief engineer of the long distance company. Now, the self-educated Carty championed of the idea of the company assembling scientists to perform research, rather than relying exclusively on outsiders.

Carty's assistant, Frank Jewett, who had a doctorate in physics from the University of Chicago, was in a better position than Carty to recruit top university talent. When Robert Millikan, America's foremost physicist, began sending Chicago's top students to Jewett, including Harold D. Arnold, Western Electric's engineering department developed a new "research branch." The Research Branch grew from Arnold and his handful of assistants in 1911 to more than one hundred by 1916--at a time when business conditions forced the company to cut back in other engineering departments. Thus was born the organization that would become Bell Laboratories, the greatest corporate research organization in the world.

Transcontinental Telephone Line

Motivation thrives on striving for a goal that appears attainable only with a superhuman effort. Such efforts, when they succeed, are called "miracles"; examples include Dr. Jonas Salk's polio vaccine, and John F. Kennedy's promise to put a man on the moon before the 1960's were over. During its formative years, Western Electric made just such a superhuman effort to meet the challenge of providing AT&T with the ability to offer transcontinental telephone service to coincide with the expected completion of the Panama Canal. The company's efforts towards that end would make an impact beyond the immediate goal, ultimately transforming the face of many industries.

In 1909, on a visit to the West Coast, John Carty promised to make available transcontinental telephone service in time for the scheduled 1914 opening of the Panama Canal. To that point, the major breakthrough in long-distance telephone had been the introduction of loading coils, which reduced the tendency of a signal to grow weaker the longer the line over which it was transmitted. The use of loading coils in the absence of further technological advance was about to reach its limit: service from New York to Denver. Longer distance calling would require technology that had not yet been developed.

In 1912, Dr. Lee DeForest provided that technology, developing the audion, a three-element vacuum tube that could not only send radio waves more effectively than existing devices, but could amplify them. Western Electric's Dr. Harold Arnold , who had the training in electron physics DeForest lacked, quickly

grasped scientifically how the audion worked. Arnold thus knew how to turn it into a practical electrical amplifier, which is what Carty knew was needed. The result was development of a "high-vacuum tube" for amplifying sound in telephone cables in April 1913--and AT&T's purchase of the audion patent from DeForest. The new tube allowed Western Electric to span the continent in 1913 and 1914. The circuit was successfully completed in June 1914, and successfully tested on July 29. Carty's challenge had been met.

Vail Kingsbury Vacuum

The planners of the Panama Pacific Exposition were less fortunate; the opening was postponed until 1915. Therefore, after hurrying for five years, AT&T had to wait six months to demonstrate its breakthrough. It was worth the wait: on January 25, 1915, 39 years after the first telephone conversation, the original participants reprised their roles: Alexander Graham Bell, from New York, called his associate Thomas Watson, who sat in San Francisco. After some initial pleasantries, Bell said, "I have been asked to say to you the words you understood over the telephone and through the old instrument, 'Mr. Watson, come here, I want you.'" From across the continent, Watson reminded Bell, "It would take me a week to get there now!" It would not take another 39 years to reach Europe. By 1927, a Western Electric radio-telephone link-up from New York to London established transatlantic service.

1913-1927 Long distance

Loudspeakers

As so often happens, a technological breakthrough in one area had a wide-ranging impact in others. Development of the high-vacuum tube amplifier did more than make possible the first transcontinental telephone line. It revolutionized communications, leading to creation of new industries including radio, television, and sound motion pictures. In a sense, Arnold's breakthrough marked the beginning of a new electronic age. Among the most immediate results of Arnold's breakthrough was the development of public address systems. The high-vacuum tube made possible development of the "loud-speaking telephone" (or loudspeaker), allowing many people to hear what conventional telephone receivers had limited to an audience of one. Further developments in the loudspeaker made possible its use in large crowds, at stadiums or in convention halls. Indeed, Western Electric public address systems were used at the 1920 presidential conventions, and at Warren Harding's 1921 inauguration. On Armistice Day (November 11) that year, Harding dedicated the Tomb of the Unknown Soldier at the Arlington National Cemetery. His address was sent by telephone lines to New York, and cross-country to San Francisco. In both cities, loudspeaker systems broadcast Harding's speech. In 1924, nearly 40,000 people attended dedication ceremonies for the first public address system ever installed at a manufacturing facility. The site was Western Electric's enormous Hawthorne plant near Chicago, where employees enjoyed the benefit of a system they had helped design and build.

The Hawthorne Plant

Western Electric founder Enos Barton, still president of the company in 1905, was responsible for moving the company's main manufacturing plant that year from downtown Chicago to a more rural setting on the outskirts of the city. Barton's urban-to-rural move contrasts with his move 36 years earlier, when he mortgaged the family farm in Jefferson County, New York, to raise money for his original investment in his Cleveland based partnership with George Shawk.

The rural Hawthorne plant became a virtually self-sufficient city, with a power plant, hospital, fire brigade, laundry, greenhouse, a brass band, and an annual beauty pageant. Hawthorne boasted a staff of trained nurses--who made house calls! Hawthorne absorbed the operations of the company's existing plants in New York and Chicago and by 1914 it was Western Electric's only manufacturing facility. During the next seven decades, the Hawthorne works--including more than 100 buildings--would produce telephones, cable and every major telephone switching system plus the equipment necessary to make it work. Western Electric even owned and operated the Manufacturer's Junction Railway at Hawthorne, "the biggest little railway in the world," which transported raw materials and completed cable around the plant. Hawthorne was also the cradle of industrial psychology, with a series of experiments that began in 1924. [Sidebar #2--Hawthorne Experiments]

1925 Restructuring

Key player

Besides acting as purchaser and as manufacturer for the Bell System, Western Electric also supplied its parent with executive talent. AT&T presidents from Harry B. Thayer to Frederick Kappel to Haakon Romnes each served as Western Electric president beforehand. The AT&T executive who presided over the biggest changes in Western Electric, and who served longest as AT&T president, Walter Gifford, started at Western but never became its president. Gifford began at Western in 1904 in the Chicago payroll department. By the time Gifford moved on to AT&T in 1908, he had become an Assistant Secretary at Western Electric.

Key moment

The year Gifford ascended to the presidency of AT&T, he redirected the business of Western Electric: he established Bell Laboratories as a separate entity, set up a separate corporation for the company's supply business. and sold the international business. Gifford established the separate entity called the Bell Telephone Laboratories Inc., which took over work previously conducted by the research division of Western Electric's engineering department. Bell Labs was 50 percent owned by Western Electric, and 50 percent owned by AT&T. Nine years later, AT&T's development and research group also joined Bell Labs.

The 1925 reorganization of the company established the institutional responsibilities which lasted until the 1980's: Bell Laboratories designed the network, Western Electric manufactured the telephones, cable, transmission equipment, and switching equipment, the operating companies installed the phones and billed customers, and AT&T long lines operated the long distance network.

Gifford also sold Western Electric's international business (except Canada), which he deemed a "distraction," to the International Telephone and Telegraph Company (ITT). (ITT has since sold a majority stake in its overseas telecommunications business to form the joint venture Alcatel N.V., which remains one of the world's top two producers--along with Lucent Technologies--of telecommunications equipment). Overseas manufacturing was a long-standing tradition at Western Electric by 1925. By establishing factories and management all over the world, Western Electric had become one of the first modern multinational corporations. In 1882, shortly after Bell had brought Western Electric into the fold, Western opened a manufacturing plant in Antwerp, Belgium. A plant in England followed shortly thereafter. Western Electric's international operations expanded to include every country with a major telephone system.

In Japan, Western Electric first sold equipment in 1890, then in 1899 helped form the Nippon Electric Company (NEC). This was Japan's first joint venture with an American firm; Western Electric's original stake was 54 percent. The joint venture originally distributed telephone equipment from the United States for the Japanese Ministry of Communication, the predecessor to Japan's telephone utility company, now called NTT Public Corporation. NEC began manufacturing soon after, and in the second decade of the century began to import electrical appliances, such as electrical fans, from Western Electric. A memo written in the 1960's by NEC president Koji Kobayashi reflects the strong ties his company still felt to Western Electric: "Western Electric is the foremost manufacturer of communications equipment in the world, and as its offspring our company has a glorious heritage. That is why we have sometimes been called 'the Western Electric of the Far East.'"

As happens so often to companies that either were first movers or achieved early industry dominance, AT&T and Western Electric both created the entities that ultimately proved to be their greatest competitors. In the case of AT&T, this meant the regional Bell Companies in the United States; in the case of Western Electric, this meant international competition: many of Western Electric's principal competitors--including Northern Telecom, Alcatel N.V. and NEC--had roots in Western Electric.

Graybar

During the first two decades of the 20th century, Western Electric became one of the largest distributors of electrical equipment in the United States. In some respects, this was a continuation of the original business of Gray and Barton: selling call bells, burglar alarms, etc. As demand increased, Western Electric stocked items made by dozens of electrical manufacturers, including Sunbeam lamps, sewing machines, electric fans, washing machines, vacuum cleaners--even toy ranges. The company's catalogue grew to 1,300 pages, as the Western Electric name in electrical appliances rivaled those of General Electric and Westinghouse.

In 1925, the company announced that what was once called the supply department would be organized as a separate corporation called the Graybar Electric Company, Inc. (after Western Electric founders Elisha Gray and Enos Barton). Three years later, ownership of Graybar passed to its employees.

The Great Depression

The Western Electric News, the company organ since 1912, ended its run in 1933. The next year, The Hawthorne Microphone temporarily ceased publication. There would have been little good news to report. The Depression's shrinkage of the American economy was deeply felt at Western Electric, where sales fell from a high of $411 million in 1929 to less than $70 million in 1933. Employment at the Hawthorne plant fell from a high of 43,000 in 1930 to about 6,000 by 1933. The company, like the federal government, resorted to a "Make Work" program at its three major plants in Baltimore, Chicago, and Kearny, New Jersey. The company paid its employees to make "articles in general demand" from furniture to cigarette lighters in order to keep them employed, then it distributed the goods--at cost--through the company stores.

At the time, telephones were not "articles in general demand." The 1930's were the only decade in the twentieth century when the number of telephones in the United States decreased. During the depths of the Depression, the number of telephones in use fell from 16 to 13 per 100 population; by the late 1970's, the number had surpassed 75 per 100 population. In the 1930's, then, telephones were still a luxury enjoyed by a minority rather than a necessity available to most. The 1936 Presidential election provided an indication of the nature of phone demand at the time. The Literary Digest conducted a telephone poll asking respondents which presidential candidate--the Democrat Roosevelt or the Republican Landon--they preferred. The poll's respondents chose the Republican challenger; President Roosevelt--whose criticisms of "economic royalists" were not designed to curry favor with the upper middle class who had telephones--won in the greatest landslide in history. In a time of great economic distress, spending on anything but necessities usually falls, and the telephone had not yet attained the status of necessity in America--hence Western Electric's hard times.

from '30-'90 usage 15% - 75%

World War II

World War II revived America's economy, including demand for Bell System services. During the first year of American involvement in the war, 1942, the number of telephones in the United States had increased about 50 percent from 1933 levels. From 1939, when the telephone was first employed as a "weapon of preparedness," until 1945, the number of Bell System long distance calls quadrupled. The nature of demand had changed significantly. Most of Western Electric's products for the Bell System during this period were radio and wire communications equipment for war use at Army and Navy bases and defense contractors across America. Western also created the communications nerve center used to direct the entire defense effort, installing the world's largest private

branch exchange (PBX) at the Pentagon in 1942, with 13,000 lines of dial PBX equipment and 125 operator positions.

The company also produced equipment for overseas use. New telephone centers sprang up in previously sparsely populated areas all over the world, to keep up with the needs of America's far-flung military installations. The company manufactured cable and wire, switchboards, and other equipment to meet Lend-Lease commitments in foreign countries. Western Electric also produced specialized communications equipment for observation of the enemy, most notably in the area of radar. RADAR--RAdio Detection And Ranging--is a method of detecting, or measuring distance from, objects that are either far away or hidden by clouds or darkness. It uses radio waves to detect and locate either fixed or moving objects. It is similar to radio communication in that it involves one-way communication, but it is different from radio broadcasting because it gathers information rather than giving it out. Radar was invented in the mid-1930's in England, where it was effectively used against the Luftwaffe during 1940's Battle of Britain. By then, Western Electric had already contracted to build radar for the American government. In October 1941, the first group of twelve field engineers were assigned to train enlisted men in how to use radar; by 1943 the group had grown to 600. The number of varieties of radio offered by the company had grown, also, to a total of 70 varieties. At the outset of the war, the radar capacities of Germany, England, and the United States were roughly equivalent, but thanks to the innovative efforts of Bell Laboratories, America was the world leader by war's end--and Western Electric had provided roughly half of the country's radar needs. Army ground and air forces, Navy ships, submarines, and planes, and Marine landing forces all employed Western Electric radar systems. Radar comprised about 50 percent of the company's war production--the rest going to radio and wire communications equipment designed for war purposes.

The demand for radar systems taxed Western's production capabilities. The Hawthorne, Kearny, and Point Breeze plants took on what work they could, set up sixteen satellite plants, including a former shoe plant and a former laundry, in nine cities, then fanned the rest out to thousands of subcontractors. A slot machine manufacturer produced antennas, a bicycle manufacturer built metal frames. Manpower was another challenge: there were not enough men to do the job, so Western hired increasing numbers of women. In 1941 women comprised 20 percent of the company's workforce; by 1944, they were 60 percent.

World War II proved a watershed for Western Electric. On the eve of the conflict, roughly 90 percent of demand for Western Electric's products came from one customer: the Bell System. By 1944, roughly 85 percent of demand for Western Electric's products still came from one customer, but that customer was now the federal government, for which the company provided more than 30 percent of all electronic gear for war. While the immediate aftermath of the war brought a swift reduction in defense needs, Western Electric's performance established a relationship that continued throughout the Cold War. When a 1956 consent

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decree ordered the Bell System to abandon non-telephone business, the one major exception was defense work.

Cold War Communications Systems

The twenty years following World War II appeared to offer Americans realization of their fondest hopes and their gravest fears simultaneously. Any expectations of a postwar return to Depression were soon put to rest by the greatest period of prosperity any nation has ever experienced. At the same time, Americans paid a stiff price for their good fortune: an extended arms race with the Soviet Union punctuated by periodic threat of another World War. During this uncertain time, Western Electric was actively engaged in both helping Americans realize their hopes--meeting the consumer demands of "the Affluent Society"--and in assuaging their fears of Soviet attack. For the first time, the company was fully engaged both in meeting demand for civilian goods and services, and in fulfilling major defense contracts.

Western Electric's relationship with the government, which had greatly accelerated during World War II, had not ended in 1945; it was just beginning. In the post-World War II era, the increasing role of electronics in military defense meant that Western Electric continued to provide important service to the federal government. This involved a range of projects, from guided missiles to military communications to radar to atomic energy. By the end of the 1950's, about 18,000 Western Electric employees were engaged in defense work alone.

There was much to work on, from the Nike guided missile program beginning in 1950 to computer-assisted air defense centers in 1958 to the emergency installation of switchboards and long-distance channels in Florida during the 1962 Cuban missile crisis.

The most challenging of all the projects was done during an earlier volatile and dangerous phase of the Cold War--the mid-1950's. Western Electric acted as general contractor for the erection of one of the biggest military engineering jobs in history--a 3,000 mile system of radar outposts across the Arctic to detect approaching bombers, called the Distant Early Warning Line (DEW Line). Awarded the contract in December 1954, Western Electric used the development work of Bell Telephone Laboratories and the Massachusetts Institute of Technology, and enlisted the assistance of 2,700 U.S. and Canadian suppliers and contractors.

The biggest threat to the project did not come from the Soviets, but from the forbidding Arctic weather. To protect themselves against -40 degree temperatures, compounded with stiff winds, Western Electric men wore 30 pounds of clothing and carried twenty-pound sleeping bags whenever going out for a stroll. The logistical challenges were enormous, involving bulldozers, enormous quantities of steel and cement, hundreds of miles of cable, not to mention provisions for the workmen. Supplies had to be shipped during the few

weeks in late summer when the Arctic Ocean was sufficiently free of ice to navigate safely.

The Arctic segment of the job was completed on schedule in July 1957. In the Spring of 1959, Western Electric completed communications and electronics phases of the 700-mile westward segment of the DEW Line through the Aleutians, and in November 1961 completed the 1,200-mile eastern segment to Iceland. The New York Times called the DEW Line "one of the modem wonders of the world."

The 1956 Consent Decree

Walker report?

The value that the government perceived in Western Electric's defense work was recognized in 1956. The culmination of an antitrust case filed by the Department of Justice in 1949, the 1956 consent decree ordered the Bell System to divest all of its non-telephone activities--except those involving national defense.

The consent decree also called for Western Electric to relinquish its 40 percent interest in Northern Electric of Canada, the last vestige of its international operations. Begun as the mechanical department of Bell Canada in 1882, Northern Electric & Manufacturing Company Limited was incorporated in 1895. In 1914, Northern Electric merged with a manufacturer of rubber-coated wire for the electrical industry. The consolidated company expanded well beyond telephone equipment. By the 1930's, Northern Electric was selling radio and broadcasting sound equipment, electric sound equipment, and other lines of electrical equipment. Throughout this period, Northern acted as a branch plant of Western Electric.

The government's decree not only shrank the Bell System, but it created a new competitor, now called Northern Telecom. Today, this onetime Western Electric subsidiary is a global giant, selling products in more than 80 countries manufactured in its plants in Canada, France, China, and other countries--including the United States. In 1990, Northern Telecom, the world's sixth largest supplier of telecommunications equipment, vaulted into the third spot by purchasing the British firm STC PLC--a onetime manufacturer for Western Electric.

The Affluent Society

In 1928, AT&T's vice president of publicity, Arthur W. Page, made a revolutionary proposal: to provide the public with a choice of various styles and colors of phones. Page noted that Western Electric made 142 different kinds of switchboard cable, but customers were only allowed to choose between "one black desk set, a hand set, a wall set, and one of those black buttoned inter-communications systems." The lesson of Henry Ford and automobiles was fresh in Page' s mind: "He made one little black instrument, too, and it did just what ours did: when it got started, it went fine, and so did ours. But, you know, Henry has recently come to the point where he realized he had to make a change and I

think now that he has made a lady out of Lizzie, we might dress up these children of the Bell System."

The Great Depression and World War II temporarily stemmed America's tide of enthusiasm for choices of style and color. The post-World War II era brought the United States the greatest harvest of economic abundance any country has ever experienced. Postwar re-conversion addressed pent-up demand in all sectors of the economy, including telecommunications. Civilian orders had accumulated (called "held orders"), until about two million people were waiting for telephones. Freed of war commitments and now able to address civilian concerns during the first full year of peace, Western Electric delivered roughly two and one-half times its 1941 civilian output.

Page's vision for the telephone consumer was not realized until the 1950s, when demand for telephones skyrocketed. By 1957, the number of telephones in the United States was three times its 1939 level, and more than 70 percent of American households had the device. Meanwhile Western Electric's engineers had been working for years on realizing Arthur Page's vision. In 1954, Western Electric mass-produced color telephones for the first time, and the next year began work on the Princess telephone. Industrial designer Harry Dreyfuss, who had assisted Bell since the early 1930's, worked with Bell Labs engineers and Western Electric's Indianapolis Model Shop to create a model that was lighter and smaller--designed for use on night tables--than the standard model. The Princess had an illuminated dial, and came in five colors. Test marketed in Colorado, Georgia, Pennsylvania, and Illinois, the Princess was a smashing success.

Statistics

The Princess proved to be just one of many Western Electric innovations at the time. The Indianapolis Model Shop was also working on other phones we now take for granted: phones with a dial in the handset, and touch tone phones. At the same time, the Northwestern Bell Telephone Company was experimenting with a novel way to market Western Electric's products. The new Telephone Shop in Minneapolis, forebear of today's Phone Stores, demonstrated telephone equipment and services in the store to customers, who could then order it "just as they would order merchandise from any other store."

Electronic Switching & the Transistor

The boom in telephone use required other innovations which were not as visible as the Princess phone. By the 1960's, projected phone use was so great that the existing network might soon be unable to keep up with demand. In 1963, the Western Electric's first electronic switching system, a private branch exchange (PBX) was introduced at Cocoa Beach, Florida. Two years later, at New Jersey Bell's Succasunna exchange, the first commercial electric central office appeared. By 1970, there were 120 such offices, servicing nearly two million customers.

The road to electronic switching had been a circuitous one, which started in the 1930's, and had led to the development of the transistor. In 1936, Bell Labs director of research, Mervin J. Kelly, told physicist William Shockley of the vacuum tube division how important development of an electronic telephone exchange might become. Shockley, working with Bell Labs physicist Walter Brattain, sought to develop an amplifier which required less power and generated less heat than the vacuum tube. Just as their research got going, the two were diverted to war work.

After the war, a third physicist, John Bardeen, joined Shockley and Brattain on the project. In December of 1947, they succeeded in creating the transistor, thereby ushering in the modem electronic era, the era of communications satellites, the computer industry--and the electronic switching of telephone calls. In 1956, Bardeen, Shockley and Brattain were awarded the Nobel Prize for their work, which thus far has been the most famous achievement by Bell Labs.

Cellular Phones

The post-World War II era brought a number of other developments out of Bell Labs, from the solar cell to the laser, with wide-ranging implications. One advance in the 1960's dealt more directly with telephony, allowing people to conveniently use the phone system from moving vehicles. By then, the Bell System had a long history of development in mobile radio telephony. As early as 1924, Western Electric had designed a system of mobile communications for the New York City Police Department. In 1946, the Bell System introduced the first mobile telephone system in St. Louis. Over the next few years, the service spread throughout the country. But as there was a single antenna site in a region, only a few calls could be handled at any one time. In the 1960's, Bell Labs had made the breakthrough which established mobile telephone as we know it today: a series of radio transmitters in hexagonal "cells." As a vehicle moves from one cell to another, electronic switching equipment transfers the call to another transmitter. The system of relatively weak transmitters and concomitant multiple use of radio frequencies yields calling quality similar to that of home or office, and the ability to get a line quickly.

After the Federal Communications Commission (FCC) set aside frequencies for mobile communications, AT&T field tested its new system in 1978 in Chicago. Three years later, the FCC authorized commercial usage of the system, a move AT&T vice president James R. Billingsley said "pulled the regulatory cork on a technological triumph that's going to work wonders for our nation over the years." AT&T's "Advanced Mobile Phone Service," began operation in Chicago in 1983. AT&T manufactured the antennae, receivers, transmitters for the local cellular companies, and the phones themselves--for awhile. Japanese competition drove AT&T out of the telephone market in 1986, and left the company as a leading supplier of the phone company equipment, which it remains today.

In the early 1990's, however, an astonishing thing happened with respect to cellular phones. AT&T conducted a survey, asking respondents whose cellular

phone they preferred to use. AT&T placed second, although the company no longer made such phones! The company got back into the market, and is now one of the leading cellular phone manufacturers, a rapidly growing market of more than 25 million in the United States alone.

The 1984 Breakup

Just as the FCC was sanctioning AT&T's addition of commercial cellular phone service, the Department of Justice was engaged in a larger exercise in subtraction: the breakup of the Bell System. Through the years, AT&T had been the target of antitrust investigation. In 1913, after discussions with the attorney general's office, AT&T vice president Nathan Kingsbury agreed to allow other telephone companies to engage in toll service over Bell System lines, and to dispose of the controlling interest in Western Union stock AT&T had acquired in 1909; in return, the government sanctioned the Bell System's limited monopoly and national telephone system.

The "Kingsbury Commitment" did not put an end to government investigation of the Bell System. The Federal Communications Act of 1934 had established the Federal Communications Commission, with jurisdiction over telephones previously held by the interstate Commerce Commission. One of the FCC's first acts was to investigate AT&T, paying particular attention to the relationship between Western Electric and the operating companies: did Western overcharge for its equipment, and recover the excess over "market" price in exorbitant rates to consumers? The FCC 's principal investigating attorney, Holmes Baldridge, became chief antitrust litigator of the Justice Department after World War II, and pursued the Western Electric/operating companies relationship again. The Eisenhower administration's Justice Department was less antitrust-minded than its predecessors, so the 1956 Consent Decree allowed the Bell System to keep Western Electric in the fold, but stripped the Bell System of most of its non-telephone business, and its interest in Northern Electric.

In 1974, the Justice Department began antitrust proceedings to seek dismemberment of AT&T, which was the largest corporation in the world. Eight years later, as a Modification to the 1956 Final Judgment (MFJ), AT&T agreed to divest its 22 wholly-owned operating companies which provided local exchange service. AT&T's work force shrunk from more than a million to less than four hundred thousand. In exchange for the divestiture, AT&T was allowed to compete in non-telephone businesses--which the 1956 consent decree had forbidden--such as computers and information services.

AT&T also abandoned two names which had been associated with the company for more than a century: Bell and Western Electric. The government ordered that AT&T forfeit use of the Bell name and logo to the operating companies (excepting the name Bell Laboratories). Western Electric disappeared as a separate entity when AT&T restructured according to its new competitive situation. One of the two primary parts of the new, smaller, AT&T was the old company's long lines department, now called AT&T Communications, which

offered regulated long distance service. The second part of the new company, called AT&T Technologies, inherited the other two segments of the old Bell System: equipment manufacture and supply (the old Western Electric) and research and development (Bell Laboratories).

AT&T Technologies, the name of which symbolized the company's long-standing heritage of research and innovation, included five segments. Network Systems, the largest segment, represented the heart of the old Western Electric: production of telecommunications equipment. Information Systems explored the possibilities of integrating voice and data capabilities into information networks. Consumer Products serviced the new market for the sale of residential telephones and telephone equipment through Phone Stores and other retail channels. Technology Systems concentrated on computer applications of Bell Laboratories research, from components to systems, and government work. Finally, International pursued overseas markets for switching and transmission systems.

Subsequent to 1984, the company restructured AT&T Technologies, and abandoned its name. Until September of 1995, the Network Systems Group included the largest segment of the old Western Electric charter, including the company's growing presence in international markets for telecommunications equipment.

Going Global (Again)

Just prior to disappearing as a separate entity, Western Electric had returned to overseas markets after a long absence. The company's 1977 agreement to supply the government of Saudi Arabia a microwave system of about 300 radio relay systems and its 1979 contract to provide the government of Taiwan with an electronic switching system, marked Western Electric's first overseas ventures since 1925. The two agreements did not, however, a global giant make: at the time of the 1983 divestiture, AT&T had fewer than 100 employees outside the U.S.

After the MFJ, AT&T intensified its overseas efforts, forming a joint venture in the Netherlands with N.V. Philips to produce telephone network equipment. This joint venture eventually became AT&T Network Systems International, in which N.V. Philips no longer plays a role. Joint ventures in Italy, Spain, Ireland, Denmark, Korea, and Japan followed in the 1980s. The company also established manufacturing plants in Singapore and Thailand to manufacture consumer telephone equipment, and in the Netherlands, Taiwan, and Korea to produce switching equipment.

In February 1991, AT&T displayed a spectacular example of its growing international capabilities. A convoy of AT&T employees and equipment followed US troops into just-liberated Kuwait to restore telephone service: Operation Desert Storm was followed by what later was dubbed "Operation Desert Switch." Using a seven-meter satellite dish, AT&T switch and phones, the company

restored outgoing international service less than 48 hours after Kuwait's February 28 liberation. A few months later, AT&T delivered two switches and an earth station to restore full service.

In 1993, AT&T signed a historic agreement with the People's Republic of China, involving research, development and manufacturing of switching and transmission systems, wireless systems, and customer equipment. China, with only two phones per 100 people (compared to more than 80 phones per 100 people in the United States), represents the largest of a number of overseas markets which AT&T was poised to explore; by 1993, AT&T had more than 53,000 employees abroad.

AT&T's establishment of a global business offered the company new opportunities, but in many respects, a global presence was nothing new for the old Bell System. On the eve of World War 1, Western Electric's overseas locations included Antwerp, London, Berlin, Milan, Pairs, Vienna. Budapest, Tokyo, Buenos Aires, Sydney--and St. Petersburg.

Today Lucent Technologies sells phones in Russia and Ukraine, marking the latest chapter in the company's roller-coaster relationship with Russia and the Soviet Union. Before the 1917 Russian Revolution, Western Electric had a manufacturing facility in St. Petersburg. The superintendent of the plant was murdered in his living room by revolutionaries, and the operation was nationalized. Western Electric's next contact with the Soviet Union came when the company produced telephone systems for America's ally during World War II. The subsequent onset of the Cold War changed Western Electric's relationship with the Soviets again.
In 1990--before the crumbling of the Soviet Union--the company reached an agreement to provide switching and transmission equipment to Armenia, which became the first Soviet Republic to establish independent international phone service. Previously, all of the Soviet union's international calls routed through Moscow--where central authorities determined which calls had priority, and where limited capacity created overload problems. In January of 1992, only 44 days after Ukraine declared its independence, AT&T, PTT Telecom of the Netherlands, and the Ukrainian State Committee of Communications formed a joint venture to build, operate, and own a long-distance network for the new republic. At the system's February 1993 inaugural, Ukraine Minister of Communications, Oleh Prozhyvalsky, said: "This marks a milestone in the modernization of our telecommunications infrastructure." It was, however, much more than that. By offering communications services to Armenia, the Ukraine, Russia, Kazakhstan, Poland, and Czechoslovakia, AT&T helped usher in the new post-Cold War world.

Consumer Products

For AT&T, the New World Order was both an international one, and a very competitive one--especially in consumer products. In the first couple of years after divestiture, AT&T reached a low point in the residential telephone

equipment market. FCC regulations once allowed telephone companies to dictate to customers whose equipment they could use. This meant that the vertically integrated Bell system could assure that their manufacturing branch, Western Electric, would have the same market share providing equipment that the phone companies did in providing service. Telephones were leased only, and a part of an end-to-end service package. That changed in the 1970's, when the FCC ruled that customers could connect their own equipment to the telephone network. It further required that each manufacturer of telephones equip them with standard plugs which fit into jacks provided by phone companies. These changes opened the door for independent manufacturers of telephone equipment, and by 1978, one million phones were sold in department stores and electronics shops. AT&T responded by accelerating their production of phones in various styles and opening phone stores which allowed customers to choose a phone, take it home and plug it in, rather than wait for a repairman to do so.

In the years immediately following divestiture, telephone customers chose increasingly to buy, rather than lease phones. AT&T rental revenues declined form $7.2 billion in 1984 to $3.0 billion in 1988. That would have done AT&T little harm if the company made up the difference by selling phones. It didn't. AT&T phones had been designed for a lease environment: they lasted forever, and were pretty homogenous. Customers in 1984 and 1985 flocked to cheaper phones with more features. AT&T considered abandoning the market entirely, as they briefly did with cellular phones, but decided instead to fight back.

Bell Laboratories designed less costly phones, which AT&T marketed more aggressively. By 1987, AT&T sold phones through 7,000 retail outlets plus 450 Phone Centers. The company also successfully entered the markets for cordless phones and for telephone answering machines. In 1987, the Washington Post reported: "Not all companies decide to raise the white flag in the face of a competitive battle ... and (some) come out of the fight a winner. American Telephone & Telegraph is a case in point." AT&T recaptured leadership of the market for residential telephones. One reason is that while in the mid-1980's, the company reduced costs in the consumer products area dramatically--50 percent in three years--superior quality remained.

Capitalizing on growing consumer impatience with the low-quality, "throw away" telephones, AT&T ran a series of successful commercials calling attention to the problems of the competition's "second-class phones." By contrast, one consumer reported that after his AT&T cordless phone fell on the driveway and was crushed by a half-ton truck, "I picked it up, switched it to talk, and couldn't believe it still worked." After gluing the pieces together, he continued to use the phone. Little wonder that a 1988 Gallup survey rated AT&T one of America's top ten companies in quality, and the company continued to win plaudits in the 1990's.

Western Electric and the Quality Movement

In October 1994 AT&T Power Systems became the first U.S. manufacturer to win Japan's Deming Prize, which salutes companies for successful dedication to the

concepts of Total Quality Management. Two years earlier, AT&T Transmission Systems had won a Malcolm Baldridge Quality Award. While some saw these awards as evidence that American business had finally caught on to Japanese management principles, Western Electric had long been a seedbed for the modem quality movement. Andrew M. Guarriello, chief operating officer of AT&T Power Systems noted that "the roots of today's Total Quality Management can be traced to the work of three AT&T scientists and quality pioneers--Walter Shewhart, W. Edwards Deming, and Joseph Juran. This award tells me quality in manufacturing has come full circle."

Over the years, quality assurance methods at Western Electric and elsewhere have evolved along with changes in the relationship between workers and their output. At the time of the company's founding, individual artisans checked their own work. In 1876, the seven year-old Western Electric was recognized for the quality of its products at the Philadelphia Centennial Exhibition, winning five first-class medals for its apparatus. While the company proved that it could create products of the highest quality, doing so consistently for large-scale output was something else entirely. At the time of the company's 50th anniversary, H. F. Albright, Western Electric's vice president in charge of manufacturing, recalled the challenges of the 1880's: "We were supposed to produce forty-eight telephones and transmitters a day. Some lucky days we got perhaps as high as a dozen or two accepted. Other days our whole shipment was rejected. The shop superintendent quit in despair, but the shops kept everlastingly at it and at last succeeded in shipping telephones that would stay shipped."

By the turn of the century, Western Electric had trained individuals as inspectors to assure specification and quality standards, in order to avoid sending bad products to the customer. In the 1920's, Western Electric's Dr. Walter Shewhart took manufacturing quality to the next level--employing statistical techniques to control processes to minimize defective output. When Dr. Shewhart joined the Inspection Engineering Department at Hawthorne in 1918, industrial quality was limited to inspecting finished products and removing defective items. That all changed in May 1924. Dr. Shewhart's boss, George Edwards, recalled: "Dr. Shewhart prepared a little memorandum only about a page in length. About a third of that page was given over to a simple diagram which we would all recognize today as a schematic control chart. That diagram, and the short text which preceded and followed it, set forth all of the essential principles and considerations which are involved in what we know today as process quality control." Mr. Edwards had observed the birth of the modem scientific study of process control. That same year, Dr. Shewhart created the first statistical control charts of manufacturing processes, which involved statistical sampling procedures. Shewhart published his findings in a 1931 book, Economic Control of Quality of Manufactured Product.

Dr. Shewhart's work had limited impact beyond Western Electric manufacturing until the late 1930's. W. Edwards Deming of the War Department--and briefly an employee of Western Electric--invited Shewhart to give a series of talks, which

Deming later edited for publication. In 1947, the newly-formed American Society for Quality Control began recognizing individuals with the Shewhart Medal for contributions to the field. The first recipient of this annual award: Dr. Walter Shewhart. By then, Joseph Juran of Western Electric and Harold Dodge of Bell Labs had made major quality control contributions to the federal government's quality efforts. During World War II, they and other engineers and statisticians from Western Electric and Bell Labs worked for the War Department, creating a series of sampling inspection plans that were published as the MILSTD (military standard) series. MILSTD set the standards that are still used in America and throughout the world.

After the war, America exported quality expertise to Japan. The Civil Communications Section (CCS) of the General Headquarters of the Supreme Commander for the Allied Powers was rebuilding Japan's telecommunications system--and improving its quality. CCS arranged for Western Electric and Bell Labs engineers to teach fundamentals of quality to a generation of Japanese equipment manufacturing executives--who then showed the world how valuable those lessons were.

The most notable agents of this effort were Juran, who spent the first dozen years of his career at Western Electric, and Deming, who had spent two summers working there. Juran, influenced by his experiences at Western Electric, emphasized the value of training programs in quality. Only through the use of such programs could every worker in the company learn the necessary quality control techniques--a necessary condition to the goal of continuous quality improvement.

At Western Electric, this expertise on quality was communicated to the shop floor--most dramatically by Bonnie Small who joined the Hawthorne quality assurance department in 1940. Her experiences there during World War II convinced her that Shewhart's abstract ideas alone were of little help to newly hired workers, so she set out to translate the ideas of Shewhart into practical methods. After joining the Allentown Plant in 1948, Small assembled a committee of quality professionals throughout Western Electric to write a handbook for the factory. This handbook represents the confluence of Western Electric's long-standing traditions of quality control and of education and training. Much of the material for the book was based on Western Electric training courses given to managers, engineers, and shop floor people from 1949 to 1956. The "Western Electric Statistical Quality Control Handbook" appeared in 1958, and has been the shop floor bible of quality control throughout the world ever since. It remains in print, available from the company today.

Quality and technical innovation have become two of the hallmarks of success in today's global competition in manufacturing. Quality and technical innovation are also the basis of Western Electric's heritage in manufacturing, which Lucent Technologies will inherit.

Motion Picture Sound (Sidebar #1)

In 1922, Research Administrator E. B. Craft decided to direct the company's developments in amplifiers, loudspeakers, microphones, and electronic recording in a new direction: towards sound motion pictures. Efforts towards that end had been tried since the dawn of motion pictures in the 1890's, most notably the introduction of the Kinetophone from Thomas Edison's laboratory in 1913. The Kinetophone's poor synchronization and sound quality proved more a distraction than an enhancement to films. Edison's failure made Hollywood moguls wary of expending much time or effort on sound--offering an opportunity to other innovators outside of the motion picture industry.

By 1923, a number of companies were working on sound developments, but Craft was undaunted by the competition. He wrote Frank Jewett, vice president in charge of research, "it seems obvious that we are in the best position of anyone to develop and manufacture the best apparatus and systems for use in this field." Craft turned out to be right. Western Electric developed an integrated system for recording, reproducing and filling a theater with synchronized sound. By 1924, Western Electric was ready to sell its system to Hollywood.

Western attracted the attention of a second-tier motion picture studio called Warner Bros., and the two companies formed a joint venture, the Vitaphone Corporation, to experiment in the production and exhibition of sound motion pictures. Four months later, the new system, called Vitaphone, debuted with the opening of "Don Juan," starring John Barrymore, at the Wamer's Theatre in New York City. Preceding the film were a series of short sound films, rather than the usual live vaudeville acts. As for the main feature, an electrical sound system--carrying the recorded strains of the New York Philharmonic--replaced accompaniment by live musicians. The system was a hit, even if the film wasn't: Quinn Martin wrote in the New York World, "You may have the 'Don Juan.' Leave me the Vitaphone."

Western Electric formed a subsidiary the following January to handle Western's non-telephone interests. Electrical Research Products, Inc. (ERPI) developed and distributed studio recording equipment and sound systems to the major Hollywood studios. Recognition for Western Electric's contributions to the film industry soon followed. In 1931, ERPI won an award from the Academy of Motion Picture Arts and Sciences for technical achievement. ERPI's system of noiseless recording was cited as "outstanding scientific achievement of the past year." ERPI also made sound equipment for movie theaters, which it leased, rather than sold- just as the Bell System had leased out the telephone equipment Western produced. ERPI equipped 879 movie theaters in 1928, and 2,391 in 1929. By 1932, only 2 percent of open theaters in America were not wired for sound. Western Electric proved better at wiring the nations' theaters than at maintaining that customer base, however, and ERPI abandoned the motion picture theater business in 1937. The company continued to produce sound equipment for movie studios until 1956, when as part of the consent decree it abandoned most

non-telephone enterprise. The company left a legacy in the motion picture industry, one reminder of which is the credit at the end of many films from Hollywood's Golden Age: "Sound by Western Electric."

The Hawthorne Experiments (Sidebar #2)

From 1924 until 1933, the Hawthorne plant was the site of a series of experiments conducted under the auspices of the National Research Council. The initial studies involved the impact of changes in lighting levels on the productivity of several groups of workers. The first two sets of tests showed that increased levels of supervision played a much larger role in productivity increases than levels of illumination.

The most involved of the experiments, the relay assembly test room experiment, involved isolating six women, then measuring their production, health, and social interactions in response to changes in working conditions, such as the number and duration of rest periods, length of the work day, and the amount of food they ate. Productivity increased as each improvement was introduced, until the crucial twelfth test, in which researchers removed the special conditions. Productivity increased again! One of the researchers called the twelfth test "the great éclaircissement, the new illumination, that came from the research." The experiments raised the possibility that, as Thomas J. Peters and Robert Waterman put it, "it is the attention to employees, not work conditions per se, that has a dominant impact on productivity."

The impact of the experiments has been felt worldwide, and by many generations. In the 1950's, a number of Japanese executives visited Western Electric and told their hosts that, Management and the Worker, a book summarizing the findings from the Hawthorne experiments, was required reading in Japanese schools of management. The phrase "Hawthorne effect" has come to mean any unexpected outcomes from non-experimental variables in social or behavioral sciences. The Hawthorne experiments have been elevated to what one historian calls the "status of Creation myth" in many fields that study the workplace, from sociology to psychology to anthropology

Jody Gruendel

From: DAMATA, JASON [JDAMATA@c-span.org]
Sent: Thursday, August 18, 2005 1:46 PM
To: Jody Gruendel
Cc: Clay T. Whitehead
Subject: some key contacts

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lbackman@cablecenter.org

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Citizenship: (circle one) US Citizen Permanent Resident Non-Immigrant

Ethnicity: (circle one) Asian / Pacific Islander Black (not of Hispanic Origin) Hispanic
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Experience

Cable-Satellite Public Affairs Network (C-SPAN) Washington, DC 7/02-present
Currently in charge of research and production for "Television and the Modern Presidency" and "Campaign Money and Message", an Amos B. Hostetter Distance Learning Project. Other duties include acting as assistant to the director and the executive producer, as well as handling guests and video editing.
To watch the project online: www.c-span.org/tv_presidency

Vice President Tree House Café Inc, Denver, CO. 11/97- present
Created the business plan, set up the operational structure and recruited a management team. Duties included marketing, human resources, distributor relations, finance and company expansion. Currently, serve as a stockholder and act as a business consultant for operations and finance.
For more information:
www.treehousecafe.com/history www.westword.com/bestof2000/sandwiches

Founder/Editor in Chief Fabric Magazine, llp. Denver, CO. 06/96-10/97
(Fabric was a magazine comprised of literary work collected from students across Colorado. It ran for four issues at 8,000 copies). Developed the mission, recruited volunteers, solicited funding, and successfully negotiated 50 distribution sites on 9 different college campuses. In charge of daily operations, community relations, marketing, advertisement, staffing, distribution and publisher relations.

Assistant to the Director of Wellness University of Denver 09/95-06/96
Assisted in re-development of student health programs, project marketing and implementation. Also acted as a student consultant and participated in community forums.

Education

University of Denver G.P.A. Major 3.7, Overall 3.2
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John Jay School of Criminal Justice New York City G.P.A. 3.68
Spring 2001 Political Philosophy, International Relations, Constitutional Law, Ethics of Law

References

Available upon request

FACSIMILE COVER SHEET

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TO: Mike Kelly

COMPANY: GMU

FAX #: 703 - 993 - 3115

DATE: 12/8/03

FROM: Jody Gruendel

Pages following this cover sheet: 1

COMMENTS:

You may contact Jason Damato at 202- 737- 3220 ext. 2044. Thank you for your assistance.

Jody

Jody Gruendel

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Monday, December 08, 2003 9:38 AM
To: 'jody@cwx.com'
Subject: library card

Hi Jody,
I received a document in the mail indicating that I can obtain a library card (thank you). However, when I called to confirm the location, I was told I am not currently in the system. The person issuing the ID told me I had to contact the "affiliate" or the "administrator". Can you please give me some guidance on the next step?
Thank you.

Best Wishes,

Jason
202.737.3220 ext 2044

7/993-3115

ss#

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HOME PHONE: HOME FAX:
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COMMENT3: Mike Kelley 703-993-3100
COMMENT4: email address cwhiteh1@gmu.edu

GMU Library - Sandy Kelso 703 993-2244
Jason Damata - researcher

Jody Gruendel

From: skelso@gmu.edu
Sent: Monday, November 24, 2003 11:37 AM
To: jody@cwx.com
Subject: Jason Damata

Hello Jody,

The two pages we discussed on the Mason web site are

http://hr.gmu.edu/forms/photo_id.pdf and

http://www.gmu.edu/univserv/allunivcard/photoid.htm

I hope these two web sites will provide the information you need.

Sandy Kelso
Fenwick Library

Susan Burgess

Jason Damata research

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Tuesday, February 01, 2005 7:52 PM
To: Clay T. Whitehead
Cc: 'DAMATA, JASON'
Subject: cable freeze timeline

Importance: High

Here's the best description I could find. I find the link to a la carte to be eye opening.

http://www.broadband-pbimedia.com/cgi/cw/show_mag.cgi?pub=cw&mon=112204&file=whydoescable.htm

Regulation has been as big a factor in the growth of cable tiers as technology and market forces. Here's a look at some of the most important regulatory moves of the past 40 years.

By John P. Ourand

Mid 1960s--The FCC initiated "Cable Freeze" regulation, cable's first real experience with must-carry. The rules mandated carriage of local signals and restricted carriage of out-of-market signals. The rules were nicknamed the "Cable Freeze" rules because they stymied the extension of cable into previously unbuilt larger markets.

1968--Content owners filed suit against cable operators, charging them with copyright infringement for retransmitting local and distant signals.
Ultimately, Hollywood lost, with the courts saying that cable operators provide an antenna reception service, which did not break existing copyright laws.

Early 1970s--The FCC adopted the policy of "deliberately structured dualism" under which it shared regulatory jurisdiction of cable television with local franchising authorities. This put rate regulation under the control of local governments. The FCC kept oversight of technical standards and signal carriage regulation.

1972--Cable operators, broadcasters and copyright holders reached a compromise, in which the cable industry agreed to support a change in the copyright law that made it responsible for copyright payments (i.e., license fees). In exchange, cable struck a deal to allow the FCC to replace the Cable Freeze with a set of regulations addressing signal carriage and access channels.

1975--The FCC adopted "anti-siphoning" rules in response to broadcaster fears that premium movie and sports programming would lure viewers and advertising revenue away from broadcast stations. The rules created content windows, prohibiting premium cable channels from showing movies that had been in theatrical release within two years; sports events that had been televised live on broadcast channels in the cable community within two years; and "series" programming. They also prohibited premium cable channels from carrying advertising.

1977--The United States Court of Appeals for the District of Columbia Circuit struck down the anti-siphoning rules on First Amendment grounds, leading premium channels like HBO and Showtime to show more recent movies, uncut and commercial-free, and allowing other channels, like ESPN and BET, to accept advertising.

Early 1980s--The FCC issued a series of rulings that preempted local regulation of services not only on a per channel basis, but also on optional expanded basic tiers.

1984--Congress passed the Cable Communications Policy Act, recognizing local authority to regulate basic rates charged by cable operators not subject to "effective competition." The practical result was to deregulate virtually all systems' rates.

Mid-1980s--The Copyright Act's royalty calculation rules were clarified.
Cable operators pay royalties for carrying distant broadcast signals based on a percentage of the revenue operators receive from the basic tier. To hold down copyright costs,

operators reduced the content and price of the basic tier, thereby maximizing revenue while still keeping copyright royalty costs low.

1992--In response to increasing cable rates, Congress passed the Cable Television Consumer Protection and Competition Act of 1992. This Act redefined effective competition, thereby reregulating most cable operators and giving the FCC a bigger role in establishing standards to judge cable rates. It introduced "retransmission consent" rules, whereby broadcasters could elect, in lieu of must-carry, to prevent cable operators from retransmitting their signals without consent. At first, broadcasters tried to charge a fee for carriage. But cable operators resisted, and wound up negotiating carriage for new networks from large broadcast groups, which led to the launch of SoapNet (ABC), MSNBC (NBC) and FX (Fox). Broadcasters demanded these networks be carried on a system's most widely penetrated tier.

1993--Several MSOs, including Time Warner, Adelphia and Century, launched a la carte services. Adelphia made every channel outside of its basic tier a la carte. Franchising authorities complained that these offerings were attempts to evade rate regulation. The FCC eventually ruled operators that offered more than six channels of a la carte were evading the rules, a decision that was affirmed by the D.C. Circuit a few years later.

1994--The FCC adopted "Going Forward" rules, allowing cable operators to add new channels to the expanded basic tier at a price of not more than 20 cents per channel plus license fees, with a total increase over two years not to exceed $1.50. The commission also created a new program package, called the New Product Tier, which cable operators were permitted to offer on an unregulated basis.

1994--A divided Supreme Court remanded the must-carry law to a lower court. The next year, the lower court again affirmed must-carry rules.

1996--Acknowledging that the 1992 Act stifled cable-industry investment, Congress passed the Telecommunications Act of 1996, phasing out regulation of expanded basic service rates, effective in 1999. Franchising authorities kept the power to regulate basic tiers where no effective competition exists.

1997--A divided Supreme Court affirmed the must-carry law.

2002--The Supreme Court refused to hear a case challenging a 1999 must-carry law that applied to DBS distributors.

Susan Burgess

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Tuesday, January 18, 2005 12:23 PM
To: Clay T. Whitehead
Subject: RE: nixon tapes

yes I searched and there is no mention of you in our archives but I have found the tapes in chronology and there is one in April of 1972 on the ITT hearings

http://www.c-span.org/apa/nixon.asp?Cat=Series&Code=APA&ShowVidNum=6&Rot_Cat_CD=APA&Rot_HT=205&Rot_WD=

-----Original Message-----
From: Clay T. Whitehead [mailto:tom@cwx.com]
Sent: Tuesday, January 18, 2005 11:44 AM
To: 'DAMATA, JASON'
Subject: RE: nixon tapes

Have you done the search for "whitehead"?

-----Original Message-----
From: DAMATA, JASON [mailto:JDamata@c-span.org]
Sent: Tuesday, January 18, 2005 9:30 AM
To: 'Clay T. Whitehead'
Subject: RE: nixon tapes

the easiest way to review them is to simply click on the link http://www.c-span.org/apa/nixon.asp

and find one that interests you. Use the search tab to find names eg; Colson

They are not sorted by date, but I will check to see if there is a way to look at them in chronological order...

A few months back I spoke with Bob Spence, the producer involved in obtaining these from the archives, and he is on alert for anything with communications mentioned. So far he has come up with nothing...

But they are interesting anyway....

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From: Clay T. Whitehead [mailto:tom@cwx.com]
Sent: Monday, January 10, 2005 10:49 AM
To: 'DAMATA, JASON'
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To: 'Clay T. Whitehead '
Subject: RE: nixon tapes

We have a lot on the c-span web site

Cat=Series&Code=APA&ShowVidNum=6&Rot_Cat_CD=APA&Rot_HT=205&Rot_WD=

-----Original Message-----
From: Clay T. Whitehead
To: Jason Damata
Sent: 1/10/05 2:35 AM
Subject: nixon tapes

http://www.ssa.gov/history/Nixon/720613ca103.rtf
<http://www.ssa.gov/history/Nixon/720613ca103.rtf>

http://www.ssa.gov/history/Nixon/EOB-312.rtf
<http://www.ssa.gov/history/Nixon/EOB-312.rtf>

more?

Susan Burgess

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Sunday, February 13, 2005 9:10 AM
To: Clay T. Whitehead
Cc: 'DAMATA, JASON'
Subject: Sifting Through History--Box #3

Importance: High

Some of this stuff is fascinating! You are missing out on a good time!
Here is what I sorted through so far

Pre-OTP
1. Executive Branch and Spectrum Management
Materials dating back to the Eisenhower administration on the establishment of an Advisory Board.

2. Comsat
There are documented squabbles over
* Legislation Amending the 1962 Satellite Act.
* Ownership/oversight of the executive board,
* Industry structure and reach
* Oversight jurisdictions
* Domsat issues
* Government Use Issues
* AT&T and the fight over satellite entry into long distance telephony
* Talk of eliminating common carrier ownership of Comsat stock
* DOJ's anti-trust division had taken an interest
*

The players so far are
OTP--CTW, Goldberg
Don Baker-DOJ
Joe Charyk--President of Comsat
John Martin--VP of Comsat
Dean Burch and Bernie Strassburg-FCC
Henry Cartucci--Western Union
Howard White--ITT
Howard Hawkins--RCA
Battle, Ashern, Crosland--AT&T
Sen. Gravel

The most interesting thing to me is
The was a movement to force AT&T to sell its stock and relinquish its stake in Comsat. Meanwhile there is media hype about Comsat becoming a competitor in the long distance market (since the MCI decision). The executive branch appointed 3 seats on the Board of Directors in perpetuity.

Susan Burgess

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Friday, February 25, 2005 6:09 PM
To: Clay T. Whitehead
Subject: RE:

Ron Kennedy once told me channel guide is a network unto itself..I will follow up with him and dig into it.

-----Original Message-----
From: Clay T. Whitehead
To: jdamata@c-span.org
Sent: 2/25/05 12:00 PM

We need to talk about TV channel guides

1. role in the history of TV for book
2. specific research topic: who owns the rights to cable and broadcast channel schedules? Would it be viable to compete with TV guide & Tivo in online program guides? This is more urgent and not part of the book.

Susan Burgess

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Friday, March 11, 2005 11:39 AM
To: Clay T. Whitehead
Subject: RE: bna

Neither jane nor I could locate it..

-----Original Message-----
From: Clay T. Whitehead [mailto:tom@cwx.com]
Sent: Friday, March 11, 2005 10:44 AM
To: jdamata@c-span.org
Subject: bna

See http://subscript.bna.com/

Is this service available via the library?

Susan Burgess

From: DAMATA, JASON [JDAMATA@c-span.org]
Sent: Thursday, April 07, 2005 5:48 AM
To: Clay T. Whitehead
Subject: RE: CTW article in Yale Law Review

when was it?

-----Original Message-----
From: Clay T. Whitehead [mailto:tom@cwx.com]
Sent: Wednesday, April 06, 2005 9:20 PM
To: DAMATA, JASON; Jody Gruendel
Subject: CTW article in Yale Law Review

Apparently I wrote such an article. Jason, can you track it down, unless Jody knows where it is.

Susan Burgess

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Tuesday, January 18, 2005 9:54 AM
To: Clay T. Whitehead
Subject: RE: Close to BUN?

Ahh now I get BUN....great synopsis for me thank you.
sounds like you have been brushing up.....
We could almost break down this emial into several chapter headings

I have some follow up questin below in CAPS.....

thanks Tom

Jason

-----Original Message-----
From: Clay T. Whitehead [mailto:tom@cwx.com]
Sent: Tuesday, January 18, 2005 12:46 AM
To: 'DAMATA, JASON'
Subject: RE: Close to BUN?

No. I wasn't clear enough. The ideas about AT&T and the networks developed over the same time period, i.e., the OTP years. But BUN was very loaded politically with the freight of the Nixon-media battles; it was unlikely to be seen (in that time and place) as a serious public policy initiative, but more likely to be interpreted (at least by the media) as a tactical move to screw the networks for political advantage.

AS SEEN IN INDIANAPOLIS SPEECH REACTIONS?

Moreover, we had put in play the key elements of broadcasting competition:
open entry domsats,

WHO WAS KEY TO THE DOMSAT ISSUES?

federal preemption of key parts of cable regulation and a resolution of key copyright issues that would allow cable programming growth, and the idea of competition eradicating the need for government content regulation via the fairness doctrine, equal time, large public broadcasting subsidies and the like.

DONE BY CABLE COMMITTE MEMBERS? WHAT INDUSTRIES WERE BEHIND YOU? WHAT OUTSIDE PLAYERS HAD TO BE DEALT WITH?

By contrast, competition in telecom increasingly seemed impossible with AT&T intact.
WHAT FAILED AT THE ONSET? WHO WERE THE KEY PLAYERS BEHIND THE SCENES AT OTP ON THIS ISSUE?

The FCC indulged telecom competition only in tiny doses to help them gauge AT&T rates.

HAVE YOU SEEN BROCK'S DISCUSSION ABOUT THIS?

Telecom and computer technology were exploding with nowhere to go.

WAS THERE SOMEONE IS CHARGE OF THIS SECTOR AT OTP?

AT&T accounted for 1/4 or 1/3 (?) of the new corporate debt in the country, yet they

fought competitive long distance, cell phones, fax machines not made by Western Electric, and on and on.

HOW DID THIS DEBT CHANGE THE MOOD IN CONGRESS?

So, breaking up AT&T was more urgent and more necessary. Breaking up the networks would have to play out over time. Hence my interest in the graph of network audience share. We broke up AT&T; we eroded the networks.

Does that clarify it?

YES THANK YOU!

-----Original Message-----
From: DAMATA, JASON [mailto:JDamata@c-span.org]
Sent: Monday, January 17, 2005 9:30 PM
To: 'tom@cwx.com'
Subject: RE: Close to BUN?

Fascinating.

So first came the ideas/movements of BUN and then came the actual term in a paper about AT&T?

-----Original Message-----
From: DAMATA, JASON [mailto:JDamata@c-span.org]
Sent: Monday, January 17, 2005 9:12 PM
To: DAMATA, JASON
Cc: 'tom@cwx.com'

Subject: Close to BUN?

This is pre-bun. I seem to recall the BUN paper was 1973, maybe 1974. I seem to recall deciding it was easier to break up AT&T than the networks, and since we could only do one at a time, it was AT&T. Also, we had laid the bun groundwork in cable copyright etc and satellites, which needed to mature, but competition in telecom was stalled without breaking up the phone

network.

-----Original Message-----
From: DAMATA, JASON [mailto:JDamata@c-span.org]
Sent: Monday, January 17, 2005 9:05 PM
To: 'tom@cwx.com'
Cc: DAMATA, JASON
Subject: Close to BUN?

Where is this in relation to the actual BUN letter? Do you remember around when BUN was made?

Susan Burgess

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more?

Clay T. Whitehead

From: DAMATA, JASON [JDamata@c-span.org]
Sent: Wednesday, April 14, 2004 7:54 AM
To: 'tom@cwx.com'
Cc: DAMATA, JASON
Subject: possible key moment--Western Union/Western Electric/Bell

In the late nineteenth century, a laissez-faire environment nurtured industrial concentration in the United States. The result was the rise of a few powerful captains of industry, whose Olympian battles shaped the economic landscape below. One such battle pitted Titan against Titan for control of Bell's antagonist. Angling to take over Western Union from William Vanderbilt, Jay Gould started the American Union Telegraph Company, in the hopes that the competition would reduce the value of Western Union stock. At the same time, Gould approached Bell general manager Theodore Vail with the intent of combining interests. Months later came what the Federal Communications Commission later called the "surprising capitulation of the powerful Western Union to the diminutive Bell Company."

Although Western Union was frightened by the proposed Gould/Bell alliance, its greatest concern was threats to its core telegraph business. Western Union abandoned telephone rights and patents to Bell. In exchange, Bell agreed to transfer all telegraph messages to Western Union, to pay a 20 percent royalty on any telephone rental income they received in the United States for the next seventeen years, and not to use the telephone business for "transmission of general business messages, market quotations, or news for sale or publication in competition with the business of Western Union." Gould finally wrested control of Western Union from Vanderbilt in 1882; by then, Western Union's onetime supplier/owner had entered into an agreement to manufacture for the American Bell Telephone Company.

When individuals such as Victor Kiam and Elisha Gray purchase a company of which they are loyal customers, it is considered a testimonial. When a corporation purchases a supplier, it is called backward integration--and that is what Bell Telephone did with Western Electric.

approved 27 (5) Dept

NCS — 1963 — speed sorts common carrier

Computer Networks

RCA is Leased interstate
common carrier
ITT, Western Union
AT&T is exchange interstate
telephone carrier

ComSAT — 02/01/63
IntelSAT formed 64

Early Bird (IntelSAT I) the worlds
first commercial communications
satellite launched by ComSAT 1965
240 voice grade circuits
1967 IntelSAT II, and III., IV.
9,000 voice grade circuits

IBM 3/4ths of market
data processing and information services
freelead by FCC jurisdiction

Computer and Telecommunications

P 27

Raymond W. McFall
1966

Western Union planned to become
a national information utility

Dec 1967 Western Union obtained approval from FCC to offer STran and Info-Com Computerized Com Services

progress

1986 has a plan SBS Orion may use his telephone

Corruption 1968

Utilities; Time Sharing
Green planning

Cable: viability
FCC jurisdiction
satellite competition/ compatibility
C

TV: Sloan, Carnegie, Allen
Educational, must ca
must carry

Cable :

- Signal importation
- ~~dig~~ must carry
- Copy rights/ franchising
-

Cable;

Telphone;

Computer;

Satellite;

TV;

Sound;

COMSAT INTELSAT
ATT/US Govt and
Signal c

Educational TV.
must carry

Cable:

Low investment; bogged down by leapfroggers, signal import, CATV copyright, royalties, fear from Hollywood jurisdiction, municipal bias vs. private, private vs. telecos; = Freeze

Telephone:

monopoly of service & manufacturing until Antitrust, MCI, Comp Inq 1, 2; Divestiture

(A) Electric Utility Market 1900 – WW II

call Edison elected

how developed, how became industry; how regulated

1885 – 1920

Westinghouse →

(A) Good book on Courts and Communications

import → distilled

(text book)

Specifically what have courts done?

U.S.S.C. and Circuit courts.

(A) Nielsen graphs – viewership

Nielsen; researcher; selling data.

historical data (Ivy)

- all band receiver circuit; could sell just AM anymore UHF, VHF.
- Jane Mak — indexing →
- "Free Re Media"
- Judge Green's law clerks...
  - Les Brown → Fordham
- [ ]
- Sid Topol: [ ]
  - Ottinger
  - Anne B. Hostetter. (find dissert.)
- C. Mason; list of online databases out here;

Vera

06/08/04

Meeting w/ Rob
RE: Midcontinent / Bismark/Fri

Rob went to Mitchell - 2 years ago

@ pull bio → Tom Simmons VP public pol.
Rod Carlson, Joe Floyds

accumulate small talk (2 days. prior)
Stories for N road, Praise SD/ND.
1st time to SD.

Teleport

longstanding supporter of C-SPAN
MID Cont used to own N teleport
they provided best service of anyone
who ever owned it...
relationship started 1951

Carriage

(Fiber & Headend)

② Joe Floyd made high priority of C-SPAN,
MID Cont has been more aggressive - in expansion to ater area...

③ Do what they say

Good Active Board

④ Floyd very instrumental board member - advice on tele production

Meeting w/ Tim 6/08/04

① Bandwidth efficient.

② Defining Vision → HDTV

Wednesday Staff Meeting 6/29/04

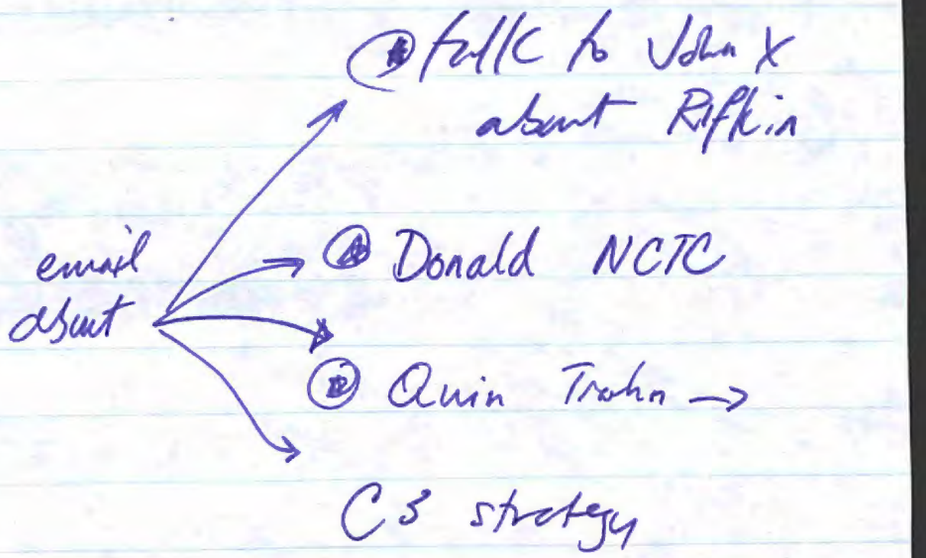
① Call contacts; verify
② Map grant

what is? → "Common Good" Apple on Friday 11th

Block/Blade 6 Hrs to Boston.
July 11th → 15th → 28th

Meg

- Reagan site
- email Doug/Mike D e July 11th
- talk to Matt e trip to Beantown.
- email Steve Sat 26/27
- Meg Steele campaign cam (feedback) education and understanding.



Medea ;

↳ (what is non-afflicted?)

- Target list.
- How to look at system?
-

Budget w/out hotels--

always fuel out- tire check before leave-

check day w/ pay.

check w/ Steve in advance days..

just travel... Mike is lead...

Dan -

309 -

3360 / or 61

3353 - Terrence (AD)

Dan - 610 879 8400

Access -

contracts;

1. Morrison...
2. BUS Visit;
3. Winner / Walker
4. Essay winners...
5. Bus visits,

Fact Book

QM

Map out Morrison...

Wednesday

ESSAY winner;

Jim Walker - going to -

Monica - Sharon Delaney

Library is ready - we are setting it up tried Mayor's office very difficult.....

Email Jerry

needs to be set up Agenda...

Press is going.....

10-2

① Jim / Monica set up reception.... Ellen Vest.

get right # on J. Walker...

② Jim Walker has list...

No plans for Wednesday.....

update; - repository - Mosier...

Spoke w/ Blade –

spoke with ?

City hall.?

Completed

Jeff

Mitchell — no C-SPAN in Mitchell

MARK Michael Farney
313 W. University
Mitchell, SD 57301
mifarney@DWU.edu
mifarney@mit.midco.net

Channel 12.

For Tom Simmons ?

5,000

1200
160
2800

33.

2,500
2,200
5,000

2,200
2,500

1,100
1,500
2600

1250

2,200
12
4400
2200
26,400

40,000

1250 rent
200 car
50 insurance
250 loan payments
300 groceries
125 phones
150 electric
2425

2425
400
( )

1,250 rent
100 electri
50 cable
150 phones
400 groceries
300 ins/car

3250
-625

1,625

Mr. Whitehead 11/24/03

(Judy)

- Careers - MIT.
elec. engineering.
PHD Management
RandD. → Nixon.
FCC → Rostow...
OTP → Confirmed by Senate.
↳ economist..
typecast as telecomm...

* developed at.. during OTP ↳
* Ford → transition... Secret....
6 months...
Nixon resign - keep coordination w/ staff → Ford.
1 year fellow.....
5 yrs. Hughes aircraft, consulting
started subsidiary
launch satellites...
most profitable sector...
Forbes magazine.
Ses AMTA... →
SES - global →
European problems

– Murdoch got start
by commercialization...

last 10 years...
fighting SEC & gov...

Now. – 65 ? now what...
not type to retire...

Entrepreneurial project...

The Book?

visiting Professor...
Academic credentials.
Full time Research APS.
starting next

organic.
what is This book?

OTP years – private.

not biography...
not kiss & tell of Nikai.

Cover Story
Newsweek 1974
Variety

Long Half Life

How common came to be what it is...

Common/gov..

- hopefully useful in thinking about where to go from here....

primarily be
How electronic commerce came to be the way it is.

in a few decisive moments
people who made the outcomes..

regulatory framework is obsolete
how did it get here?
what would happen if we cut ourselves off???

risk is terribly small

decisive moments.

Chronologically vs. subject...

← OTP. → opened it up.

Space to help - begin to organize

- events?
- people?
- What's been written? - relevant or irrelevant? superficial...

journal articles.....

- What's been written about re economics, legal .....?

- the filter - what's important?... do certain articles stand out as pivotal....?

USSC.→ Red Lion... Starr's judicial treatment. substance-.

① What are issues... from him

② Key events – chronologically...

Q4

– Why did we have a monopoly phone company?

– Theodore Vail – great con man.
© 1920
"natural monopoly"
inevitable one company had to own everything.....
to justify that, since it is a monopoly, we have to protect monopoly from competition...

Vail's role... What I can write...

Why 3 networks?

— David Sarnoff —
radio — tv. Consolidation ....

1) Historical Accuracy
2) Major writings ... don't want to repeat. —

— Anthology of 1 classic —

Keys → historical components to each piece ...

To Start;

1) Historical events

2) Policy trends

3) Force key issues and events ...

Broad Audience is people who fund students;

concerned people --

.. framework. ....

* people ... the threads ...

NY - WSP.
70-74

broadcasting reg
tele com reports
tv digest
speeds, test, letter. ..

[redacted] - GM → telecom policy

- What is going on at GW
- Georgetown rooms

models → (of the past)
CBS - tv telegraphy / copyright ...

VAIL - Natural Monopoly
David Sarnoff -
Control of N tech
Booknotes

WWII →

TV networks - FCC
ATT.

Philo T. Farnsworth

4 hist.

1.) creation of industry
tele - broad

2.) Consolidation 3 TV
Phone monopoly

3.) Competition phase ... OTP ...

4.) "Proliferation phase" - once comp established ..
Metamorphosis
fiber satellite, email, ..
recording industry,

- Digital era..
- Shockley
- Von noimen.
- IBM Gates - windows.
-

Begining of comp
Carter phone

Cable HBO - Gerry Levin
- Copyright
Turner

Satellite - Intelsat → ★ galaxy.

US → ★ world...

ASTRA ↔
Direct TV
Fiber - economics
Internet - Ant. + mil
Case ATT

Killing apart - public broadcast.....

Fairness Doctrine
Lions Gate
Advertising
Movie Industry.

— Why are Phone company?

= 3 TV networks for so long?

— Why did comm get regulated?
-de regulated
regulation to create
competition in oligopoly...

I.T. → mini comp.. 80's

When did information become

Quotes → that illustrate comm
and people perceptions...

failures to understand..

Themes. "A journalist...
Themes
≠ wasn't sure people of
{ Maine have anything to say to
people of Texas" }

(IBM 80)
TOM. WATSON. The market was
maybe 5-10 computers

Gates → Intel chip → : "No conceivable application
for something more than 16 kbits."

Head of Sony 1970's → Communication → psychology.

Communication in Re
Lore on terrorism...?

final problem
bulk of pop - mis/un informed -

(worldspace) (Africa/Asia)
tremendous
capability...

VOA → propaganda...
develop a way to get
moderate Islamic voices...

more information sources...
tech/poli issue...

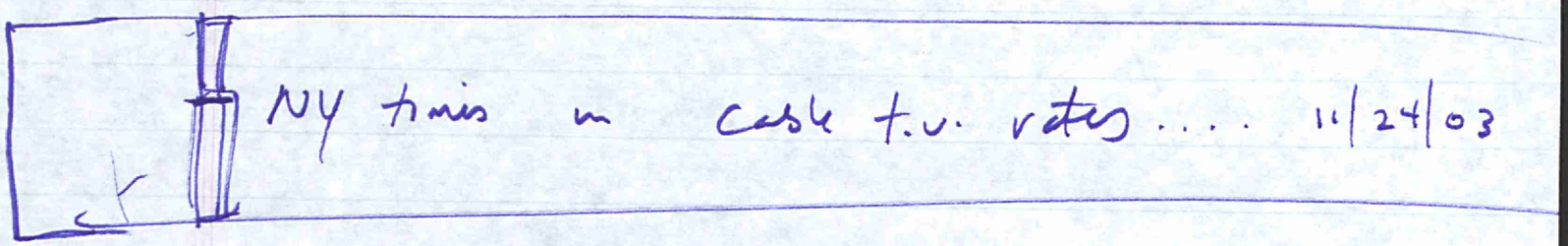
Categorize ..... it .....
4 or 5 folders...

Sthengmoxie@peoplepc.com

Cable copyright compromise

cable –

Diagram



Goldberg

NAEB

Policy direction change

- Public Broadcasting Service
  Miami 1971 (CPB)
  How do you fund/regulate structure

- Mountain Shadows —
  Deregulation

- In Dianapolis Speech.
  Post re-election, "Eliot
  gossip"

- NCTA — OTP.

- Cabinet committee Report....

* PB Act - 68

* Cabinet Committee....

*

⊛ – elimination of fairness doctrine –

COW principle

⊛ Bruce Owen. Economist inc..

FCC freeze no more importation of distant signals.

– Copyright tribunal –

Broadcasters.

⊛ Leonard Goldenson → ABC T.V.
⊛ Sig Mikelson → news director for CBS
⊛ Brinkley ↳ Agent business..

– Broadcast. ⇒

⊛ Andy Eagles ⇐ Ingles ⇐ RCA → SATCOM.
⊛
⊛ Reed Hunts for. Ch FCC .....
⊛
⊛ Alan Brinkley's book – Creator of digital T.V.
⊛ Broadcasting magazine → book lists in magazines..
⊛ Three Blind mice
/Con. Anderton

Mark Claspin Miller - left winger
hooked conservation -

* Bruce Owen — chief economist
(Jonathan Rose) — BUN →
Break up N Networks...

Notes 10/17/03

- subject sub categories.

Timelines
Veil/Essays
Scrapp
GTP 69-75

Creation
Consolidation
Competition
proliferation.

Cybermedia
Inter-media...

- abstract / words → ✓
- gather timelines for guidance ✓
- System of communication (Ping)
  emails? →
  does this work? →
- what should I flesh out?
- Taping
- I spoke with Goldberg ✓ about R speeches
- Brian gave me, Paul Warnke's card

(- public diplomacy use?
- inter-media, Haleh.
-)

how did it influence early years?
Veil → Scrapp.

How to approach proliferation.

- ID, nexis, library
- Cable museum
- NOV no pay even at Sec
-

Jenkins ?
Zworkin ?
RCA ? , GE ?
ATT ? → DBM
Farnsworth ?
technology ?
international developments ? — BBC ?
pivotal — WW II era ? → Focus ← media
govt telecomm
technology
microwave
radar
T.V.
networks

What about early years do you see as a pivotal ...??

electronic

* Computer Thread is a side-light ...
*

yes bandwidth
Spectrum - crucial ...

Vail - creative stage ...
blocks →

Inter-media.

GMU — the online ... resources .....

BBC .....

get professors → Squared away

organisation → Structure (*) →

Words tagging & N. Viewship shares ???

over time.

Viewship graphs } gen shows, cable ... advent of Sebelite ... update ted data
- what is my data source: Nielsen,

all relevant data

→ ① relevant data,

Viewship of Net news. .....

mike with

by subject →

{ television ;
radio ;
regulation ;
spectrum
Media ownership.

Broadcast
* Media Deleon
= Rider.

* Bibliography file

{ Chuck Colson
"Fuck 'em" }

(The Burn memo)

Magazine rack

(D) Radio becoming a business
telephone is already
a business...

making radio into a
business...

- ... telephone into a business.

Student ID# → $

Mr. Kelley.... [mail.gmu.edu.....}
activate my email
account...

jdamata...
pm1 or
6003a 4918.

library
- Kevin Sanders -
library Admin...

Kevin Sanders

Alex GMU
Mass Telecomm
Director regard and
working...
Congress, FCC...
Spectrum management.

Creation, consolidation
of phone system.....

Veil, asking questions.....
Thanks.....
What looks most interesting????

Commercialization of radio
wireless telegraphy develop
radio & telephone

Veil/Sarnoff.

Bill Paley... key players...

Capital set of Stocks
a Returns

Salvenger

Kite flying on The Mall

©1970 ± 1

→ D Angle →

Whose support do we need...
if so ???
Who specifically ...
name

CMU

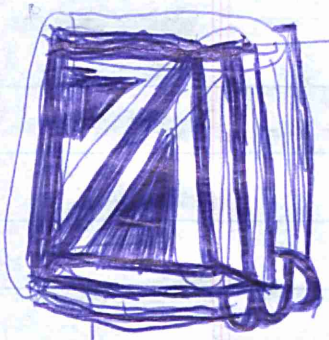
Tuesday w/ David Yepsen

Audio glitch... effects of ??

Stark regrets:
- Gephardt caucus gov
- ~~76, 80, 84~~ commercials
- Move on ad on deficit
- McCain
- Clinton NH
- Elizabeth Dole
- Pat Bradley?

Other openings
- DAVID KAY ?
- ~~Stephanopoulos~~ on the powerful votes of
- Bush lately? NH and IowA
- Dean to Ver gov VJ dinner
  "The ground is always shifting

- Commercial policy?
- Jimmy Carter discovered IowA - Jolly Pedal
- Eugene McCarthy
-



Suggestions for Memo

flow charts

1. operational structure
   - * job descriptions
   - * technology breakdown

hours needed
flow
salaries
overhead
synergies

Articulated vision for the future

or

* R&D process of evolution of ophis

compatibility, identify
* academic contacts, potential candidates.
schools

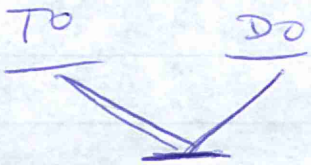
Educational Effectiveness

? student testimony

* student turn out — attendance
* ability to duplicate to broad audience
* and maintain effectiveness ???

Introduction → analysis

Conclusion → optimization



- write today
- Retrieve clips
- transcribe notes
- PAT ANDERSON — Nitun content
- Scully appointment
- call CTW ← interviews
  - open lines on voice?
  - anything else?
  - Chron.
  - GMU on Wed.
- check insurance
- Re lease 5:30
  - lease / deposit / $
  - storage → furniture
  - dog
  - block board
  - check art work
  - copy / Research
  - get re key
  - write paper / Telecom

(703-356-3836

CABLE TELEVISION

Year	Operating Systems	Total Subscribers	Ho
1960	640	650,000	
1965	1,325	1,275,000	
1970	2,490	4,500,000	
1971	2,570	5,300,000	
1972	2,655	6,000,000	
1973	2,991	7,300,000	
1974	3,158	8,700,000	
1975	3,450	10,800,000	
1976	3,651	10,800,000	
1977	3,801	11,900,000	
1978	4,030	12,900,000	

- Archives
- Vail
- NASA gaps,
  - what 2 extract
- Ikey, etc...

Why AT&T + radio?
greed?
develop for tele- spin-off

Marconi spark gap →

Why no early commercials?—

boundary - who is ???
creation/ consolidation

Wireless = telecom Nerd

tension between
standards & innovation

My Thesis (Western Union
Marconi - RCA
AT&T...

Alex: people... early
broadcast...
NBC/CBS...
consolidation of
broadcast
RCA → NBC → telecom

Fabric, social/economic drivers
technology → regulation...

Need timeline 1900–

Westinghouse

Vail — ——— who was doing what, when?
GE ———
Vail ———
AT&T —— 1893 1934

govt/ consumer/ operator/ regulator

players converge...

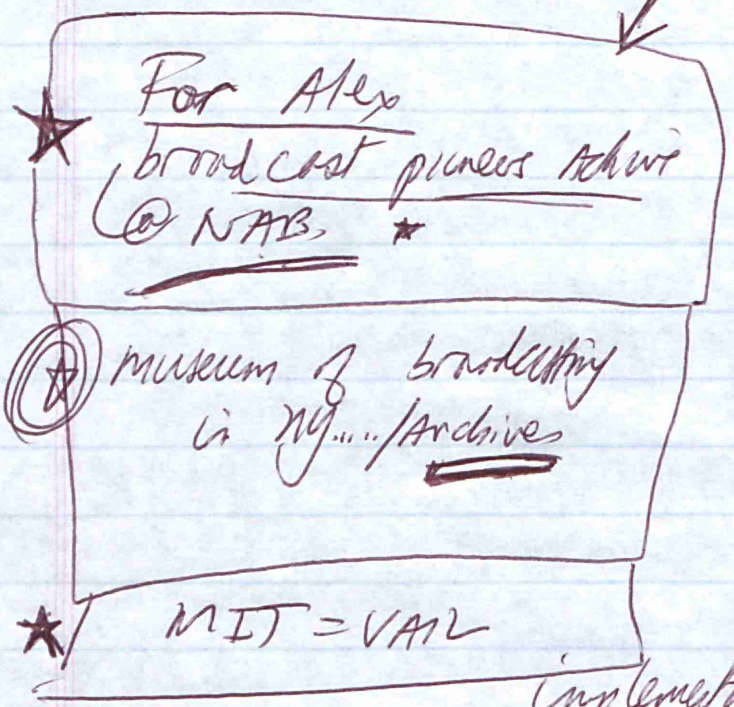
elect photo transmission... late 1920,
when did news ful completion??

Need early news wire...
Fax scheme... .... photos...
fax...

Sloman Anti-trust

Kingsbury

Willis Stanley.



moments

life to these moments

footnotes

commodity of

implementation inventions

Thoreau effect

Boston Texas, Walden...

www.aircwav.com/the-telephone.

[MIT.]

Milken - meetup?
McOwen -
Financed -
How was it.

Friend Lucy. -

Shultz - Att.
1970's

Servicl manufactory -

1876

Bell

1876 invention

Saunders $ Hubbard

Western Union

1st phone line 1877

1881 — Bell purchases Western Electric

Bell made $ on technology using leased delivery systems to WE/others.

1878 National Bell Pres. Forbes shipping transmitting

1878 commercial exchange 1st

Western Union — (Edison competes)

1879 patent infringement

1881 Purchases Western Electric

1882 — controlling interest in West Union.

Reorg 1885 VAIL — railroad, mail, telegraphy, AT&T Long Lines.

1885 Long distance

CORPORATE RESTRUCTURING

Phones 51,600

109,342

1900

Reorganized — 1899 AT&T

Am Bell Run by Hudson and Fisch.

Regional operating companies.

Reorganized 1907 J.P. Morgan — NY based $

Reorganized 1911 Bell System

horizontal control / vertical integr.

1880's Bell shifts from holding company to manufacturing ...

1890's, ... common battery switchboard w/ central power source which results in corporate structure

1893 — pole approved

1897 → 7.5 return on investments AT&T
43 railroad

1900 → 97% of all US calls were local
1907 loading coil
1911 — audion - deforest
1912 vacuum tube

1907 Salisbury

Doolittle - interwar period, improved suburban service
pre — Under Railroad legislation/ private capital
1907 Public Utilities Act.

"Where The water flows!!...

(Roosevelt initiated) hydro-electric power-- leading up to 34 comm

Pressed into Service--

'34 comm.

MIT-

(617) 253-5671

Reference (617) 253-9357-

Tom's interest

Vail;

prologue how did we get to 1900..

12/31/1899

AT&T, subsidiary...

1899-1900 Reorganisation - parent company,....

putting parent company in NY.....

new guys

Fish?

MASS legislature -
NY corp for freedom..

That gave them flexibility in raising $, impose a mgmt company

→ Raising Capital $, imposing professional management

→ during 1900-1905 JP Morgan control — intermediaries buying stock by of the controlled company. - WU

Railroad tycoons.

Morgan →

1907 Vail —
Will ....

J.P. Morgan

how did Will., get acquired

How did They get big enough...??!?? to buy Will or was it morgan. was it in effect a merger....

(Financing....)

How did They get → big enough to buy Will why vail in?

Vail - universal service co-opted regulation for monopoly....

[State regulatory agencies....]

J.P. Morgan -> natural monopoly within states..

Where the water falls — Clarence Dill / CC. Dill.

flows

Washington State.

Could → Morgan
Standard oil, R&R,
Robber barons, trusts

→ chairman of commerce committee.

Com.

Did tele quote successfully cutting across end's geographic area?

(A) overlapping systems.

How, did it make A
why did it happ?

Understanding what Mega did is eng.
local competition
came and went
↳ how why ---

TRACK DOWN:

M

① The Switchboard Problem
Technology and Culture '89

② The Telephone and PhD. dissertation
University of Pennsylvania 1989

1876/77/78 Inventions – Patents – creation of industry

1879 Patent Resolution w/ Western Union ?

1882 Aquisition of Western Electric ?

1885 Re-organisation, relocation,

1887 Interstate Commerce Act

1890 – Sherman Anti-trust Act

1894 Patent Expiration – competition –

1898/1900 relays, switching, trunking, loading coils

* 1899 AT&T an umbrella parent co.

1900 Trusts J.P Morgan vs. Trocia Keys, Bell stock & bonds declining morgan takes control

? Vail brought back.

1907 Mississippi / States begin regulation / common carrier

1907 Vail

1908 Aquisition of Western Union, (two wire system)

1910 Mann-Elkins, & (standard oil)

1911 long distance NY to Denver

1912/13 Kingsbury commitment

1913 Anti-trust suit filed

1921 Graham Willis solidifies monopoly precludes anti-trust -

1934 Comm Act of 1934 → FCC, rate regulation.

expand up to WWI. (Role of wireless)

navy take over →

— Was the telephone part of that navy ambition?

— Post WWI debate — back to private sector

— GE, RCA, the Navy. — wireless telegraphy

What were the connections between Vail & Morgan before Vail came back [illegible]

The anchony of a Er

Morgan's Interest

Why AT&T???

How did he take over??

VAIL's

local vs. State controls

Regulatory attitude

municipalities vs State vs Fed...

creation
competition
consolidation

flesh. at. way DISTANCE

creation
consolidation
competition

creation
consolidation
regulation
competition
patents / spin offs

competition
creation
competition
consolidation
regulation

371-396

Telegraph / Telephone

physical size ★—★ trade revenues

When did Tele tip the scale ??

Municipal/state Regulation re: Telephone vs telegraph

WWI: Feds role? who did? what was the debate? Returning it?

★ Patent Freeze of WWI allocation of vacuum tube?

★ Interchange, Parallels, RCA as it relates

1919/1920 → Depression — what happened??

Legislative History of 1934 — leading up to.....

838.4407

Forged consensus; Science, Technology, and economic policy in the US, 1921-1953

Princeton, Hart, DAVID M

associationalism & Keynesianism

War Industries Board, Bernard Baruch

Bureau of Standards

guggenheim RCA and open patent pool

National Recovery Association (NRA), June 1933

office of Scientific Research/Development

Eric-glen

War Production Board 7076231

War Production Board
AA. 40.16 N6 1945
Mueller, Milton HE8819. M843. 1957

Hart Forged corrosion
Q127.46 H52 155f

War Industries Board
HC106.2 C8
Clarkson HC 106.2 - C67
Crowell " " C7
Baruch HC 106.2 A5 1941

McChesney, HE8698. M34

McMahon, Robert
Radio/TV legislation. 2759 KF2801.

Paglin KF2762. 113. A15 1989
Legislative history of 1934 communications

Telecommunications: economics and regulation
James (Henry) Rosse C.
Gross
AU HE7781. H4

Public Utility Regulation (1910)
HD 2766. A4 G7

100 years of Bell — TK 6023.M6

Anatomy of Success — HE 8846 .A85 S66 1985
Strategy — Bell, etc...

TK 6015.K5
TK 6357.H4
TK 6023.M3
6357.D47

Forbes — HE 8815.P5
HD 9685.

History of Telecommunications Technology

TK 5102.2.S73.2000

Decision to Divest
KF 2849 A4 D44 1986

Telecom Research Resources
TK 5102.7 B73 1995

Anytime, Anywhere; Ent

The fall of the Bell System.
HE 8846.A5 T44 1987

History of telecom 1840 - 1941
1941 - 2000
TK 6637 A2 1987

1117 2003

Did ICC have hand in notes?
Yes 1910 – PPI, Page 176-201.

Paul Walker FCC
Chief of telephone investigation, 1930's
page 77 Golden.
= Monopoly

(703) 921-5388.

= The Micropolitics of Telecommunications Policy 1955–1958
Grau Freedman & Charles Cameron.

Robinson, Glen O 1969
The Federal Comm Act: an essay in Origins and Regulatory Purpose
In Paglin Harno ed,
A legislative history of Comm Act 1934

Noll, Roger G. 1987
The political foundations of regulatory policy
in McCubbins & T. Sullivan, eds
1987 Congress: Structure and Policy,
Cambridge Univ. Press

Cole

1991 The telephone problem and the road to Telephone Regulation in the U.S. 1876-1917
Journal of Policy History 3(1)43-69

- When the water ~~flows~~ falls, Clarence Dill
- The Switchboard Problem
  technology and Culture 1979
- The telephone war →

DAVE.
IS Sotman, still Alive?

- (Museum of Independent telephony)

wonder?
- FCC investigation of the telephone
  - No
  - Sly Gyulston.
  - deny the 1930's.

(A) (A)

Louis Galambos, Johns Hopkins
IS HE STILL AROUND-??

- C. C. Dill "Hope to stretch Ether Channels"
  NY Times 12 Sept 1926
- Wallace C. White → Papers File 51, Library of Congress.
- Kerry, Irish : Clarence Dill: The Life of A Western Politician.
  Univ of Washington.
- (A) Donald Godfrey, C. Dill and the 1927 Radio Act
  Journal of Broadcasting

Significant Issues.

① Formation of AT&T / FSN.

② Financing Story. → CAPITOL STRUCTURE

③ Vail: long distance, standardization
→ "natural monopoly" . . . .
where did that idea
come from . . . ??

↳ Who originated that idea??
↳ How did that relate to regulation??

wasteful merger . . .

Why did AT&T bonds become convertible?
Was Morgan and Fish collaborating . . .

More Decisive Moments

① AT+T Capitalization

② Vail decisive moment

Emergence

③ Centralization of State Reg.. and AT&T Role.- Hanna Ellis./

④ Cross Licensing Post WWI

idea of Toll broadcasting

⑤ * "The money trust investigation" 1922 - House - Congress

Edward Herriman (w)

Telegraph / Telephone; RCA; WWII - Shifting from NAT'L control to privatized → 1920 Formation of RCA, + Marconi, + NAVY.?

② Audion Amplification } complications - formed to control
③ AT&T / voice by radio. } wireless telegraphy - AT&T, wireless voice transmission

{ How wireless telegraphy / wired telegraph.--

Roper Committee → formed by S of Com – Roosevelt
recommended FCC to divest ICC of telecom.
to invigorate comm

→ Splawn " Report = ICC too preoccupied w/ RR to reg tele

1887 • Inter State Commerce Act + major amendments of the years

Hepburn Act of 1906 →

1913 ← @ Mann Elkins brought tele under ICC, AT&T argued the need for separate legis. but denied
additional regulation was "casually accomplished"
by then half the States had reg (non discrim)

1910-1913 - = majority of state commissions jurisdiction are telephone.

Kingsbury b/c
1. WU created unfair advantage for Postal telegraph
2. Bell aquisitions unchecked
3. AT&T refused to interconnect

Kings Answered all 3
b/c of costly duplicative comp...
Independents joined Bell in supporting a lifting of aquisition restrictions.

Willis Graham → * ICC terminated Kingsbury
" ICC control over mergers..
* ICC very little reg.

C.C. Dill key to keeping Comm privitized p 11.

1934 - Tele/Tele yard stick → reasonableness" authority to prescribe minimums / maximums "rates"..

* Did vril use concept of public interest / convenience to justify "natural monopoly?" vague↑

* White Bill - Dill Bill established FRC
5 member commission - ↓independent - (7 by 34)
DAVIS Amendment = spectrum zones 1928

page 837 → See 17 of 1927 Bill prohibits radio mergers but allows telephone mergers to continue Interstate Commerce Act..

Dr Walter M.W. Splawn report - Splawn special counsel house Committee on Interstate & Foreign Commerce, member of FCC
="prolific abuses"

Walker Report 2/23/1938

Shomaker v C & P Telephone 20 ICC 614, 618-620 (1911)

= "equal treatment" - rates
= nothing but a difference in the service rendered or in facilities furnished can justify any difference in charges exacted"

(1907) → Texas & Pacific Rail v Abilene Cotton Oil
developed framework for use of tariffs to govern rates

(1921) Western Union v Esteve Brothers 256 US 566, 571
= once rates were filed w/ Agency in a tariff, they were only lawful rates"

1906 Hepburn Act empowered the ICC
- to condemn "unjust rates"
- to prescribe "just and reasonable" rates
maximums

∴ The Hepburn Act changed a weak, ineffective agency into one with the essential powers needed for effective regulation"

but

it could only permit rates then enforce an increase of lower rates

Transportation Act of 1920 — allowed to prescribe minimum and max charges

∴ from 1906 - 1920 - no minimum price

pages 45-49.

Dill

At & t lobbyist worked extensively behind the scenes to kill rate-fixing provisions and garnered a majority of the committee against it ...

In response Dill introduced Res. # 325 authorizing investigation into

1. Financial structure
2. methods of competition
3. discriminatory practices
4. Suppression of patents
5. Refusal to sell equipment
6. the extent to which local (R&D for radio manufac) subscribers had borne the cost of
7. Failure to reduce charges during period of falling costs
8. exorbitant salaries for management
9. methods of propaganda $, politics to influence the outcome of elections
10. Army Corps patents.

Dill dropped investigation : it would wreck the (Gifford) company ... "

Origin of theory of natural monopoly

John Stuart Mill : "the vestiges of local monopoly were being swept away by the technical and economic advantages of the industrial revolution"

=

George Gunton : "concentration of capital does not drive small capitalists out of business, but simply integrates them into larger and more complex systems of production"

1888 Henry Wood : "any consolidation which reduces the cost of production is legitimate and contributes to the public welfare"

Henry Carter Adams credited with associating the natural monopoly with large, fixed investment and hence declining average cost

Alfred Kahn : "natural monopoly gradually emerged as an attempt to explain the persistent tendency of competition to produce inferior results and, on the other hand to justify it abandonment."

(uses public utilities to demonstrate;)

competition/utilities : "is generally conceded, a failure"

State Regulation

"telephone rates were regulated by state commissions prior to the implementation of Federal regulation"

Brock 56

Joint board determines inter/intra state

Public Sentiment

"With the rise of big business the term private enterprise acquired definite meaning where as once it signified liberty, freedom, and individualism, it now meant danger as well — the threat of giant corporations. Suddenly, big business seemed to menace America. Large corporations represented the same centralized power against which the founding fathers had fought their revolution. Perhaps inevitably, American big business evoked a powerful regulatory response."

McCraw, 6f

What -> ?

If govt. had gone the way of mandatory interconnection - as opposed to monopoly what would have happened?

One or two candidates. ... decisive moments.

The industry has taken its form ___

Wireless | RCA → Fit wireless telegraphy Western Union

Role of telegraph.

land / wireless ...

Western Union - duopoly.

NBC -> Sarnoff .... entertainment from telegraphy.

wireless - class

↳ 1920's →

Marconi, William (RCA, manufacturing)

1930's.

#1 → Wireless, Finding when telephone ~~solidified~~ ... Solidified ...

#2 Wireless, wireless telegraphy

WWI → WWII → DOD + Bell .....

history of. Microwave? network ...

{How much did N contribute ???}

ATT / Sarnoff / Microwave = T.V.

Cortelphone →

{HUSH A Phone) →

The social impact of Re telephone

Poole

Archives & Resources

① Which ones are worth approaching

① Who maintains Bell web site ??

② [The Picture... Big picture...]

Q → Western Union's behavior....
↳ AT&T Aquisition --

AT - Eiere telephone - Jan 1902

George F. Baker - John. Waterbury → March 1902

↓

Mackay + →

50-53....
Page AT&T
Story of industrial
conquest → Danielian - (sp.)

NY people

Mackay (largest owner of stock) → Waterbury → desired merger of
↓
Morgan

Telegraph - Automated Voice

in manufacturing was in telephones

.... William Orton ...

Why couldn't Vail acquire Postal?

Why was Bell able to Aquire Western...?

origins of ??

- sublicensing

why → State Reg ... of telephone

local exchange = switch board

→ What happened to the telegraph?

—

(*) AT&T Bell Laboratory Archives...
Warren, NJ.

page 9%

"Pre-emption" local → Sweeping powers

(*) What stopped At&T → ??? MID 1930s.
when did it plateau...

{ Wrld into (USInd telephone association) }

HUNCH: continental telephone....
there was a consolidation of ind..
but what stopped them?

(*) WElectric / ATT →

(*) Senator → ___ in 1960

⊛ Competition + regulation....

⊛

www.law.berkley.edu/journals/btlj/articles

⊛ Statistically - Western Electric

David Gabel

Early Tele(phone) regulation

Queens University.

Meeting with Tom 05/14/04

- Post 34 developments
- relationship with DOJ
- ITT
- towards divestiture — hush/Carter/MCI,
- process of accountability → weekly efforts? results?
- common carrier demise of 71 — involved?
- What's with McGowan?
- books books books
- Vail papers / ATT annuals
- Alex's paper, Rodin
- GE, RCA, Mercani, Postal Telegraph
- @ — Any meeting lately?

Perspectives on Anti-trust...

* Vail/Morgan connection — Fish...

* State regulatory → early

@ Electric Utility business... circa 1900
regulatory aspects...
regulation/capitalisation...

↳ chart of Electric Utility stocks
internet bubble..
(Peaked in 1910?)

-MCI-

John Goeken Goeken

archives?

Henry Geller; might know Goeken?

□= Tom has info

Find → Lawrence G. Roberts. of MIT.

Urgent Datran → company → digital microwave network.

□ = (Sam Wyly) { ① University computing
② (campaign finance.) }

history // history.nasa.gov / SP-4217

□= Tom has info

6. Book

- historical perspective -
- what are his key elements
- time frame
- industries
- subject matter... heading technology, economics, politics, regulation.

(Social impact of Telephone) Poole Poole

other writings... 5

Stove piping, Silo approach writing

H.P. DAVIS VP of Westinghouse becomes head of NBC

(Frank Conrad) (1920)

Prodigy -

AT&T organized to report to

uncoordinated policies ← FCC
State regulatory
Judge Green

Quester ④ Truman 1951 - Communications Policy Board

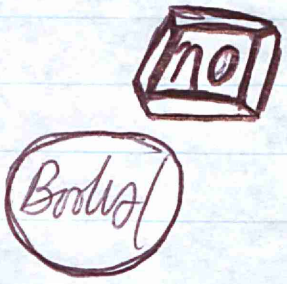
Rostow 1968
Ash council 1971

* credits competition (decentralisation with ability to adapt and create new technologies)

PS

* tied to 34 ACT - Cantor 14:94 ④

technology industry structure
historical industry responses



Distortions:

S.Fs... List of S.Fs...

Broke a Early State regulation

CBQ → circuit subscription

State/ regulations

Gabel → look for Gabel

AT&T, telecom regulations. Look Bibliographies

Denny Ellerin 1938
[Story of industrial] overview of States...
Conquest...

Archives, 1938 investigation → (exhibit 2096)

Bibliography → references
423-426.

staff report

2096

38 report

license contract?

relations

agrees of

1938 report

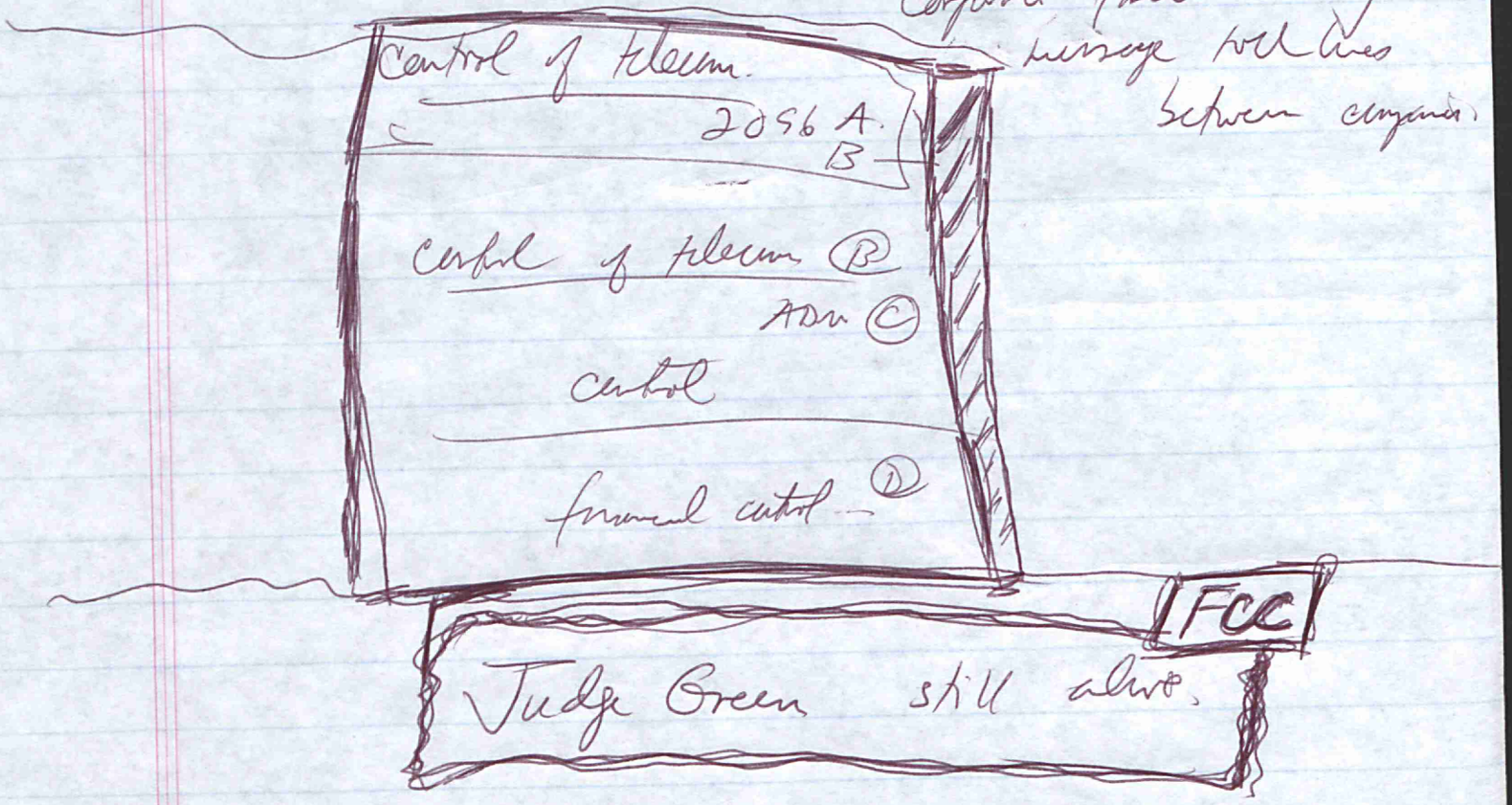
Exhibit 1360

ABC

Corporate financial history

merger relations

between companies



Massachusetts:

Ersela Alexander.
Boston Sub station,
(617) - 301 - 3540

North Dakota: Sharon Lehrkind's direct
(701) - 328 - 2400

Heritage center.
Bismarck → on capitol grounds.

701. 328. 2666

archives. state.

Research
DiscoverND.com/hist
archives library
open, search

(Library of Congress)

public service commission
railroad commission
annual reports.

jdavis@state.nd.us. → questions

April Malqueen
Cell 3053848

Johnny X
202-285-2961

Mike D