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THE TELEPHONE—A COMING INDUSTRY

An Address by Mr. Arthur W. Page,
Vice President of the American Telephone &
Telegraph Company: Mrs. Langbourne Williams Presiding

Mrs. Williams

In the name of the Junior League, I take great pleasure in welcoming the Bank of the Manhattan Company here for its fifth course of lectures. The subject of the first lecture is "The Telephone—A Coming Industry." The telephone business is a very important one for women to know about and understand since the telephone is such a vital part of every home. Mr. Page, the speaker today, is the son of our great war-time Ambassador to England. For many years he was editor of the magazine World's Work. In 1927, he became Vice President of the American Telephone and Telegraph Company, in charge of Public Relations. He is well qualified to interpret the telephone business to us.

I have the honor to present Mr. Arthur W. Page.

Mr. Arthur W. Page

As Mrs. Williams has mentioned my father, I think I ought to remind you of the well-known scientific fact that speaking is not a hereditary accomplishment.

The telephone business is in one sense a big business. The Bell System is perhaps the largest single corporate undertaking in the country. On the other hand, I think it is, in another sense, perhaps the smallest business in the country, for the great majority of services we render are rendered for five cents or less. The bulk of the business is made up of local calls and these small items are peculiar in that every transaction is an individual transaction and different from the one that went before. When you pick up the telephone and ask for COlumbus 5-7642 or any number, you want the exclusive use of a particular set of instrumentalities all the way from your telephone to the particular telephone you are calling. What is more, you want it very quickly. What you really ask for is that you may have the use of a telephone plant that may cost thousands of dollars. You want this plant made available instantaneously and you want the privilege of using it as long as you like. For this service you pay the established rate, which is five cents or maybe a less amount.

Or suppose you want to talk to Chicago or San Francisco. For this service much more telephone plant will be used, which in the latter case may

run up into million dollar figures. For this service also you pay merely the established rate, which is only a few dollars. When you are through using these long circuits they must be held in readiness for whoever may next desire to use them.

The picture I want to get in your minds is that ours is not a quantity production business, but it is one of individual transactions in each case. Somebody has to attend to your particular wants. It is a kind of tailor-made job. As it is that, you have to have a very highly organized and specialized group of people serving you, because they have to do their work correctly and rapdily. And so it is that the most important thing in the telephone business is not the buildings and the equipment, but it is the quarter of a million people that provide the tailor-made job according to the instructions you give them.

For that reason I thought I would tell you one or two stories about these people. One night two or three years ago, in the middle of winter, the operator in the small town of Potter, Nebraska, was sitting in the telephone building. There was a blizzard going on. About eight o'clock she heard an airplane coming from the east. Then it got overhead. Then it went a little to the west, but came back so that she could hear it again. That was unusual. She expected the mail plane about eight o'clock. It always came by at that time. But when it came back she suspected something was not altogether right. So she listened perhaps another thirty seconds to the plane overhead, and it did not go on its way. As she was alone she could not send for any help, but she remembered that there was a landing field some thirty-five miles further west at Sidney. So she called the landing field and described what was happening, and asked what she should do. The man at the landing field told her to call the Union Pacific section foreman at Potter and ask him to get out twenty-five or thirty men with red flares as fast as he could and put them around a nearby field. She did that, and about the minute the red flares began to appear the plane came down, hurtling out of the blizzard, and landed. The pilot was lost and the plane nearly out of gas. The operator's quick thinking had saved a life.

Another time there was, if you remember, a very severe flood in Vermont. Montpelier, the capital, was entirely cut off from all communication with the rest of the country. Nobody knew how much relief was needed, or how

much distress existed there, or what should be done about it. There was a section repair group of the telephone outfit that got up that morning and, realizing that a certain toll line into Montpelier was not working, they took a car out and started along the line to repair it. They could not follow it exactly because the valley was mostly under water. After twenty miles of struggle they got to the Wells River. There they saw the difficulty. The line crossed the Wells River ordinarily merely by the wires going from a pole on one side to a pole on the other side. But the river had risen so that it had spread over on one side twice its usual distance and washed out the pole. The wires were still there, but they formed a span covering what was ordinarily two poles, and out in the middle, over a raging torrent filled with logs and debris, the little wires which hold the telephone wires to the cross arms and the insulators had gotten crossed over each other, so that there was a short circuit, and that had stopped the service into Montpelier.

One of the men climbed the nearest pole, hitched his safety belt around the four wires that were left, and worked himself out on four copper wires some sixty feet, until he was right over the middle of the torrent. He knew as well as anybody, that if he fell, that would be the end of him. But he worked himself out there and cleared the four wires. Then a thing happened which he could not be sure would not happen; that is, one of the wires broke. He still had three, but that is a pretty small support to carry a heavy man. But he carefully turned himself around and hitched himself back on the three wires to the pole, cut in his instrument on a wire there, checked through, and reported to both ends that the world could talk to Montpelier and arrange for whatever relief was necessary.

Why do you suppose telephone people do such things? Nobody would order a man to do that. Nobody had ordered the girl to look out for the airplane. But they do it because they are filled with an extraordinary esprit de corps. You expect it in the war stories about famous infantry and cavalry regiments of the Black Watch and the Fifth Michigan Cavalry. But you get it in this crowd that work in the telephone business not only in emergencies but all the time. It is their game and their life and their pride, and they like doing it. That is the reason they do it well.

That spirit of service, as I say, is not only shown on extraordinary occasions. It is displayed by the telephone employees generally in the day-to-day business. Perhaps you can best appreciate this when I say that, due to this

spirit of service which carries a constant effort to do a better job, and also due to the study and research to improve methods and equipment, service today, as compared with ten years ago, shows continuing improvement. For example, if we relate these betterments to the large annual volume of exchange traffic we find there are one hundred and twenty-five million fewer calls with answers slower than ten seconds and approximately the same number of fewer calls with service inaccuracies.

From the public point of view you would not have noticed that because you very easily get used to things that are satisfactory, and you very easily assume that the thing should get better all the time. So it is a fact that a good telephone service must be a constantly improving one because, when you think of it in a detached way, that is really the public conception.

Sometimes the public's conception of telephony is like the public's conception of the efforts of most business, which reminds me of a girl who went to the ball game with her admirer. The home team got to be a run ahead and stayed that way until the ninth inning. Then the opposing team got three men on bases. There were two out and a mighty hitter at the bat. Then he hit the ball way out into the right field. The right fielder turned and ran just as fast as he could go. Just before the ball came down he jumped in the air and caught it with one hand, but lost his balance and fell. However, he kept the ball. The game was over and his side had won. Everybody rose and cheered and yelled. The girl's escort was frantically yelling. As he finally calmed down a little he realized the girl had not said a word. He said, "My lord, Anne, didn't you see what he did!"

She said, "Yes."

"Don't you know he won the game?"

She said, "Yes."

"Well," he said, "why don't you cheer?"

"Well," she said, "I thought that is what he was there for."

The instrumentalities that are operated by the telephone group are not foolproof things. To show you how delicate they are, I will tell you that the power in a 25-watt lamp is enough to carry 25,000 telephone conversations. Telephone facilities, in fact, have to be finely adjusted — not only the instrument which you occasionally drop on the floor, but the switchboards and wires and cables, and everything else connected with them. And in order to

got all this equipment so that it will work, and so that it will work between all points, an extraordinary amount of research and organization is essential.

When Dr. Bell had invented the telephone, and the Emperor of Brazil had seen it and made his famous remark, "My God! It talks," he was right. It did talk. It talked from one room to another. In a year or two it would talk from Boston to Cambridge. In eight years it would talk from Boston to New York if you had a voice that could be heard about as far as Providence. About 1892 you could talk about one thousand miles. By 1915 the telephone could take you to San Francisco.

This expansion does not just happen. You have to, as I say, work on one item at a time. When you have a discovery, the next thing is not universal use. Something may be proved to be possible from a laboratory experiment, but that is an extraordinarily different thing from operating it with sufficient speed and accuracy and low enough cost so that the public will use it. Take, for instance, the trans-Atlantic telephone which is common enough now. About 1915 there was worked out in the laboratory a system for giving this service. Then a group of telephone engineers stationed at Arlington, Virginia, spent months doing everything they could contrive to make other engineers sitting in the Eiffel Tower hear what they said. Night after night they carried on their tests and nobody heard anything. It was extraordinary that both governments thought this experiment so important that the American government loaned the Bell System the Arlington Station on this side and the French government in the middle of the war loaned the Bell System the Eiffel Tower for a certain period each night.

Finally, the engineers on the other side heard a historic sentence. It was, "Hello, Shreeve." And after that for twelve years a laboratory and engineering group of four thousand people made it a major undertaking to perfect that development. In 1927, we got to a point where we could open an overseas service. The service was first started between New York and London and the charge at first was pretty high, though we lost money just the same.

I remember the cartoon in Punch which had the usual picture of Uncle Sam on one side and John Bull on the other, and Uncle Sam said, "Hello, John," and John Bull said "Well, Sam, you said a pocketful."

Since 1927, the radio telephone has brought about sixty-five countries within voice reach of the United States. If you go back to the spread of the wires on the land the only limit now is the extent of land you have got, because

you can have a long distance wire if there is any land. The only limit on the radio telephone is the size of the earth, because you can talk around it, and around it twice, if you want to. But there are some limitations on the use of it.

I remember when the engineers were talking to Australia prior to opening that service. They asked me if I would like to talk. I said I would. I listened to one of them talking to Mr. McDonald. Then I listened to another one talking to Mr. McDonald. Then when I talked it was also to Mr. McDonald. So I said to him, "Isn't there anybody else in Australia who can talk on the telephone?"

"Yes," he said, "there are a lot of them, but they aren't fools enough to get up at five o'clock in the morning of the next day to do it."

So you see, there are not many hours of sunlight on that side of the world which are likewise business hours on this. There is some difficulty about it.

The telephone business is really divided into two main things — one is transmission, and the other is switching. Of course, the telephone would not be very much good to you if you had only your one wire from one place to another. It is the fact that you can be switched from your telephone to any one of perhaps 30,000,000 telephones in the world which makes the thing useful to you.

The first switchboard was in New Haven and had about twenty lines. Boys did the work of connecting these lines together. At first boys were used quite generally at switchboards for this work.

Well, now it is a long cry from that simple switchboard to the present switching system in an area like Northern New Jersey. Here, for example, with a dial telephone it is possible with very little manual assistance to connect to any number in your own town as well as to any number in the nearby towns. If the number called is in a manual office, the electrical impulses from your dial translate themselves into an illuminated number showing the number called. On certain calls electrical impulses representing the number desired are translated into a spoken number which tells the operator the number that you would have said if you had said it to her.

If we had continued to operate on the boy basis, it would have become an almost impossible task to recruit and to train the number of boys that would

have been required. Further, it soon became apparent that young women could do this work more efficiently and in a way more satisfactory to the telephone users. This change was made very early and has continued to the present day.

There is a thing in the telephone business which is quite different from most, and that is because it is a business of individual transactions there is no quantity production in it. The more of it you have does not mean the cheaper it is. In fact, if you had the practices now as they were in the beginning, you could not possibly afford to have a telephone system which could let you call any one of a million and a half telephones in New York. The economies of unremitting research have enabled you to get a vastly better and wider service. But they cannot produce the kind of economy which you get in a quantity production business. Yet the thing has been kept sufficiently cheap so that there are more than six times as many telephones in the United States in proportion to the population as there are in Europe, and the people use it nine times as much.

Without it, what we have now would not operate at all. I mean, the kind of living we do we could not do. If you had to send all messages by boys into a modern skyscraper the skyscraper would have to be entirely used up by elevators. So you could not have the concentration of business or population without the telephone; nor do I think you would have had the dispersal to the suburbs without the telephone.

The Bell System is organized with operating companies in each state, or in a group of states. The companies are then subdivided into divisions, districts, and finally exchanges, so as to give the individual employee the utmost responsibility. You have in each operating company a staff, and in the American Company a staff, and in the laboratory the research staff, and in the Western Electric Company, a concern for manufacturing standard equipment, another staff. So that behind all the exchange units is the maximum amount of information and assistance which it has been possible to get.

Those two factors--the apparatus, which is a very highly organized thing, and the group of people with the highest esprit de corps--are two of the main elements. The other element is the vision of the management. You do not hear a great deal of talk about that in most business, but the fact is that the ideals and objectives of a business do not grow up from the bottom; they are created at the top. If you will let me, I will tell you of three or four instances of this

idealism, which is primarily responsible for the thing being in the shape it is now.

When the present headquarters company was organized, about nine years after the invention of the telephone, in its charter application was put the following objective. You will have to excuse me for reading a part of this, because it takes almost all of the romance out of it. It was written by a lawyer. This is what it says:

> "And it is further declared and certified that the general route of the lines of this Association, in addition to those hereinbefore described or designated, will connect one or more points in each and every city, town or place in the State of New York, with one or more points in each and every other city, town or place in said State; and in each and every other of the United States and in Canada and in Mexico; and each and every of said cities, towns and places is to be connected with each and every other city, town or place in said States and Countries, and also by cable and other appropriate means with the rest of the known world as may hereafter become necessary or desirable in conducting the business of this Association."

When that was written, there was not any cable for telephones. There was no way of talking more than two hundred and fifty miles. So that the statement about "appropriate means" was a complete shot in the dark. But the pioneers had faith. I do not know how they had so much. Whenever I read that prospectus I cannot help thinking of the story of the old farmer who watched the rabbit in the hat trick. He and his wife watched the prestidigitator take a handkerchief out of the hat, and then they watched him take a rabbit out of the hat. Then he had the platform cleared and said he was going to take an elephant out of the hat. The farmer leaned over to his wife and said, "Mary, that is a good trick, even if he can't do it."

Well, these people did not know how to do it, but it was finally done.

The first part of the history of the telephone company was taken up with an effort to license people in different parts of the United States to set up telephone companies under Dr. Bell's patent. About half the activity was engaged in fighting patent suits. It was not very long after the Bell System had won them when enough of the patents ran out so that anybody could go into

the business. Almost everybody did. Many towns had two telephone companies, and half of your friends might be on one system and half on the other.

There was a dreadful state of confusion. This was based upon a very profound belief in the American mind that no matter what else happens competition is a good thing. Mr. Vail became President of the American Telephone and Telegraph Company with this condition existing. His objective was stated as "One policy, one system, and universal service." In other words, he was going to convince the American public that as far as the telephone was concerned their fundamental beliefs in the value of competition were wrong. That was a large order. It took him a good many years to do it. Now, the fact that he succeeded in doing that--he had the correct vision to begin with, and he succeeded by painstaking effort--I think is one of the great reasons why you have a real telephone system in the United States. In other words, it was an idea that was important.

He also was the man who was insistent that no matter what happened you had to push the long distance service; you had to have a nation-wide service. It was not easy, but he kept at it, and he kept the research people working at it. He had a great boost in the calamity that happened when Mr. Taft was inaugurated, for you remember there was a blizzard that cut off Washington from the rest of the country. While he had at that time open wire lines to Washington, he insisted that from then on we should have safe lines to Washington. There was not completed then the research to enable you to put telephone wires in cables. That was completed in his time. At present, more than 90 per cent of the millions of miles of telephone wire in the United States are in protected cables so that they cannot be hurt by a storm.

Mr. Vail died April 16, 1920, shortly after the War was over. He had resigned as President the year before. There were about twenty-five thousand members of the Bell System in War service. These twenty-five thousand were mostly in the Signal Corps. Not only were a large number of employees in the Army and Navy but a great part of the material which had been manufactured for use in the Bell System was likewise sent to France. As a result of the transfer of men and material to War activities, the telephone organization in the United States itself was depleted and when the great pressure of the boom came on it immediately after the War, there was a tremendous problem created because the telephone business, like other traffic, is very bad when it jams. Mr. Thayer,

who followed Mr. Vail between 1920 and 1925, recreated the service and set it again upon a high standard.

In 1925 Mr. Gifford followed Mr. Thayer. From that time until this the ideal of the founders of the Company has been fulfilled in that practically all telephones in the world are now connected with the Bell System "by wire and other appropriate means" as the charter stated. But to my mind, more significant than that accomplishment is the statement of policy which Mr. Gifford made before a Convention of the National Association of Railroad and Utility Commissioners in 1927:

"The fact that the ownership is so widespread and diffused imposes an unusual obligation on the management to see to it that the savings of these hundreds of thousands of people are secure and remain so. The fact that the responsibility for such a large part of the entire telephone service of the country rests solely upon this Company and its Associated Companies also imposes on the management an unusual obligation to the public to see to it that the service shall at all times be adequate, dependable and satisfactory to the user. Obviously, the only sound policy that will meet these obligations is to continue to furnish the best telephone service at the lowest cost consistent with financial safety. This policy is bound to succeed in the long run and there is no justification for acting otherwise than for the long run.

"It follows that there is not only no incentive but it would be contrary to sound policy for the management to earn speculative or large profits for distribution as 'melons' or extra dividends. On the other hand, payments to stockholders limited to reasonable regular dividends with their right, as the business requires new money from time to time, to make further investments on favorable terms, are to the interest both of the telephone users and of the stockholders.

"Earnings must be sufficient to assure the best possible telephone service at all times and to assure the continued financial integrity of the business. Earnings that are less than adequate must result in telephone service that is something less than the best possible. Earnings in excess of these requirements must either be spent for the enlargement and improvement of the service furnished, or the rates charged for the service must be reduced. This is fundamental in the policy of the management."

In other words, this business which has a million security owners, a quarter of a million workers, and which has almost all of the population as customers, is a trustee business. There have been no great fortunes made in it; there is no speculation in it. It is a trustee business which we hope in the long run will deserve your confidence so that people here will look upon the telephone as people in England have looked upon the Bank of England--that is, as a trustworthy service which gives you the best that is possible.

MRS. WILLIAMS: Mr. Page has very kindly consented to answer any questions that anyone in the audience may like to ask him.

MR. PAGE: I have been asked whether we expect the telephone to be superseded by something else, for instance, such a thing as radio. I do not. You know, science did not proceed in an orderly manner. The first thing that should have been discovered is radio, which is a simple process of sending signals in every direction. Then, if science had been logical, it would have found a way to direct sound waves in a particular direction from one point to another instead of in every direction. That would have been the discovery that wires were the best means of doing this. Nowhere on land does the radio do it as effectively or really as cheaply as it is done by wire. And that would have been apparent to everyone if the discoveries had been made in the proper order. Added to that, so far as we know, there are not nearly enough radio channels to take care of over-land telegraph traffic, not to mention telephone traffic. We use radio-telephone across the sea. The reason for that is that we have no wires across the sea.

QUESTION: Can you give us a comparison between the telephone in England and the telephone in the United States? In England, I understand the telephone is owned by the government.

MR. PAGE: The telephone is owned by the government in perhaps most of the countries in Europe. The development in Europe as a whole is about a sixth and the use about one-ninth of what it is here. I do not believe in government ownership and operation. But the whole difference does not arise from the difference between private and government operation. Part of the difference is the fact that they are very small countries, telephonically speaking, separated by barriers, and the different administrations are naturally coordinated under one head. Then there is also a difference in the habits of the people. So you have to get the French and the Germans to agree to what happens across the line, and vice versa.

QUESTION: What part of the telephone revenue goes out in State and Federal taxes?

MR. PAGE: I should think between $80,000,000 and $90,000,000.

QUESTION: What percentage of it?

MR. PAGE: About nine per cent.

After all, on that tax question again, we expect to pay taxes if all the country is going to be taxed. That is all right with us. But it is not a matter that so much concerns us as it concerns you. We cannot pay the taxes unless we get the money. If you want us to pay $85,000,000 or $90,000,000 taxes for you, and you wish us to pay the cost of collecting them from you, and giving them to the Government, that is perfectly all right. As a Company we have not objected to taxation except where we were specifically singled out to pay an undue burden.

QUESTION: What is the expense in England to the owners of telephones in comparison with this country?

MR. PAGE: I have been asked the comparison of rates in England. That is very difficult, because you know the telephone rates vary according to the kind of service, not only here but there. In general, the British rates are not very different from ours. On the other hand, in this country a telephone operator's wages will buy very much more telephone service than it will in England. The government service just about pays. And they keep their books very accurately. But they have not extended the service. You see, what they have now is what we would call the cream of the business. They have not pushed it out to a maximum development.

QUESTION: It seems to me you have a very expensive initial investment. However, you get back all your initial investment with the thousands and millions of telephone calls. Then why does it not become a quantity production?

MR. PAGE: When you add another telephone to New York you have added a much more expensive thing than if you add another telephone to Potter, Nebraska, because in New York you have to allow for trunks between every exchange in the city, so that any telephone can reach any one of the million and one-half other telephones; whereas in Potter you have to arrange to reach only another hundred or so.

QUESTION: Will you please tell us about television?

MR. PAGE: Television is in the class with those inventions which I said had not been developed to a point of commercial use. We had television operating between two buildings in New York five or six years ago. But I think we are just as far from having any practical use for it as we were then.