

THE TELEPHONE IN IOWA

BY CHARLES C. DEERING

In 1875 Alexander Graham Bell, Scotsman by birth, American by adoption, invented the electric telephone and applied for a patent.

Bell was a teacher of acoustics and a student of electricity.

His invention came as he was seeking to devise a multiple telegraph.

The apparatus he made in 1875 transmitted sounds, recognizable as the human voice, but the first complete and understandable sentence was transmitted in March, 1876, a few days after his patent had been granted March 7, 1876.

Bell's device was for all practical purposes, the receiver used today. The user spoke in a loud voice into this piece of apparatus and then placed it to his ear and waited for the response—the next step was to use two of these pieces of apparatus as one set, one as a transmitter and one as a receiver.

A company was formed to manufacture telephones and to develop their use. This company determined not to sell telephones, to lease them only, and the original company and its successors adhered to this policy until comparatively recent years.

The original telephone was a good receiver but a poor transmitter; however, more efficient transmitters and also signaling devices and then switchboards were developed so that the telephone became a practical thing.

Many people scoffed at the thought of its ever becoming more than a scientific toy, but Bell was a man of vision, and made this remarkable prophecy in March, 1878, only two months after the opening of the first telephone exchange at New Haven, Connecticut.

He said, in part:

The great advantage it possesses over every other form of electrical apparatus consists in the fact that it requires no skill to operate the instrument. All other telegraph machines produce signals which require to be translated by experts, and such instruments are therefore extremely limited in their application, but the telephone actually speaks, and for this reason it can be utilized for nearly every purpose for which speech is employed. . . .

At the present time we have a perfect network of gas pipes and water pipes throughout our large cities. We have main pipes laid under the streets communicating by side pipes with the various dwellings, enabling the members to draw their supplies of gas and water from a common source.

In a similar manner, it is conceivable that cables of telephone wires could be laid underground, or suspended overhead, communicating by branch wires with private dwellings, country houses, shops, manufactories, etc., etc., uniting them through the main cable with a central office where the wires could be connected as desired, establishing direct communication between any two places in the city. Such a plan as this, though impracticable at the present moment, will, I firmly believe, be the outcome of the introduction of the telephone to the public. Not only so, but I believe in the future, wires will unite the head offices of the telephone company in different cities, and a man in one part of the country may communicate by word of mouth with another in a distant place

In conclusion I would say that it seems to me that the telephone should immediately be brought prominently before the public, as a means of communication between bankers, merchants, manufacturers, wholesale and retail dealers, dock companies, water companies, police offices, fire stations, newspaper offices, hospitals and public buildings, and for use in railway offices, in mine and (diving) operations.

Agreements should also be speedily concluded for the use of the telephone in the Army and Navy and by the Postal Telegraph Department, although there is a great field for the telephone in the immediate present, I believe there is still greater in the future.

In view of the conditions in those days, this was a most remarkable statement.

The first public showing of the telephone was at the

Centennial Exhibition at Philadelphia in 1876, where it was shown in an obscure location and attracted little attention until visited by Dom Pedro, Emperor of Brazil, who had previously known Bell. From that time on it was exhibited in a conspicuous place and was seen by thousands.

The first commercial telephone exchange was placed in service in January, 1878, at New Haven, Connecticut. It had eight lines and twenty-one telephones.

The powerful Western Union Telegraph Company, recognized the telephone as a competitor, organized the Gold and Stock Telephone Company and entered the telephone field using a transmitter invented by Thomas A. Edison. It built many exchanges.

The Bell Company claimed patent infringement and brought suit. Before a court decision was reached the Western Union settled with the Bell Company, and agreed to retire from the telephone field. This was in November, 1879.

The Bell Company agreed to buy the telephones and exchanges which the telegraph company had built. The Western Union at that time owned fifty-five exchanges with 56,000 telephones. Four of these exchanges were in Iowa.

In April, 1880, the American Bell Telephone Company was organized and became an operating company with power to hold stock in other companies.

In 1885 the American Bell Telephone Company organized a subsidiary, the American Telephone and Telegraph Company, to build and operate long distance lines to interconnect the various regional Bell companies.

In 1900 the American Telephone and Telegraph Company succeeded the American Bell as the parent company.

EARLY INSTALLATIONS IN IOWA

Quite a little of the very early use of the telephone was private line service, to connect one's home and place of business, or hotel and railway station.

So generally, telephones for this private line service, as well as telephones for exchange service, were rented from the parent Bell Company.

As early as 1879 there were a number of these private lines in Iowa. One was in Dubuque, where lumberman Moore had a line connecting his office and lumber yard. His son, A. A. Moore, went to Boston and brought back these two telephones.

A. A. Moore later established himself in the lumber business in Marshalltown. He was one of the organizers of the Marshalltown Telephone Company, and was long prominent in the independent telephone field in this state. He was one of the organizers of the Iowa Telephone Association a trade organization of the independent companies.

Another of these early private lines was at Cedar Rapids and connected the stores of H. C. Waites and Pope & Billaus.

At Boone A. J. Barkley had a line connecting his office with the Court House at Boonesboro, two miles distant.

The first commercial exchange in Iowa was built by the Western Union Telegraph Company at Keokuk. It opened for business in September, 1878. The Western Union also built exchanges at Des Moines, Davenport and Ottumwa.

The first private telephone exchange in Iowa, and perhaps in the United States, connected the Burlington fire stations in November, 1878.

The first Bell exchange in Iowa was opened at Dubuque in June, 1879.

The first telephones in Des Moines were installed prior to the building of an exchange. They were on a line connecting F. M. Hubbell's office at Fifth and Mulberry with his home on Fifth, north of Grand.

Davenport a few years later, in 1880, counted ninety-six telephones "in actual connection with the central office." "On yesterday," the proud Davenport *Gazette* reported, February 21, "orders were taken for six more, and still other applications are known to be awaiting the substitution of the present instruments for those of the Bell Telephone Company." Subscribers in Davenport had the privilege of conversing with users in Rock Island and Moline "day and night."

In September, 1880, Oskaloosa business men were look-

ing forward to receiving a "bell telephone system." "Such a system would be greatly to the advantage of our business and professional men," the *Oskaloosa Herald* asserted on the ninth, "and should be secured."

Earlier in the year, Cedar Rapids boasted of twenty-nine subscribers to the telephones there, and a short while later a line connecting Cedar Rapids and Marion, one of the earliest "toll" lines in the state, was completed, with twenty-five subscribers.

With so few instruments in use, the telephone was for long quite a novelty, and new subscribers had to get acquainted with their uses. The Council Bluffs *Nonpareil* was guilty of more than a little exaggeration in 1880 when it reported that "the telephone is the greatest invention of the age, but this particular age is so well advanced that nothing seems to astonish it, and the 'speaking machine' has come to be a daily use and an absolute necessity in the transaction of business and the affairs of everyday life just as though it was down on the regular programme or 'bill of fare' with the commencement of time itself."¹

Nevertheless, many an individual, like the gentleman "from a neighboring town" reported by the *Nonpareil*, "who had read all about the telephone but never saw it," thought, "he must show himself to be up with the times, and glancing at one of the speaking tubes that extend through the *Nonpareil* office building, gravely remarked: 'I see you have the telephone in use here.' He knew such a thing existed and was willing to run the risk of hitting it by pronouncing the first hole in the wall he saw a telephone and thus prove himself to be familiar with the looks and workings of the wonderful machine."

Not only was its appearance a novelty, but its use was even more so. The *Dubuque Herald* quoted approvingly the *New York World* in March, 1880, which asserted, "there seems to be a popular misapprehension about conversing through a telephone. It is not necessary to roar into the

¹ Council Bluffs *Nonpareil*, quoted in the *Dubuque Herald*, Jan. 17, 1880.

instrument so that you can be heard eight blocks away. The telephone don't [sic] work on that principle. If you are talking to a man don't yell so as to disturb all peaceable citizens. Stand back two or three feet [sic] from the mouth piece of the transmitter and speak slowly and distinctly in your ordinary voice. The telephone is not deaf. Don't cry "hello" in bill board type; rather whisper it minion."

That this caution was necessary to new users is the advice of the following lines:

Do not saw the air too much with your
 Mouth, thus: but use all gently;
 For in the very torrent, tempest, and (as I may say)
 Whirlwind of your passion you must
 Acquire and beget a temperance
 Oh, it offends me to the soul
 To hear a robustious, periwig-pated fellow
 Tear a telephone to tatters, to very
 Rags; to split the ears of the boys
 At the Central Office, who for the most part
 Are capable of nothing but inexplicable
 Dumb show and noise—especial noise.
 I would have such a fellow whipt
 For o'erdoing Termagant
 It out herods Herod
 Pray you avoid it.

EARLY TOLL LINES

The parent Bell Company licensed several companies to build in various parts of Iowa, and at one time there were at least as many as eighteen such licenses in this state. Seldom were there toll lines connecting the exchanges of these various licensees and often not all of the exchanges of a given licensee were connected together.

The earliest toll lines were of iron, one wire, grounded, with a limit of commercial service of fifty to seventy-five miles; conversations over longer distances were usually repeated by an operator at some intermediate switching point; the strong lunged operator was a prize.

These grounded lines were subject to cross talk and to other electrical interference. One of these grounded toll lines from Boone to Des Moines paralleled for some distance the trolley line running to Valley Junction (now West Des Moines). Users of this toll line alleged that they could hear the conductor on the street car ring up fares.

The grounded toll line was followed by the metallic (two wire) line, and copper with its superior conductivity replaced iron wire. Other advances, notably the telephone repeater, made transcontinental service a reality.

Toll line connections between Iowa cities were thus obviously few in the first years. An early attempt to establish telephonic connections between Council Bluffs and Des Moines in January, 1880, was such important news that the *Dubuque Herald*, on the opposite side of the state, head-lined the news as²

A TELEPHONE FEAT
DES MOINES AND COUNCIL BLUFFS PLACED
IN COMMUNICATION BY TELE-
PHONE.

" . . . On Sunday afternoon last a successful telephone connection was made between Council Bluffs and Des Moines, which are nearly 150 miles apart. The wire used was a telegraph wire, with all the instruments "cut out." Manager O'Brien and Assistant Noack of the telephone exchange office at this place, connected a Bell telephone and Blake transmitter with a Des Moines wire at the Rock Island depot. The telegraph operator, Mr. Smith, of the depot office at Des Moines, attached a telephone instrument to his end of the wire, and at 2 o'clock telegraphed Operator Josslyn at the office here that he was ready for 'business.' "

The circuit was then opened and conversations were carried on between the gentlemen in Council Bluffs depot and Mr. Smith at Des Moines, by telephone.

" . . . Altogether the test was quite a success. Mr. Smith said he could hear persons in Council Bluffs and Omaha conversing with each other quite distinctly. The Edison in-

²Ibid

strument is used in Des Moines, while the Bell is used in this city. Had both instruments been Bell the conversation would no doubt have been more distinct. Of course the success of the undertaking was owing to the fact that all the telegraph wires, or nearly all, were quiet at the time. Had they been working the "sympathy" between them would have been too great to distinguish the words clearly. In long distance the telephone wire will have to be placed by itself, and nothing will prevent a conversation between Council Bluffs and Des Moines or any other distant cities. The success of Sunday's feat clearly demonstrates the fact that before long the telephone will be used as a means of communication between cities in all parts of the state. With a little more exertion we could have the pleasure of sitting in Council Bluffs, and listening to the proceedings of the legislature at Des Moines."

In the pioneer days of the eighties quite a number of telegraph men became Bell telephone managers.

Another of the early toll lines was built from Des Moines to Winterset. The *Iowa State Register* of November 5, 1882, told of the opening of this line and said that service would be furnished free for one day, and also, "to accommodate all who desire to converse from their Des Moines homes to Winterset, little books, costing \$5.00 and \$10.00 will be provided, in the form of a thousand mile ticket; these must be left at the central office and a strip will be torn out for each 'talk' which the owner has with Winterset. Parties without books will be required to go to the central office in this city to do their talking."

Try and imagine asking today's subscriber to go to the central office to make an out-of-town call!

In those early days the building of toll lines was financed, in part, by the sale of such coupon books, though usually the purchaser retained possession of the book, and coupons in payment of tolls were taken out when bills were paid.

Later, in the nineties, the independent companies financed the building of much toll line in this way, sometimes selling these coupons at a discount.

EARLY EQUIPMENT

The earliest exchanges serving, principally, the business district of a town, used open iron wire strung over roofs; poles were used when no other supports were available.

Native poles were frequently used for early construction work. These poles were usually short lived, although a Missouri man, who used a lot of native poles, alleged that they hardened with age, and jokingly said that in some cases the poles would last longer than the holes in which they were set.

Northern and western cedar have been favored timber for poles for a long time. Treated pine poles are used in increasing numbers and have a very long life.

Previous to the use of cable, the open telephone wires to the central office sometimes terminated on cross arms bolted across the office window and then insulated wires entered the building through a hole in the window casing. Sometimes the open wires terminated on the roof on cross arms bolted together into a square rack which was called a "tower"; from the tower they entered the building via the skylight.

Alley construction sometimes was on long timbers reaching across the alley and supported by poles at either end. This kind of construction in the alleys usually supported the electric wires also.

All of this old style construction was unsightly, hazardous and interfered with fire fighting.

In cities and towns open wires have given way to aerial and underground cable, except for minor construction. Even in the country considerable cable is being used.

Cable is used on important toll routes.

Experiments are being made trying to find an inexpensive insulation for use on wire for farm line construction; a wire that can cheaply be plowed into the ground where it will be free from storm and mechanical damage. One of the problems is to find an insulation that will not be attacked by gophers.

For many years all telephones were of the magneto (hand crank) type and with local batteries in the transmitter circuit. Prior to the invention of dry batteries these local batteries were of some wet, acid type which occasionally did some damage. They were always messy and expensive and required a large cabinet to provide room for the batteries.

In the early days of these magneto telephones some exchange instructions told the subscriber to turn the crank to get central, then await an answering ring before taking down the receiver, then give central the called party's number (or more likely his name), then the subscriber cranked again to ring the called telephone.

These early instructions usually told the subscriber not to use his telephone during a thunder storm.

In this connection note the following from the *Muscatine Journal* of July 28, 1881:

It would be well if the telephone subscribers would bear in mind that it is dangerous to use the telephone during a storm. At every flash the indicators fall and it is impossible for the young lady operator to tell who calls. Besides in using the ear trumpet in the ear, it is easily charged with electricity, and she is in great danger of being knocked down. The same applies to subscribers too.

In some exchanges the operator rang every subscriber each morning and said—"Morning test, ring off."

The telephone booth of the "gay nineties" was quite different from today's edition. It was usually very much larger and quite ornate, of golden oak, double walled, with glass in two sides and door, and silk drapes between the inner and outer glass.

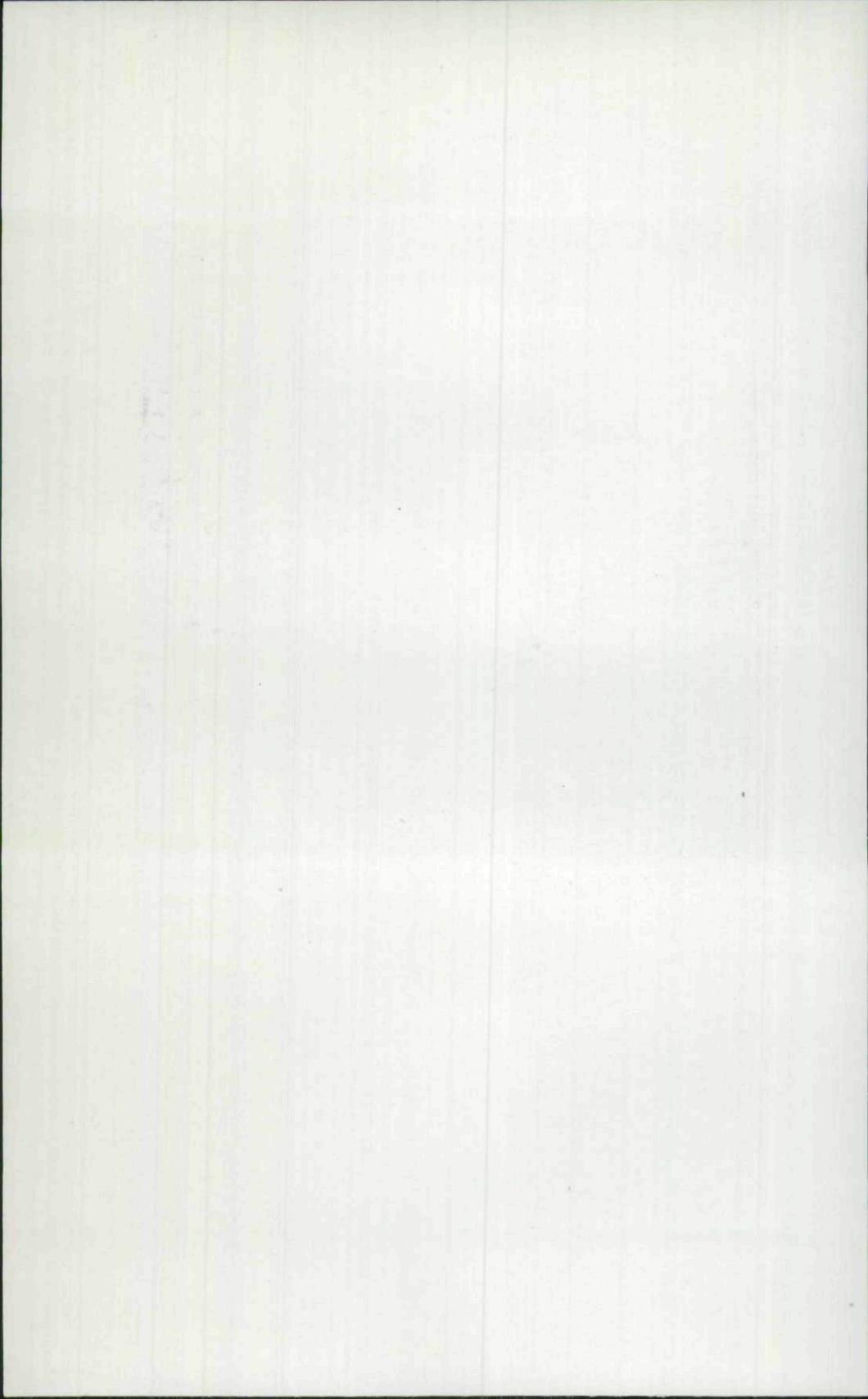
The toll line company connecting with an exchange frequently furnished such a booth for use at the central office.

The following tale is supposed to be authentic:

A business man in a small Iowa town decided that the town needed telephones and so he built an exchange. Later he built one of the better houses of the town and planned to put the telephone switchboard in his house. He



HIGH TELEPHONE POLES, 1880'S
Walnut Street, Des Moines, looking West from Fifth Street.



and there was no question but that it should be moved; further Mr. Brown thought the big wood pole was unsightly, and so after some discussion of the subject he agreed to pay for a structural steel pole.

BELL COMPANIES

From the latter part of 1879, when the Western Union Telegraph Company had withdrawn from the telephone field, until 1893, when the fundamental Bell patents expired, the Bell Company had the field to itself. It had its struggles and growing pains and difficulties in financing.

A long list of men are entitled to credit for the progress made by the Bell Company in this state up to this point. Among those prominent in these years of pioneer work were W. A. Leary, George B. Engle, Jr., E. T. Keim, D. H. Ogden, E. A. Clark, E. E. Thompson, Chas. E. Hall and Geo. E. McFarland.

Great credit is due these two last named for their perseverance through the struggles and vicissitudes of the pioneer stages of the business; they also carried on through the years of competition that followed and played an important part in the consolidations which eliminated the dual exchange situations and brought about the conditions which prevail today, complete interconnection regardless of property ownership.

In 1893 there were three Bell companies in Iowa operating sixty exchanges with less than ten thousand telephones. Des Moines had less than nine hundred telephones.

The possibilities of a large telephone development had not yet been seen; rates for exchange service were high; business houses made up the majority of the subscribers list; doctors and some others had residence telephones.

In some exchanges the printed bills stated that the charge included a \$20.00 royalty to the parent Bell company.

With high rates and small lists of subscribers the value of the service was limited; so much so that now and then

an exchange had to close for lack of patronage. In at least one case (Perry) three attempts were made before the telephone exchange came to stay.

This is a partial list of exchanges built by Bell licensees in those early days. Licensees' name and year service began are stated:-

Keokuk	Western Union Telegraph Co.	1878
Dubuque	Keim and Ogden Co.	1879
Ottumwa	Western Union Telegraph Co.	1879
Davenport	" " " "	1879
Des Moines	" " " "	1879
Council Bluffs	Omaha Electric Co.	1879
Sioux City	Sioux City Telephone Ex. Co., Inc.	1880
Glenwood	Glenwood Telephone Exchange Co.	1880
Maquoketa	Jackson County Bell Telephone Co.	1880
Cedar Rapids	Hawkeye Telephone Co.	1880
Clinton	Clinton and Lyons Bell Telephone Co.	1880
Oskaloosa	Iowa Telephone & Telegraph Co.	1881
Mt. Vernon	Hawkeye Telephone Co.	1881
McGregor	Iowa and Minnesota Telephone Co.	1881
Indianola	Iowa Telephone & Telegraph Co.	1881
Iowa City	" " " "	1881
Muscatine	Hawkeye Telephone Company	1881
Red Oak	Red Oak Telephone Company	1881
Cedar Falls	Hawkeye Telephone Co.	1881
Waterloo	" " "	1881
Winterset	" " "	1881
Webster City	Iowa & Minnesota Telephone Co.	1881
Vinton	Iowa Telephone & Telegraph Co.	1882
Atlantic	Iowa Union Telephone & Telegraph Co.	1882
Boone	Hawkeye Telephone Co.	1882
Shenandoah	Iowa Union Telephone & Telegraph Co.	1883
Fort Madison	Iowa Union Telephone & Telegraph Co.	1883
West Union	Iowa & Minnesota Telephone Co.	1883
Cherokee	Iowa & Minnesota Telephone Co.	1883
Colfax	Iowa Union Telephone & Telegraph Co.	1883
Ames	Ames and Nevada Telephone Co.	1883

With the expiration of the fundamental Bell patents in 1893, manufacturing companies were formed to make independent telephones and switchboards and the era of competition started.

RISE OF THE INDEPENDENTS

Perhaps the first independent telephone exchange in Iowa was built at Jefferson by Chas. G. Cockerill, operating under the name of the Cockerill Telephone Company. In 1891 the City Council of Jefferson passed a resolution granting the Cockerill Telephone Company the right to occupy the streets and alleys with pole lines. In 1893 Cockerill built toll lines to Farlin, Churdan and Scranton.

In the early days of independent telephony in this state a number of telegraph operators, doctors and druggists were organizers of telephone companies. The telegraph operators were interested because of the kinship between the telephone and the telegraph; they had some knowledge of electrical communication. Examples — E. H. Martin of Webster City, Geo. N. Bandy of Perry and Chas. E. Wells of Boone.

Doctors probably became interested for they saw its time saving advantages, and time saving is often life saving. Examples—Dr. A. A. Deering, Boone; Dr. C. F. Bennett and Dr. G. G. Bickley, Waterloo; Dr. G. W. Greaves and Dr. Chas. McAllister, Spencer; Dr. W. F. Cram, Sheldon.

Druggists' interest, it is believed came about as follows: When a toll line ran into a town where no exchange service was available, the toll line owner was anxious to have the toll station in an establishment that was open long hours; often that place was the drug store. Then the druggist sent a messenger for the called party. Sometimes a private telephone line was installed to reach a frequently called person; hence the druggist well knew the needs for exchange service. Examples — B. C. Way, Britt; Clويد H. Smith, Odebolt; J. W. Stewart, Grimes; Theo. I. Swift, State Center.

Independent telephone companies were organized by citizens and local capital built exchanges (usually these were single exchange companies) in most of the cities and towns where the Bell Company had exchanges, and also in a great many towns which the Bell Company had thought too small to support an exchange.

These independent companies universally had low rates; they had no patent royalties to pay; they were inexperienced and had little idea of maintenance costs; none of depreciation.

Competition ran wild.

In dual exchange situations rates were slashed; often residence telephones were free to business subscribers. Sometimes bitter feelings were engendered between various partisans.

For many years no Bell company would connect its toll lines to an independent exchange (even in a non-competitive situation) unless the independent company leased Bell transmitters and receivers.

March 18, 1896, the following men met at the Commercial Exchange, Des Moines, and organized the Iowa Telephone Association, a trade organization of the Independent Companies of the state:

E. H. Martin	Webster City
J. L. Stevens	Boone
C. E. Wells	"
W. H. Crooks	"
A. A. Moore	Marshalltown
C. E. Great	Eldora
C. F. Bennett	Waterloo
C. G. Cockerill	Jefferson
Geo. N. Bandy	Perry
F. A. Ferguson	Clearfield
H. Baum	"
F. A. Dwinell	Sioux City
H. O. Woodruff	" "
A. T. Hess	Des Moines
S. T. Slade	Oskaloosa
Ed. K. Himes	"
W. A. Hauts	Parker, South Dakota
J. E. Keelyn	Chicago

A constitution was approved, resolutions were adopted and committees were appointed.

One of the resolutions recommended certain rates for long distance service. Another "Resolved that this Association deems it but just that telephones used in railway stations shall be paid for at the same rate as business telephones." Later the legislature made it compulsory for railway companies "to install a telephone in each passenger or freight depot."

The officers elected at this first meeting were:

President	E. H. Martin
Vice President	A. T. Hess
Secretary	Ed. K. Himes
Treasurer	S. T. Slade

The Iowa Telephone Association changed its name to the Iowa Independent Telephone Association in 1906, and still represents the independent telephone companies. It is one of the older trade associations of the state.

In those earlier days of the Association when there was much bitter feeling between the Bell and the Independents, some of the Association meetings had a sergeant-at-arms guard the door lest a Bell spy hear what was being said.

Following is a very incomplete list of other prominent pioneer Independent telephone men of the state:

J. S. Bellamy	Knoxville
P. C. Holdoegel	Rockwell City
J. H. Shoemaker	Waterloo
A. T. Averill	Cedar Rapids
C. M. McFatrige	Moravia
D. M. Griswold	Winterset
Otto Wettstein	La Porte City
D. N. Smith	Clearfield
W. H. Durin	Cedar Rapids
M. McFarlin	Des Moines
H. E. Teachout	Des Moines

In the early part of this century the largest independent company was the Western Electric Telephone System, whose

head office was at Mason City. It was headed by B. C. Way (now a Director of the Northwestern Bell Telephone Company) and Truman Potter. The Western Electric had a number of exchanges in northern Iowa, and about 3000 miles of toll line in northern Iowa, southern Minnesota and eastern South Dakota. None of this property was in competition with the Bell Company.

The Western Electric was the first independent company in this part of the country to connect up with the Bell toll lines.

In large numbers of these competitive, dual exchange situations, the Bell Company was able to continue in business only because it afforded its subscribers long distance service.

The independent companies built some toll lines, but they were limited in extent and did not afford as much service as the public wanted.

Both the Bell and the independents lacked capital for a rapidly expanding business. The independents had to depend on local capital which was hard to get in sufficient amounts and so earnings went back into plant and often no dividends were paid; this in turn made it difficult to interest investors.

The parent Bell Company reduced its royalties almost to the vanishing point in competitive situations. Its investors were reluctant to put more money into a western subsidiary where competition was rampant and no dividends were in sight.

Neither side knew how hard up the other was.

This competitive situation continued for many years. There were towns with as many as three exchanges; one Bell, one Commercial Independent, and a Farmers Mutual.

In 1905 there were 147 Iowa towns with two exchanges.

During this period the public became fed up with these dual exchange situations. To get full service the subscriber must have two telephones; two directories to consult, the ringing of two bells caused confusion, and there were two

bills to pay. In no other line of business is competition such a nuisance and so intolerable.

Due to the public demand and to the economic waste, consolidations took place, starting about 1909. One company would buy out the other and consolidate the exchanges in a town.

In a general way, the company with the most telephones in a town would buy. It took several years to bring about results but in the end all but five of the cities and towns received unified service. In some of these places dual exchanges remain to this day.

These years of competition, bringing low rates, keen solicitation for business, genuine efforts to establish good public relations brought about a development of the business, a saturation point previously undreamed of.

RURAL, FARM PHONES

There was little development of rural telephone service until the advent of the Independent companies.

In the early days solicitation of farmers to take telephone service met with poor response. Many a farmer looked at the telephone just as the business man had done many years earlier and said it might be a nice thing to visit over, but that it had little practical value for him.

However, in the late nineties the telephone was in much more general use in the cities and towns than ever before and a rapid development of rural service took place.

Often the telephone company encouraged groups of farmers to build their own rural lines up to the city limits and there the exchange owner connected and did their switching for a low fee. Such farmer-owned lines are called service station lines or switchers.

The exchange owner was prompted to encourage the farmer to build his own telephone lines because of difficulties in financing; the farmer became interested because he

could furnish part of the labor and keep down first cost and get a switching rate that was much lower than the regular rental.

Most of this sort of development took place during the days of dual exchanges; when the farm line contract expired there was intense rivalry between the two exchange owners to secure the new contract, not because of the revenue it brought in, but because of the influence on the town subscribers.

Hundreds of country schoolhouse meetings were held on these contract renewals; the Bell man and the Independent were given an opportunity to present their arguments and quote switching rates.

This rivalry ended with the passing of the dual exchange situations. There are many of these lines in service today; perhaps 3500 or 4000 of them.

Slowly, gradually, these service station lines turn to the exchange owners to furnish them complete service. In the majority of cases, obviously, farmer-owned lines will not be well maintained and when the time comes for complete rebuilding, the service station line often says to the exchange owner—"You take over, you're in the telephone business."

Some of the early farm lines used the top wire of the fence as a conductor; sometimes they insulated it, often not. Glass bottles were sometimes used as insulators. Often two by fours were used to raise the wires sufficiently high for clearance at gates and highway crossings.

For several decades census figures—we have two sets of census figures; the general census taken every ten years, and the electrical census taken every five years, the last one in 1937—have shown that Iowa has more farm telephones per hundred farms than any other state. The highest saturation was reached in 1920 or soon thereafter; eighty-six telephones per hundred farms.

The depression days of the early twenties brought about a moderate loss of farm telephones, then came gains but

not enough to offset the losses. The depression of the thirties brought about a big loss of farm telephones from which there has not been complete recovery.

Many a telephone man soliciting a former farmer subscriber has been able to prove that the use of the telephone would result in a dollar and cents saving, only to be told by the farmer — "But I want to drive to town."

Will this situation change now that we have a rubber and labor shortage and greater need for conservation?

Prior to 1930 every year had seen an increase in the number of telephones in service. Depressions brought about a slowing down but not a stoppage of gains; but from 1932 to 1935 there were material losses of telephones. So the idea that the telephone business was depression proof was shattered.

Up to the late nineties telephone property in the state was assessed by the Executive Council, and taxes were paid to the state, and went into its general fund.

Then the law was changed. The property was still assessed by the Executive Council (by the Tax Commission after its formation); then the average value per mile of line ascertained and this valuation certified out to the county auditors, and by them spread into the districts where the pole lines are located. Taxes are then paid at the prevailing millage rates.

Telephone wires are used for other communication purposes than talking; much of the leased wire telegraph services are over telephone wires, such as press and brokers circuits and teletypewriter service.

The broadcasting networks connect their stations with leased telephone wires.

March 2, 1942, the War Production Board issued an order "To Limit the Use of Scarce and Critical Materials by the Wire Telephone Industry."

Some of the provisions of this order are:

Discontinue the conversion of manual offices to dial offices, or the conversion of one type of manual office to another type.

Discontinue the replacement of existing wall and desk types of subscriber's instruments with hand sets, except in any instance where any such subscriber's instrument is beyond repair.

Discontinue the installation of extension telephones in residences except when such extensions are necessary for the use of those charged with responsibilities for the public health, welfare or security.

Employ party-line service in those instances where party-line installation will conserve scarce and critical materials.

Discontinue replacements or additions to existing plant for the betterment or relocations of such plant, except to replacements essential to the maintenance or protection of service.

This conservation order of the War Production Board is, perhaps, only the first step in the curtailment of telephone service for civilian users due to the extreme and ever growing shortages of copper and other scarce metals and materials.

The next telephone service curtailment order may be more drastic and stringent and may impose some degree of actual rationing of telephone service to civilian users who are not connected with or important to war effort.

Up to the time of this writing the telephone companies have had a low priority rating for materials and supplies needed for maintenance and repairs and no priority rating for plant additions and extensions, unless connected in some way with war work. This condition prevails in spite of the fact that in this modern world the need of good communication service to facilitate war and defense efforts, civilian defense, public morale and everything connected with it, seems to be recognized by all.

Five hundred and thirty-eight companies operate 935 exchanges in Iowa and serve over 555,000 telephones.

In point of saturation, Iowa stands fourth among the states. Only California, Illinois and New York have more telephones per hundred of population, and in rural development Iowa ranks highest.

—Charles C. Deering, secretary-treasurer of the Iowa Independent Telephone Association since 1913, has been active in telephone work since 1898. He is also the son of one of the leaders in the development of the independent telephone system in Iowa.

A RADIO PIONEER

WOI - AMES, 1923-1940

BY A. G. WOOLFRIES

Iowa State College was actively engaged in the radio field for many years before the advent of broadcasting. The Electrical Engineering Department, under Professor F. A. Fish, maintained a highly efficient amateur station operating under the call letters 9YI. This station was in operation prior to 1914. The 240 cycle note of the synchronous spark transmitter was well known throughout the middle-west before the beginning of voice transmission.

When the first regular broadcasts from KDKA had demonstrated the possibilities of this means of communication, the Electrical Engineering Department determined to construct a broadcasting station. Mr. Harmon B. Deal, a graduate of Massachusetts Institute of Technology, was chosen to supervise the project. He was assisted by one of the engineering students, A. G. Woolfries, later chief announcer of the station. Early in October of 1921 work was begun on a fifty watt set—a "super-power" outfit for the time. Plans were later changed to increase this output to 100 watts. With this power, the transmitter first went on the air the evening of November 21, 1921, using a wave length of 375 meters and the call letters 9YI. The following April (1922) the call WOI was assigned by the Radio Division of the Department of Commerce.

Almost immediately upon its inception, the station inaugurated a schedule of service reports consisting largely of weather forecasts and livestock market news. The forecasts were sent by commercial wire from the United States Weather Bureau. The market reports were copied from a long wave code broadcast by NAJ, the government station at the Naval Training School, near Chicago. This service from NAJ was continued for nearly three years,

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