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# A history of the telephone in the Midwest (1875-1920)

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A HISTORY OF THE TELEPHONE  
IN THE MIDWEST  
(1875-1920)

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A Thesis  
Presented to  
the Faculty of the Department of History and Government  
Municipal University of Omaha

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts

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by  
Robert H. Christie  
July, 1954

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## Preface

The purpose of this study is to present in an orderly manner a history of the early telephone companies and, at the same time, give a semi-technical description of some of the early practices, procedures, and equipment developed and employed by the many telephone pioneers. The importance of the telephone on population growth, a comparison of the telephone industry with other industries, or the importance of the telephone in helping to overcome the extremes of nature, as well as many other areas of study were necessarily omitted in order to keep the subject within reasonable limits. In the future, these areas of study might be profitably explored in separate projects.

A major portion of the existing material concerning the development of the telephone industry in the Great Plains region is held by some member company of the Bell System. Extreme caution must, therefore, be exercised if an unbiased account is to be prepared. The writer does not claim to have avoided all pit falls in this respect but a conscientious effort has been made to present an impartial history of the Northwestern Bell Telephone Company.

A generous thanks is herewith offered to the Northwestern Bell Telephone Company and several of its very capable employees for their kind and generous assistance. Appreciation is also extended to Dr. Frederick Adrian for his capable and patient help and the significant part he played in the successful conclusion of this study.

## CHAPTER I

### INTRODUCTION

The development of the telephone industry, although it started first in the East, was no less rapid or significant in the Northern Great Plains region. As the telephone was speedily improved to a point where it could be used as a commercial instrument, the opportunities for expansion were tremendous and likewise the problems of business organization multiplied many fold. New developments came rapidly; among the major improvements were switchboards, city-wide service, and finally toll service. These new communication wonders were a far cry from the first crude telephone developed by Bell and Watson.

It was on June 2, 1875, that these two men first succeeded in transmitting sounds of a sort, but not an understandable human voice, by mechanical means. Bell, skilled in the science of sound but not electricity, along with his capable co-worker Watson, worked to improve their invention. After many unsuccessful attempts, Watson, quite by accident, discovered that success had been achieved. The first public demonstration of the new gadget, as it was called by many of that day, took place

in Boston on May 10, 1876.<sup>1</sup> On a national scale, the first recognition given the telephone came that same year at the Centennial Exposition in Philadelphia where considerable publicity was obtained through the interest manifested by Dom Pedro II, Emperor of Brazil.<sup>2</sup> This marked the end of the strictly experimental stage of the telephone and it was soon ready for use by the general public.

There then followed a period of business organization before the telephone could be exploited commercially. With the creation of the Bell Patent Association, on February 27, 1875, the evolution of the present-day Bell System may be said to have begun. On July 9, 1877, there was created what was known as the Bell Telephone Company and Gardiner G. Hubbard, a long-time associate of Bell, was selected as trustee. It was Hubbard who originated the idea that telephone equipment should be leased but never sold.<sup>3</sup>

The first receipts from the telephone business, as such, consisted of twenty dollars from one James

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<sup>1</sup>American Telephone and Telegraph Company. Information Department, The Career of Alexander Graham Bell (1946), 17.

<sup>2</sup>Ibid., p. 18.

<sup>3</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", I, 25, (Collection of unpublished material located at the headquarters of the Northwestern Bell Telephone Company, Omaha, Nebraska).



Emery, Jr., of Boston, in 1877. The money was paid for a one-year lease of a pair of box telephones, the financing and accounting were in such condition that Charles Williams, Jr., an agent who collected the money, carried it around in his pockets for days, "Because I didn't know what to do with it".<sup>4</sup>

The first subsidiary Bell organization to assume corporate form was the New England Telephone Company incorporated on February 12, 1878, with a capitalization of \$200,000. On June 29, of that same year, another new organization which was to be known as the Bell Telephone Company was formed. This company was incorporated under the laws of the state of Massachusetts and was capitalized for \$450,000. The reason for forming the new company was to extend telephone operations throughout the country.<sup>5</sup>

The Bell Company, however, was not the only group interested in the development of wire communication. By the early part of the year 1878, the American Speaking Telephone Company, a subsidiary of the Western Union

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<sup>4</sup> Ibid., I, 26.

<sup>5</sup> Ibid., I, 27.

Telegraph Company, offered serious competition to the Bell interests. The main issue between the two companies was over patent infringement. There followed a long-drawn-out series of court battles in which the Bell patents were finally upheld and the Western Union Company was forced to withdraw from the field.<sup>6</sup>

The national aspect of the telephone development was first officially recognized in the name given to a company organized by articles of association signed on February 17, 1879, for the National Bell Telephone Company. The papers were filed on March 13, 1879, and called for a capitalization of \$850,000. This company was doomed from the beginning because the many small companies which had been licensed to install telephone equipment were in need of technical and financial assistance and this company was not large enough to offer and supply the necessary equipment and assistance.<sup>7</sup>

The American Bell Telephone Company was organized in Massachusetts on March 20, 1880, and the papers were

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<sup>6</sup>Ibid., I, 33.

<sup>7</sup>Ibid., I, 34.

filed on April 17, of that year for a capitalization of \$7,350,000. This company, almost at once began to exercise the function of a central or parent organization and this led eventually to the formation of a subsidiary corporation, the Western Electric Company, Inc., which was to manufacture all Bell equipment.<sup>8</sup>

The first service provided telephone subscribers consisted only of a pair of telephones connected by a single grounded wire which had to be provided by the user. There was no interconnection with other telephones, so the usefulness of this device was quite limited and it did not become very popular.

The first switchboard, which was a means of interconnecting the various telephones, was installed in New Haven, Connecticut, on January 28, 1878. This board had a capacity of eight lines and served twenty-one subscribers. In comparison, the first switchboards, as far as can be determined, that were installed in the Northern Great Plains region were as follows: Dubuque, Iowa, June 15,

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<sup>8</sup>Ibid., I, 35.

1879; Minneapolis, Minnesota, February 15, 1879; Omaha, Nebraska, June 1879; Fargo, North Dakota, April 1881; and Deadwood, South Dakota; October, 1880. With the development of the switchboard the market for the telephone was increased many fold as large numbers of telephones could then be interconnected.<sup>9</sup>

Long distance service was the next step forward and a long distance line from New York to Boston was completed on March 27, 1884. This line proved to be so successful that an ambitious program of long-lines construction was soon undertaken. More money was needed to construct the long distance lines so permission was asked of the Massachusetts Legislature to increase capitalization. The legislature refused an increase so other means had to be found to raise the money and this led to the formation of the American Telephone and Telegraph Company, which was incorporated in the State of New York on February 28, 1885, with a capitalization of \$30,000,000.<sup>10</sup>

Long distance lines began to fan out in all directions: first from New York to Philadelphia; later,

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<sup>9</sup>Ibid., I, 30.

<sup>10</sup>Ibid., I, 36.

by 1889, telephone wires reached west to Buffalo and south to Washington. New York and Chicago were linked by a long distance line on October 18, 1892; by 1911, the lines had reached Denver, and by 1913, Salt Lake City. Finally, on January 25, 1915, the first transcontinental telephone line connecting New York and San Francisco was opened with Bell in New York and Watson in San Francisco conducting the first conversation across the nation.<sup>11</sup>

The final move towards consolidation of the national telephone industry came on March 27, 1900, when the stockholders of the American Bell Telephone Company voted to merge with the American Telephone and Telegraph Company and the structure of the Bell system assumed, substantially, the form which it has had since that time.<sup>12</sup>

From a very crude beginning the telephone business developed into an industry of national importance very rapidly. Compared with other American corporate giants the telephone industry had a rather quiet youth. The

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<sup>11</sup>ibid., I, 37.

<sup>12</sup>ibid., I, 39.

policy of leasing rather than selling equipment, and an almost complete monopoly in the field safeguarded by patents, eliminated a great many problems which otherwise might have developed at a later date.

## CHAPTER II

### THE TELEPHONE COMES TO THE MIDWEST

Although the telephone was of great value in the East, in the West, where distances were vast and population was thin, its acceptance was even more rapid and welcome. The telephone enabled people in the isolated communities to communicate instantaneously and the disadvantages of being separated by many miles were at least partially overcome.

Much of the vast area which now includes the states of Iowa, Nebraska, Minnesota, North Dakota, and South Dakota was sparsely populated in 1877. That was the year in which the first pairs of telephones were brought into the midwestern region.<sup>1</sup> Telephones were ordered in pairs and connected by a single wire. Communication was restricted to the two telephones as there were no switchboards to interconnect them. Each instrument had but one place to talk and listen alternately; separate trans-

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<sup>1</sup>"Histories of Controlled Companies of Iowa Telephone Company", I, 1. Collection of unpublished material located at the headquarters of the Northwestern Bell Telephone Company, Omaha, Nebraska.

mitters and receivers, for each instrument, was a development which came later. Even with such crude devices, the telephone proved its worth and Midwesterners soon demanded more telephone service.

All of the early telephones were not of Bell manufacture or even factory products. Many of them were home-made affairs built to serve a very local need. Theodore Birchard, of Marshalltown, Iowa, in 1877, made himself a set of telephones; another such experimenter was George E. McFarland, who probably did more to stimulate the early use of the telephone in Iowa than any other man.<sup>2</sup>

It is difficult to fix the exact date when Bell-leased telephones were first used in Iowa. Either late in 1877, or early in 1878, Bell-leased telephones were placed at the ends of a line connecting the mill and office of the Moore Lumber Company in Dubuque, Iowa. Shortly thereafter, in July of 1878, telephones were placed in the residences of J. W. Blythe, J. E. Peasley, and J. W. Patterson at Burlington, Iowa. These telephones

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<sup>2</sup>Ibid. I, 2.



were connected by a single grounded wire. Later that same year six telephones were installed in Des Moines; two were placed on a line connecting the Old Savory and Old Aborn hotels, two, on a line connecting the office of F. M. Hubbell and his residence, and two connecting the Cate and Graham warehouse with the Rock Island Railroad office.<sup>3</sup>

In Minnesota, telephone service was installed for experimental purposes in June of 1877. The first line connected the residence of R. H. Hankinson and the Minneapolis City Hall. Hankinson, who held a Bell sublicense from C. H. Haskins of Milwaukee, was a telegrapher, and he organized the Northwestern Telephone Company which was later incorporated as the Northwestern Telephone Exchange Company.<sup>4</sup> When the experimental telephone was placed in the Hankinson residence it was without the knowledge of Mrs. Hankinson. The story is told that it was placed in a small closet, the door of which had been left closed. When one day Hankinson's wife heard a "spooky voice" from behind the closed door she became alarmed and hastened

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<sup>3</sup>Ibid., I, 4.

<sup>4</sup>Ibid., II, 3.

board or telephone exchange service available in this community.

In St. Cloud, Minnesota, the first telephones were installed in June of 1880. They connected the Freeman and Coates Livery barn with the Northern Pacific Railroad depot. The telephones were used to call livery rigs when passengers arrived in town. Four other telephones were later installed on the same line; they provided a means of communication between the McCormick's, West's Hotel, the Balder and Weber Brewery, and John Platt's Saloon. This type of separate line service was continued in St. Cloud until an exchange was established there in 1882.<sup>8</sup>

An item in a January, 1897, issue of the Zumbrota, Minnesota, newspaper revealed that it was the practice for some years to install separate line telephone service in that area. The item read:

B. C. Grovers' Livery Stable and the Zumbrota House were connected by a telephone this week. So excellent is the service that the clock can be heard ticking in the room at either end of the line.

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<sup>8</sup> Ibid., II, 5.

As has been stated, it was the general policy of the Bell group to lease but never sell outright any equipment. The following paragraphs set forth the terms of a typical contract under which the Bell Telephone Company, at Boston, agreed to lease telephone instruments in 1877; this was before the introduction of switchboards:

The undersigned lessee of telephones agrees to take good care of the same, and all fixtures connected therewith; and will not transmit messages for hire, nor remove, transfer, or attempt to sell said instruments or use them upon any other line, or at any other place, except as herein specified, and at the expiration of the time for which this agreement is made will surrender the same to the Bell Telephone Company, or its authorized agents, in as good condition as when received (ordinary wear alone excepted); and in default of payment as herein below agreed, or in case of violation of any of these conditions, or if this lease be assigned by the lessee's act, or by operation of law, the lessee shall, at said company's option, terminate and said company, or its authorized agents shall have the right, and the lessee hereby gives them permission, to enter upon the premises wherein said telephones may be and take possession of and remove said telephones and fixtures; and the lessee shall have no claim for the repayment of any monies which may have been paid for rent or otherwise, under this lease. In case either of said instruments is lost or destroyed, it is agreed that the lessee shall pay the lessor the sum of fifty dollars as liquidated damages for each instrument so lost or destroyed, but the property in such instrument shall remain in the lessor, and such payment of liquidated damages shall give no right to use such instrument.

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Said Company is to keep said telephones in good working order, and repair the same at its own expense (except when injured by the carelessness or neglect of the lessee or servants thereof), and will maintain the line in good condition for the time specified herein, and make all necessary repairs of the same as expeditiously as possible, in cases where the line is furnished by it, and is to have free access at all reasonable times to the instruments and premises where they are used, for the purpose of inspecting or repairing the same.

From the above terms it is quite apparent that the Bell group was determined to retain not only its telephones but also any parts that might remain of damaged or burned instruments. About the only rights the lessee had was to make a call and let the telephone hang on the wall.

The early use of the telephone was considerably retarded because of its limited field of operation. The lack of switchboards and long distance service hindered the growth of the industry, but these problems were solved, to a certain extent, within the first few years.

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<sup>9</sup>Ibid., II, 5-6.

## CHAPTER III

### THE EARLY GREAT PLAINS TELEPHONE COMPANIES

In the early years there were many small companies which were of little consequence except in their own areas. Most of these companies either failed or were consolidated into larger systems. Actually, in the five states of Iowa, Minnesota, Nebraska, North Dakota, and South Dakota there were only three companies of much significance, the Iowa Telephone Company, the Nebraska Telephone Company, and the Northwestern Telephone Exchange Company. These three companies were, in later years, to form the backbone of the present-day Northwestern Bell Telephone Company. In the beginning, nevertheless, these companies were extremely small and their operations were quite limited by the Bell-granted licenses.

The first licenses were merely permits to use instruments and install private lines. With the development of switchboards the licenses were broadened to include the operation of one or more exchanges.

From 1878 to 1883, most of the telephones in Iowa were operated by very small companies which had one or more exchanges. A contract held by George B. Engle Jr., of Cedar Rapids, was the foundation stone for the development of a telephone system in that state. Just how Engle got his contract is not known. He went to Burlington, however, where he constructed a number of private lines and later built a private telephone exchange for use by the city of Burlington. This special system was opened on October 8, 1878. The switchboard was installed in a centrally located fire station with telephones in various stations throughout the city. This system was used by both fire and police departments and was the first exchange of its kind in that area and perhaps in the United States.<sup>1</sup>

About this time the Western Union Telegraph Company decided to enter the telephone field using Edison instruments. It opened an exchange at Keokuk in 1878, and the next year set up exchanges at Ottumwa, Dubuque, Davenport, and Des Moines. The Edison telephone seemed to be a better

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<sup>1</sup>"Histories of Controlled Companies of Iowa Telephone Company", I, 2. (Northwestern Bell unpublished data).

instrument than those that were used by other companies and therefore won a great deal of favor with the public. The question of patent infringement came up, however, and after a long series of court battles the case was decided in favor of the Bell interests and Western Union was compelled to leave the telephone field. The Western Union interests in Iowa were reorganized on a Bell license as the Western Telephone Company and thus continued operations. The successor of this company was the Central Union Telephone Company of Chicago.<sup>2</sup>

During and following this period of strife, the Bell interests in Iowa continued to grow and develop. At Cedar Rapids, in 1879, George Engle Jr. formed a partnership with David Holt Ogden, a telegrapher and newspaper man. A new organization was then formed called George B. Engle, Jr., and Company. This group succeeded to the license rights of the National Bell Telephone Company.<sup>3</sup> In his efforts to promote the telephone business, Engle built and opened an exchange at Dubuque in 1879, where he received a great

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<sup>2</sup>Ibid., I, 5.

<sup>3</sup>Ibid., I, 3.

deal of assistance from E. T. Keim who had been at the Philadelphia Centennial and was a telephone enthusiast. Early in 1880, the Engle Company also established an exchange at Cedar Rapids.<sup>4</sup>

Engle and Ogden seemed to have the confidence of the National Bell Telephone Company, and through its representative, Gardiner Hubbard, they were offered the license for Iowa, Minnesota, Wisconsin, and Illinois, provided they could organize a company with \$40,000 capital. Many persons were doubtful as to the commercial value of the telephone and this made it extremely difficult to sell stock enough to raise the needed \$40,000. More than a year later, on October 12, 1880, the two men organized and incorporated the successor of the George B. Engle, Jr., and Company, the Hawkeye Telephone Company, which had a capital stock of \$25,000. This was the first telephone company, to be incorporated in Iowa, that included in its articles of incorporation, the expressed purpose of building more than one telephone exchange. Due to delay in organization of the company, Engle and Ogden lost a lot of the territory which

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<sup>4</sup>Ibid., I, 4.



had been originally offered to them and in the end were generally restricted in their operations to the state of Iowa.<sup>5</sup>

In 1881, the company opened an exchange at Iowa City; a little later exchanges were opened at Fort Dodge, Waterloo, Cedar Falls, Independence, Oskaloosa, Muscatine, and elsewhere. As the company grew, the need arose for more and more capital. To meet this need the name of the company was changed to the Iowa Telephone and Telegraph Company on February 10, 1882, and the capital stock was increased to \$250,000.<sup>6</sup> Even this did not prove to be sufficient and later that same year a group of Davenport businessmen purchased the company from Engle and Ogden. This brought to a close the careers of the two telephone pioneers who had done so much to lay a solid foundation for a telephone system in Iowa.

The consolidation of Bell properties in Iowa was well under way by 1883, and in that year W. A. Leary, united many of the small companies in operation at that time.

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<sup>5</sup>Ibid., I, 4.

<sup>6</sup>Ibid., I, 5.

The Iowa Telephone and Telegraph Company became the central organization and absorbed the following companies: the Ames and Nevada Telephone Company; the Balch and Root Illinois exchanges and their DeWitt, Iowa, exchange; the Burlington Telephone Company; the Creston Telephone Company; the Clinton and Lyons Bell Telephone Company; the Exchange Bell Telephone Company (of Adams, Taylor, and Ringgold Counties); the Glenwood Telephone Company; the Jackson County Bell Telephone Company of Maquoketa (etc.); and the Southwestern Iowa Telephone Company's exchange at Shenandoah.<sup>7</sup>

The capitalization of this company, likewise, proved to be too small; therefore, in June of 1883, Leary organized the Iowa Union Telephone and Telegraph Company. Within a short time another consolidation took place and the Southwestern Iowa Telephone and Telegraph Company, more of the Balch and Root interests in Illinois, and the telephone rights of W. A. Leary in Page County, Iowa, were added to the Iowa Union Telephone and Telegraph Company.<sup>8</sup> With the continued consolidation of all of these many companies

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<sup>7</sup>Ibid., II, 2.

<sup>8</sup>Ibid., II, 9.

the Iowa Union Telephone and Telegraph Company acquired exchanges in Burlington, Fort Madison, Creston, Red Oak, Glenwood, Ames, Clinton, Maquoketa, DeWitt, Clarinda, Shenandoah, Boone, Centerville, Chariton, Fort Dodge, Grinnell, Harlan, Independence, Indianola, Iowa City, Knoxville, Moticello, Anamosa, Muscatine, Newton, Osceola, Tipton, Winterset, Cedar Falls, Atlantic, Tama City, Vinton, Waterloo, and Whatcheer in Iowa; and at Sterling, Morrison, Mount Carroll, and Lanark in Illinois.<sup>9</sup>

Burlington, Iowa, had at that time eighteen thousand inhabitants and the largest exchange in the town had two hundred and thirty subscribers. Toll lines were needed in almost every part of the state, but the exchanges were not operating at a profit; therefore, it was difficult to get people to invest their money in a business that appeared to be not too sound.<sup>10</sup>

The Iowa Union Telephone and Telegraph Company became a part of the Iowa Union Telephone Company in 1887 as the process of consolidation continued.<sup>11</sup>

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<sup>9</sup>Ibid., II, 6.

<sup>10</sup>Ibid., II, 10.

<sup>11</sup>Ibid., II, 10.

Bell properties in Iowa in 1884 numbered sixty exchanges scattered over an area of about 150 miles by 300 miles. Very few of these scattered exchanges were connected by toll lines. Throughout the state different types of equipment were used and the style and quality of outside construction varied considerably.<sup>12</sup>

Another of the early companies was the Iowa and Minnesota Telephone Company. This corporation was organized in February of 1881, and incorporated in March of 1881, with its headquarters at Dubuque, Iowa. It came about as a result of the consolidation of the Sioux City Telephone Exchange Company, the Marshalltown Telephone Company, and the telephone interests in Iowa of J. J. Dickey and L. H. Korty. This company became a part of the Iowa Union Telephone Company in 1887.<sup>13</sup>

The Central Union Telephone Company of Chicago was another of the pioneer telephone groups. It owned and operated exchanges at Des Moines, Davenport, Dubuque, Cedar Falls, Keokuk, and Ottumwa. The operation of toll

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<sup>12</sup> Ibid., II, 11.

<sup>13</sup> Ibid., II, 3.

lines covering a radius of fifteen to twenty miles from each of its exchanges, was also a part of the company's activities; these lines were in turn connected with those of the Iowa Union Telephone Company which controlled most of Iowa except for the exchange at Council Bluffs and the toll lines in Pottawattamie County, which were owned and operated by the Nebraska Telephone Company. The Central Union Telephone Company of Chicago was consolidated with the Iowa Telephone Company in 1896.<sup>14</sup>

The Iowa Union Telephone Company came into existence January 31, 1887, and was formed through the consolidation of the Iowa Union Telephone and Telegraph Company and the Iowa and Minnesota Telephone Company. This was brought about in part by W. A. Leary, a stockholder in the Iowa Union Telephone and Telegraph Company, who was very active in movements to accomplish a merger of Bell telephone interests in Iowa. The consolidation was deemed advisable in order to put the exchanges on a sounder business basis and to permit expansion through the building of toll lines. This company went out of existence nine years later when it

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<sup>14</sup>Ibid., II, 11.

became a part of the Iowa Telephone Company which was incorporated at Davenport on August 28, 1896. The general offices of the company were moved from Davenport to Des Moines in 1904. The first president was Joe R. Lane. In 1898, Casper B. Yost became its president and he continued in that capacity until May 1, 1919, when he became chairman of the board of directors. Thus, the Iowa Telephone Company was organized through the consolidation of the Iowa Union Telephone Company and the Central Union Telephone Company properties in Iowa.<sup>15</sup>

The final step in consolidation in Iowa came on December 9, 1920, for on that day the Iowa Telephone Company changed its corporate name to the Northwestern Bell Telephone Company. While its corporate name was changed, active operation of telephone properties in Nebraska, Minnesota, North Dakota, and South Dakota did not begin until January 1, 1921. The following brief summary of the scope and volume of its business as of December 31, 1920, indicates in a measure the extent of

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<sup>15</sup>Ibid., II, 1.

its development:

Total number of central offices	125
Total number of company stations	164,182
Estimated number of toll messages originated during 1920	5,283,336
Estimated number of exchange calls handled	289,327,500
Total number of employees	3,235
Estimated yearly payroll	\$3,250,000

The Iowa Telephone Company's securities outstanding ranged from about \$100,000 at the end of 1896 to approximately \$4,000,000 at the end of 1920.<sup>16</sup>

Telephone development was not restricted to the east side of the Missouri River as like progress took place in Nebraska. There was a host of small companies, as in Iowa, that were gradually consolidated into a large corporation but the process was a much simpler affair than it had been in Iowa.

The Nebraska Telephone Company was incorporated in Omaha on July 1, 1882, at \$250,000. The company continued as such until its property was taken over, through purchase, by the Northwestern Bell Telephone Company on January 1, 1921. The Nebraska Company began to expand almost immediately

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<sup>16</sup>"Corporate Histories of Northwestern Bell Telephone Company and Predecessor Companies", I, 21.

and on August 7, 1882, purchased the property of the Beatrice Telephone Company and later in the year, on December 27, 1882, the properties of L. H. Korty at Arlington and Blair were also purchased. In addition to certain toll lines purchased in 1882, the property of the Omaha Electric Company and telephone properties at Plattsmouth, Fremont, Grand Island, Columbus, and Kearney were added to the system. Certain Nebraska properties owned by Korty and Dickey were also purchased in 1882, as was the perpetual right from the American Bell Telephone Company, to use Bell telephones in Nebraska. With the great increase in its size it was necessary, in 1883, to increase the capitalization of the company to \$500,000.<sup>17</sup>

The year 1884 saw the continued expansion of the Nebraska Telephone Company with the purchase of the Black Hills Telephone and Telegraph Company. By 1900, the Nebraska Telephone Company was providing service in all the larger communities in Nebraska and western South Dakota.<sup>18</sup>

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<sup>17</sup>Ibid., II, 24.

<sup>18</sup>Ibid., II, 24.



To illustrate the close alliance with local companies by the national telephone company the following facts are presented. The American Company owned about one-half of the stock in the Nebraska Company from 1883-1912, and in 1912, the American Company acquired all the capital stock of the Nebraska Telephone Company except that of its qualifying directors.<sup>19</sup>

Casper B. Yost, also president of the Nebraska Telephone Company, wrote a letter on August 19, 1896, in which he described the operations of his company.

This company owns and operates all the exchanges and toll lines in Nebraska and in the Black Hills region of South Dakota and in Council Bluffs and Pottawattamie County, Iowa. The company has 22 exchanges and 108 public toll line stations.

Nearly every city, or village of any size, in the territory of this company has a telephone exchange and a toll line connecting same with the other cities and villages. The total miles of toll line wires are 2,380 and the total mileage of toll pole lines is 1,268. It has on its payroll 148 people. In the cities of Omaha and Lincoln, the company has erected and is occupying its own buildings and in both these cities all telephone wires in the business district have been placed underground. New toll lines are now being constructed and by the end of this year over a hundred miles of new toll lines will be added to the mileage given above.<sup>20</sup>

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<sup>19</sup>Ibid., II, 25.

<sup>20</sup>"Casper B. Yost", Unnumbered collection of letters and writings of Yost found at Northwestern Bell Headquarters.

In July of 1899, the properties of the Iowa and Nebraska Telephone Company in Nebraska were purchased by the Nebraska Telephone Company. This purchase covered the Wayne exchange with 110 subscribers and a twelve-subscriber exchange at Wakefield, also 180 miles of single iron-wire toll line. The toll lines purchased extended from Bancroft to Pender, to Thurston, to Emerson, to Wakefield, to Wayne, to Winside Junction, and to Winside; from Winside Junction to Carroll, to Randolph Junction, to Randolph; from Randolph Junction to Belden, to Coleridge, to Hartington; from Laurel Junction to Laurel, to Dixon, to Allen, to Martinsburg, to Ponca, to Jackson, to Hubbard, to Emerson; from Jackson Junction to Dakota City; and from Homer Junction to Homer. The unfortunate part about the new addition was that there were no connecting lines to Sioux City. By August of 1902, there were 16,285 subscribers of the Nebraska Telephone Company.<sup>21</sup>

President Yost did not believe in too rapid expansion of telephone service. An excerpt from a letter he wrote

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<sup>21</sup>"Corporate Histories of Northwestern Bell Telephone Company and Predecessor Companies", II, 24.

bears witness to this:

....we might have had more subscribers, but I am not one of those who believe that every one who rides on a street car is in need of, or can afford a telephone.

As time went by the telephone became increasingly popular in Nebraska particularly as toll lines were extended to more and more places. In 1906, the number of telephones in service increased over thirty-one per cent. This is indicative of the rapid growth of the telephone industry in the Midwest.<sup>22</sup>

On December 31, 1920, the day before the Nebraska Telephone Company became a part of the Northwestern Bell Telephone Company, its operations were as follows:

Total number of central offices	144
Total number of company stations	103,772
Estimated number of toll messages originated during 1920	2,938,300
Estimated number of exchange calls handled during 1920	191,607,900
Total number of employees	2,780
Estimated yearly payroll	\$3,211,284

The stock outstanding increased from \$17,800 in 1882, the year the Nebraska Telephone Company was incorporated, to \$11,000,000 in 1920.<sup>23</sup>

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<sup>22</sup>Ibid., II, 40.

<sup>23</sup>Ibid., II, 41.

In the meantime telephone development had been making rapid progress to the north. In fact, early in 1878, R. H. Hankinson, of the Northwestern Telegraph Company, organized the Northwestern Telephone Company in Minneapolis, and on December 10, of that year it was incorporated under the name of the Northwestern Telephone Exchange Company with \$10,000 in stock. This was actually the oldest of the three large telephone companies that were later joined to form the Northwestern Bell Telephone Company. The license issued to the company provided rights in Minnesota and in the Dakota Territory.<sup>24</sup>

The company developed rapidly and in March, 1883, increased its capital stock to \$2,000,000. This action was the result of the original stockholders disposing of their interests to the Erie Telephone and Telegraph Company, which continued to control and direct the operations of the company for nearly twenty years.<sup>25</sup>

The Northwestern Telephone Exchange Company operated in a somewhat different manner from the other early

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<sup>24</sup>Ibid., III, 43.

<sup>25</sup>Ibid., III, 45.

companies. It became the policy to license small groups to conduct operations and several were so licensed in 1882. Among the companies beginning operations in the early eighties were the Duluth Telephone Company, the Brainerd Telephone Company, the Crookston Telephone and Telegraph Company and Electric Light Company, the Fergus Falls Telephone Exchange Company, the Grand Forks Telephone Company, the Fargo and Moorhead Telephone Exchange Company, and the Southeastern Dakota Telephone and Telegraph Company. At Yankton, the exchange of the Erie Telephone and Telegraph Company became a part of the Northwestern Telephone Exchange Company in 1883. In later years the company did away with the policy of subletting its license rights and the many small companies thus created were absorbed back into the parent organization.<sup>26</sup>

The development in the Dakota Territory was divided in part between the Nebraska Telephone Company and the Northwestern Telephone Exchange Company. The Nebraska Company centered its activities in the Black Hills region while the Northwestern Exchange Company centered its

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<sup>26</sup>Ibid., III, 46.

activities in the eastern sections of the Territory. The central section of the Dakota Territory was somewhat of a telephone void and remained so for several years until the area had increased in population to the place where it could support a telephone system.

The directors of the American Bell Telephone Company of Boston gained control of the Northwestern Telephone Exchange Company by purchasing the controlling interests in the Erie Telephone and Telegraph Company. Thus, a similar pattern was followed as with the Nebraska Telephone Company which also was controlled by the American Bell Telephone Company.<sup>27</sup>

The growth of the Northwestern Telephone Exchange Company kept pace with other developments in the Midwest and the scope of business on December 31, 1920, the day before it became a part of the Northwestern Bell Telephone Company, was as follows:

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<sup>27</sup>Ibid., III, 55.

Total number of exchanges	184
Exchanges in Minnesota	89
Total number of company stations	190,323
Company stations in Minnesota (July, 1920)	158,296
Number of toll messages handled in 1919	6,017,753
Approximate number of exchange calls handled during 1919	333,072,175
Total number of employees	5,348
Total employees in Minnesota	4,231
Estimated yearly payroll	\$5,298,640
Estimated yearly payroll in Minnesota	\$4,392,803

The outstanding stock of the Northwestern Telephone Exchange Company increased in value from \$928,550 on December 31, 1887 to \$16,150,000 on December 31, 1920; in 1912 the value of the stock had been doubled, from \$6,000,000 to \$12,000,000.<sup>28</sup>

The next step in corporate organization was on a regional level. The actual organization on the Northwestern Bell Telephone Company was initiated with the change of the corporate name of the Iowa Telephone Company on December 10, 1920, to the Northwestern Bell Telephone Company. The next step was taken on January 1, 1921, with the purchase of the Nebraska Telephone Company and the Northwestern Telephone Exchange Company by the Northwestern Bell Telephone Company. The three companies had acted

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<sup>28</sup>Ibid., III, 57.

substantially as one from 1909 to 1920; Casper B. Yost had served as president for all three companies, but even this cooperation did not make for the most efficient business organization. The headquarters, during the provisional unification, had been at Omaha, the home of Casper B. Yost, and it was natural that this city should also be chosen as the headquarters for the new corporation. With the formation of the Northwestern Bell Telephone Company, the corporate structure of the telephone industry in the Great Plains region was somewhat set and has remained substantially the same down to the present day.<sup>29</sup>

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<sup>29</sup>Ibid., III, 58.



## CHAPTER IV

### LOCAL SERVICE DEVELOPMENTS

The improvements in local service have made vast strides since the first switchboard in this area was installed at Minneapolis. The devices and practices used and followed in this long development provide an accurate story of the improvement of telephone service. The change from magneto to common battery service and the change from manual to dial service have been the two major improvements since the development of the switchboard.

The first switchboards to be placed in service in the northern midwest were opened in 1878, and 1879. Since the switchboard was a new device, the location of a board always posed quite a problem. Sometimes it was located in a drug store, a barber shop, or in a home, as is the practice today in many small towns. Usually no special building was constructed.

The early switchboards were quite crude and the first one in Minneapolis was located in the city hall. The board was somewhat of a homemade affair and was supported by the

legs of an old sewing machine. Eleven telephones were connected to this board. The Blake carbon transmitter was used and the first circuits were closed single wire. The drop on the switchboard fell when the line was open at the subscriber's end. This device was later abandoned and magneto bells were used instead, while magneto current actuated the drop on the switchboard.

Across the river in St. Paul another early switchboard was located. P. G. Reynolds, an early telephone pioneer, described this board as follows:

The equipment of the St. Paul Exchange was home-made and consequently very crude. The board was made of pine, 6 by 10 feet, with a ten drop Western Electric annunciator at one end, with a string to restore the drops. At intervals, brass strips were attached to the board, as was the original jack knife spring. When a plug was inserted in this jack by the switchboard, it cut off the battery that was common to all lines, and by a cord connection to the brass strip, established a connection to the top part of a spring jack located on an operator's table. The operator asked the subscriber whom he or she wanted, then shouted to the boy (at the switchboard) to connect whatever line she required. After ringing the party, the connection was established by withdrawing the plug, thus allowing the spring jack to resume its normal position.

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The home-made board was followed by the so-called Western Electric Standard of twenty-five line capacity.<sup>1</sup>

In Iowa, the first commercial Bell telephone exchange was opened at Dubuque in 1879. Burlington, Iowa, adopted the first telephone fire alarm system exclusively for that purpose. This exchange was put into operation as early as October 8, 1878, when the nineteen telephones of the system were placed in service.<sup>2</sup>

A switchboard which saw general use during the eighties was the Gilliland Standard switchboard. It had a box-like transmitter fastened directly to the switchboard and the receiver was much like the present desk-type telephone in general appearance. The first telephone transmitters were called microphones. Later, annunciators (transmitters) were suspended from cords in front of the switchboards and then came the various head receivers and the chest-type transmitters which were used for many years. Even in the early switchboards comfort of the operators was an important factor. In the early nineties, the superintendent of the

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<sup>1</sup>Northwestern Bell Magazine, (October, 1923), 15.

<sup>2</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", III, 7.

Nebraska Telephone Company wrote to the Western Electric Company and said:

I do not like the idea of placing the annunciators so high as to require the operator to be constantly looking upward. It is not an easy, natural movement of the head or eye.<sup>3</sup>

The placing of a call has not always been as easy as it is today. The familiar dial tone or, "Number Please", have been achieved only through a long trial and error process. The placement and completion of a call in the early days sometimes was quite an operation. The following instructions, from the Webster City, Iowa, card telephone directory of 1881 offer proof of this.

1. To Call--Give the crank one quick turn. This rings your bell and also signals the Central Office. The Operator will answer by a return signal. Then (and not till then) take down the hand telephone, place it to the ear, give the number (instead of the name) of the party you wish to be connected with, and listen a moment. The operator will instantly connect the wires and signal the party wanted, who will please not "ring back", but take down the hand telephone and say, "Who wants No.--?" Then give your name and office and proceed.
2. When the conversation is finished, the party called for the connection should hang up the

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<sup>3</sup>Ibid., X, 2.

hand telephone and again give the crank one quick turn as a signal to the Central Office to disconnect the wires. This is important, as other parties may be waiting to speak to you, and, unless disconnected, the operator will report your wire as "occupied".

3. In using the Telephone, several points should be observed: Hold the hand telephone between the index and second fingers, allowing the ends of the fingers and thumb to touch the flange. Keep it pressed closely to the ear (the best ear if there be any difference, as is frequently the case), stand with the lips six to ten inches from the transmitter, and speak in a moderate tone of voice. Strictly avoid shouting.
  4. When not in use, the hand telephone should be left hanging upon the fork, as otherwise the battery runs down rapidly.
  5. Do not use the telephone during a thunderstorm.
  6. All inquiries about trains should be made to the operator at the Central Office, who is instructed to gather such information from the depots for distribution.
  7. In the case of fire in your neighborhood, inform the Central Office immediately, giving correct location and nature of the fire. The operator will give the alarm instantly.
  8. Subscribers are requested to report promptly to the manager any apparent neglect or interruptions.
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9. Any person with consent of subscribers, may use the telephone in case of sickness, accidents, or to give an alarm of fire.
10. The Company will be glad to have subscribers show the working of the Telephone Service to all who may evince an interest in the matter, but otherwise (except as noted above) the use of the Telephone is limited to the subscriber, his family or employee in his interest.
11. No post office business to be transacted by telephone.

D. L. Hunter, Manager, Webster, City, E. T. Keim, General Manager.<sup>4</sup>

The problem of safety devices has always been one that required a great deal of attention; particularly lightning protection. In 1885, little strips of gold leaf paper were used as lightning arrestors on central office equipment. This was replaced later by a fine strand of silver wire which in turn was replaced by the seven ampere fuse. Soon after engineers used a section of 24-gauge or smaller aerial cable and finally heat coils and carbon blocks were developed.<sup>5</sup>

The first line tests were quite irregular and often were not too accurate. The telephone manager at Fremont,

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<sup>4</sup>"Card Telephone Directory", Webster City, Iowa, 1881.

<sup>5</sup>"History of the Northwestern Bell Telephone Company", X, 4.

Nebraska, in 1892, complained of the annoyance and expense caused by telephone offices west of him not calling by a certain hour in the morning and that he in turn could not establish a connection westward from Fremont. It was finally decided that the manager at Columbus was to call the Fremont manager by 7:45 each morning. If he did not get through, he was to call each intermediate exchange to find where the trouble existed. If the lines could not be cleared by 8:00 A.M., the Columbus manager was to notify the Omaha office by telegram and make arrangements to have the trouble cleared at once.<sup>6</sup>

In the beginning, all local lines as well as long distance lines were tested each day. In 1894, the manager of the Nebraska City exchange was urged to follow the Omaha practice where it was common procedure to "call up every subscriber every morning in order to see if their telephone apparatus was in good working order".<sup>7</sup>

Generally speaking the service in some of the smaller towns was not too good. At times, when calls could not go through, it was because the operator was out for a

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<sup>6</sup>Ibid., X, 5.

<sup>7</sup>Ibid., X, 16.

cup of coffee or had just decided to close the office because it was a holiday. Many a lengthy check of lines was made only to find the trouble was a vacationing operator. Another of the small town problems was the habit of the subscribers to chat with the operators and get the latest gossip. As this did not allow the operator to render the best in service, it was frowned upon by the telephone companies. A forty-year-old Pierre, South Dakota, directory asked the cooperation of subscribers and requested that they "Do not parley with operators." Further it stated, "Patrons must call by number. Central girls have no time to look up your number." While this was a common plea of telephone companies, it remained the habit in early days to call by name.

Another problem in smaller towns was the location of telephones. In 1891, G. T. Sprecker, manager at Norfolk, Nebraska, experienced trouble finding a new agent for one of his stations. He was advised to make use of a dentist's office as a last resort; the in-

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structions he received are as follows:

There is, however, some objection to placing a telephone in the office of a dentist, unless the conditions are somewhat exceptional. In the first place, a dentist is not likely to be in his office before half past eight or nine and likely to close for lunch and for supper and perhaps not be in the office in the evening. Such service would not be conducive (sic) to build up an exchange at all. ....No use trying to keep the exchange going unless you can give good service. There is little inducement for a subscriber to pay his rental now. Prompt answers to calls and continuous service from seven in the morning until nine at night are essential. Bear these points well in mind in making any arrangement, and use your judgment.<sup>8</sup>

In the beginning, it was thought that men would make the best operators, but women soon entered the field and they proved to be a great deal more popular with the public. During the nineties, however, it was the practice to use men operators at night. It was extremely difficult to find a man who could remain alert all night to answer all calls that came into the switchboard. At Hastings, Nebraska, the manager was informed that the calls were too frequent during the night "To permit (sic) of a man going to sleep." The manager was further advised to have the night operator report at 9:00 P.M. and not any earlier.

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<sup>8</sup>Ibid., X, 7.

He was then required to keep awake until 7 A.M., at which time he was to be relieved. The man was then to have time off for sleep, but was to report back at 2:00 P.M. to do such line work as necessary until 6:00 P.M. He was then free till 9:00 P.M., thus having about three hours in the evening to himself. Many of these men operators later became important persons in the telephone company as is evidenced by the number honored in Bell Telephone Magazine. To further improve the service and stop some of the complaints about poor service, it was recommended that a relief operator be employed. The pay was to be two dollars per week to relieve the day operator at noon and to work during the evening until 9:00 P.M.<sup>9</sup>

Fifty years ago the manager at Council Bluffs realized that he had an excellent night operator and sought to get him an increase in pay. In the reply he received from the main office, they agreed that the man was an excellent night operator, but they could get good

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<sup>9</sup>Bell Telephone Magazine, June, 1943, 9-17.

night operators for thirty dollars per month and that was the limit the company would pay.<sup>10</sup>

Early regular operators were scored in proficiency tests; they were graded on the rapidity with which they answered calls, delays in disconnecting calls, giving wrong numbers, cutting off a subscriber, incorrect ringing, or even saying, "Hello". All of these errors were figured on the percentage basis. With a score of 100% the operator was eligible for the average maximum salary of \$37.50 per month. The lower the percentage the lower the wages, and an operator who went as low as 65% or 70% would only receive \$20.00 per month; a seventy per cent operator was regarded as being pretty poor.<sup>11</sup>

The early switchboards were so high that a person had to stand up to operate one of them. For this reason many labor-saving devices were worked out by the operators, one being to put parties of mutual interest on the same line. Thus, such a combination as a physician, drug store, undertaker, and livery stable, all on one line, was not uncommon.

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<sup>10</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", III, 3.

<sup>11</sup>Ibid., III, 5.

The duties assigned operators in the early days were not only numerous but sometimes quite laborious. For instance, Retta Cooch, who started her telephone career at Lisbon, North Dakota, in 1899, as an operator, recalled that her duties, besides being an operator, called for her to change batteries on telephones, repair ground wires, install telephones, and repair all lines in need of repair that she could reach. Generally speaking, the smaller the office, the more tasks were required of the operator.<sup>12</sup>

Long distance operators were among the first specialists at the switchboard. In the early eighties they were called "extra-territorial" operators. Gradually there developed a system for placing long distance calls and these operators had to know this system and also the best routes and alternate routes in order to speedily complete their long distance calls.

The lot of the early operator was not an easy one. In most cases the operating room was not located in a company building and only make-shift arrangements were

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<sup>12</sup>Ibid., III, 10.

available at best. There were no rest rooms or running water. Many offices were heated by stoves which the girls had to fire themselves. Ventilating fans were unheard of, and power ringing for signalling was not in use. The hours were usually extremely long, twelve hours per shift. There were no vacation periods, or sick benefits. Any overtime served was free while the wages ranged from \$2.50 per week to \$10.00 per week and probably no more than ten girls of the Nebraska Telephone Company got the maximum.<sup>13</sup>

In February, of 1923, a milestone in switchboard operating procedure was reached when a complete uniformity of operations was put into effect. These procedures were of such importance that a three-hundred page book was issued describing them. Each operator needed to be familiar with this book in order to perform her duties efficiently.

Many persons became interested and desired telephone service in their own business. In 1895, the secretary of the Board of Education at Superior, Nebraska, made inquiries as to the cost and details of installation of a telephone system. The reply to his inquiry was as follows:

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<sup>13</sup>Ibid., III, 12.

We act merely as agents for the American Bell Telephone Company in the rental of telephones for private line purposes, and this is the purpose you have in view.

For private lines, we rent a telephone and a transmitter for \$10.00 per year each. A telephone and a transmitter are necessary to be used at each location, which are termed "stations". The signalling bell, battery and other apparatus necessary to render the telephone and transmitter complete for service at each station we sell outright at the rate of \$20.00 per station. Twenty-five foot white cedar poles can be purchased at Omaha, delivered at the depot for \$2.00 each. Fifteen or twenty, or more can be purchased for less. We will sell you wire at \$7.50 per mile at Omaha; insulators at 6 cents each at Omaha. The freight, the expense of erecting and putting in operation, and all maintaining in working order to be done entirely by the party leasing the telephones. All that we guarantee is that the instruments shall be in proper order when they leave our hands. The rental upon the telephone and transmitter is charged from the time it leaves Omaha until returned to us again; ALL EXPENSE OF TRANSPORTATION and maintenance to be borne by you. We can arrange to send a man to put up the lines and instruments if desired... ..at almost anytime that you desire. The instruments can be put in without disturbing the schools...<sup>14</sup>

This letter gives a good idea of costs for a private telephone system in 1895. There is no information to indicate what action was taken by the School Board in this matter.

In 1895 the American Bell Telephone Company

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<sup>14</sup>Ibid., X, 7.

published a circular of new annual rental charges. Different rates were to be charged for sets consisting of magneto telephones and battery transmitters, according to the type of line the subscriber used; there were private lines, club lines, social lines, or special arrangements for speaking tube purposes. Another pamphlet gave the rates for fire and police lines.

A novel type of telephone service, called one way service, was offered in Hastings, Nebraska, in 1897. The service was described in a letter written by Mr. Yost:

Parties having that class of service can elect either to be able to call up any subscriber but cannot be called up by anyone; or they can elect to be called up by any subscriber but cannot from their telephone call up anyone.

The rate for that class of service in Hastings is for a business house or office \$24.00 per year, and for a residence \$21.00 per year.<sup>15</sup>

Mankato, Minnesota, residents were offered one-way service at the rate of one dollar per month on five-party lines, which was somewhat cheaper than the Nebraska Company for the same type of service.

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<sup>15</sup>"Casper E. Yost Bible" (unnumbered pages)

An opportunity to publicize telephone service on a large-scale came to the Middle West in 1898 with the holding of the Trans-Mississippi and International Exposition at Omaha. In an agreement with the Nebraska Telephone Company to furnish telephone service at numerous places on the Exposition grounds, there was also the provision for "space in the Electricity Building for exhibiting a switchboard in operation, and such historical exhibits as may be agreed upon..." By the end of that same year, Omaha was boasting 2,360 telephones compared with 311 for South Omaha and 458 for Council Bluffs.<sup>16</sup>

Message telephone service rates were quoted in Nebraska in 1899. Among the rates quoted were "Nickel-in-Slot" for business and residence. This type of service would have four parties on a circuit and each outgoing call would cost five cents and the customer had to guarantee to use not less than \$2.50 per month in calls. Another type "Nickel-in-Slot" service was for residence customers only. Here ten parties were on a circuit with

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<sup>16</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", X, 9.



each outgoing call costing five cents and the customer agreeing to use not less than \$1.50 worth of calls per month. Within three years these rates were reduced and each additional call cost four cents and for one hundred calls or over, the rate became three cents. The residents of Omaha were offered one-party (special circuit), two, three, four, and six party business telephone service; and one, two, three, four, and ten party residence service.<sup>17</sup>

The early billing practices were considerably different from the monthly statements telephone customers are accustomed to today. In 1881, new subscribers at St. Paul and Minneapolis, who resided more than a mile from the central office were required to pay for their telephone service a year in advance. Charles E. Hall, in his memoirs, described some of the early billing practices in other areas as follows:

The managers made out the rental bills (charges for local service) against their subscribers, notifying the general office when collected. In most exchanges the bills were made out for a quarterly period. In one exchange they were made out for a year in advance, in other a half year in

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<sup>17</sup>Ibid., X, 12.

advance, and in others quarterly in advance. The quarterly subscriber, however, paid two dollars more per annum for his telephone than the others. In none of the towns were collectors billed and collected monthly.<sup>18</sup>

It is quite apparent that no standard procedure was followed and that billing practices were somewhat a matter of local choice.

As subscribers increased in the larger cities, more and larger exchange facilities had to be provided. By late 1901, the Omaha exchange had grown to such an extent that there were 3,800 telephones in the city and it was decided to construct another central office, at Thirty-third and Harney Streets to be known as the Harney Exchange. This exchange served Omaha for about thirty-five years. Eventually, additional exchanges had to be put in service as the telephone won additional favor and this was true in other large cities, the same as in Omaha.<sup>19</sup>

The installer-repairman of 1902, would be quite amazed at modern methods and equipment. When a lineman of about 1902 was sent to help install a telephone on the premises

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<sup>18</sup>Ibid., X, 10.

<sup>19</sup>Ibid., X, 11.

of a new customer, according to Nels Nordquist, of Omaha, it was customary for him to run a single, iron insulated wire (then called "KK") from the pole to the house where it was terminated on a wiring block. The installer picked his equipment from the storeroom and, in Omaha, either took a streetcar or walked to the installation job. He carried with him a Blake magneto subset (containing the bells, the ringer, the induction coil, and the condenser), a block with two paper fuses, two glass battery cells, a package of electrolite (salmoniac crystals, then called "prisms", a lead crow foot, and a ground rod. He assembled the battery on the job. The paper fuses were painted on one side to serve as a conductor. Ordinary stock doorbell wire, known as "enunciator" wire, was used for the inside wiring of the telephone to the terminal block. For appearance sake, the installer would customarily wrap the inside wire around a pencil to make a coil, about two inches long, at the bottom of the block and also at the subset. Another practice of the installer was to adjust the carbon button on the transmitter to the sound of the voice of the person

in the household who would most generally be using the telephone. Even with that, on rainy days the telephone gave poor service compared to modern standards. The lineman, not the installer, ran the ground wire, drove the ground rod, and connected them,<sup>20</sup>

Information service for telephone subscribers began at a rather early date. In Omaha the service was available in 1903. The records were kept on small one and one-half by two and one-half inch cards on which one listing was by name and the other was by address.<sup>21</sup>

Another great improvement in telephone service came about with the change-over from grounded circuits to all metallic circuits. This brought about a great difference in the quality and distance of transmission.

Common battery service was introduced into the Omaha exchange in 1904; common battery being the system wherein all the subscriber had to do to get the operator, was lift the receiver. With the old system the subscriber always had to give a few turns on the hand generator before he could get the operator. This changeover necessitated a change

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<sup>20</sup>Ibid., X, 12.

<sup>21</sup>Ibid., X, 12.

in all of the telephones in the city. A fifteen-section local and seven-section long distance switchboard was also installed at this time. In addition, 145,000 feet of telephone cable were placed in Omaha that year. A corresponding growth likewise took place elsewhere.<sup>22</sup>

By late in 1903, the Nebraska Telephone Company was operating forty-two exchanges.<sup>23</sup>

In 1905, the Iowa Telephone Company was operating fifty-eight exchanges and 38,489 telephones, 30,309 of which were served over metallic circuits. The greatest increase came about in the larger towns; Des Moines increased 60%, Davenport 19%, Muscatine 35%, Fort Madison 37%, and Cedar Falls 79%. In Waterloo, the gain was 163% during the last four months of the year. In comparison, by 1908, the Iowa Telephone Company was operating fifty-five exchanges, serving 46,000 telephones and sixty-nine per cent of these telephones were served from common battery switchboards and sixty-two per cent were served from underground cable from company-owned buildings.<sup>24</sup>

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<sup>22</sup>Ibid., X, 14.

<sup>23</sup>Ibid., X, 14.

<sup>24</sup>Ibid., X, 15.

In many rural areas cooperative systems were constructed with the aid of telephone employees, but the systems remained the property of the residents. In 1905, a development such as this was started at St. Cloud, Minnesota, and another at Brewster, in the same state, where the number of subscribers grew from fifty-three in 1905, to three hundred six by 1909.<sup>25</sup> The development of these rural systems was thought to be more economical if carried out by the farmers themselves. The farmers were not as particular with their construction; they could more readily make use of materials at hand; and they could also supply cheap labor by doing the actual work themselves. Also, the general limit to a company line was ten persons but farmers could put from fifteen to twenty on a line and probably be better informed, even if the service were not so good. In 1909, a superintendent of the Nebraska Telephone Company testified before the State Railway Commission concerning rural telephone service as follows:

We cannot use such a service to meet the demands of some patrons, we furnish nothing but metallic

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<sup>25</sup>Ibid., X, 15.

service and I believe that we could not furnish grounded service in Nebraska, but the farmers can. The number of stations is an important factor in the cost of furnishing service. Our standard farm line is a ten-party line. The average number of stations today is less than eight stations per line. It is estimated that the average number of stations per line on farm and small local company farm lines is, say not to exceed ten per line.<sup>26</sup>

Improvements in lines and central office equipment were not the only advances that were being made. By 1905, the old clumsy wall set transmitter was being replaced by the hollow-arm transmitter. This telephone was much more convenient to handle as it could be moved around, did not take as much space, and provided equal if not superior voice transmission to the old type telephone.

It was found necessary in 1908, to generally raise rates. A check of the records does not reveal that this caused any slackening in the demand for telephone service, but rather, that a continuing demand brought increased revenue.

The next great step forward in telephone service was the installation of automatic or dial equipment.

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<sup>26</sup>Ibid., X, 18.

As early as 1914, dial equipment was being installed in the midwest on an experimental basis. In Omaha, the first dial equipment was placed at the Atlantic central office in 1921. Shortly thereafter the Jackson and Douglas central offices were combined and there, too, dial equipment was installed. The process was somewhat the same throughout the midwest as a gradual changeover to dial equipment was begun.

In May, 1921, four new names for Omaha central offices were put into use: Jackson was a completely new office, while Atlantic, Kenwood, and Market replaced the names of Tyler, Colfax, and South.<sup>27</sup>

The following table indicates the combined growth of the Iowa Telephone Company, the Nebraska Telephone Company, and the Northwestern Telephone Exchange Company -----the three companies which were united to form the Northwestern Bell Telephone Company.

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<sup>27</sup>Ibid., X, 29.



<u>End of Year</u>	<u>Central Offices</u>	<u>Company Stations</u>
1913	311	274,633
1914	339	304,559
1915	342	336,877
1916	371	389,634
1917	446	426,009
1918	450	398,607
1919	483	439,380
1920	473	464,716
1921	497	476,991

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## CHAPTER V

### EARLY OUTSIDE PLANT CONSTRUCTION

Outside plant construction began when the first wire was strung to connect two telephones. So long as the telephone was in the infant stage there was little need to worry about too many wires, but as time passed this became a real problem and of great concern to city governments, individuals, and telephone companies.

In the beginning little thought was given to the securing of rights of way for overhead wires. The development of the switchboard changed all of this because the number of wires was multiplied many fold and they became so heavy that special provisions had to be made for them. In many towns and cities, municipalities granted the right to string overhead wires and this grant became known as a franchise. Overhead and underground privileges were included in many of the franchises granted companies and many of them remained in force for years.

The common mode of transportation for construction men was a horse and wagon. The wagon was light one-seated

vehicle in which the man or crew could carry the necessary tools and equipment. In the larger exchanges, the rigs were usually owned by the company, but in the smaller ones they were usually rented from the local livery barn. While the lineman was up a pole, there were many instances of run-away horses and this caused considerable loss of time and equipment. The dangerous aspects of the work were recognized by the company and one of the main points of the safety program emphasized the importance of not dismounting from a wagon while it was still in motion.

The early linemen were required to work long hard hours. In addition, it was often extremely difficult for them to get to the place where they were to work. They did not have the power machinery to dig post holes, but had to do that and much other work which today is done with power tools by hand. "Boomer Linemen", were men who gained their experience by moving from place to place. These persons would compare somewhat to an apprentice in one of the trades.

Pole requirements varied in different localities as

various agencies of government adopted different codes; some did not bother to set up any regulations while others required that all wires be placed underground. At Atlantic, Iowa, in 1882, which was a typical installation, thirty foot poles carrying six pin cross arms were erected, and knobs were placed underneath to accommodate more wire.<sup>1</sup>

The first wires were strung over housetops, churches, livery stables, saloons, or anywhere else that was necessary in order to get service to a customer. It was soon realized that running wires on roofs was not a good practice since it was almost impossible to service them and, besides that, many times the telephone companies had to pay prohibitive fees for roof privileges. As an example, W. F. Davidson of Minneapolis, in 1889, was given one free telephone and a dollar reduction in the rate for a second telephone in exchange for roof privileges.<sup>2</sup> Soon, all efforts were directed towards getting the wires off the roofs and on poles or into cables.

The first methods used in connecting a subscriber's telephone with the switchboard were extremely crude and

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<sup>1</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", IV, 3.

<sup>2</sup>Ibid., IV, 4.

not at all standardized. In some cities, a tower was constructed on the central office and all lines were brought to the tower, and thence down into the office. One of the more successful of many schemes that were tried was at Council Bluffs, Iowa. There, the outside plant was connected with the switchboard by the following means; the lines all ran to a box containing lightning arrestors, placed on top of a pole in front of the office window, and then, by means of a cable, through a hole in the window casing to the switchboard. There were other systems, some varied only in minor detail while others were considerably different, and all were thoroughly tested to discover the best points of each.

Keeping the wires straight on all the cross arm pins was quite a problem. Finally, definite rules were established as to the number and designation of cross arm pins; the rule was, "In numbering pins and knobs on crossarms stand with your back to the office; commence at the top at the left-hand side, and count from left to right exactly as you would read the print in a book."<sup>3</sup>

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<sup>3</sup>Ibid., IV, 5.

Probably the most common poles in use were the thirty foot poles with ten pin cross arms and braces. In many cases there would be from ten to twelve cross arms on each pole with knobs on both the top and bottom of the arm. Needless to say, in urban areas it was most difficult to see what kind of a day it was because of the number of wires hanging from the poles.

Digging holes into which to set the poles was a difficult job when done by hand. In some sections of Minnesota and in the Black Hills of South Dakota the soil was too hard and rocky to permit the use of digging equipment. In such cases dynamite was used to blow the holes out.

The pole lines of small town exchanges also became over-burdened with wires. There, planning was not too good and as another telephone was added more wire was just added to what was already on the poles, and again an almost impossible engineering and aesthetic situation developed. In the town of Owatonna, Minnesota, all open iron wire was used and to accommodate all of this heavy

wire it was necessary to put ten to twelve cross arms to each pole. This was a typical situation and was duplicated in many small towns at that time.

The joints in open wire construction were always a source of considerable trouble. In the first place they were difficult to make, and in the second, many that looked good were not very efficient for transmission purposes. As late as 1921, H. A. Hottelzer, of Castlewood, South Dakota, recalled years later, that before he could get some rusty farm lines to work he had to inspect, clean the rust, and resolder about ninety percent of the hand-made span joints.<sup>4</sup> This problem was somewhat solved with the development of sleeves and new soldering techniques.

Until 1894, the outside plant, in St. Paul, Minnesota, was mainly open wire and some of the long leads in the east end of the city were common return. (Common return was a ground return system). However, by 1895, metallic circuits (two wire system) was provided throughout the city.

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<sup>4</sup>Ibid., IV, 8.

In an attempt to bring some semblance of order out of the various methods of pole line construction, the engineering department of the American Telephone and Telegraph Company, in 1903 and 1904, prepared handbooks on this subject. Detailed specifications were given for the construction of twenty-foot pole lines carrying six wires and for twenty-five foot pole lines carrying twenty wires. This information was distributed on a nationwide basis and helped, to some extent, to bring about some uniformity in pole line construction.

One of the novel developments in local service, in the large cities, was poles called circle tops. They were special poles used in Omaha, Minneapolis, St. Paul, Davenport, and to a lesser extent in some of the smaller exchanges. "Circle tops" were used to provide for block distribution; a circular metal frame was placed on top of the pole and the wires radiated in all directions from it to connect all of the telephones in the immediate vicinity. These poles were not found to work very well as too much weight and stress were placed upon them and they tended



to snap more readily than conventional poles. Various types of poles were used; in Omaha, wooden poles were used exclusively, while in Minneapolis, ornate metal poles were used along some of the residential streets. Some of these poles were reported to be as much as seventy-five or eighty feet tall. It was estimated that the Nebraska Telephone Company and the Iowa Telephone Company, in 1899, each used about 30,000 poles annually.<sup>5</sup>

As early as 1888, the problem of interference from other electrical lines was of great concern to telephone companies. Telegraph wires, electric motors, street cars, and many electrical devices interfered with telephone transmission. In many cases, all that could be done was to route the wires around or away from the interference. In places where this was impossible various types of sheathing and circuits were tried in an attempt to do away with the annoying interference.

The open wire lines continued to be a source of trouble. The joints, particularly continued to be the

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<sup>5</sup>Ibid., IV, 6.

weak spots. In an attempt to solve this problem, definite rules were set up as to how an open-wire joint should be soldered. There were also rules in regard to trimming trees, repair of broken poles, tightening of slack wire, the proper placing of guy wires, and many other jobs. By 1896, the sleeve system, instead of clamps, was being used to repair broken copper wires and this improved strength as well as transmission.

The early linemen were not supplied all of their tools by the company. Such things as the safety belt and accompanying tools could be purchased by the lineman at cost from his foreman. The safety belt was not used by many of the linemen because it was thought to be an unnecessary item and just a nuisance; also, it was not uncommon for a pole to break while the lineman was climbing or working on it, and in that case, his first thought was to fall free of the pole. In more recent times greater stress has been placed upon safety, and all linemen are required to check poles before climbing them.

They are also required to wear safety belts which are now furnished at company expense.

Naturally when the first lines were placed in service their potential life span was unknown. The Nebraska Company found that after twelve years of operation, 1882-1894, its first Lincoln-Ashland line was useless because the poles were no longer serviceable. To replace this line cross arms were placed on the other Lincoln-Ashland line and two copper wires, which had been on brackets, were placed on them thus giving two metallic circuits between Omaha and Lincoln on the same poles. The life expectancy of lines varied according to local conditions, but in all areas the life was increased by treatment of poles and other new developments.<sup>6</sup>

Telephone service was not always first brought about by a telephone company. For example, the Gordon, Nebraska, telephone system was established in a manner similar to many small towns. There, in 1896, a group of local people erected an exchange and required each subscriber to supply his own telephone and run his own line into the central

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<sup>6</sup>Ibid., IV, 10.

office. This system worked fairly well in small towns, but was unsatisfactory in larger communities.

The use of cable started early in the development of telephone service but it is impossible to determine where or when the first aerial cable or the first underground cable was used in the midwest. It is known that cable was first used to connect the outside plant with the central office. As early as May 25, 1889, at Burlington, Iowa, four one-hundred pair lead covered cables were installed between the central office and the outside plant.<sup>7</sup>

Telephone lines so cluttered the streets of downtown Omaha, that the Omaha City Council, in January of 1887, introduced a resolution which required that the telephone and telegraph wires be removed from Douglas, Farnam, and Harney Streets and placed underground; action however was deferred until 1892.

The methods and means of splicing a cable, in the early days, varied considerably from modern practices. Following is an account of how the early cables were spliced:

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<sup>7</sup>Ibid., IV, 11.

The first cable splices were made with a soldering copper, and later coppers were designed especially for this purpose. Telephone men were not then adept users of soldering copper, so tinner's were called to solder the joints in cable sheaths. Later it was found that these joints could be wiped as a plumber wipes a lead joint. So the telephone man would make the test and splice, and then scout around town to secure a plumber to wipe the joint for him. Before the invention of paper insulation and dry cores for cables, they were cotton insulated and filled with paraffin or other compounds. The heat from the wiped joint would often cause these compounds to liquefy and run into the joint, much to the disgust of the plumber who might be unable to wipe the joint on this account. The joint had to be closed, however, so after the plumber had safely gotten down from (an aerial platform) what he termed a 'perilous perch', a place to which the lineman was safer than a baby's cradle, the lineman, a foreman, manager, or superintendent, just whoever happened to be left, would get a soldering copper and finish the job, usually doing as well as anyone could do. As the use of cables grew with great rapidity, plumbers were hired especially for joint wiping and linemen were encourage to experiment on old pieces of lead cable so as to acquire themselves the art of joint wiping. As the use of cables became increasingly popular the splicer had to become an expert tinner, plumber, electrician, and handler of wire and tests.<sup>8</sup>

When the first cable was installed in New Ulm, Minnesota, the installers neglected to call the plumber to finish the job. The conductors were spliced together, after a fashion, by the local crew; then instead of the usual lead coating,

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<sup>8</sup>Northwestern Bell Magazine, February, 1921, 7.

they built a box around the joint and filled it with paraffin wax. This installation was on the roof of the building and one hot day the wax melted and dripped down into the office. The next day the plumber was called and the cable received the proper lead coating.

Pure lead covered cable gave the most trouble because, after two years, the lead got fine cracks in it and allowed water to enter, thus causing the cable to short out. Development of new and improved types of cable was essential for the improvement and expansion of telephone service.

Another of the problems confronting telephone pioneers was the existence of several competing companies in a town. This led to some very wasteful and inconvenient features; one of the worst was the presence of more than one pole line per street. Another was the inability to interconnect telephones of competing companies. If a person was a subscriber of company "A", the telephone could not be connected with any telephones belonging to companies "B" or "C". Consolidation of the various telephone companies eliminated the duplication of services and cleared many a midwestern street that had formerly

been a maze of poles and wires.

The first underground cable was not always entirely successful. John L. Friel, of Minneapolis, years later recalled an experience in burying fifty-pair cable ten inches underground from Hopkins to Lake Streets in Minneapolis: "This cable was in trouble a number of times due to horses stepping on it and cutting it with the calks of their shoes".<sup>9</sup>

Additional testimony was supplied by Friel as to the number of pole lines in an area:

Before the joint use of poles, telephone plant in alleys was frequently quite unsatisfactory. Sometimes three separate pole lines would be built in one alley, it is recalled. The consolidation of plants of former competing exchanges also tended to reduce the outside plant in many communities of this territory over the years.<sup>10</sup>

The first cable that was laid in the northern mid-west was at Minneapolis. In October of 1890, the Northwestern Telephone Exchange Company approved the laying of this cable along Nicollet Avenue. Two years later, the first underground cable in Nebraska was placed in service at Omaha by the Nebraska Telephone Company. In Iowa, the

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<sup>9</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", IV, 13.

<sup>10</sup>Ibid., IV, 12.

first cable was put into service in 1905, by the Iowa Telephone Company at Burlington.<sup>11</sup>

The capacity of these early cables was not very large. For example, in 1902, the Nebraska company reported exchange cables placed in service as follows: (aerial) twenty-five pair, 32,796 feet; fifty pair, 38,608 feet; one hundred pair, 14,498 feet; and two hundred pair, 531 feet; while for underground it was; one hundred pair, 894 feet; and two hundred pair, 11,078 feet. By 1904, some four hundred pair aerial cables were in service, although sixty-five pair cables were very popular and used considerably in some residential areas.<sup>12</sup>

Thus, outside plant construction was improved a great deal in the years following the 1880's. The development of this phase of telephone operations was essential to the growth and success of the telephone industry. Without such advancements as cable, power tools, pole preservatives, et cetera, efficient telephone service would never have been possible. These developments were

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<sup>11</sup>Ibid., IV, 14.

<sup>12</sup>Ibid., IV, 14.



important steps in building a telephone system that brought near instantaneous voice communication from coast to coast.

## CHAPTER VI

### THE DEVELOPMENT OF LONG DISTANCE SERVICE

At first, long distance service was an impossibility since it was not scientifically possible to transmit the human voice over long distances. Subsequent development of new circuits, vacuum tubes, et cetera, coupled with an increase in the number and size of the exchanges, ultimately made long distance service both desirable and profitable. The building of these lines, in the beginning, did not proceed in an organized manner.

The first attempts at long distance communication were rather poor because there was no known means of boosting the voice. In some cases, a conversation of six miles was thought to be an achievement of considerable note. In a short time, longer toll calls were possible through the cooperation of the operators. The person making the call gave the message to the operator who in turn relayed it on to the next operator, or as many operators as there were exchanges to go through, and the information was relayed to the other person who in turn

gave his answer in the same manner. It was the test of a good long distance operator to be able to repeat a message well, and succeed in getting a reply, while other operators were attempting to do the same thing. Operators who worked in exchanges like Centerville and Osceola, in Iowa, were considered to be very lucky by the other operators, because those two exchanges had no long distance connections and thus the operators did not have to shout back and forth down the line relaying messages.

Toll service also posed special problems for the subscribers as special transmitters had to be used. The difference in transmitters was the source of many complaints; a typical complaint was answered by the manager at Council Bluffs, Iowa, in April, of 1893, as follows:

I am sorry that Mr. Davis is not satisfied with his desk set. It is impossible to give him a long distance transmitter in connection with the desk set, except where he has metallic service, and that we cannot furnish it in Council Bluffs except with the yearly rental of \$80.00,....If he should pay that price for the telephone in his office, we could then put the long distance transmitter on his desk, and the Blake Transmitter, as on the other instrument, in his office. We made the best looking set we knew

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now in connection with the Blake transmitter. We usually use, as a standard for the Blake transmitter a walnut piece of wood which does not look near as well as the one we sent him, and, for the one we sent him we paid \$8.00 cash.<sup>1</sup>

The Solid-Back or long distance transmitters, by 1898, were providing better service than the Blake transmitter. Thus, the Blake instrument came to be used only for local calls and gradually was replaced.

In 1900, the Gudaby Packing Company of Omaha, had special equipment installed so that they could make a regularly scheduled five-minute call each day to Boston. The special installation was necessary because the toll call required a twenty-four volt system and the local branch exchange was only a sixteen volt system.

Various methods and schemes were used to stimulate public use of long distance lines. One of the more novel schemes was the arrangement of a chess game to be played between Chicago and Davenport. The circuit was to be kept open from 6 P.M. to 1 A.M., without charge; but as to who won the chess game, no one seemed to have thought it important enough to record.

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<sup>1</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", XI, 8.

Another attempt to popularize the telephone was made in 1898, at the Trans-Mississippi Exposition which was held in Omaha. This great fair was to have been opened with a telephone conversation between President McKinley and President Wattles of the exposition; the talk was planned for June 1, but there is no evidence that it actually took place. Telephone equipment, however, was on display at the fair and it served to acquaint the public with the new wonder.

From 1890 to 1897, there was issued a national telephone directory of those who had a telephone suitable for toll or long distance calls. Most telephones of those years were of kind suitable only for calls within a town. Some local directories specifically designated subscribers who possessed toll telephones. In 1896, for example, the Davenport, Iowa, directory had a large star opposite the listing of about five percent of the subscribers, referring to a footnote which read: "Equipped with copper metallic circuit and long distance equipment."<sup>2</sup>

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<sup>2</sup>Ibid., XI, 14.

Even as late as 1910, long distance users were informed in a note in the Marshalltown, Iowa, directory which stated, "Please remember that the first operator you get is not the toll operator and has no knowledge of toll matters."<sup>3</sup>

Thus, fifty years ago, long distance lines were not too efficient, and though many persons marvelled at the wonders of the telephone, many others decided it was easier to take the train on a short business trip rather than attempt to get anything accomplished over the telephone.

One of the weakest spots in long distance service was caused by having to use the facilities of several companies, each of which operated in a slightly different manner. This slowed service considerably and was a nuisance to both subscriber and operator. Gradually, there came about a standardization of long distance procedure so that the operator in Grand Island would know what to expect when she placed a Chicago call. As an example of the standardization procedure, the Minneapolis

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<sup>3</sup>Ibid., XI, 17.

and St. Paul telephone users were advised in October of 1901, to use their long distance or toll service as follows:

Subscribers desiring to talk with parties in other cities and towns will please ask the operator first answering your call for "Toll Board". In reply, please give your number and name, also the place and name of the party desired. Subscribers asking for connections between Minneapolis and St. Paul are requested to give the telephone number of the party wanted. This is in the interest of rapid service.<sup>4</sup>

Later, in 1906, the subscribers in Minneapolis and St. Paul were urged to call "Long Distance" when calling persons in another town. This was the first time the term was used in this area and was another step in the direction of uniformity.<sup>5</sup>

Further progress in this direction was made in 1911, when the Northwestern group of Bell Companies issued a rule book on long lines procedure. These rules were followed until 1919, when the American Company issued a long lines operating practice book which was known as Bulletin 10. Bulletin 10 achieved on a national scale that what had already been accomplished on a regional scale

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<sup>4</sup>Ibid., XI, 17.

<sup>5</sup>Ibid., XI, 17.

and marked the final step in the standardization of operational procedures.

The construction of the lines for toll service was a very exacting and difficult accomplishment. W. P. Ryan, who was foreman on the job when the St. Paul, Minnesota, - LaCrosse, Wisconsin, long distance line was constructed in 1905, described the work as follows:

On the fifth of April, 1905, our camping outfit consisting of a sleeping car, wagon, cook car, and water tank arrived and we were set to start the line to LaCrosse. The camping outfit was built for a crew of 17 men and a foreman. The wagons were moved twice a day. Immediately after breakfast the outfit would be moved to where we expected to eat dinner...then to where we would be at the end of the day...We had a team of bronchos for running around, going to town for groceries, etc...When we got to Minneiska, we were camped along the Mississippi...able to get our daily baths...We were now in the rock country and used dynamite in practically all the holes. In a week or so all of the ground men became very adept at this work. They were instructed in the dangers of the work, so we did not have any accidents.<sup>6</sup>

In addition to the construction of new lines other new discoveries were made which improved toll service. Loaded lines and phantom circuits not only improved transmission quality but also increased the number of conversations that could be carried on a single pair of lines

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<sup>6</sup>Ibid., XI, 18.



at one time.

The problem that took the greatest length of time to solve was that of rate charges. In the beginning, rates were set in the local areas with little reason and as the system grew these multitudinous charges were almost impossible. In some places hack fare between towns was cheaper than the telephone charges.

Attempts to stimulate the use of toll service brought about certain rate adjustments; among the first were reduced night and holiday rates. A typical example was provided by the Iowa Telephone Company which on January 21, 1908, put into effect the following night rates:

....after 8 P.M. one-half the day rate shall be charged for all toll-line connections, provided that the full day rate shall be charged at night on all connections where the day rate is 20 cents or less.<sup>7</sup>

The Nebraska Telephone Company had even earlier, on January 1, 1900, made special provisions for night rates on toll service. This was done not only to stimulate use during slack periods but also to make the load more balanced during the day.

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<sup>7</sup>Ibid., XI, 22.

Soon a serious rate problem developed concerning neighboring communities. For example, in 1908, the charge for a call from Omaha to South Omaha was ten cents for non-subscribers and five cents for subscribers. This plan was under continual fire and finally, the manager of the Nebraska Telephone Company attempted to explain the position of the company with the following letter:

The Nebraska Telephone Company more than 10 years ago established the practice of charging 10 cents for service between the Omaha and South Omaha exchanges for non-subscribers. This difference in rate for subscribers and non-subscribers was probably originally based upon the fact of the larger volume of business from subscribers and the further fact that the business from non-subscribers would be entirely from the public pay stations which must be maintained by the Telephone Company.<sup>8</sup>

In later years, this problem was solved by setting up base rate areas within which toll rates did not apply. However, it was not until 1917, that rates for long distance telephone service became definitely established on a national basis. Even after this time it was recognized that many rate inequalities still existed and exhaustive studies were made in an attempt to eliminate them. It was finally decided that distance and time should be the deciding factors in rate charges. The initial time period

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<sup>8</sup>Ibid., XI, 19.

was set at five minutes, but experience proved this to be too long and it was reduced.<sup>9</sup> Finally, there evolved the system of determining long distance rates according to the class of service used, length of conversation, and air-line miles between the points involved in the conversation. This system did not go into effect throughout the country at one time, but as the years passed continual adjustments were made.

During World War I, the telephone system of the country was operated by the Postmaster General. At this time new efforts were made to standardize long distance rates and on December 13, 1918, Government Order Number 2495, called the Burleson schedule of classified long distance rates was announced. This schedule defined five classes of long distance telephone calls (1) station to station, (2) person to person, (3) appointment, (4) messenger, (5) collect. It also established the basis for rates for the various classes of calls, effective as of 12:01 A.M., January 21, 1919. Included, too, was the establishment of night rates on station to station calls, specifying that between 8:30 P.M. and midnight

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<sup>9</sup>Ibid., XI, 12.

the rate would be one-half of the day rate on such calls and that from midnight until 4:30 A.M., the rate would be one-fourth the day rate, except that the charge would not be less than twenty-five cents. Provision was also made in the schedule as to the time to be considered in rate charges for station to station calls. The governing hour was determined as the one at the place where the call was placed, irrespective of the time zone in which the called telephone might be; a practice which has generally prevailed since that time. The schedule also specifically declared that day rates applied only between 4:30 A.M. and 8:30 P.M. This schedule did much to clear the air about long distance charges and finally placed them upon a nationwide equitable basis.<sup>10</sup>

The local companies also faced certain problems of their own which were not apparent on a regional basis. The Iowa Telephone Company was no different, than any other, and the toll problems of the company began when the first toll circuit was constructed between Mason City and Clear Lake. This line was constructed by George Frost, in 1879, to connect his office and the court house in

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<sup>10</sup>Ibid., XI, 31.

Mason City.<sup>11</sup>In Iowa, the toll system grew rapidly but few if any of the early companies bothered to interconnect their systems.

Ample evidence of growth was reported by the minutes of the second annual meeting of stockholders on January 15, 1885, of the Iowa Union Telephone and Telegraph Company:

Toll lines: During the year we have added to our toll lines 285 miles of poles and 322 miles of wire ....November 1884 showing the largest income from toll lines during the existence of this company and the outlook from this source is much more encouraging than from the exchanges. The company now has in operation 45 exchanges and 247 toll stations and 1974 miles of poles and 2,625 miles of wire, exclusive of exchange lines.

One hundred additional miles of toll lines were placed in service by January 21, 1886.<sup>12</sup>

The winter of 1886-87, was a milestone in the development of long distance outside plant construction. It was at this time that a toll line crossing was placed over the Mississippi River at Burlington, Iowa. A spliced pole, made like a ship mast splice and 110 feet high, was set on the Illinois side and another, eighty-five feet tall, was set on a bluff on the Iowa side. The wire was of

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<sup>11</sup>Ibid., XI, 1.

<sup>12</sup>Ibid., XI, 4.

number "14" "plow" steel, and the span was 3,600 feet long. As there were no toll lines in the vicinity on the Illinois side, a connection was not made until three years later. In the meantime, the steel wire had been replaced by a more efficient phosphor bronze wire, but this particular river crossing never achieved the importance that had been expected when it was first constructed.<sup>13</sup>

The month of January, 1898, saw the formal opening of long distance service between a number of Iowa cities along the Mississippi River and others along the Missouri River. A typical invitation, like the ones distributed at Keokuk, Iowa read as follows:

The Iowa Telephone Company  
in connection with the  
American Telephone and Telegraph Company  
invites you to attend the opening of their  
Long Distance Lines  
connecting Keokuk with the principal cities East of the  
Missouri River  
Wednesday, January twelfth  
Eighteen Hundred and Ninety-eight

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<sup>13</sup>Ibid., XI, 5.

From 2 to 5 p.m. and 8 to 9:30 p.m. Parlor Hotel Keokuk<sup>14</sup>  
 Similar invitations were extended for the formal openings  
 of long distance service at Fort Madison, January 14, and  
 at Muscatine, January 20. These formal openings were the  
 exception rather than the rule, although they did tend to  
 popularize long distance service.<sup>15</sup>

On February 19, 1898, long distance service was  
 opened to Iowa City. In commenting on the new service  
 the Iowa City Herald stated in part:

....the event marked an event in Iowa City's  
 history, our people for the first time being put  
 in touch with the distant cities of this country,  
 with the introduction to what will speedily be  
 voice communication around the globe....<sup>16</sup>

The annual report of the Iowa Telephone Company  
 for 1905, gives a good general idea of the growth and  
 improvement of telephone service in that state:

At the close of the year over 30,000 stations  
 connected with the company's toll lines beside  
 those directly owned and operated. (In the course  
 of the previous seven years, too, all of the Com-  
 pany's grounded long distance lines had been changed  
 to metallic or two wire lines.) The old long dis-  
 tance lines had meanwhile also been replaced by  
 heavier constructed lines with greater capacity.<sup>17</sup>

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<sup>14</sup>Ibid., XI, 12.

<sup>15</sup>Ibid., XI, 12.

<sup>16</sup>The Herald (Iowa City, Iowa), February 19, 1898.

<sup>17</sup>"History of the Northwestern Bell Telephone Company  
 (1877-1947)", XI, 9.

By 1910, many professions recognized the value of long distance service, which, however, proved to be most important in the journalistic field. This importance was expressed by the Burlington, Iowa, Evening Gazette in an article which appeared on December 30, 1910, and said in part:

The telephone--our greatest modern invention--has revolutionized the science in newsgathering, and Iowa was the first state in the Union to recognize this fact when a dozen leading Iowa afternoon newspapers banded together as the Iowa Evening Press, installed special telephone instruments and commenced gathering and distributing Iowa News by telephone a year ago.

In those days, twelve months ago, the idea was experimental and a novelty, but it has attracted wide attention and the idea has grown until there are a half dozen states in the Union now utilizing the plan for quick news distribution....The telephone, with its instant transmission of news, has been the latest invention to be utilized to aid the perfecting press and the typesetting machine.<sup>18</sup>

The development of the Iowa toll system was not unique as a like system was constructed by the other companies in the area. As early as June 10, 1886, the Nebraska Telephone Company completed a toll line between Nebraska City and Lincoln. The general manager of the

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<sup>18</sup>The Evening Gazette, (Burlington, Iowa), December 30, 1910.



Nebraska Company was also authorized to construct a line between Omaha and Ashland as soon as possible. This line was to follow the most direct route while the wire was to be copper number "10" standard gauge.<sup>19</sup>

As toll service grew, the Nebraska company adopted the practice of using alternate routes for long distance calls. This merely meant, that if the direct lines to a town were busy that same town might be reached by going through another exchange and using alternate lines. In 1882, the manager at Beatrice, Nebraska, was advised that on calls from his exchange to Omaha, his calls were to be routed from Lincoln and Nebraska City, if the circuits between Omaha and Lincoln were in use, and provided that the circuits between Omaha and Nebraska City were not in use.<sup>20</sup>

The annual Report to Stockholders for 1893, of the Nebraska Telephone Company, stated that more toll lines had been constructed that year than in any previous year. It also announced that the new headquarters building in Omaha, had been completed and occupied.<sup>21</sup>

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<sup>19</sup>"History of the Northwestern Bell Telephone Company (1877-1947)", XI, 5.

<sup>20</sup>Ibid., XI, 8.

<sup>21</sup>Ibid., XI, 8.

A few years later, in 1896, the Nebraska Telephone Company authorized the construction of many new copper toll lines. These lines connected Tecumseh with Elk Creek, Elk Creek with Table Rock, Table Rock and Pawnee City, Table Rock and Humbolt, Humbolt and Dawson, Dawson and Salem, Salem and Falls City; Grand Island and Kearney, via Ala, Wood River, Shelton, Gibbon, and Buda; also York to Fremont via McCool Junction; Hastings to Juaniata; Wymore to Odell. This was a considerable extension of service in Nebraska and some of these lines were not completed until 1898.<sup>22</sup>

A year later, 1897, this expansion was outgrown and more construction was authorized. The new lines were again to be of copper metallic circuit. The towns to be connected by the 363 miles of new lines were: Bancroft and Emerson, Norfolk and Sioux City, DeWitt and Harvard, Ong and Hebron, Roca and Hickman, Wahoo and Yutan, Wahoo and Valparaiso, Fairbury and Steele City, Grand Island and Chapman, Grand Island and St. Paul, Nebraska, Seward and Ulysses, Columbus and Fullerton. It was also decided to place another pair of copper

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<sup>22</sup>Ibid., XI, 10.

wires between Lincoln and Omaha, and Omaha and Fremont. Thus, in a period of two years, the long lines of the Nebraska Company were extended greatly and service was made available to many thousands of persons who before had been cut off from telephone service.<sup>23</sup>

It was also in 1897, that the telephone systems of Nebraska, Kansas, and Missouri were interconnected with a junction at Falls City, Nebraska. There the wires of the Nebraska Company joined those of the Missouri and Kansas Telephone Company and another great step was completed in the unification and coordination of long distance service.

By 1898, there were six copper wires in service between Omaha and Lincoln to carry the increased traffic. There were also four copper wires in service between Omaha and Fremont and between Lincoln and Crete.<sup>24</sup>

The first phantom circuit was placed in service between Omaha and Lincoln about 1900. This was an important innovation because it made it possible to carry three conversations, simultaneously, over two pairs of

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<sup>23</sup>Ibid., XI, 10.

<sup>24</sup>Ibid., XI, 9.

metallic lines. The Nebraska Company also continued to expand conventional lines and in 1901, opened thirty-six new toll offices.<sup>25</sup>

A letter written in 1903, by President Yost of the Nebraska Telephone Company bears witness to the rapid growth of the system in Nebraska:

We have 3,925 miles of pole lines for toll purposes and have over 16,000 miles of copper toll lines. Our business was never so good as at present.<sup>26</sup>

Western Nebraska and eastern Colorado, however, had not been connected as late as 1908, and it was not deemed advisable to do so then. There was nevertheless an Omaha to Denver line which passed through Kansas City. The Nebraska system did continue to grow, and as time passed, joined in the first transcontinental system.

To the North, the Northwestern Telephone Exchange Company constructed a toll system. One of the first toll lines ran between St. Paul and Minneapolis. The early experiences with this line were recorded in the minutes of the March 1885, meeting of the board of directors, of the Northwestern Telephone Exchange Company as follows:

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<sup>25</sup>Ibid., XI, 9.

<sup>26</sup>Ibid., XI, 10.

The first line connecting the two (St. Paul and Minneapolis) exchanges was put up in April (1879) and proved so advantageous that another wire was strung in June, but owing to what is known as inductive effect, the operation of both wires at once was difficult and at times impossible. In November the second wire was taken down and strung along another route, but along side of the telegraph wires whose inductive influence is so great as to seriously impair the usefulness of the wire.<sup>27</sup>

One of the first rural lines was installed in 1887, between Fargo and Casselton in North Dakota. C. R. Meredith, formerly a druggist at Casselton, recalled that the first long distance telephone booth was placed in his Casselton store. This service proved to be so popular that in a short time more lines were needed and soon one was built to Jamestown and another north to Mayville.<sup>28</sup>

By 1894, there were forty toll lines in operation between Minneapolis and St. Paul. Since this was toll service, a charge of fifteen cents for five minutes was made on all calls between the Twin Cities.

The establishment of toll service to small towns was frequently a gamble by telephone companies. Because of this fact, towns were sometimes required to make certain

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<sup>27</sup>Ibid., XI, 5.

<sup>28</sup>Ibid., XI, 6.

guarantees of patronage before a line was constructed. A typical town that faced such a problem was Zumbrota, Minnesota; in part follows the discussion of the telephone company offer in the Zumbrota News, on February 28, 1895:

The company does not ask a bonus but only a guarantee of patronage, that the business men will agree to take a certain amount of coupons individually, said coupons good in payment of communication on the line. The advantage of a line of this kind is incalculable and the more so because the company promises communication with the Twin Cities. (Minneapolis and St. Paul) and later on with other points.<sup>29</sup>

Norther Minnesota saw a considerable extension of toll lines in 1897. In that same year St. Cloud, Minnesota, and Fargo, North Dakota, were directly connected by toll lines. This was the cause of quite a celebration for both towns as well as all along the line. As a part of the festivities, the telephone company allowed free use of the line all day long.

There were still, however, some towns in which long distance service was quite a novelty. Eveleth, Minnesota, was one such town and F. E. Lister, one time Duluth district manager, recalled how the system worked in that town:

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<sup>29</sup>Ibid., XI, 9.

In the early days, 1903-07, the village of Eveleth, Minnesota, had two policemen, one on duty at night and one on duty day hours. Frequently there were long distance calls from Duluth, etc., for the police department. To facilitate the prompt completion of toll calls, I installed a 6-inch gong on the pole on Main Street. The telephone operator would ring the gong and in a few minutes the policeman would call from the nearest telephone, and the call would be completed. Publicity was given the plan, which resulted in the installation of a few residential telephone stations, and later on the police department had telephone service installed, a few years later a p.b.x. system.<sup>30</sup>

Within a few years, attempts were being made to expand service in the Dakotas. In North Dakota, by 1910, new lines were under construction to meet those of a Montana Company to the west and also to the north where service was extended to Winnipeg, Canada. The central section of South Dakota remained somewhat of a telephone void for a few more years as there was not adequate population to support a telephone system.

The combined efforts of the national and local companies were all devoted to the establishment of a nationwide toll system. The first successful New York to San Francisco transcontinental telephone line crossed Iowa and Nebraska, and was completed late in 1914. This

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<sup>30</sup>Ibid., XI, 18.

line was 3,390 miles long, required 130,000 telephone poles, and passed through thirteen states. Copper wire was used because of superior transmission qualities and each section of a circuit required 870 pounds of copper wire; since there were two circuits a total of about six million pounds of copper was used. On August 2, 1915, Minneapolis and St. Paul were joined by telephone with San Francisco through the Omaha circuits.<sup>31</sup>

With the advent of toll, extra-territorial, or long distance service, each term being correct according to the locality, the market for the telephone was greatly increased. Small towns, large towns, and all points in between could then be placed in direct communication. Long distance service proved to be not only a profitable business for the telephone companies, but also indispensable as a service to the modern American businessman, as well as the American public in general.

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<sup>31</sup>Ibid., XI, 27.



## CHAPTER VII

### CONCLUSION

With the unification of the three major Great Plains telephone companies and the completion of coast to coast service, the dreams of many telephone pioneers became an accomplished fact. The creation of the Northwestern Bell Telephone Company, which was granted a license by the American Telephone and Telegraph Company, ended the period of consolidation in the Great Plains region.

The first telephones were brought to the Northern Great Plains region in the late 1870's and early 1880's. They were not very practical devices and many improvements were necessary before they were put to use as commercial instruments. Utilization of the improvements proceeded as rapidly as scientific progress would allow. Other devices, such as switchboards and long distance service, were also developed, which in turn made the telephone more useful and popular.

The growth of the telephone in the Great Plains region was typical of the industry as a whole. The first telephone exchanges were naturally found in the larger centers of population. These exchanges proceeded through

two major improvements--the change from magneto to common battery service and the change from manual to dial service. These improvements were made over a great number of years and in some instances have not been completed to this day.

Early outside plant construction was carried out with little or no planning. As the communication system grew this created an almost intolerable condition in some cities and towns. Proper planning and design, as well as new developments and techniques, were necessary before adequate telephone service could be supplied to the public.

Long distance service, in the early days of the telephone industry, was not possible because the scientific principles of such service had not yet been discovered. As time passed and new developments were perfected long distance service became possible, practical, popular, and profitable.

The value of the telephone to the whole of the United States is inestimable. In the midwest, however, where distance was one of the most serious obstacles in the path of civilization, it was of even greater value.

The telephone provided a means whereby distance could be conquered in seconds instead of days, thus conserving vast amounts of human energy and invaluable time.

The growth of the Northwestern Bell Telephone Company accurately reflected the development of the telephone industry as a whole. The history of the telephone industry on the Great Plains is actually a history in miniature of the telephone industry in the United States. Unlike earlier improvements, such as canals and railroads which gradually penetrated westward, wire communications developed almost simultaneously in the West and in the East. While business practices and ethics in the industry varied considerably during the period, there was never the bitter struggles and violence which characterized the growth of American industry as a whole. This was no doubt due in part to the fact that the Bell System was a service industry and was quite closely controlled by the government while the practice of leasing rather than selling patents eliminated many contests.

Thus, in less than fifty years after the first telephone

was brought to the region which comprised the states of Iowa, Nebraska, Minnesota, North Dakota, and South Dakota, most urban and rural communities were interconnected by the vast network of telephone lines operated as a unified system by the Northwestern Bell Telephone Company.

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