The Kingsbury commitment (when Vail first started suggesting the concept of "natural monopoly")Mueller (page 92), resulted in swapping of properties and a "dual system". That period seems key to setting the stage for an ultimate take over.
The Graham Willis act repealed the Kingsbury provisions, which lead to Bell acquiring massive portions of the market more easily. (By the time the Communications act of 1934 was enacted Bell had 85% of market share)
At first glance it looks as though the period in between Graham Willis 1921 and the Comm act of 1934 were the crucial years in which Bell solidified its status as a regulated monopoly.

However, I postulate that because the movements for serious investigation and re-regulation of the telephone industry leading up to the Comm Act of 1934 were all shot down, it was the Comm act of 1934 that was paramount as a "defining moment" for the Bell monopoly. The act said in effect, the government accepts the concept of Bell as a natural monopoly and will regulate it as such despite allegations of "prolific abuses" (Splawn report)

See (provision Sec 221 *Special Provisions Relating to Telephone Companies)* (Paglin 749) which is taken from ICC guidelines modified in Graham-Willis.

In other words, it seems the act was a rubber stamp of approval for Bell's "special regulatory privilege"(Paglin page 837) when the rest of the telecom industry was subject to guidelines of section 314 "The Preservation of Competition in Commerce" (Paglin, page 25)

It is written that "AT&T lobbyists worked extensively behind the scenes to kill rate fixing and competitive provisions (of the act) and garnered a majority of the committee against it" (Paglin 46)

In response an enraged Dill introduced legislation authorizing investigation into Bell's;
1. Financial structure
2. Methods of competition
3. Discriminatory practice
4 Suppression of patents
5. Refusal to sell equipment to competitors
6 the extent to which local subscribers has borne the cost of R&D for motion picture and radio
7. Failure to reduce charges during a period when the market price was falling
8. Exorbitant salaries for management
9. The methods of propaganda for, financing of and involvement in political realms suiting Bell's cause
10. The DOD-Bell-Western Electric relationship including many patent sharing issues that served an unfair advantage to Bell.
(Where the Water Falls 190-93)

After much pressure from lobbyists and others in the Congress Dill backed off the resolution despite it being passed :
"Senator Dill explained on Senate floor that Mr. Gifford (ATT President) had been 'insistent that it would wreck the telephone companies business and make it impossible to do business and painted a very black picture'" 78 Cong. REC 8824 May 1934)

What is particularly interesting is that Walker used that resolution to commence an investigation that became known as the Walker report (1939), which was used as late as the 1960-'s when MCI was entering the market and anti-trust was being invoked.

When it was indicated the Senate was about to ask for the prosecution of Fall, Doheny and Sinclair, Fall took the Fifth Amendment. Owen J. Roberts, a noted lawyer in Pittsburgh and Atlee Pomerene, a former Ohio senator, convicted Fall, Doheny and Sinclair. They served their terms in the penitentiary, but always maintained that they were innocent of any intent to commit a crime.

Writing the Radio Law

My writing the first radio law of 1927 was entirely unexpected. Here's how it happened. Two high school boys in my state, one in Wenatchee and the other in Waterville, wrote me letters in December 1925 complaining that the American Society of Composers Authors and Publishers (ASCAP) demanded they pay a fine of $250.00 for each phonograph record they had played on their amateur radio stations because they had no license, and asked for help. I had never heard of ASCAP, but replied I would investigate.

A few days later Charley Hart then special Washington correspondent for the Portland Oregonian asked me if I would like to have a story out home about myself. He was the same Charley Hart who had given me my first job 17 years previously back in Spokane on the Spokesman-Review. When I asked "About what?", he said the Oregonian was operating an experimental radio station in Portland and a few nights previously a singer at the Pantages Theater sang two songs over the radio and that now ASCAP demanded $250.00 for each song. I recalled the letters from the two boys and asked "What can I do to help?" He replied "Here is a 13-word amendment to the copyright act that will protect against such fines." It read, "Provided, that reproduction by radio shall not be considered as reproduction for profit." I knew these stations were not operated for profit so I introduced the amendment. It seemed so fair and proper that I thought I would have little difficulty in passing it.

I then had no information of what had developed regarding this subject all over the country where new radio stations were being built and rushed into operation and were using copyrighted music controlled by ASCAP. I did not have the least conception that I was injecting myself into the middle of the radio-ASCAP fight. But I didn't have long to wait.

The second morning after I had introduced the amendment, a group of representatives of broadcasting stations from Baltimore, Philadelphia, Washington, New York and Chicago, came into my office. They were enthusiastic for the amendment. They said they had been walking the streets, trying to think of some kind of legislation to protect the stations that could not afford to pay these tremendous ASCAP fees, and that out of a clear blue political sky, as it were, had come this amendment that was a complete solution. More than that, they said, it was introduced by me, a senator whom they hardly knew was in the Senate. They wanted to know if they could have hearings on it. I explained that I would be glad to ask the chairman of the patents committee to hold hearings, and urged them to see him also.

The second morning after that some leading musical members of ASCAP came to my office. They were a group of the important musical men from New York, mostly from Broadway. John Philip Sousa began by asking, "Why do you want to deprive us of our livelihood?" And Jerome Kern asked, "Do you own a station, or have you been an attorney for a station?" When I explained that this all came about as a result of those two songs that had been sung over the experimental Oregonian station, and that it was run purely for the entertainment of the people in the Northwest, and that the station made no profit, Gene Buck said, "This is only the beginning of trying to take away our protection."

I also told them about the two boys who had written me letters saying that they were ham operators in small towns in my state, and that ASCAP had demanded $250 for each phonograph record they had played over their ham radio stations. Sigmund Romberg said they wouldn't bring action against boys like that, and Ira and George Gershwin and others of the group agreed.

I told them that when I introduced the amendment, I had no conception of how far reaching it would be, and that I was certain we could change it so as to cause no particular loss to the members of ASCAP and yet would free the users of their music who were making no profit from such use.

They said that they wanted to present witnesses at the hearings, and invited me to attend the musical program they were going to give at the National Press Club for its members, without any charge. I learned later that they caused their

members to write personal letters to all of the members of the Patents Committee, protesting the adoption of my amendment.

Those hearings were the beginning of my long contests in Congress on this subject. I proposed to exempt only the amateurs and non-profit broadcasters, but had no success. During the hearings I realized the need for a new radio law.

I had learned as a Congressman and Senator, if a member knew more about a certain subject of legislation than any other member, they would not only listen to him, but would soon consider him a leader of legislation on that subject. So I decided to write a radio law.

I began by contacting the radio engineers connected with the Bureau of Standards and talking with radio broadcasting people whenever I had the opportunity. I was soon convinced that the country needed a new radio law badly but could I write it?

I was in somewhat the same position as Senator John Kennedy said he was when he considered running for the nomination for president in 1960. He said he reviewed the different democrats who were being talked about for the nomination, and none of them seemed to have outstanding qualifications much greater than himself. So he said to himself, "Why not?" and made the race and won the nomination. Just so, I regarded the writing of radio legislation. No other senator was even mentioned or qualified to write this law. Every senator with whom I discussed the subject said he knew nothing about radio except we needed legislation to regulate the granting of licenses, and urged me to go ahead and prepare a bill.

Under the court decisions, the Secretary of Commerce was compelled to issue and renew licenses under the law written for controlling ship to shore radio. The interference of stations was bad everywhere and getting worse. The people were demanding new legislation.

Writing the 1927 Radio Law

Wallace White of Maine was considered the radio expert of the House. He was chairman of the House Commerce Committee. He had introduced a bill to place radio regulations under Mr. Hoover, the Secretary of Commerce. I examined his bill. It authorized the Secretary of Commerce to grant all radio broadcast licenses, to allocate wave lengths to different uses,

and to reserve bands of frequencies for new uses that might develop.

I disagreed with many of its provisions. I was opposed to authorizing Mr. Hoover to have all these powers. He would not be able to handle the work personally. Under this plan the nation would soon have a bureaucratic system run by civil service appointees. The situation demanded the full time services of a number of officials. They should handle the work by divisions of experts on the different problems developing all over the country. I decided to provide for a commission of five members from five different sections of the country.

Both bills failed to protect fully against foreign ownership of corporations that might be issued licenses. Among other minor objections to White's bill was a charge for licenses. Since radio was to be free to the people, I thought licenses should be free to those who provided the programs.

White's bill was indefinite as to the basis for issuance and renewal of licenses. I prepared a clause providing that the commission grant and renew licenses as needed by the people, but wasn't satisfied with that. I tried a number of phrases. Finally, I decided to use "convenience and necessity," the basis provided by the Interstate Commerce Act for granting railroad franchises, but I wasn't satisfied with the language after the Senate passed the bill.

When I passed my bill, it differed in several respects from White's bill. This immediately caused a spirited public discussion as to the merits of the two bills. Senator James Watson of Indiana, republican chairman of the Senate Commerce Committee said to me, "Dill are you for or against Hoover as to this proposed radio legislation?"

I replied I had nothing against Mr. Hoover, but that I thought this new rapidly developing art should not be under one man, nor handled by department employees. Instead I favored an independent commission of men selected from different sections of the country to select experts for handling the new and rapidly enlarging uses for radio service.

"Then you're against Hoover," he said. "That's all I want to know. I'll appoint you chairman of a sub-committee to hold hearings on your bill."

The House passed White's bill and the Senate substituted my bill. The other conferees all said they did not understand the differences, so they appointed White and me to work out a compromise bill. We met twice a week for months and agreed on many provisions, but could not agree as to my commission plan.

I should add here that the one provision upon which we spent more time than any other besides the subject of a commission, was the clause stating the basis for granting and renewal of licenses. We both agreed "convenience and necessity" was not sufficient and proposed several other words. Finally one of us, and I'm not certain which it was, proposed to add "public interest" and after considering the broad discretion this would give whoever granted or renewed the licenses, we decided on "*public interest*", so the clause as finally adopted read, "public interest, convenience and necessity." These words would empower the Commission to limit the amount of advertising, prohibit programs that it decided were harmful to the public as a whole, and to refuse to renew licenses of those who disregarded its rulings. Radio broadcasts were going into the homes of the people. The words, "public interest" were agreed upon as the protection to the public against abuse of the privilege to use a frequency and were not a violation of the rights under the First Amendment. One newspaper editor wrote, "It is the people's Magna Carta of the law," and Congress and also the Supreme Court so considered it in the "Doctrine of Fairness" rule.[3]

We believed then, and now after more than 30 years of experience, I am sure no better words could have been used. "The public interest" demands the protection of the listeners. The Commission can apply it as new problems arise.

When we returned in December, I was more determined than ever that the new law must provide for creation of a commission. Having been a newspaper man, I knew news. White had continually refused to discuss developments in our meetings, while I kept repeating the need of a commission and explaining how much more efficiently a commission would carry out the provisions we had agreed upon as new and unforseen developments came in the uses of radio.

[3]In Red Lion Broadcasting Co. v. FCC, 395 U. S. 367, the Supreme Court approved the Commission's so called Rule of Fairness, by which it requires stations that permit one side of a controversial question to be heard to give equal time to the opposition. The law does not so require, but the public interest is best served by this requirement.

After weeks of meetings, in which we agreed on every other provision for a new law, including the granting of licenses without payment of fees and the "public interest, convenience and necessity" clause, White offered a compromise provision to create a commission for one year to make the regulations, allocate wave lengths for different uses, and fix bands of frequencies for future uses, after which control would be under the Secretary of the Interior with the commission to act as an appellate body. I insisted all existing licenses be terminated within six months and the commission grant all new licenses and all renewal licenses during that year, and White accepted my proposal.

White defended his concession by pointing out that the commission would become an appellate body after one year. I pointed out that five men representing different parts of the country would make rules and regulations for granting licenses and operating the stations, and stated I believed the commission would prove so valuable that Congress would continue its control at the end of the year. In my own mind, I was certain I had my foot in the door of regulation by a commission, and the opposition would not be able to prevent its permanent full control of radio regulations in the future. The law became known as the Dill Bill, because it created the radio commission.

White had little difficulty in having the House adopt the conference report. I had a series of contests in the Senate. Under the rule, I called it up in the what is termed, "the morning hours," which ends at 2:00 p.m.[4] Some senators feared licensees would acquire vested rights in the wave length they used. I pointed to the requirement that every applicant must sign a waiver under oath not to claim any right in a wave

[4]Sol Tashoff, now publisher of Broadcasting, was one of the most active radio reporters. He circulated typewritten stories. Senators who read them became boosters of my bill, because they understood it. William E. Borah had criticised my bill, but declined to appear at hearings and later supported it. Albert Cummings an expert on railroad matters filed an amendment to declare radio stations common carriers. The broadcasters descended on this proposal as buzzards on a dead carrion. They had induced the committee to leave this out of the original bill, so that he withdrew it without a vote.

length beyond the terms of his license, and that the President was empowered to close any station if he decided it was endangering national defense.

Some believed the law should declare the United States owned the air. I explained that ownership of the air could not prevent radio signals from passing through the air. The government must control the equipment that broadcast the signals. Others insisted the only safe method was government ownership and operation of all radio stations as done by every other government in the world at that time. The opponents forced six roll calls on amendments with instructions to send the bill back to conference to make changes proposed, but the Senate sustained the report against every attack.

After all such attempts had failed, Cole Blease, a senator from South Carolina, attacked the report because it would deprive each state of the right to control radio within its borders. This was manifestly so improper many senators left the chamber as he talked on and on. When he finally sat down, Vice-President Dawes said quickly, "The question is on adoption of the report. All in favor say Aye." The chorus of Ayes was strong. When he said, "All opposed say Nay," Blease was the only one voting Nay, and Dawes declared the report adopted.

Dawes had presided almost every day during the contests over the conference report. As some other senator took the floor, Dawes motioned to me to come to the rostrum. When he shook hands, he said in a low voice, "I congratulate you on the adoption of the report and also on the bulldog tenacity with which you held your ground and licked all your critics because you were so well informed they couldn't shake you. Come into the office."

In the office he said, "I like your new law because it permits privately owned radio stations." I replied, "Yes, it will bring millions of dollars for research to develop radio and turn American scientific initiative loose in the laboratories. Within 10 years we will lead the world in every kind of use of radio." Then I added, "And I'm one of the dangerous, radical senators, too."

"I've been thinking about that as I watched you handle this bill on the floor," he replied. "What impressed me most was how you repeatedly defended your position by references to the Constitution as the basis for certain provisions. I've about made up my mind that when one of our Senate radicals is given responsibility of writing legislation he quits agitating and bases his position on the provisions of the Constitution that apply to the particular subject, so we need not worry about him." I replied, "We are a part of His Majesty's Loyal Opposition."

Traditions of the Senate

I thanked him and, as I walked back to the office I recalled how he was known as "Hell and Maria" Dawes in the war, and that on the first day he presided as Vice-President, he had overridden the long established custom for 140 years of swearing in the new senators by having them escorted to the front of the chamber by their fellow senator of the same state, one by one, and sworn in in groups of not more than three. That first day he had shouted at the waiting senators-elect to come forward and all be sworn in at once. Two years later he accepted the established practice of swearing in only two or three at one time. He too, had succumbed to that something known as tradition in the United States Senate, that ever seems to hover over the members of that body.

History records that members of the Senate have seldom seemed to disregard those traditional customs which gentlemen will observe at all times. While I was there, Huey Long of Louisiana was the only member who stooped to political abuse of a fellow senator, and he too had ceased that practice before he was assassinated.

Members of the Senate are proud of their fellowship with one another. They respect one another for honest opinions and rely upon the integrity of one another in all matters that come before that body, so are uniformly courteous to one another.[5]

[5]As an illustration, while a House member I heard Boise Penrose, the brusque outspoken reactionary senator from Pennsylvania, pay tribute to Senator LaFollette, the fighting progressive senator from Wisconsin. I was talking to Senator Jones from my state in the Senate lobby, when another senator entered and said LaFollette had just made a wild statement in a speech about the railroads. He said to Penrose, who was reading a newspaper, "Do you think that's true, Penrose?" to which Penrose replied, "Of course it's true, Bob LaFollette wouldn't lie to the Senate."

Interviews with Coolidge

Following the battles I led in securing the adoption of the conference report, the newspaper reporters began referring to me as "the radio expert of the Senate." When senators repeated it, before asking how the new law could be applied to certain objectionable practices by radio broadcasters, I often replied I was like a one-eyer man among the blind — I could see a little bit. However, I studied every new feature in the rapid development of the art in so many places and so many unexpected ways that I was better informed on the subject than other senators.

The newspapers reported that President Coolidge might veto or refuse to sign the bill, because of the question of constitutionality under the commerce clause, and because Hoover had opposed the commission. White and I discussed the situation and agreed we better go to the White House to talk to him about it. I said, "You go first. You're a republican and know him better than I do."

I had called at the White House soon after Congress convened in December, 1923, to get acquainted with Coolidge. I had told him of my friendship with President Harding. I said, "He spoke highly of you, and urged I become acquainted with you." Then I repeated that Harding had said, "Mr. Coolidge is a man of few words, but has big ability. He will probably succeed me as president." Coolidge smiled and replied, "That was most kind of President Harding. Too bad it had to happen as it did."[6]

[6]Senator Porter Dale of Vermont told me he went to the home of Coolidge's father to see Calvin sworn in as President the night after Harding's death. A newspaper man drove him there. It was so dark they couldn't determine which by-road led from the main highway to the Coolidge home, so they stopped at a farm house and Dale went to the door. An old farmer answered his knock. He held above his head an oil lamp. When Dale explained that Harding had died and they were going to see Calvin sworn in that night, the old farmer's arm shot up full length above his head as he exclaimed, "Cal Coolidge president!" Dale said he would liked to have had a snapshot of that sight. Coolidge was in doubt as to the legality of his father, a justice of the peace, swearing him in as President. So they drove to a cross roads store to telephone the Chief Justice of the Supreme Court in Washington. It was a hot night, and while waiting for a connection they each drank a bottle of pop. Dale said he was reaching for his pocketbook when Coolidge laid down a dime and said, "There's mine." About midnight the father asked Calvin if they should go ahead, and Coolidge said, "You better shave." It was 1:00 a.m. when he took the oath.

I told him I was a farm boy in Ohio and had gone to the Northwest which was undeveloped and that we would be asking for certain legislation for our future development. He said, "I was a farm boy too. Tell me what your state needs. Maybe I can help."

When I went to see him about the radio bill, Congressman White had already talked with him. I had asked him to go first because he was a republican. I told Coolidge I hoped he would sign the radio bill, even though he might not approve all its provisions, because the country needed such legislation so badly. He asked just what my understanding was as to the commission. After I reviewed briefly our long struggle about the commission and had compromised by giving a commission full control for only one year, he smiled and said, "You bested him. If a commission is started here they always stay."

He said he had talked to White. "He's all for it, the Attorney General says it's constitutional and Hoover said I should sign it, and he's supposed to know more about radio than anyone else. Now you say sign it, so I think I will."

I thanked him and arose to leave. He said, "Wait a minute. I have to appoint five commissioners, I don't know anybody qualified. You've met such men in the hearings. Who do you recommend?"

I replied, "I'm a democrat and haven't thought about appointees."

"I must appoint two democrats," he answered. "It's not a partisan matter. It'll be hard to find qualified men. Glad to have your recommendation." I thanked him and told him I would talk with White and maybe together we could send him the names of some men for the commission.

I left the White House feeling flattered. When I told White he said Coolidge had made the same request of him. Coolidge signed the bill February 23, 1927, the day after I talked with him. We later sent names to the President, and two of them were the same. When Coolidge announced the appointments, he didn't name anyone that either of us had suggested. I told White that Coolidge was a much more clever politician than most people thought, and we both had a good laugh over how he flattered us.

Previous to that interview I had talked with him after his return from North Dakota where he issued his famous statement, "I do not choose to run." I told him I thought his decision was wise because while it would not have been a third term, it would have violated the two-term tradition. He replied, "I wasn't thinking about that so much. When I made that statement I had been here four years. When I thought about staying six years more, it was too much for one man to bear." When I replied I hadn't thought of that, he added, "I have been like a man in a tunnel with a load on his back. It was dark in there and the going was hard. Since I made that announcement I can see the light out there and the going is easier now."

Following the election of 1928, my brother, Walter M. Dill, came to Washington, D. C. from Ohio. I took him to meet the President. When I introduced him, I said, "Mr. President, you should appreciate our coming to see you because we are two men who voted against you and have come to congratulate you. You know there aren't many of us left in this country any more," and he laughed out loud. Then I remembered it was remarkable to have won such a complete victory when he had made only one speech, and won too despite the Harding scandal that hung over the administration. He said, "Had to be something bigger than myself that helped me. No man could do that alone."

During his regular term I had many conferences with him. On one occasion after I had explained a request for help, and he said, "I'll see what I can do." Then he asked, "You know Will Rogers?" and when I said I did, he continued, "He's a real humorist. You know that military fellow who stands beside me at White House receptions and introduces people to me. When Rogers came along and he said, 'This is Will Rogers,' and I held out my hand, Rogers stepped back and said, 'I didn't get the name'." Then Coolidge laughed and said, "Had him as a White House guest afterwards."

On another occasion after talking to him about some of my troubles in Puget Sound, and he had promised to see what he could do for me, as I started to leave the office, two white collie dogs were lying on the carpet. One of them came to me and I patted his head. Coolidge came to us and said, "You like dogs. The dog knows it. Come back, I want to tell you about

him." He talked several minutes about the dog. I told him I appreciated his taking so much time with me, but that he was belying the nick-name of Silent Cal which the newspaper boys gave him. He replied, "Never see in the newspapers the next day what we talked about."[7]

Tests of the Radio Laws in Court

An old proverb reads, "Let me write the songs of a nation and I care not who makes its laws." I can paraphrase that to read, "Let me tell what the laws mean, and I care not who writes them." We have so many courts and so many cases involving such a myriad of alleged wrongs, that different judges in widely different cases on similar subjects, make unexpected interpretations of our laws. Even the supreme court decides cases by five to four votes. A change of one judge sometimes brings reversal of former rulings in a new case.[8]

During the last one-half century the Commerce Department, the Radio Commission and the Federal Courts have placed interpretations upon the radio laws never intended or expected when we wrote them. The first radio law of 1910, simply provided for passenger ships carrying 50 passengers or more. The law of 1912, directed the Secretary of Commerce to issue station licenses, to fix certain bands of frequencies for the use of the United States, and forbade licenses for any frequencies that would cause interference with its stations.

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[7]He had told me on another occasion of refusing to make certain speeches when running with Harding in 1920. He said the campaign committee arranged a series of speeches to be made from the rear of a train which would make whistle stops in New Jersey and Pennsylvania. They had arranged to have Geraldine Farrar sing to draw the crowds. A few days before the trip, they informed him Teddy Roosevelt, Jr. would also speak from the train. "I told them, 'I'm not going'," he said. When I asked why, he said, "I refused to have two prima donnas along."

[8]Abraham Lincoln in his debates with Stephen A. Douglas for election to the Senate more than a hundred years ago simplified this most clearly. Douglas charged that Lincoln wanted to destroy the Supreme Court because Lincoln repeatedly attacked that court for the Dred-Scott decision. Lincoln's reply illustrated how directly and simply he could go to the heart of an argument against him. He said, "Judge Douglas is all wrong. I don't want to destroy the court. I just want to change some of the lawyers on the bench." Lincoln always called him "Judge", never Senator, although he had been elected twice to the Senate. This was a sly dig at Douglas, who was appointed judge soon after arrival from Massachusetts, but couldn't be re-elected.

Secretary Herbert Hoover's refusal to renew a license to Intercity Radio Company, because it would interfere with existing stations, caused the District Court of Appeals, on February 5, 1923, to order the license be granted.[9] The next year after the passage of the 1927 law, a Chicago station sought an injunction against the Radio Commission. It claimed ownership of the wave length because it had used it previous to the passage of the law. Both the district court and the Court of Appeals refused the injunction. The case was appealed to the United States Supreme Court.[10]

Taft's Refusal to Interpret the Radio Law

Charles E. Hughes, former Justice of the Supreme Court, who had resigned to run for president in 1916, wrote the appellant's brief. He argued that the use of the frequency had given the user a property right in the ether. This was a claim of vested rights in a radio frequency which senators had feared when we passed the radio bill. I was deeply concerned about it. I talked with Chief Justice William H. Taft. He was always so good natured and so friendly that I dared to ask him for a conference.

It was a Saturday morning. He was most cordial and asked me to come to his home. He took me to his study and I told him I desired to discuss the importance of a case from Chicago, then before the court. I explained that I had no personal interest in the case, and suggested that being a member of the legislative branch of the government, if I overstepped my rights in discussing the case, he should inform me and I would desist.

He chuckled and said he didn't think I would violate the proprieties and asked, "What's on your mind?"

I stated it was the White case from Chicago I wished to discuss, because the issue was whether or not the user of the wave length had acquired a vested right in it, and that therefore the Commission could not grant a license for that wave length to another or interfere with its use. "That was the big question in the Senate when I presented the conference report, and I assured the Senate such vested rights were impossible to secure.

"I have no desire to discuss the merits of the question," I said, and he asked, "What is your interest?"

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[9] See Hoover vs Intercity Radio Company, 206 Fed. 1003.

[10] See White vs Federal Radio Commission, 29F(2) 113.

"This is an entirely new question, never considered by courts in other countries, because the governments in all other countries own and operate all radio stations," I said. "I am anxious that the court give this issue special consideration." I stated I had understood it was customary for the justices to meet after the argument of a case and express their views and the majority vote determined the verdict. "This being an entirely new legal question, I want to suggest that in this case, the judges re-read the briefs and any new cases the attorneys may have cited, before they meet to decide the verdict."

Without responding to that suggestion, he said from his reading of the briefs he doubted the court had jurisdiction of the case. "If there is any way to avoid making a decision, I want the court to dismiss it," he added.

I protested that would be most unfortunate. I said, "Millions upon millions of dollars are being invested in stations and radio research. Is the law constitutional and does the court sustain the power granted the Commission to regulate the radio industry?" Then I asked, "Why do you desire to avoid making a decision on the subject? This is a new kind of commerce under the Constitution."

He interrupted me by saying, "I'm not certain that radio is commerce. There's a telephone on my desk. I can cut the wire and no information can reach me over that receiver. But these radio waves are different. They go everywhere. I can't shut them out. If a receiver is used, those waves come through the walls to it. I read that these radio waves go out in all directions. I can't see a radio wave. I can't hear a radio wave. Yet it is everywhere. Maybe that's commerce. I don't know. If I ever have to write a judicial decision about it, I shall need to get in touch with the occult."

I thanked him for his courtesy and he said he had appreciated my coming to discuss the subject.

When the argument was made in Court, I attended. The justices asked questions as to the details of how the case had gotten to the Court, and a few days later dismissed it on the ground that it had no jurisdiction. So the claim of vested right in the wave length was dead by the decision of the lower courts until the Supreme Court would act upon it in some future case.

It remained for Charles E. Hughes, as the attorney who had written the strong brief referred to, to write the first Supreme Court decision as to the constitutionality of the radio law, after Taft had resigned and Hughes had been appointed Chief Justice, as I shall explain in a later chapter.

As the author of the radio and communications acts, I want to say on behalf of Congressman White and myself and Chief Justice Hughes, that none of us, forty years ago, could have any conception whatsoever of how the greed for profits would subvert our purpose to give the American people the use of the radio waves in the "public interest," simply by over commercialization of programs.

This greed for profits has brought about such abuse of the privilege to use advertising to provide revenue for operation of stations that could not be foreseen. It has come so gradually that neither the Commission nor the courts placed sufficient limitations on the amount of advertising. The fact is that millions of radio and television owners simply refuse to listen to the daily routine of programs because of excessive advertising. It is objectionable to so many people that another group of business men have organized cable companies to supply radio programs with the advertising omitted, for which they charge a monthly fee. But this destroys free radio for the American people, which was one of the chief purposes of privately owned radio system created by the 1927 law.

Members of Congress recognizing the complaints of their constituents, have appropriated funds to subsidize and improve the programs of educational and non-profit stations. If the commercial licenses continue the practice of excessive advertising and especially the breaking into entertainment and news programs with multiple ads, which makes them more objectionable, Congress may order the Commission to reduce the number of frequencies and reduce the power for use by profiteering stations and to grant more licenses to non-profit licensees. If necessary, Congress may order the Commission to limit specifically the percentage of time of any program advertising and direct that ads be used only at the beginning and end of programs, with multiple ads forbidden.

If these seem drastic remedies, they may come because of the abuse of "the public interest, convenience and necessity."

Radio and television broadcasting are privileges granted by Congress, not rights owned by licensees, to be used without regard to the wishes and the enjoyment of the American people. They will insist that this most miraculous means of communication yet discovered and invented by man, shall not be degraded by commercialization to make uncontrolled millions in profits at the expense of the listening public.

Marvelous Radio and Television Programs

But not all of the results of great commercialization have been objectionable — far from it. Private ownership has brought tremendous investments in radio and television programs that government ownership would have been many years longer, if ever, in providing for the information and enjoyment of radio and television owners. They include great world events as well as national political conventions, and events of world wide interest. They include instantaneous reproduction by satellites encircling the earth and even of battle scenes in all parts of the world. They are free to all to look and listen.

Without the almost unbelievable development of the art, astronauts could not have gone to the moon and transmit their words and actions, and the scenes from where they land. The three nation-wide chains, NBC, CBS and ABC, that operate without any control by the Federal Communications Commission make such reproduction possible.

Services to the State of Washington

While giving much time and attention to radio legislation, that was a minor part of my work. The major part was to serve the state of Washington. Most of those activities again, were behind the scenes, just as most of the work on the radio law had been. I took particular interest in assisting Senator Hiram Johnson of California, the champion of Boulder, now known as Hoover dam. I favored the dam. It was a great project for the West. Its construction would be a precedent for building Grand Coulee.

I travelled to California and Arizona as a member of the sub-committee on public lands. Senator Hiram Johnson was chairman. On the train I said to him one night, "If you had taken the vice-presidency with Harding, you would be president now."

won those in the primaries and could control them. Other favorite son votes, were White of Ohio, 52, not enough to make 770; Traylor of Illinois had 40; Reed of Missouri, 27; Byrd of Virginia, 24; and Ritchie of Maryland, 23. He must have those 88 votes on the next ballot. Sam Rayburn was Garner's manager. Roosevelt men had tried repeatedly to induce Rayburn to throw those votes to Roosevelt.

Sam Rayburn's Great Service to the Nation and the World

I knew Rayburn well. I talked to him about it that morning of July 1. We had served together on the House Interstate Commerce Committee, and I was then chairman of the Senate Commerce Committee, and he, chairman of the House Interstate Commerce Committee. We agreed that Roosevelt must win on the next ballot or he would lose the nomination, but he still had hopes Garner could win. I finally said, "Sam, too many northern delegates just will not vote to nominate a southerner. If we don't nominate Roosevelt, Newton D. Baker of Ohio will be nominated. He has become a conservative democrat. Neither you nor Garner wants that," to which he replied, "We sure are not for Baker." Neither of us knew it then, but Rayburn stood at the crossroads of the nation's future that day. That night when he turned the Garner votes to Roosevelt, he performed his greatest service to his country and the world. He turned the course of history as no other man at that time could do.

At 5:30 p.m., Farley called a number of Roosevelt leaders together. He said, "I want this to be most confidential. Don't repeat it even to your wives. I am certain Rayburn and Garner will throw Garner's votes to Roosevelt on this next ballot. I want you men to know it now so you will hold your delegations solid for Roosevelt. We must not lose a single delegate."

Farley then said no deal had been made nor would be made as to the vice-president. He said several men in that room had been mentioned for vice-president and that personally he would be glad to see any one of us the nominee. "But we must all understand that if Garner wants the nomination for vice-president, we must give it to him." We did not know that the California and Texas delegations were having fierce caucus fights right then over switching to Roosevelt.

Senator Wheeler who had been talked about for vice-president, had asked me if I wanted it, and I had told him I had no

I had never heard the proposal, but said I would investigate it when I was re-elected. To my amazement, I learned two states had passed old age pension laws to pay $30 per month, and that the Labor Department was urging Congress to pay that amount in all states to abolish poor houses. So in 1929, I introduced the first federal old age pension bill.

The pension committee refused a hearing. The chairman said, "Why, Senator Dill, you aren't serious about this, are you?" and I replied, "I most certainly am. Our poorhouses become the human dumping grounds for every kind of human derelict, whose only crime is that they are poor. They are a disgrace to a civilized people." Other members said hearings would be a waste of time.

Two years later the effect of the depression was spreading over the nation. Several states had adopted an old age pension law, including New York. Some states whose representatives were on the pension committee had old age pension laws. The committee not only granted a hearing. They reported the bill. It failed to pass that session, but in 1933, the committee reported the bill and I passed it through the Senate by unanimous consent.

The House committee reported the bill favorably, although some southern members opposed it. When I asked Roosevelt to make it a "must" piece of legislation, he said he couldn't because he had included so many bills in the "Must List." He said, "If the House passes it, I'll sign it. If not, at the next session I'll propose legislation to cover not only old age pensions, but also providing a plan for monthly contributions by employees and employers to pay annuities after 65 to all retired workers." Then he added, "And I'll call on you to help pass it through the Senate." His plan became the Social Security law.

Communications Act

When the democrats took control of the Senate in 1933, I became chairman of the Commerce Committee. Following the passage of the Radio Law, radio broadcasters complained of high rates by the telephone and telegraph companies. President Hoover recommended placing control of telephone and telegraph business under the Radio Commission. Roosevelt also recommended such legislation. The Interstate Commerce Comcission (ICC) was authorized to regulate those companies, but

it had been too busy with railroad cases to do anything. In the 1933 session I conferred at length with Roosevelt on the subject and we agreed that Congress should create a new Communication Commission with power to regulate these companies. He said to me, "Not only should all communication companies be under the same commission, but it should have power to fix rates of the wire companies. This will cause a fierce fight, but don't let them frighten you or talk you out of it." I didn't realize then how right he was.

When I conferred with Sam Rayburn, democratic chairman of the House Committee on Interstate Commerce, he urged me to prepare the new legislation. He said he knew little about radio. I agreed to write the bill, but needed expert assistance as to the telephone and telegraph business.

My Commerce Committee had only three clerks then. So I conferred with Joe Eastman, chairman of the ICC, because it had had jurisdiction over telephone and telegraph companies. Eastman favored the change. He said, "We have not had time to consider telephone and telegraph problems."

Senator Smith Brookhart of Iowa had recommended Albert Stephan, an examiner for the ICC. I interviewed Stephan and was convinced he could do the job. When I asked Eastman to lend him for the work and he readily agreed, he said I should call upon any other employees of the ICC who could assist me.

The Committee authorized me to appoint a sub-committee with myself as chairman, to hold hearings and prepare the bill. When we reached the rate fixing provision, I soon learned the telephone lobbyists were strongly opposed to granting such powers to the new commission. They interviewed the members of the Committee one by one. They induced some democrat senators to try to influence me to drop the rate fixing part of the bill.

I recall Senator Alben Barkley of Kentucky, said, "Why don't you leave the rate fixing power out of your bill? We can add that next Congress." Senator Carl Hatch, New Mexico, said, "I wonder if it is worth making a fight over the rate provision on your bill at this time?" Even Robert Wagner of New York, said, "Maybe it would be better to leave out the rate making clause." Senator Ellison Smith of South Carolina indicated that it would be best to omit the rate making clause. All were

democrat members of the committee. James Couzens of Michigan was the only republican member of the committee who favored the rate making clause.

I soon realized that the telephone company would have a majority of my own committee unwilling to approve the rate making provision of the bill. Without the rate making clause, the bill would have no teeth. I decided it was not worth the effort I was already making, simply to pass a pro forma regulation bill. But I was on the defensive. I wanted to take the offensive so the telephone company would be compelled to explain its objectionable practices.

The Flank Attack on the Telephone Company's Rate Base

I was never a military man. Yet this was a battle and the telephone company had unlimited money and all kinds of publicity people to carry on this fight. I knew nothing about military tactics. However, in reading stories of military campaigns and of the battles themselves, I had learned a flank attack might win, when a frontal battle would be lost. My problem was to devise a flank attack that the telephone companies would fear more than a rate regulation provision in the new law.

I had been told that when the telephone company secured certain patents developed by the Signal Corps of the Army without expense, which made possible several conversations on a single wire with no interference, I was told the company had issued millions of dollars of additional stock on the basis of this enlarged use of its wires. But I had no proof. How could I learn if these statements were true?

I knew that any government department or private corporation under a congressional investigation was in a most difficult position. Senators and Congressmen and investigating attorneys are not bound by rules of evidence. They can subpoena any official or individual or records. They can make any charges or conclusions they decide upon and a defendant is helpless. If a witness refuses to answer, he may be cited and tried for contempt. I talked to Wheeler and Couzens about an investigation of the patent situation, and they both favored it strongly. Wheeler said, "You can count on my help." Couzens said, "I'm glad you're going after that crowd. You can rely on me." So I decided to introduce a resolution to investigate the telephone company.

I introduced Resolution No. 325 on April 25, 1934, which is printed in full in Volume 57, page 1382, of the Congressional Record. It reads as follows:

INVESTIGATION OF AMERICAN TELEPHONE & TELEGRAPH CO., ITS SUBSIDIARIES, ETC.

Mr. DILL submitted the following resolution (S.Res. 225), which was referred to the Committee on Interstate Commerce:

Resolved: That the Committee on Interstate Commerce, or any duly authorized subcommittee thereof is hereby authorized and directed to make a thorough and complete investigation of the operations, relationships, and activities of the American Telephone & Telegraph Co., its subsidiaries, affiliates, and other concerns in which it or they have any direct or indirect financial interest or in which any of its officers or directors hold any office or exert any control and shall report to the Senate the facts as ascertained and make recommendations for such legislation as the committee deems desirable.

In making said investigation, the committee shall, among other things, investigate and report particularly on the following subjects:

(1) The financial structure and relationship of the company and its subsidiaries and affiliates and the extent to which its holding company structure enables it to evade regulation or taxation; the extent of interservice contracts between the American Telephone & Telegraph Co. and its subsidiary companies, and particularly contracts with the Western Electric Co. and other manufacturers of electrical communication equipment, if any; also the sale prices of telephone equipment to telephone operating companies, the profits upon such sales, and the effect of such sales upon the rate base of operating companies when used as a basis for telephone charges in the various states; and the probable savings by telephone operating companies purchasing equipment under a system of competitive bidding;

(2) The activities of and expansion by the company and its subsidiaries and affiliates into fields other than telephone communication, including teletype service, telephoto service, broadcasting, motion-picture distribution, and the manufacture of electrical equipment;

(3) The methods of competition with other companies and industries, with reference to equality of service, reasonableness of rates, both local and long distance, depre-

ciation accounting practices, discriminatory practices, suppression of patents, method of accounting for royalties accruing on patents, sale, and refusal to sell equipment to competing companies, maintenance of exorbitantly high prices because of monopolistic control, and particularly the relationship of the company with Electrical Research Products, Inc., and its relation to independent motion-picture organizations, and its practices in the interests of the company;

(4) The extent to which local subscribers have borne the cost of the research developments for long-distance appliances, radio, motion-picture, and other inventions not related to the improvement of local service;

(5) The reasons for voluntary reductions in long-distance charges and the failure to reduce local charges during the past few years of generally falling prices;

(6) Its relation as an employer with its employees, and the extent of its reduction in number and wages of employees while maintaining exorbitant salaries for high officials and a continuous high dividend rate; and

(7) The methods whereby the company or its subsidiaries or affiliates or its officers or directors have sought through propaganda, or the expenditure of money, or the control of channels of publicity to influence or control public opinion or elections.

That the said committee is hereby authorized to sit and perform its duties at such times and places as it deems necessary or proper and to require the attendance of witnesses by subpenas or otherwise; to require the production or inspection of all accounts, books, papers, and documents; and to employ counsel, experts, and other assistants, and stenographers at a cost not exceeding 25 cents per hundred words. The chairman of the committee, or any member thereof, may administer oaths to witnesses and sign subpenas for witnesses; and every person duly summoned before said committee, or any subcommittee thereof, who refuses or fails to obey the process of said committee, or appears and refuses to answer questions pertinent to said investigation, shall be punished as prescribed by law. The expenses of said investigation shall be paid from the contingent fund of the Senate on vouchers of the committee or subcommittee, signed by the chairman and approved by the Committee to Audit and Control the Contingent Expenses of the Senate, not to exceed $25,000.

Some newspaper reporters mentioned the resolution but gave it little attention then or afterwards. Not so with the telephone lobbyists. They were all attention. What I am about to say here was never published. I didn't report it to anybody.

The second day after I introduced the resolution, the chief lobbyist and one of the New York telephone officials came to my office. "Why did you introduce that resolution?" and "Do you intend to try to have it passed?" they asked. I replied that I would press for its passage because I wanted the information the resolution covered.

"But why?" they repeated. I said, "I'll be perfectly frank with you gentlemen. Let's not pretend anything."

First I congratulated them on persuading democratic members on the committee to oppose the rate fixing provision, so I couldn't report the bill with the rate making clause. "You have won the opening skirmish of this battle, but not the battle itself," I said. "Since I can't report a bill with teeth in it, I'll proceed to let the American people know what the great telephone company has been doing to them. Then in the next session I'll pass the bill."

They left, saying they regretted my action, but appreciated my frankness. To my surprise two days later, Senator Daniel Hastings of Delaware, a republican member of the Committee, who had led the opposition to the rate making clause, came to my office. He was an able and aggressive Senator.

I expected him to say he would fight passage of the resolution and oppose me at every step if I secured an investigation. He surprised me as much as I had surprised the telephone company officials. Without any preliminaries, he began, "Dill, if we drop opposition to your bill, will you drop this proposed investigation?"

I looked at him a moment and replied, "I'll not agree to drop it, Hastings, but I'll say this: 'If you fellows let me pass this bill, I may be so busy preparing a good bill and getting it enacted into law, that I may not have time to make the investigation'."

He arose, smiled and said, "All right, go ahead with your bill." We shook hands. That ended opposition to the bill. I

never knew whether Hastings had conferred with the telephone people, nor whether he influenced them or they influenced him to let the bill go through without opposition. I was too pleased to inquire.

Passing the Communications Act

With the opposition ended, we proceeded rapidly to formulate the bill. On May 14, 1934, when I laid the bill before the Senate, I explained the assistance the committee had been given, particularly as to the provisions for regulation of the telephone and telegraph business. Mr. Eastman, as chairman of the ICC had more than kept his promise to lend to me the Commission's experts. They included in addition to Mr. Stephan, Mr. Porter, acting chief counsel, Mr. Stout, and ex-examiner of the Commission, and he, himself, reviewed the provisions as rewritten from the ICC law. In addition, Mr. Stewart, the chief communications official for the state department, and Mr. Boots of the Senate Legislative Counsel, gave advice that was most helpful. I stated to the Senate, "It is one of the most carefully prepared bills that have been reported for some time, at least by this committee." After questions by several senators as to certain provisions the Senate passed the bill without a single objection.

Two weeks later, the House Interstate Commerce Commission reported the bill with some minor amendments. Mr. Rayburn urged the passage promptly on June 2, 1934, and after a few hours discussion, the bill passed that same day without a roll call. A conference committee made a unanimous report a few days later, which both houses adopted and President Roosevelt signed the bill.

As for the investigation, I did not press for that. Congressional investigations are to secure information for preparing legislation. Anyhow, the Communications Commission would possess the power to fix rates and my resolution would necessitate full study of all matters relating to the basis for rates.

It must be said that more than 30 years elapsed before the FCC made any real regulation of the telephone company. It was a tremendous undertaking. During 1965, it found the value of the telephone properties had increased from $5,000,000,000 in 1935, when the law was passed, to $33,000,000,000. That was the value of the stock owned by 2,500,000 stockholders.

The outcry by stockholders against limiting profits was loud and long, but the FCC continued its investigation and in 1967 ruled that the profit should not exceed 7½% on the value of the properties. The company did not appeal. Rate reductions in long distance rates were ordered. The rate reductions in 1967 amount to 120 million dollars, 87 million additional in 1968, and 150 million dollars more in 1969, making a total of 357 million dollars in three years. Although new television licenses and new regulations took so much time, the FCC made only small reductions for 30 years, once the Commission got down to the work of fixing rates for telephone and telegraph companies, they seemed to be trying to give real protection to the public, without seriously interfering with fair profit returns to the stockholders of the company.

However, state commissions raise rates and I have previously pointed out the abuse of the use of radio and television frequencies by excessive advertising and the failure of the Commission and the courts to stop such abuse. If necessary, Congress can remedy the situation. Members of Congress are not appointed. They are elected and therefore more responsive to the needs and demands of the people who listen and look at radio programs.

If the abuse of the use of the radio waves by overcommercialization and too much violence in entertainment programs grows worse or even continues, Congress will probably be forced by the demands of the voters to remedy the siutation by restrictive legislation.

Passing First Railroad Retirement Act

Near the close of the session I clashed with the Senate Policy Committee as to taking up the Railroad Retirement Bill. Always they had argued that certain other important legislation which must go to conference should be passed first. Next to the last day before adjournment I determined to act. I stated that I intended to move to take up the Railroad Retirement Bill at the first opportunity. I didn't tell them that Garner had already agreed to recognize me. He favored the bill.

Their objection this time was that filibustering would prevent consideration of other minor bills. I explained I had given my word to the railroad brotherhood leaders months ago to bring the bill up for passage before adjournment. I said, "Those railroad men have waited for years for a retirement bill. They

"I decided to have Orchard tell that story in the Haywood case," said Darrow. "I questioned him closely and he enlarged upon how he had played with the children. Then I asked him, 'Did you still intend to explode the bomb under that room?' and he replied, 'Of course,' I glimpsed out of the corner of my eye at the jury and saw some of them draw back with a look of horror and I said, 'That's all, Mr. Orchard'."

Darrow said in his eleven hour speech to the jury, lasting a day and a half, he did not discuss that answer, but pointed out that Orchard's absolute disregard for the lives of others, even innocent little children who might be killed when murdering his intended victim, showed him to be an inhuman monster whose testimony was not worthy of consideration or belief. The jury deliberated all night and the verdict was, "Not guilty." Darrow's closing words to the jury were so eloquent, I insert them here:

> *"The eyes of the world are upon you twelve men of Idaho tonight. Wherever the English language is spoken, men are talking and wondering about your verdict. If you decree Bill Haywood's death, from the railroad offices in the great cities, from every bank in the world and from amongst the spiders of Wall Street, you will receive paeans of praise, and from wherever men hate Haywood because he fights that accursed system upon which the favored live and grow rich and fat — from all those you will receive unlimited praise.*
>
> *"But if your verdict be 'Not guilty,' men out on the broad prairies where they toil with their hands, out on the wide ocean where men are tossed and buffeted by the waves, all through the mills and factories and in the mines down deep in the earth, where men and women labor and suffer, weary with care and toil, in all such places, they will kneel tonight and ask their God to guide your hearts. They are the poor, the weak, the suffering, they are stretching out their helpless hands to you jurors tonight in mute appeal for Bill Haywood's life."*

Supreme Court's First Decision on News Reports

In 1934 the Associated Press brought suit at Seattle for an injunction to prohibit Radio Station KVOS at Bellingham, Washington from reading news from Seattle and Bellingham newspapers. Judge John C. Bowen dismissed the complaint. The Associated Press appealed to the Circuit Court of Appeals at San Francisco. Station KVOS employed me to join former judge William H. Pemberton at Olympia and Kenneth C. Davis of Seattle to defend Judge Bowen's decision. The Circuit reversed Judge Bowen's decision, and on writ of certiorari, we argued the case in the Supreme Court in November, 1936, and secured reversal of the Court of Appeals' decision.

This was the first case of that kind in any court. Judge Pemberton argued the damages were less than the jurisdictional amount of $3,000. I argued the radio station was simply rendering a public service to listeners at distant points where large numbers of people on islands, on farms and in lumber camps could not learn the news for hours or days, and that the news was in the public domain.

Justice Roberts questioned me about that statement. I said, "If a man in a hotel lobby read the news reports to others in the lobby, the Associated Press couldn't prove it was damaged." Then I added, "These reports lose their news value when published. They were in the public domain. Reading them over the radio station simply enlarged the number of listeners outside the city and the lonely places for several hours." The court ruled that the value of the news read over the radio was less than $3,000, the amount necessary for its jurisdiction.

The fear of the Associated Press that radio stations would capitalize on this decision was soon dissipated. By 1940 the radio news networks developed news services for subscribing stations, and also many stations hired their own reporters. The result was that the big radio and television networks soon furnished immediate news coverage from all parts of the world, independent of the newspaper associations. Then the AP and the UPI soon found it good business to serve radio stations with full news coverage also.

I handled a number of radio appeals from the Commission's rulings to the Circuit Court of Appeals in the District of Columbia for attorneys in cities far removed from Washington. After my return to Spokane, I became so busy in the legal work involving hydro-electric power business that I had little time for radio cases, except those which raised questions in the local and other Northwest courts.

American Telephone & Telegraph Company

OFFICERS FOR THE YEAR 1907.

THEODORE N. VAIL,	*President.*
EDWARD J. HALL,	*Vice-President.*
THOMAS SHERWIN,	*Vice-President.*
CHARLES P. WARE,	*Vice-President.*
WILLIAM R. DRIVER,	*Treasurer.*
CHARLES EUSTIS HUBBARD,	*Secretary.*

DIRECTORS

CHARLES W. AMORY.	CHARLES EUSTIS HUBBARD.
THOMAS B. BAILEY.	WILLIAM LOWELL PUTNAM.
GEORGE F. BAKER.	THOMAS SANDERS.
FRANCIS BLAKE.	SYLVANUS L. SCHOONMAKER.
ALEXANDER COCHRANE.	NATHANIEL THAYER.
T. JEFFERSON COOLIDGE, JR.	THEODORE N. VAIL.
W. MURRAY CRANE.	JOHN I. WATERBURY.
HENRY S. HOWE.	MOSES WILLIAMS.

REPORT OF THE DIRECTORS

OF

AMERICAN TELEPHONE AND TELEGRAPH COMPANY.

NEW YORK, March 10, 1908.

TO THE STOCKHOLDERS:

The results of the business for the year 1907, as shown by the Comptroller's statement appended, were as follows:—

Profits	$23,479,290.10
Interest	7,209,902.16
Balance	16,269,387.94
Dividends paid	10,943,644.00
Carried to Reserve	3,500,000.00
Carried to Surplus	1,825,743.94

The following were the corresponding figures for the year 1906:—

Profits	$17,857,687.37
Interest	4,886,750.61
Balance	12,970,936.76
Dividends paid	10,195,233.50
Carried to Reserve	1,773,736.62
Carried to Surplus	1,001,966.64

SUBSCRIBER STATIONS.

The number of stations at the end of the year operated directly by the associated companies which constitute our system in the United States was 3,035,533,

an increase of 308,244. In addition to this number there were 755,316 exchange and toll stations connected to our system by our toll and long-distance lines, but operated by local, co-operative and rural independent companies or associations having sub-license or connection contracts. Adding also our telephones employed for private-line purposes, there was a total of 3,839,000 stations connected to the Bell system as against 3,070,660 stations at the close of the previous year, an increase of 768,340 stations.

The increase in the number of subscriber stations operated directly by our associated companies was less than last year, due to more rigid collection of bills and more careful scrutiny of applicants. As the average cost of connecting subscribers far exceeds the average annual income per station, permanency is more desirable than numbers. The result has been an improvement in the class of subscribers, so that, notwithstanding this smaller increase in subscriber stations, the increase in gross revenue is fully equal to that of former years.

Wire Mileage.

The total mileage of wire in use for exchange and toll service was 8,610,592 miles, of which 1,141,687 were added during the year. These figures do not include the mileage of wire operated by sub-licensees.

Traffic.

Including the traffic over the long-distance lines, but excluding sub-licensees, the daily average of toll connections was about 494,000, and of exchange connections

about 18,130,000, as against corresponding figures in 1906, of 462,000 and 16,478,000; the total daily average for 1907 reaching 18,624,000, or at the rate of about 5,997,000,000 per year.

Construction.

In the early part of the past year there were signs of a coming change in general business conditions, and steps were taken to stop all construction not necessary either for immediate demand or to put the plant in condition to economically meet future demand. The result of this action has been satisfactory. The construction expenditures during the latter part of the year were largely reduced.

The amount added to construction and real estate by all the companies, excluding sub-licensees, constituting our system in the United States during the year 1907 was :—

For exchanges	$44,184,800
For toll lines	4,426,400
For land and buildings	4,310,200
	$52,921,400

Construction of Previous Years.

The amount added in 1900 was $31,619,100; in 1901, $31,005,400; in 1902, $37,336,500; in 1903, $35,368,700; in 1904, $33,436,700; in 1905, $50,780,906; and in 1906, $79,366,949, making the grand total of expenditure upon these properties during the eight years $351,835,655.

Maintenance and Reconstruction.

During the year $36,626,667 was applied out of revenue to maintenance and reconstruction purposes.

The total amount of maintenance and reconstruction charged against revenue for the last five years was over $147,000,000. This expenditure is reflected in the superior condition of the plant, the theory and practice being that the plant must be kept in standard condition at the expense of revenue.

American Telephone and Telegraph Company Investment.

The amount contributed by the American Telephone and Telegraph Company in 1907 by way of investment in its own long-distance plant ($1,285,000), in real estate ($585,485), and in the purchase of stock and bonds and in advances to its operating companies ($29,952,000), was in all $31,822,485, an addition of about ten per cent. to its entire investment up to January 1, 1907.

Associated Companies.

financial condition.

The associated operating companies of the United States (not including the American Telephone and Telegraph Company) commenced the year with rather an abnormal indebtedness. Measures were at once taken to bring this within the normal limits of current operations. This has been done and the obligations of those

companies to other than the American Telephone and Telegraph Company decreased for the year $21,000,000, while the cash on hand increased at the same time $1,500,000—a net improvement in such liabilities of $22,500,000.

During the year the Western Electric Company decreased its indebtedness $9,400,000 and increased its cash $1,150,000, making a net improvement of $10,550,000 for that company.

The total improvement of our associate operating and manufacturing companies in the United States was $33,050,000, bringing the current and floating indebtedness of all the associated companies well within the limits of current operations.

construction for the current year.

Estimates of all the associated operating companies and of the American Telephone and Telegraph Company for all anticipated requirements for 1908 have been prepared, thoroughly studied and considered in connection with available resources. Maximum expenditure in each case has been agreed upon, which is well within the available resources. All who are responsible for the expenditures are working in entire accord with these agreements and understandings, and it is believed that the results will be well within the limits fixed.

Western Electric Company.

The Western Electric Company desired to extend its relations with our company and the associated companies, and to cover with its operations the entire

telephonic field, whether connected with the Bell system or not. At the same time it was thought that the management, which would remain the same, if brought into closer touch with the general organization of the Bell system, could avoid duplication of effort in electrical and mechanical development and in this way and by the concentration of the purchase and distribution of supplies effect greater efficiency and economy.

To this end contracts have been made with most of the Bell companies, and the contract between our company and the Western Electric Company has been modified in respect to the sale of telephones and telephonic apparatus.

The business of the year 1907, considering the unusual conditions and the large contraction in business, was fairly satisfactory, if taken alone by itself. When taken in connection with the overstock from 1906, and the amount of merchandise and material on hand or in process at the beginning of the year, it shows very small profit.

Marketable goods and merchandise on hand at the end of the year 1907 were inventoried at $2,000,000 less than cost, and concessions in prices to the amount of $335,000 were made.

These items, in addition to the high rates and unusual amount of interest paid, made it necessary to pay substantially all of the dividend of 1907 out of surplus.

At the end of the year cash and cash assets exceeded the payables by about eighteen per cent. The quick assets including merchandise exceeded the payables more than two to one. The plant stands on the books

at about $12,000,000, which is fifty-one per cent. of the actual cost.

During the year an issue of bonds to the amount of $15,000,000 was authorized which will be used when conditions are favorable to provide additional working capital if needed.

A proposition was made by our company to purchase the outstanding share capital of the Western Electric Company at a price agreed upon with some representative shareholders as fair and equitable. Over 30,000 shares have accepted the offer, making the total holdings of our company over 120,000 out of 150,000 shares.

Gross Revenue and Expenses — Operating Companies.

Attention has been given to the operating expenses with a view to bringing them down to the lowest economy consistent with the highest efficiency.

In spite of increase in wages and the continuance of the same high standard of maintenance which has always prevailed, the ratio of expense to gross revenue has decreased so that the net revenue shows a gratifying improvement.

It is expected and believed that the continuation of the present policy through the coming year will produce equally satisfactory results.

The following table shows the year's results of all the telephone operating companies associated with the Bell system, not including the long-distance business and the Bell Telephone Company of Canada, for the year 1907, compared with 1906.

COMPARATIVE CONSOLIDATED STATEMENT OF BELL TELEPHONE COMPANIES IN UNITED STATES. AMERICAN TELEPHONE AND TELEGRAPH COMPANY NOT INCLUDED.

(EXCLUDING DUPLICATIONS.)

	1906.	1907.	Increase.
Gross Earnings .	$105,441,600.	$120,753,200.	$15,311,600.
Expenses:			
Operating and General .	47,206,400.	53,242,300.	6,035,900.
Maintenance .	30,639,200.	34,665,700.	4,026,500.
Total Expenses .	77,845,600.	87,908,000.	10,062,400.
Balance, Net Earnings . .	27,596,000.	32,845,200.	5,249,200.
Deduct Interest .	5,197,800.	7,025,500.	1,827,700.
Balance . .	22,398,200.	25,819,700.	3,421,500.
Dividends Declared	16,682,000.	19,206,100.	2,524,100.
Undivided Profits .	5,716,200.	6,613,600.	897,400.

ISSUE OF NEW SHARE CAPITAL.

Early in the year, anticipating the possibility of an uncertain financial condition, your Directors authorized an offer of 219,252 shares of capital stock to the existing shareholders, at the ratio of one share to each six shares then held. Of this issue all but 9,486 shares were subscribed for and taken. The money realized placed our company in such condition that it was enabled to fully protect all of its associated and allied interests during the exceedingly critical financial period just passed, and left it in a position to meet all anticipated demands of the current year based on a complete discussion of and agreement on the requirements and resources of our company, and of the associated and controlled companies.

With this issue there are now outstanding 1,525,280 shares of capital stock distributed among 23,469 shareholders, an increase of 5,275 over January 1, 1907, being an average of sixty-five shares each.

It will be interesting to note that 1,312,502 of these shares are held by 23,453 shareholders, an average of less than fifty-six each, the balance, 212,778, being held by sixteen shareholders of 5,000 or over shares each —an average of 13,298 each. More than three-quarters of the entire share capital is held in New England.

SELLING TELEPHONES.

The policy of our company in the past has been to lease telephones, and to allow the Western Electric Company to sell only apparatus to our licensees. Believing that the best interests of all would be advanced by the general use of standard telephonic apparatus, after consultation with and with the approval of our associated and licensed companies, we authorized the Western Electric Company to sell both telephones and telephonic apparatus to all applicants. While the time has been too short to show positively the effect of this policy, the indications are that the benefits direct and indirect will be large, particularly in the development of unoccupied territory in connection with the Bell system.

Exaggeration of Telephone Profits for Speculative Purposes.

Much of the agitation against legitimate telephone business is founded on false and exaggerated statements of the profits originally made by the early Bell companies.

These statements have been used by the promoters of both good and bad enterprises.

As a matter of fact, the shareholders of The American Bell Telephone Company and its predecessors paid into the treasuries of those companies more actual cash than was represented by the capitalization at par value.

The only shares of The American Bell Telephone Company not issued for cash at par or at a premium were the shares amounting to $5,100,000 issued in exchange for the shares and property of the National Bell Telephone Company. The premiums received by the company on further issues of stock amounted to more than this sum.

The substitution of the American Telephone and Telegraph Company for The American Bell Telephone Company was, in effect, the purchase of the property of The American Bell Telephone Company for cash at somewhat less than the average market price prevailing prior to the purchase. None of the American Telephone and Telegraph shares now stand on any other basis than cash at par value.

In view of the enterprise shown and the risk incurred by the original investors, who received no interest or dividends for years, the return was certainly not large to those who created an enterprise which has probably

done more to bring about a new and advantageous condition in the affairs of mankind than any other industry in the history of the world.

Physical Valuation of Telephone Plants.

For the purpose of determining the relation between the physical plant and the capitalization, a valuation of the exchange, toll and long-distance line plant included in the Bell system was made at the close of the year. The valuation was based on the replacement cost of the existing plant, and does not include any "unearned increment" or allowance for franchises, but assumes a clear field and free franchise. When to this valuation is added the value of rights of way now unobtainable, patents, franchises, and other valuable considerations, it will be conceded that the Bell system is unique. This showing is interesting and should serve to correct some popular but erroneous impressions.

January 1, 1908, all obligations of the American Telephone and Telegraph Company and its associated operating companies in the United States, including capital stock at par, held by the public were	$554,939,000.
Cash on hand, quick receivables, working assets, and sundry investments were	$101,074,000.
Balance, Capital representing plants,	$453,865,000.
The plants are carried on the books of the various companies at . .	$492,496,000.
Appraised value by Engineers (copper at 15 cents)	$488,296,000.
Outstanding obligations against plant,	$453,865,000.

Appraised value in excess of outstanding obligations	$34,431,000.
Book value exchange construction only, per exchange station . .	$114.
Book value all plant (toll line and exchange) of Bell operating companies in United States (not including long-distance) per exchange station . .	$149.
Book value all plants in the United States, including long-distance, per exchange station	$162.

Promotion and Competition — Independent Companies.

The unusual production and prices, during the past few years, of those commodities which this country sells to the whole world, with accompanying very general distribution of wealth, resulted in an almost phenomenal financial and industrial activity, stimulating new enterprises and promotions of all kinds, among them independent telephone companies.

The exaggerated stories of the fortunes made by original telephone investors, together with misleading statements of probable profits, made it possible to launch many of these companies pledged to *low rates for exchange service and high dividends to investors.* At these low rates, with "maintenance" and "reconstruction" expenses either intentionally or ignorantly disregarded, these companies for a time had an appearance of prosperity.

The result has been unfortunate in nearly every case.

The promises and pledges as to rates and profits, made as an excuse for their coming, as a basis for their franchise, and as an incentive to attract capital, are now admitted to be impossible. Most, if not all, of these companies, which have had an existence long enough to force attention to the items of "maintenance" or "reconstruction," are now asking for increased rates, and to be absolved from onerous conditions freely accepted and assumed at the beginning. Reorganizations are now in progress.

It would seem, as a whole, that the gain of the public through competition based on low rates has not compensated for the loss of capital invested in these enterprises.

During this period of strife and rush for development and extension, many subscribers were connected to exchange systems with little or no benefit to themselves or advantage to others, and much was done that under ordinary conditions would not have been done.

Rates and Rate Regulation.

The result of these conditions has been to create in the minds of the public, and of public bodies, misleading and mistaken ideas of the telephone business. It has encouraged attempts at regulation of rates and business on lines that if obligatory or persisted in would be ruinous. In controversies as to rates, the policy of our associated companies has been to make a complete and absolute showing of the condition, cost and value of plant, cost and value of service, cost and necessity of proper maintenance, and the broad position is taken

that neither our company nor the associated companies have anything to conceal or anything to apologize for. That the capitalization of all the companies is conservative, far within justifiable limits, and in the relation between the replacement value of the properties and the capitalization of the companies, unique. Fair rates, therefore, should be authorized or acquiesced in, for it is only by fair rates that good service to the public and permanent, healthy conditions can be created or maintained. With a full knowledge of all surrounding circumstances and conditions, it is believed that this would be fully acquiesced in by the public.

Fair rates would insure high-class plant and equipment maintained at a high state of efficiency, and would provide fair wages to employees, the highest paid for similar class of employment. Both of these are necessary to good service.

Fair rates should give fair return on the investment, and promise fair return on new money needed. This is necessary to maintain the interest of the existing shareholders in the proper administration of the business, as well as to provide for the continually increasing public demand.

Any revenue produced over and above such requirements and the proper reserve to provide for contingencies could be used for the benefit of the public, allowing the company to retain a part sufficient to stimulate the most efficient and economical management. It would be difficult, if not impossible, to get effective and economical management, such as would produce the best results for both the public and the shareholders, without recognizing this principle.

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It does not seem possible that there can be any question of the justice of this position. That being granted, the facts to be settled are : —

Is the management honest and competent ?

What is the investment?

Is the property represented by that investment maintained at a high standard?

What percentage of return does it show?

Is that a fair return?

Is it obtained by a reasonable distribution of gross charges?

If these questions are answered satisfactorily, there can be no basis for conflict between the company and the public, and the less the working conditions are made inflexible by legislative proscription, the better will be the solution of the constantly changing problems incident to a growing business.

The question of maintenance is of the greatest importance and will be referred to more at length later.

Competition.

The value of any exchange system is measured by the number of the members of any community that are connected with it. If there are two systems, neither of them serving all, important users must be connected with both systems. Connection with only one is of but partial value and cannot be satisfactory. Two exchange systems in the same community, each serving the same members, cannot be conceived of as a permanency, nor can the service in either be furnished at any material reduction because of the competition, if return on

investment and proper maintenance are taken into account. Duplication of plant is a waste to the investor. Duplication of charges is a waste to the user.

The advantages claimed for competition are lower rates and improved service. Exhaustive competition may temporarily produce either or both of these results, but, as before stated, this temporary gain is purchased by an excessive waste. Duplication of plant and operation cannot produce either result without exhaustive competition. Given the same management, the public must pay double rates for service, to meet double charges, on double capital, double operating expenses and double maintenance. In most cases of proposed competition an examination of the prospectus will show that, by some process, it is expected to make good a capitalization equal to at least two or three times the actual cost of the construction. The only benefits are to the promoter.

Public Control.

It is contended that if there is to be no competition, there should be public control.

It is not believed that there is any serious objection to such control, provided it is independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return, and good management or enterprise to its reward.

What is Fair Return on Capital?

With guaranteed or reasonably certain income, money can be obtained for any enterprise at moderate rates.

With uncertainty — owing to competition and opposition, possible or actual, or possible regulation of rates without proper investigation or consideration — a more or less speculative price must be paid.

Subject to these general rules, "locality" and existing general conditions will establish the rate.

Fair Charges. Upon What Based.
Exchange Service.

An exchange system is made up of circuits (each consisting of two wires) radiating from a central office, or from central offices connected by trunk lines, so arranged that each circuit can be connected directly or through trunk lines with the others. There are in these circuits of the Bell system about 7,000,000 miles of wire — over two miles of wire to each subscriber — one-half in underground conduits. The system of radiating circuits is the most expensive part of the exchange system to build, it is least durable, therefore most expensive to maintain, calls for the largest part of the total investment, and consequently must bear the largest part of the cost of capital.

The real value of a telephone exchange system depends entirely on the distribution and number of other members of the same or other communities connected with the same or connecting systems, with whom any subscriber can have prompt and satisfactory communication.

Any member of a community connected with an exchange system can be reached as well, but not as conveniently, from a central or public office as from a subscriber's station.

To reach any member of a community not connected with any exchange system, whether from public station

or subscriber's station, is too inconvenient and impractical to be considered for ordinary use.

Therefore, the particular circuit connecting any subscriber with the exchange is what might be termed a *convenience to that particular subscriber, but a necessity to all other subscribers.*

It is not merely the maintenance of the individual circuit connecting with the exchange that is paid for by any subscriber; *it is in a greater measure the use from time to time of the circuits, trunks and facilities which make communication possible with all other subscribers.*

It is the ability to communicate with others that makes the exchange valuable; it is the use of other circuits than your own.

The cost and value of the system to any subscriber do not depend so much on the number of communications had as on the number and extent of other circuits and facilities necessary to give the communications desired.

It is plain, therefore, that the character of the circuit connecting any subscriber with the exchange does not determine either the cost or value to that subscriber of the exchange connections.

The many and complicated systems of charges prevailing indicate the struggles experts have had in their efforts to establish consistent and reasonable rates.

As the value of the exchange to the subscriber depends upon the number of subscribers within reach — rates must be so established that the maximum number of subscribers can be obtained, so that the greatest number of those with whom communication may be wanted will be connected with the exchange. The cost of any

circuit, therefore, must be largely distributed between those who may desire to communicate with the particular subscriber connected by that circuit.

The cost or value cannot be exactly distributed — an approximation is reached by measured service charges, or by a classification of service between business houses and residences with a sub-classification of plant between "direct" and "party" line.

Business rates are higher for the reason that presumably the business subscriber connects with the greatest number of other subscribers, and consequently makes use of the greatest number of circuits and operating facilities in an exchange.

Residence rates are lower because the residence subscriber connects with a limited number of other subscribers, and because he makes more limited demands on the central office.

It being established that the measure of value is not in the particular class of line connecting any subscriber to an exchange, but in the use of the exchange system as a whole, and that the value of any exchange depends on the area covered and the maximum number of desired individuals that can be reached, rates must be so adjusted that no rate shall bear unjustly on particular individuals or classes; that, at some rate, connection with the exchange is within reach of anyone who can add to the value, to others, of the exchange, and that, as a whole, the revenue will be sufficient to maintain the plant, pay fair wages, make enough return on capital and enterprise to insure good economical management and sufficient capital to meet the increasing demands of the public.

"Toll" Line and "Long-Distance" Service.

Toll line and long-distance communications require, as in exchange connections, the exclusive use of a circuit, two wires, between two points for an interval of time, varying with the conditions; over the whole system the average "time interval" consumed in the completion of each communication is about seven and one-half minutes.

Direct service between two points with large demands for service is the least complicated; the average "time interval" of each communication lasts about three and one-half to five minutes. Between points of small demand, or between intermediate points on local lines, both complications and cost increase, and the average "time interval" is not less than five minutes each. Between points on side or branch lines, or distant points requiring combinations of circuits, or complicated and delicate auxiliary apparatus with many attendant operators, complications and cost increase rapidly, and the "time interval" taken for each communication varies from five or seven and one-half minutes to an indefinite period.

Cost is determined by the capital and maintenance charges of the plant and operating costs, divided by the average number of communications.

Cheap rates for service depend upon high average use of facilities.

High average is obtained ordinarily in public service by putting on higher pressure — crowding — or in some way rendering more than normal service through or

over any given facilities during the limited periods of great demand.

It is by this means, and by this means only, that cheap service is rendered to the public.

Whatever inconvenience or discomfort there may be caused on one hand is compensated for by the reduced price charged for service.

In this particular, toll line or long-distance service is unique. In whatever way the circuit is made up, a certain "time interval" must be given exclusively to each communication, and to the communicating parties. No other communication can be crowded on that circuit during that "time interval."

Any "time interval" passed without being utilized is lost beyond recovery. A good average cannot be made by crowding two or more communications into the "time interval" of one, nor by putting on higher pressure to get more "time intervals" over the same circuit.

There are only a certain number of five-minute "time intervals" in each hour, or five-minute "spaces" on each clock. If you want more "time intervals" or more "spaces," you must take more hours or more clocks. In toll line business anything above the normal capacity of each circuit must be provided for by additional circuits.

Toll line or long-distance business requires the presence of the communicating parties; for that reason it is confined to the business or working hours of the day; and further, the greater part of this business is not only limited to those few hours when parties are most likely to be located at some particular place, but to that part of those few hours immediately after the

general business of the day has developed. For this reason the greater part of the toll line or long-distance business is crowded into an exceedingly small part of the business day. The periods of great demand are short. The facilities provided are idle a great part of even the business hours.

The diagrams following illustrate this most graphically — one taken at Washington, where the business hours, due to the newspaper correspondence, extend well into the night, the other at a city which shows better than the average.

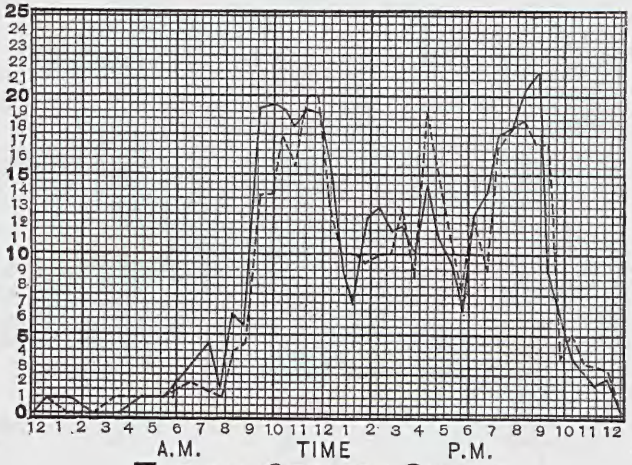
Examination shows that about half the facilities are utilized to a fair part of the capacity during business hours only. All the rest are utilized only to a fractional part of the capacity at any time. If during certain hours the business as shown on these diagrams could be subjected to a half hour's delay, the facilities required could be reduced one-third at least.

Toll line or long-distance business is in the minds of the public similar to telegraphic message business. There is no comparison. Telegraphic circuits between points are at most one wire, on all trunk lines two to four circuits over one wire.

Telegrams are handed in, filed before an operator and despatched in order. In this way the business is distributed more uniformly over working hours, and during the night hours the lines are used for press messages, night messages, or for long-distance messages in transit.

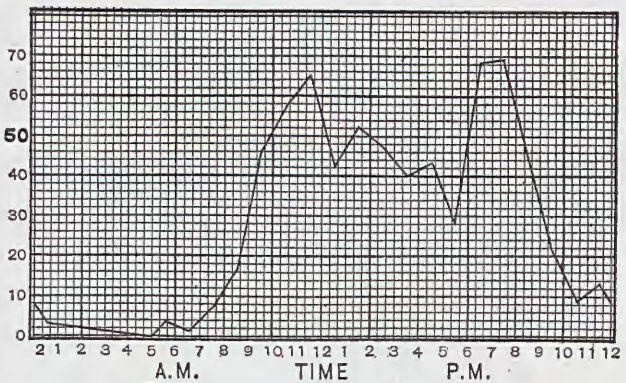
Maintenance.

Utter disregard for repairs and reconstruction, usually comprised under the head of "maintenance," has been



TYPICAL SERVICE CHART
OF
LONG DISTANCE TOLL CALLS

Full Line —— represents Orders received
Dash Line --- represents Completed Connections



TYPICAL SERVICE CHART
SHOWING VARIATION IN
IN AND OUT LONG DISTANCE TOLL CALLS
HANDLED HOURLY IN
WASHINGTON, D.C.

the cause of more misunderstanding on the part of the public and public bodies having to do with rates, of more self — or selfish — deceit on the part of promoters of telephone enterprises, and of more mistakes on the part of the investing public than any one factor in the telephone business.

With a new plant, "current repair" is at a minimum, and can be for a time disregarded; with a growing plant, it is too easy to lose it in construction; but sooner or later, if not provided out of current revenue, where it belongs, it will be found either in increased construction — that is, capital charges — or in a depreciated plant.

Any company paying dividends and fixed charges, particularly dividends, without first providing for proper maintenance, can have but one end — disaster.

In any consideration of this question the leaning should be towards liberal rather than inadequate maintenance. In any properly administered company any excess would be found in betterments or construction, and consequently in reduced capital investment, while inadequate maintenance would soon show in quality of service and in reconstruction requirements. In other words, surplus maintenance would be offset by decrease of capital charges, while inadequate maintenance requiring new construction in time would increase capital charges.

Attention is called to the facts shown above that during the past five years there has been expended out of revenue for maintenance and reconstruction about $150,000,000 on plant, which now has a replacement value of $488,000,000.

Comparative Statistics and Statements.

Appended hereto, as usual, are a series of comparative statistics showing certain phases of the development of the business of the company and its associated companies; the balance sheet of the company as of January 1, 1908; also a comparative statement of the earnings and expenses for the years 1906 and 1907, and a statement showing the net revenue and the dividends paid 1900-1907.

In connection with the improvement shown in the year's business, it may not be amiss to call attention to the fact that each year in the past has shown an improvement over the previous year, whatever may have been the general business conditions.

Everything indicates that the current year will be no exception to this.

It is only in times like the present that the true economy and value of the telephone service with its varied relations to the dispatch and conduct of business and to social relations can be realized. This only emphasizes the fact that of all services the telephone service is the last to be dispensed with.

General.

The past year completes what may be called the thirtieth year of corporate organized work in the development of the Bell Telephone System. In the mind of Mr. Bell, the invention and its application had simultaneous growth. During the first year, such of the many "imaginations" and ideas as to development as were demonstrably practical were assimilated and the

business was established on the lines now followed which make our company with its associated companies a national system with millions of subscribers connected by millions of miles of circuit with local exchange systems, all bound into one large comprehensive system by the toll and long-distance lines with their 163,000 miles of poles and 1,664,000 miles of wire, the whole inter-dependent and inter-communicating, an aggregation or union impossible to destroy in detail, and impossible to reproduce as a whole.

Each year has seen some progress in annihilating distance and bringing people closer to each other. Thirty years more may bring about results which will be almost as astonishing as those of the past thirty years. To the public, this "Bell System" furnishes facilities, in its "universality" of service and connection, of infinite value to the business world, a service which could not be furnished by disassociated companies.

The strength of the Bell system lies in this "universality." It affords facilities to the public beyond those possible on any other lines. It carries with it also the obligation to occupy and develop the whole field. The urban field was the first to receive attention and the development keeps pace with the demand. The semi-urban and rural demand came later. This has been met both directly by the operating companies and indirectly through local, co-operative and rural combinations, under license from, and connected by toll lines with, our operating companies. The policy adopted during the year, of selling telephones and telephonic apparatus, has given fresh impetus to this line of development, which is now showing most gratifying results.

This position of our company has been reached only by a large expenditure of capital, which is, however, fully represented by plant and property with an earning power that must be considered satisfactory.

If this expenditure is but considered as the financing of thirty-five distinct companies occupying thirty-five distinct territories and is considered as so distributed, rather than as a whole, the aggregate does not seem formidable. In this focussing of capital there are distinct advantages in that the revenue is derived from so many and such varied sources, and that the success of our company lies not in the success of any one company but in the average of all.

For the Directors,

THEODORE N. VAIL,

President.

That the administration and policy have been consistent and uniform from the very beginning;

That the interests of the Bell system are dependent upon giving the best service possible under existing conditions, and anticipating as far as possible any improvement.

Telephone service in its close personal touch with every subscriber is a unique service, different from all other public services; efficient service requires the co-operation of the user, it requires prompt attention on the part of the public.

In every use of the telephone system three human factors are brought into action—one at each end, one or both anxious and probably impatient, the one at the central office, as nearly a machine as is possible, a trained expert with at least as much intelligence and reliability as the best stenographers, typewriters or bookkeepers. This central office factor is the personal servant for the time of the factors at the end and is entitled to the same consideration that is given to their own personal staff. Perfect service depends on the perfect co-ordinate action of all of these factors—any one failing, the service fails. This should never be forgotten. All attempts so far to eliminate the personal factor of the central office, to make it a machine, have failed in systems of any extent; there are times when, at the central office, action guided by intelligence, is absolutely necessary.

History and Development of the Telephone System.

In spite of repeated attempts to make known the real facts of the early history and evolution of the Bell system, there seems to be still much misunderstanding.

At the risk of being prolix, and of repeating what has often been told, the history and evolution and development will be retold as briefly as possible.

The telephone was first introduced to the public in 1876, and put to the first practical or commercial use in 1877. During that year was organized the first "association" or "company" to hold the patents. The first companies to systematically exploit the business were formed in 1878, one for New England, and one for the rest of the United States and Canada. These two companies succeeded to all the rights and property of the original association. The capital, $650,000, 6,500 shares at $100 par each, represented the patents, such rights and property as had resulted from the time and money expended up to the spring of 1878, and in addition $100,000 in cash.

Early in 1879, these two companies were consolidated into one company, the National Bell Telephone Company, the first company to attain any prominence.

The capital of this company was $850,000, 8,500 shares of $100 par value each. $650,000 in shares was given share for share for the stock of the two old companies and $200,000 in shares left in the treasury. The treasury stock was sold as the company required the money, *for the best price obtainable.* The $200,000 par yielded to the treasury $430,000 in cash, an average of $215 per share, the last 500 shares having been sold for $600 each.

It was during the existence of this company that the permanent foundations were laid upon which is built the present comprehensive system.

It was in the fall of 1879, that the settlement was made with the Western Union Telegraph Company which removed the most formidable and powerful competitor from the field.

It was during this period that those fancy flights in the prices of the stock took place, the $100 shares (of which there were only 8,500) being quoted at one time at $1,000. Few, if any, transactions took place however at this price or anything near it. The sale of 500 shares of the treasury stock at $600 per share was probably about the best price at which any considerable transaction took place.

The stock of this company was fairly well distributed among 338 holders, an average of about 25 shares each, twelve holding in lots of 200 shares or over an aggregate of 4,795 shares out of the 8,500 shares.

At the highest quotation the total market value of all the shares of the company would have been $8,500,000. According to the popular belief, over twelve of the original investors have been credited with realizing, if not more, at least as much as this.

No dividends were paid by this company.

The rapid increase in the business called for more capital. Early in 1880 the American Bell Telephone Company was organized and the business of the National Bell Telephone Company transferred to it. The shareholders of the National Bell Telephone Company were given for each share of their stock six shares of the new American Bell Telephone Company stock. 8,500 shares of the treasury stock were at the same time sold at par.

At the close of 1880 there were 540 holders of the 59,500 shares, an average of 110 each. Twenty holders of 500 shares or over had in the aggregate 33,190 shares. This was the last year that a majority of the stock was closely held.

In 1881 the first dividend was paid.

The American Bell Telephone Company continued the business until 1899, during which time the capital stock had increased from $5,950,000 to $25,886,300. The $25,886,300 capital was held by 6,961 shareholders. 62,649 shares were held by 61 shareholders in blocks of 500 shares or over, while the balance, 196,214 shares, was held by 6,900 holders.

The increase in the stock had been sold for cash at various times, yielding the company more than enough in premiums above par to offset the shares that had been issued for patents, inventions, and property of the National Bell Telephone Company.

When the American Bell Telephone Company transferred its business to the American Telephone and Telegraph Company there had been over $28,000,000 actual cash paid into the treasury of the company by shareholders as against $25,886,300 capital outstanding. During the time no stock dividend or dividend of surplus in cash to pay for stock issued was made.

The market price of the American Bell Telephone Company shares during the year ranged above $200 a share. The company was paying 15 per cent. dividends yearly.

The demands of the business required much larger capital than could be provided under the corporate powers of the American Bell Telephone Company. The American Telephone and Telegraph Company, a company organized to operate the long-distance traffic,

purchased the business in 1899. The consideration was cash, but in effect the shareholders of the American Bell Telephone Company received two shares of the American Telephone and Telegraph Company for each share held. The dividends were put on a 7½ per cent. basis and were increased in 1906 to 8 per cent., at which rate they still continue.

Since 1900 the stock of the American Telephone and Telegraph Company has been increased from time to time as the business called for money. At the close of 1909 there were in the hands of the public $256,475,300.

So much of this stock as was not sold to the shareholders at par was sold for cash at a premium, the highest at $152 per share, or was issued in exchange for the convertible bonds at about $134 per share. None of the stock has been issued as a dividend, nor have any cash dividends been declared to meet payments for stock issues.

At the close of 1909 the premiums thus received over the par of the outstanding share capital amounted to over $14,000,000.

The original owners and promoters of the telephone were first of all business promoters. Their idea was to develop the business on broad lines. Whatever reward they expected or received was the legitimate reward following a legitimate development of a substantial and beneficial business.

The Bell system was founded on the broad lines of "One System," "One Policy," "Universal Service," on the idea that no aggregation of isolated independent systems, not under common control, however well built or equipped, could give the public the service that the interdependent, intercommunicating, universal system could give.

This is no recent or new idea or theory. It is coexistent with the business; in fact the theory was evolved and developed before the business, and the business has been developed on that theory.

To develop the business it was first necessary to develop the "art." It was unique, nothing like it existed; the whole art of the practical application of electricity was new and undeveloped.

To develop the business to the best advantage all the best in the way of instrumentalities, apparatus and methods must be controlled. Apparatus and methods at the start were crude, but new instrumentalities and new methods were suggested from daily association, practice and study.

It was necessary to develop these, improve and reduce the useful to practice, and eliminate the worthless. For this purpose a staff of technical, electrical and mechanical operating experts must be gathered together and educated. To educate and assist these, to enable them to do intelligent work, avoid repetition and duplication, all that had gone before and all that was being done here and elsewhere must be known. For this purpose a bureau of research and information was formed. Patent and legal experts must be employed and educated to secure the advantage of this work and study, as well as to furnish protection in the use of the patents.

A highly developed manufacturing organization under proper supervision and control was required to reduce to practical use these ideas and inventions, as well as to secure the standardization and uniformity of instruments and apparatus.

To ascertain which were the best of the methods being evolved in field practice, to educate the others in the use of them, to assist generally in the develop-

ment, and to bring about standardization of operating practice and methods, a staff of traveling experts, observers and teachers was placed in the field.

It is necessary to the growing and constantly improving business that this work be continued. It is being done much more economically and far more effectively by this company than it could be done by the associated companies, and without expense to them except so far as it is covered by the miscalled "rental" of telephones.

The preliminary work was certainly difficult enough. Add to that the necessity of educating a doubting, hesitating public who looked on the invention as little better than a toy, and some idea of the task can be formed.

In the promotion and exploitation of the business two methods were possible.

One company covering the whole country. This would require a large executive and administrative staff in the field, and a large capital which, at the time, it was impossible to secure. Under this method, state organizations would also have been necessary to hold franchises.

The other way was to enlist a large number of individual workers, each with some capital, large faith and expectation, with great capacity for work, who would cover the field and develop the business.

To insure a common policy and central control, all licenses were issued for small units of territory under restricted terms, confining the business entirely within each territory. The parent company owned and furnished the telephones, had all reversionary interests or rights in the territory, and the right to connect the units with each other for the purpose of forming a universal intercommunicating telephone system. For this purpose the long-distance lines and other toll lines were

built. Under these temporary licenses certain rentals, so-called, or royalties, were paid to the parent company for the use of the telephones and other inventions owned, and also as compensation for all the many other services rendered, as described above. When these licenses were made permanent and included all future as well as all existing inventions, and the right to the business within the units of territory, the parent company retained an interest in the business which was represented by a stock interest in each company.

These licenses called for a continued certain percentage of the stock of the company, but this right was soon waived by the parent company.

Through purchases to defeat the attempts of hostile interests to get possession of some of our associated companies, through the necessity of financing the companies for the purpose of keeping up with the demands for development, and through the purchase of its pro-rata of new issues, the American Telephone and Telegraph Company acquired its large holdings.

The book valuation of the American Telephone and Telegraph Company's interest in the share capital of the associated operating companies December 31st, 1909, was nearly $306,000,000; *of this only* $16,000,000 *was received through contract or for licenses.* The balance, $290,000,000 was obtained under precisely the same conditions that shares have been received by the other shareholders.

While the settlement with the Western Union Telegraph Company in 1879 removed from the field the most formidable and powerful competitor, it must not be concluded that the American Bell Telephone Company had the field to itself. The Bell system did not then, nor did it in any year or any time since the great value of the telephone to the world was established,

have a monopoly of the business or anything approaching it.

Patents and inventions were necessary for defence, but were no protection against imitators.

There was a continued running fight in the courts and in the field. The fact that the Bell won every case in the courts availed it nothing except that it was credited with a monopoly which did not exist.

The only time that the Bell Telephone was without a competitor was at the Centennial Exhibition of 1876.

Competition.

There is not, nor can there be, any competition between these local associated operating companies, as under the conditions under which they can use the instruments and inventions, they must operate entirely within their respective territories; nor can there be competition in the telephone exchange systems operating in the same territory such as exists between other public utilities, certainly not such as exists between two gas companies or even between a gas and an electric light company.

The telephone system does not give you a "commodity" or a "product," or even a "service" except so far as it is service to make up a "path" or "line" or "highway" for personal communication with a party at some distant point.

The value of a telephone system is measured by the possibility of reaching through its connections *any one—at any possible place.*

There can be said to be no limit to those with whom one may desire communication at some one time or other. Ordinarily your communications are confined to a certain few other subscribers; occasionally you may wish to reach certain others, but there are times

when it is an absolute necessity to get a connection with some one possibly unthought of or unknown before, and the importance of this connection may be vital.

A purely *local* exchange has a certain value.

If it has, in addition to its local connections, a connection with outlying contiguous localities, it has a largely increased value.

If it is universal in its connections and intercommunication, it is indispensable to all those whose social or business relations are more than purely local.

A telephone system which undertakes to meet the full requirements must cover with its exchanges and connecting lines the whole country. Any development which is comprehensive must cover some territory which is not, and may never become, profitable in itself but must be carried at the expense of the whole. *It must be a system that will afford communication with any one that may possibly be wanted, at any time.* To do this the system must offer a connection of some kind, and at such rates, as will correspond to the *value* of the system to *each* and *every user.*

"Interdependence," "intercommunication," "universality" cannot be had with isolated systems under independent control, however well connected. They require the standardization of operating methods, plant facilities and equipment, and that complete harmony and co-operation of operating forces, that can only come through centralized or common control.

Wherever two systems exist, each has, with the exception of a percentage common to both, a different list of subscribers. Those of large and extended social or business connections must connect with both, while those who do not connect with both get only partial service—the same character of service offered by two street car lines, each having its tracks on and running through the principal main street of the town but each extending into and serving entirely different sections of the community.

Offering a connection with a so-called competing exchange, having a list of subscribers either entirely or largely different, is offering a different service, except so far as they connect the same subscribers, and there it is of no benefit, as either one would serve the purpose. Two exchanges, each with the same list of subscribers, cannot, in the nature of things, exist. One or the other would be unnecessary because a subscriber would be paying twice for the same service when either exchange gave all that could be obtained from both. It would be like paying two fares each time you ride in a street car to maintain a parallel line, although you could ride in but one at a time. Competition of that character increases the cost to you. Competition is only of service when it reduces your cost or increases your service.

ECONOMY OF COMPETITION.

By reason of duplications, duplication of investment, duplication of operation, competition in telephone systems cannot, in the nature of things, produce economy in operation, and without economy there can be no reduced charges.

With only one system, at once is eliminated the duplication of subscribers' lines—so also is eliminated the greater part of the unused and idle staff, equipment and plant, and with this are also eliminated capital investments, capital charges, operating salaries, plant maintenance and depreciation. That it contributes also to the comfort and convenience of the subscribers is in itself no small consideration.

WHAT HAS COMPETITION DONE FOR THE PUBLIC?

No one can dispute the fact that the Bell methods and system are the standard and have been accepted as the best the world over.

Telephone rates have fluctuated. Beginning with simple and crude instrumentalities and methods, with small developments, the rates were low. As facilities increased, as methods and apparatus improved, and apparatus almost new and hardly in use had to be discarded to make place for new and improved methods, rates had to be increased.

In the New York City exchanges, apparatus and plant practically good as new to the value of over eight and one-half millions of dollars, have been discarded because new improvements had made them obsolete, nearly all between the years 1883 and 1902, and the same is relatively true of any exchange system. As methods, plant and apparatus became more fixed and permanent, methods of operating improved, operating expenses declined, and reductions in rates followed—not because of competition.

REDUCTION OF RATES AND DEVELOPMENT.

The diagrams on pages 26 and 27 show the course of rates and development from 1894 to 1909, in the principal cities and exchanges with and without competition. The non-competitive cities and exchanges are about 50 per cent. larger than the competitive.

The *average revenue* per exchange station in competitive and non-competitive Bell exchanges each year for this period is shown in diagram on page 26. The slightly higher average revenue in the non-competitive cities is due to their larger size.

The two curves showing the reduction follow almost exactly the same lines, and the percentage of reduction is almost the same.

Competition certainly had no effect on the Bell revenue, was of no benefit to the public, compelled all to pay two subscriptions instead of one for complete service, besides all the other disadvantages of dual exchange systems.

CHART
showing
REDUCTION IN THE AVERAGE YEARLY "BELL" EXCHANGE REVENUE
derived from
CERTAIN GROUPS OF CITIES
arranged by
Five Year Periods — 1894 to 1909.

NOTE:-This Chart shows graphically the relative changes in the Average "Bell" Exchange Revenue derived from a group of Cities **WITHOUT** Competition as compared with another group of comparable Cities **WITH** Competition during the period.

The figures represent the Average Exchange Revenue per Station which would have been obtained for the year ending on January 1st of each period if the number of Stations on that date had been maintained during the entire year. "Toll" Stations and "Commission Pay" Stations were eliminated in arriving at the average figure.

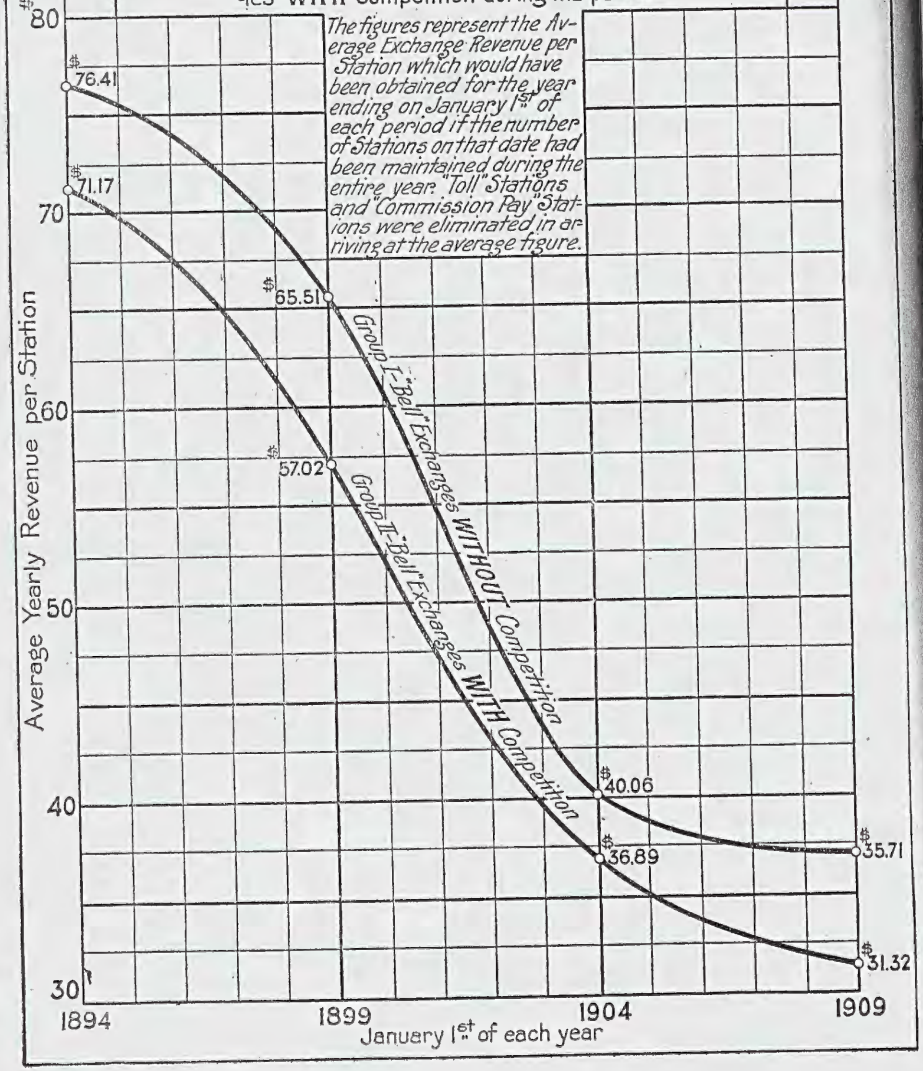
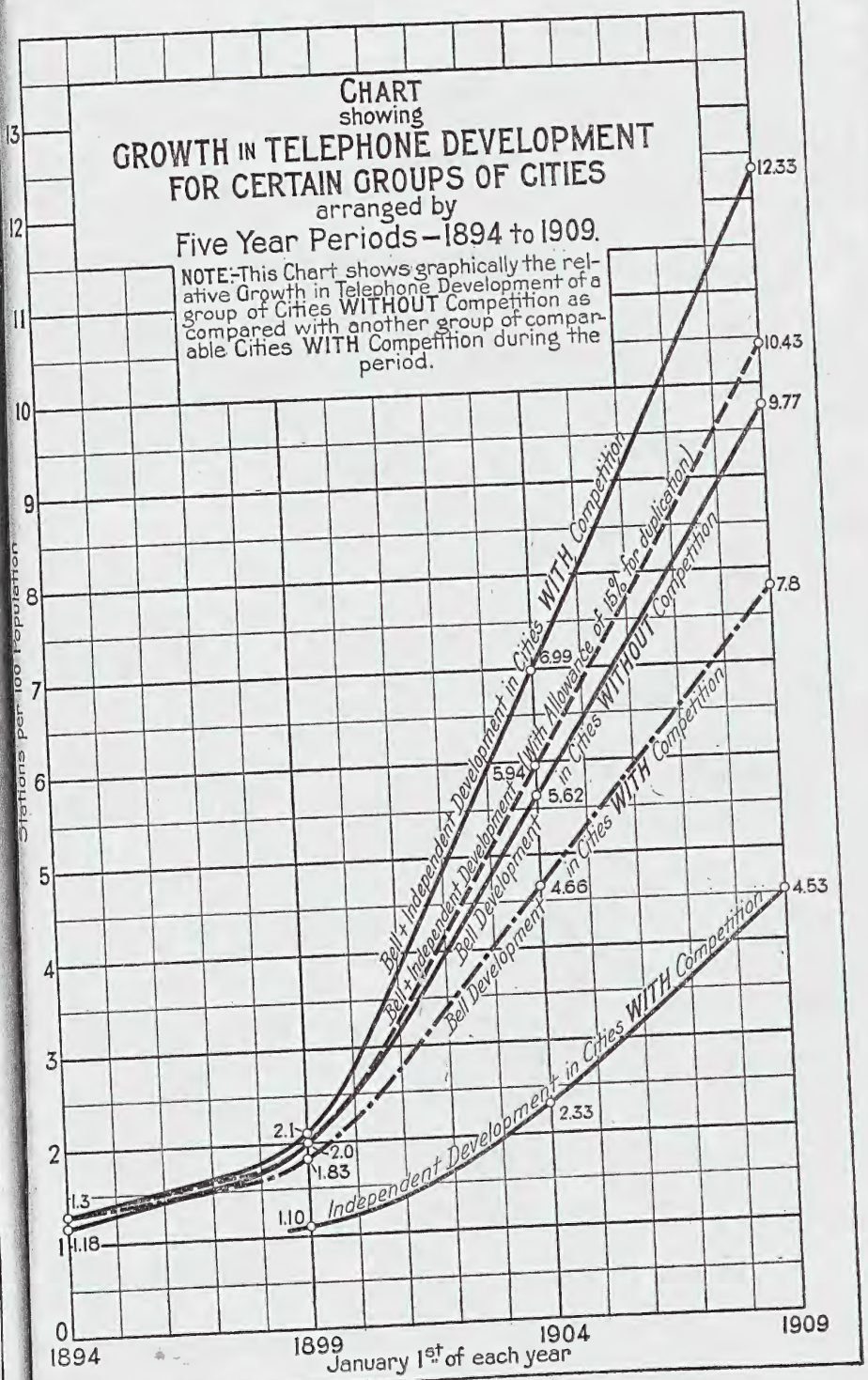


CHART
showing
GROWTH IN TELEPHONE DEVELOPMENT FOR CERTAIN GROUPS OF CITIES
arranged by
Five Year Periods—1894 to 1909.

NOTE:-This Chart shows graphically the relative Growth in Telephone Development of a group of Cities **WITHOUT** Competition as compared with another group of comparable Cities **WITH** Competition during the period.



The *development*—that is, the number of exchange stations per 100 population—for Bell exchanges without competition and for the Bell and opposition exchanges in cities with competition, is given on page 27. The same cities are used as for page 26.

The combined Bell and opposition development in the cities with competition in 1909, allowing 15 per cent. for duplication, was 10.43 per 100 population. The average duplication is probably nearer 20 per cent. than 15 per cent.

The Bell development in cities without competition was 9.77—only three-quarters of one station per 100 population less.

The Bell development alone in cities with competition is 7.8 stations per 100 population, or only 2.5 stations less than the combined development, as against the opposition development of 4.53 stations per 100.

The opposition figures are taken from opposition statements and include all the larger places where there were such exchanges and those of the largest development.

MINIMUM RATES.

For Bell exchanges aggregating some 700,000 stations with no opposition, the mean minimum rates for 1909 were $36.00 per year for business, and $23.75 for residence, as against the mean minimum rates in 1894 of $68.10 for business, and $56.00 for residence.

In cities with competition, where there were Bell exchanges aggregating 550,000 stations and opposition exchanges aggregating 322,000 stations, the mean minimum rates for Bell service were $41.25 for business, and $22.80 for residence; for the opposition service, the mean minimum rates were $37.15 for business, and $23.25 for residence.

AVERAGES OF OPERATING UNITS OF ASSOCIATED OPERATING COMPANIES, 1895 TO 1909.

(See Table, next page.)

The table on page 30 shows the averages of the revenue, expenses and other average operating details of the associated operating companies for the years 1895, 1900, 1905 and 1909.

Taking the years 1895 and 1909, the average exchange revenue per station for exchange service was reduced from $70.00 to $31.50, or 55 per cent.; the total revenue including toll revenue per exchange station reduced from $81.00 to $41.00, or one-half; the operating expenses including taxes reduced from $31.50 to $17.10, or 45 per cent.; maintenance per station reduced from $26.20 to $13.00, or one-half. Total operating expenses were reduced from $57.70 to $30.00 per station, or not quite one-half,—that is, reduction of operating expenses of about one-half brought about a reduction in cost to the public of exchange service of over one-half.

The other figures show the various costs and expenses. The average plant cost, including toll and exchange construction, was reduced from $260 to $145 per exchange station, about 45 per cent. All plant costs show a decrease per unit, although there has been an increase in both labor and material.

These statements, statistics and diagrams should establish the claim already made that reduction in rates followed closely reduction in expenses, and that reduction in expenses was the result of the broad policy of development and improvement, the policy of the Bell system from the beginning, and not forced upon it by competition;

That competition in the telephone business is not a beneficial competition; and

That there is within the reach of every one needing it a connection with the Bell telephone system.

AVERAGES OF OPERATING UNITS OF ASSOCIATED OPERATING COMPANIES, 1895 TO 1909.

AVERAGE PER EXCHANGE STATION.	1895.	1900.	1905.	1909.
EARNINGS:				
Exchange Service	$69.75	$44.68	$33.31	$31.37
Toll Service	11.35	12.60	9.95	9.42
Total	$81.10	$57.28	$43.26	$40.79
EXPENSES:				
Operation	$29.15	$21.63	$16.96	$15.14
Taxes	2.23	2.37	1.49	1.93
	$31.38	$24.00	$18.45	$17.07
Balance	$49.72	$33.28	$24.81	$23.72
Maintenance and Depreciation	26.20	17.68	13.91	12.93
NET EARNINGS	$23.52	$15.60	$10.90	$10.79
Per Cent. Tel. Exp. to Tel. Earnings	71.0	72.8	74.8	73.6
Per Cent. Maint. and Depr'n to Aver. Plant, Supplies, etc.	9.1	8.4	8.9	8.4
Per Cent. Incr. Exchange Stations†	15.7	26.5	24.5	11.6
Per Cent. Incr. Miles Exchange Wire†	15.9	33.2	27.2	7.1
Per Cent. Incr. Miles Toll Wire†	21.3	25.2	12.4	4.4
Average Plant Cost per Exchange Station (including Exchange and Toll Construction)	$260.00	$199.00	$145.00	$145.00
Average Cost per Mile of Pole Line (Toll), including Wire	$219.00	$348.00	$438.00	$610.00
Average Cost per Mile of Wire (Toll), including Poles	$81.00	$71.00	$62.00	$63.00
Per Cent. Gross Tel. Earnings to Average Constr.	33.4	31.7	31.7	29.6
Per Cent. Net Profits to Aver. Capital Stock	10.11	9.44	8.34	8.14
Per Cent. Dividends to Aver. Cap. Stock	5.07	6.19	5.75	5.95

† Increase during year shown, over previous year.

WESTERN UNION TELEGRAPH COMPANY.

In taking over a substantial interest in the Western Union Telegraph Company, this company assumed a substantial obligation to the public in addition to that which it already had. To make clear the extent of this obligation and the resulting advantages, and to illustrate the various shades of relation between the telegraph and the telephone, some explanations will be interesting and instructive.

The connection or relation between the telephone and the telegraph is not in any sense one of substitution, it is supplementary; one is auxiliary to the other.

Telegraphy eliminates the time of transit of correspondence, by the electrical transmission of the text from office of origin to office of destination, but it is incomplete in that the methods of collection and delivery are slow and primitive.

Telephony eliminates distance by placing parties at distant points in direct personal communication with each other, but the expense prohibits its use for the transmission of written messages over long distances.

Telegraph operation as carried on must have a separate, distinct and entirely different operating organization and equipment from that of a telephone company.

Line construction and maintenance are common to both the telephone and the telegraph, and can be combined or performed jointly with economy. The same wires may be used for both telephone and telegraph circuits and at the same time. The differentiation between telephone and telegraph construction and operation begins with the stringing of the wires.

Where there is density of message traffic sufficient to keep busy an expert telegraph operator, the telephone

cannot be used in competition with the telegraph in the handling of message traffic, but at some point of less density of traffic the telephone will gradually supersede the telegraph in handling message traffic.

The elementary differences in the scope and operation of the telephone and the telegraph in the handling of telegraph traffic indicate that each will occupy a distinct and a well-defined field.

The telegraph between centres of density and for long distances.

The telephone for short distances and for the collection and distribution between the customer and such centres.

About 65 to 70 per cent. of the telegraph traffic is between, that is, both originates and ends in, about 550 cities and towns of 10,000 or more population. The Western Union telegraph lines reach over 22,000 smaller cities and towns and villages, at most of which the commercial telegraph traffic would not of itself support a telegraph office. This business is now being performed necessarily under some joint arrangement, for the greater part with the railroad companies. While these arrangements will be continued, a greatly extended and improved service will be given in connection with the Bell system with over 5,000,000 stations located in 50,000 cities and towns, most of which will be put in immediate connection with telegraph offices at central points. *In this way the electrical transmission of messages will be extended from the actual point of origin to the actual point of destination.*

There are comparatively few places where there is business enough to warrant a "night and day" telegraph service, but there is no place where "night and day" telegraph service is maintained that is not in the centre of a "Bell system." Practically no Bell

exchange is ever closed—therefore there are few subscribers of the Bell system who cannot be placed within reach of night and day telegraph service.

Under the new conditions, when in full operation, each service, the telephone and the telegraph, will find its level of use, its field of best usefulness, with a distinct improvement in, and advantage to, both services.

Such economies as follow will be taken advantage of to increase the facilities and where possible reduce the cost to the public.

Before any change can be made in the existing rates for existing service, it will be necessary to await the result of studies now being made, as it is claimed that the irreducible cost of handling is so near the revenue received for each commercial message that no reduction in rates would be justified by any probable increase in business.

Improvement and extension of existing service and introduction of new classes of service will be the first effort of all interested. The first of these will be the introduction of the "Night Letter" and others will follow.

The benefits and advantages from this complementary operation will come, but not all at once. Careful study and consideration are being given to all questions by all interested. Existing plant will have to be rearranged or reconstructed, new plant constructed on proper lines. The necessary safeguards for the protection of the company and the public will have to be worked out.

The idea of operating the telephone and the telegraph in accord, each supplementing the other, is not a new or untried one, but has been ineffective because of the lack of common influence in the control of the operations. With the employees of both companies actuated by a common purpose, this can be effectively done; without a common influence in the operation it has been practically impossible.

General Considerations.

It is the duty and obligation, as well as self-interest, of a public service corporation to give efficient service up to the limits of reasonable practicability and to furnish such service at a reasonable price.

As a rule all capital invested in any public utility is permanently invested. It cannot be salvaged to any extent, nor can it be used for any other purpose. The chance of any return upon the capital is entirely dependent upon inducing or educating the public to make use of the service so offered. To do this, whatever is offered must be offered at a price which leaves the user a margin of profit—if not in money, in comfort and convenience—at a price which the public will accept, and that must necessarily be below the actual value of the service to the public.

Although there have been abuses in corporate management and in the manipulation of both property and securities, *for which there is ample remedy if existing laws are enforced*, yet it must be admitted that the tremendous development of utilities in this country as compared with other countries, with their contribution to the comfort and convenience of the public, is to a certain extent due to the lack of proscriptive restrictions.

The profits that have been realized by public service corporations in the development of new and beneficial facilities are insignificant in comparison with, and are certainly justified by, the enhancement of values and the unearned increment which have accrued to the public and which could not have existed but for this development.

The one attracts more attention because of its corporate character, while the benefits are of a private character, widely dispersed in smaller units and as a rule to individuals.

It is but natural that corporations should have some misgivings about a control of internal management by a body *without any responsibility that could be called accountability*, and without the practical knowledge or experience or information which comes from the daily dealings with questions; a control which would undertake to decide upon questions widely different, complex and far-reaching, over which expert managers of life-long study and experience are sometimes at a loss; a control over methods of business which usually are the evolution of years of practice, and are so interwoven with the fundamentals of business that they cannot be changed suddenly without great disturbance.

Too much importance is apt to be attached to claims of theorists or inventors, as any one can judge by comparing the wonderful promises and claims made with the results achieved.

All great developments in any line of industry have been from crude and imperfect beginnings by a process of evolution, by improvement in detail the result of suggestion from association, operation, or study.

The original idea upon which may be founded great development may be revolutionary but it never springs full-fledged or perfect into the world.

Public utility companies have obligations and are responsible both to the public and to their shareholders. It is a responsibility with accountability. Prevent them from imposing upon the public with fictitious issues of securities, or with exactions on the public with which to pay dividends on those fictitious securities.

As to their internal management, operating methods, leave something to their self-interest, to their responsibility with accountability; do not impose upon them such control as might force upon them new methods, new

apparatus, new ideas which have not been tried out, which have not been put through the crucible of practical experience. Theories and new ideas will be welcomed by any progressive corporation for without them development would be stayed, but all that is improvement must come through a process of evolution, by the gradual elimination of the useless and adoption of the useful, through experimental application modified to existing conditions.

We believe that if there is to be control, there should be protection, and that beyond the lines set forth above, any control ceases to be control and becomes management or operation. We believe that management or operation by a body without any accountable responsibility would be prejudicial to the best interests of the service and of the public, and destructive of property and the rights we are supposed to possess.

Our company has a vital interest in the proper solution of the telephone problem, and we believe that we are working the problem out on the broad lines of the greatest benefit to the public as a whole.

For the Directors,

THEODORE N. VAIL,
President.

BELL SYSTEM IN THE UNITED STATES.

	Dec. 31, 1895.	Dec. 31, 1900.	Dec. 31, 1903.	Dec. 31, 1908.	Dec. 31, 1909.	Increase, 1909.
Miles of Exchange Pole Lines	25,330	30,451	67,698	108,539	113,893	5,354
Miles of Toll Pole Lines	52,873	101,087	145,535	161,452	164,111	2,659
	78,203	131,538	213,233	269,991	278,004	8,013
Total Miles of Pole Lines	184,515	705,269	2,345,742	4,909,449	5,337,436	427,987
Miles of Underground Wire	2,028	4,203	9,373	19,906	22,698	2,792
Miles of Submarine Wire	488,872	1,252,329	3,424,803	4,901,363	5,119,892	218,529
Miles of Aerial Wire	675,415	1,961,801	5,779,918	9,830,718	10,480,026	649,308
Total Miles of Wire	215,687	607,599	1,265,236	1,732,039	1,804,552	72,513
Comprising Toll Wire	459,728	1,354,202	4,514,682	8,098,679	8,675,474	576,795
Comprising Exchange Wire	675,415	1,961,801	5,779,918	9,830,718	10,480,026	649,308
Total	237,837	508,262	1,135,449	1,668,211	1,829,942	161,731
Total Exchange Circuits	1,613	2,775	4,532	5,043	4,968	75†
Number of Exchanges	281,695	800,880	2,241,367	3,215,245	3,588,247	373,002
	27,807	55,031	287,348	1,149,384	1,554,445	405,061
Number of Bell Stations	309,502	855,911	2,528,715	4,364,629	5,142,692	778,063
Number of Bell Connected Stations*	14,517	37,067	89,661	98,533	104,956	6,423
Total Stations				7,721	10,354	2,633
Number of Employees	2,351,420	5,668,986	13,543,468	18,499,376	19,925,194	1,425,818
Number of Connecting Companies	51,123	148,528	368,083	463,021	517,341	54,320
Exchange Connections Daily						
Toll Connections Daily						

*Includes private line stations.

†Decrease.

1910

TRAFFIC.

Including the traffic over the long-distance lines, but not including connecting companies, the daily average of toll connections was about 602,500, and of exchange connections about 21,681,500, as against corresponding figures in 1909 of 517,000 and 19,925,000; the total daily average for 1910 reaching 22,284,000, or at the rate of about 7,175,448,000 per year.

PLANT ADDITIONS.

The amount added to plant and real estate by all the companies, excluding connecting companies, constituting our system in the United States during the year 1910 was:—

Real Estate	$2,518,133
Equipment	19,628,357
Exchange Lines	13,409,546
Toll Lines	14,959,048
Construction Work in Process	3,067,734
	$53,582,818

PLANT ADDITIONS OF PREVIOUS YEARS.

The amount added in 1900 was $31,619,100; in 1901, $31,005,400; in 1902, $37,336,500; in 1903, $35,368,700; in 1904, $33,436,700; in 1905, $50,780,900; in 1906, $79,366,900; in 1907, $52,921,400; in 1908, $26,637,200; and in 1909, $28,700,100, making the total expenditure for additions to plant during the eleven years $460,755,700.

MAINTENANCE AND RECONSTRUCTION.

During the year $52,028,000 was applied out of revenue to maintenance and reconstruction purposes.

The total provision for maintenance and reconstruction charged against revenue for the last eight years was over $283,500,000.

CONSTRUCTION FOR THE CURRENT YEAR.

Estimates of all the associated operating companies and of the American Telephone and Telegraph Company for all new construction requirements in 1911 have been prepared. It is estimated that about $60,000,000 will be required for current additions to plant in 1911, of which amount some $30,000,000 will be provided by the existing and current resources of the companies. All who are responsible for these expenditures are working in complete understanding of these estimates and the limits set on their expenditures.

DEPRECIATION.

The question of depreciation has been considered very critically and analytically during the past year, by commissions and other bodies, in connection with studies on the rate question. While a depreciation reserve was generally favored, there seemed to be a disposition to apply experience and theories, gleaned from other lines of business, to the telephone business.

The telephone business is unique in that it supplies its own terminals, which are vast in number, are temporary in character, and call for large investment, unique in that a very considerable part of its plant is of a rapidly deteriorating character. Underground conduits and cables and aerial cables are fast changing this, but in the outlying rural and semi-urban districts and for long-distance lines construction will always have to be overhead on poles. There is nothing analogous to it in industrial or public utility service except the telegraph.

The entire disregard or underestimating of depreciation and future replacement, is the cause of nearly all the financial disasters that have occurred in the telephone business, and has been the common failing of newcomers in the telephone field from the beginning to the present time.

Current repairs on new plant, even of the old time temporary character, were small; no surplus or reserve was provided; profits were apparently large, as were dividends.

A false atmosphere of prosperity surrounded the business which was not dispelled until replacements of plant through decay or obsolescence became imperative; until the overhead gave way to the underground, until the individual board gave way to the multiple central office system, until central office energy supplanted the magneto system, until exacting construction requirements of long-distance speaking began, until expansion of business and extension into new fields, some unremunerative, were obligatory; until a condition existed where, to correct mistakes of the past, capital had to be expended without producing any corresponding increase in the revenue.

The inevitable was in some cases postponed by excessive charges to construction account, but came in time, as it is bound to come under such conditions. The apparent profits and dividends had been at the cost of the capital and, at the time of the greatest necessity, resources were at the lowest ebb.

Ignorantly or wilfully, every cause but the right cause was blamed, and although the management had been in the hands of the outside interests, the Bell parent company was given the responsibility, had to carry the burden, and assume the work of reconstruction and rehabilitation.

An illustration may make the necessity of depreciation reserve even clearer. If a carter or local expressman or hackman owning his own carriages, horses or motor cars, should consider as profit all revenue over and above his current expenses and costs of current repairs, and should spend it, saving nothing with which to replace his plant when worn out or damaged beyond repair, he would be called thriftless and improvident. He had enjoyed his capital, and had nothing upon which to raise more.

The present policy of the Bell System is to provide against every probable contingency and to base the amount and extent of such provision on past experience—not on future expectations. It is conjectured that the future will show a decrease in the depreciation or reconstruction due to decay, wear and tear, and obsolescence. Changes—improvements—are going on as rapidly as in the past, but the general character of plant and methods is assuming more permanency. The improvements are being evolved from, and are being grafted on to, the old system and methods. The disturbing and sometimes seemingly destructive conditions following the rapid development of high pressure power and transmission have been to a great measure overcome.

All this has been made possible through the unremitting study and research of the staff of the Engineering and Experimental Departments of the Company, who by close attention, observation and study, anticipate and provide for all such contingencies and conditions as can possibly be anticipated or provided for in advance.

Under these conditions there is small probability that any such causes as those which forced the wholesale reconstruction or rearrangement of plant in the past will again occur; it is, however, for the benefit of the public and of the corporation to have an ample reserve for any contingency which may happen.

Local telephone service up to the present requirements cannot be furnished by isolated or individual companies, and facilities for general service must be co-extensive with speaking limits, so that it is imperative for any system which pretends to be comprehensive to meet, and meet promptly, all demands for service. Its public usefulness as well as corporate existence and prosperity make it imperative to meet the continuing demand for extension which sometimes seems almost overwhelming in its magnitude.

Not only must this increase be met, but to be met economically or efficiently, it must be anticipated; subways cannot be built conduit by conduit, or filled wire by wire—cost would be prohibitive and service impossible. Central office buildings must be located and erected and connected by subway with the general system before switchboards or wires or equipment can be introduced. When built they must be built for the future. To build for present requirements only, and enlarge as demand comes, is impossible in much of this work; and, where possible, impracticable from service standpoint, or prohibitive from that of cost. Advance construction of this kind of the Bell Telephone System, including construction in process, December 31, 1910, was estimated at $180,000,000. Had no plant been built in advance of needs except that which was unavoidable the expenditure would have been reduced by $112,000,000, but the cost of the plant not built at first, if provided later and only as required, would have been $250,000,000 instead of $112,000,000. In other words, not to provide for advance construction doubles the cost of the plant.

The capital for this advance construction must be provided by and at the cost of the present, as was the advance construction of the past provided by and at the cost of the past. To the extent that advance construction reduces the cost of necessary plant and anticipates reconstruction and replacement, to that extent the capital charge to be borne by present and future is reduced and to that extent it immediately puts the depreciation reserve to its intended use. The criticism that any excess of reserve is at the cost of the present for the benefit of the future is true, but only to the extent that it may be found eventually to be in excess of actual requirements. In any case it would be no more than might rightly be considered an insurance against obsolescence which cannot be foreseen.

FIGURES FOR THE YEAR.

The following tables show the business for the year of the Bell Telephone System including the American Telephone and Telegraph Company and its associated holding and operating companies in the United States, but not including connected independent or sub-licensee companies, nor the Western Electric Company and Western Union Telegraph Company except as investments in and dividends from those companies are included respectively in assets and revenue. All intercompany duplications are eliminated in making up these tables so that the figures represent the business of the system as a whole in its relations to the public.

The gross revenue collected from the public in 1910 for telephone service by the Bell System—not including the connected independent companies—was $165,600,000; an increase of nearly $16,000,000 over last year. Of this, operation consumed $54,000,000; taxes, $8,000,000; current maintenance, $25,700,000; and provision for depreciation, $26,200,000.

The surplus available for charges, etc., was $51,000,000, of which $11,550,000 was paid in interest and $25,000,000 was paid in dividends to the public.

The total capitalization, including inter-company items and duplications, of the companies of the Bell System is $1,114,310,979. Of this $502,306,910 is owned and in the treasury of the companies of the Bell System. The capital stock, bonds and notes payable outstanding in the hands of the public at the close of the year were $612,000,000. If to this be added the current accounts payable $21,700,000, the total obligations of every kind were $633,700,000, as against which there were liquid assets, cash and current accounts receivable, of $53,600,000, leaving $580,100,000 as the net permanent capital obligations of the whole system outstanding in the hands of the public.

Against these obligations, the companies had prop-

erty $696,700,000—an excess of $116,600,000, or 20 per cent.

There is a large additional surplus, which is legitimate and proper and which could be properly added to the book Surplus, representing as it does the value of intangible property, such as franchises, contracts, patents, rights of way, both public and private, which are not carried at any valuation in the book accounts.

In every case where the public authorities have appraised the plant of the companies, the valuation has been far in excess of the book valuation. It is within the bounds of conservatism to say that the obligations of all the companies outstanding in the hands of the public are represented by 150 per cent. of property at a fair replacement valuation of the plants and assets, not including public franchises.

In spite of these facts and figures shown from year to year in our annual reports; in spite of reports to the contrary of every public or semi-public body which has examined and reported on the value of the property of the Bell System; in total disregard of information at the disposition of every one, there are many who for some purpose or other—sometimes to induce credulous investors to take some worthless securities in hope of extraordinary and impossible returns; sometimes for political purposes; sometimes for sensation or notoriety—continue to spread the reports of fabulous over-capitalization of the Bell System as a whole and of its component parts, and gross and extortionate charges for service.

Particular attention, therefore, is invited to the tables following, and also to the one showing averages of operating units of associated companies, on page 13.

Bell Telephone System in United States.

COMPARISON OF EARNINGS AND EXPENSES, 1909 AND 1910.

(ALL DUPLICATIONS, INCLUDING INTEREST, DIVIDENDS AND OTHER PAYMENTS TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY BY ASSOCIATED HOLDING AND OPERATING COMPANIES, EXCLUDED.)

	1909.	1910.	Increase.
Gross Earnings	$149,914,708	$165,612,881	$15,698,173
Expenses—Operation	$49,731,941	$54,235,449	$4,503,508
Current Maintenance	23,723,681	25,763,082	2,039,401
Depreciation	21,115,272	26,264,927	5,149,655
Taxes	6,976,306	8,355,015	1,378,709
Total Expenses	$101,547,200	$114,618,473	$13,071,273
Net Earnings	$48,367,508	$50,994,408	$2,626,900
Deduct Interest	10,221,383	11,556,864	1,335,481
Balance Net Profits	$38,146,125	$39,437,544	$1,291,419
Deduct Dividends Paid	23,910,603	25,160,786	1,250,183
Surplus Earnings	$14,235,522	$14,276,758	$41.236

COMBINED BALANCE SHEET, 1909 AND 1910.

(DUPLICATIONS EXCLUDED)

ASSETS:	Dec. 31, 1909.	Dec. 31, 1910.	Increase.
Contracts and Licenses	$7,212,781	$2,943,381	$4,269,400*
Telephone Plant	557,417,146	610,999,964	53,582,818
Supplies, Tools, etc.	17,048,196	20,987,551	3,939,355
Receivables	49,744,919	26,077,802	23,667,117*
Cash	32,055,866	27,548,933	4,506,933*
Stocks and Bonds	38,166,284	64,766,089	26,599,805
Total	$701,645,192	$753,323,720	$51,678,528
LIABILITIES:			
Capital Stock	$352,904,063	$344,645,430	$8,258,633*
Funded Debts	187,685,339	224,791,696	37,106,357
Bills Payable	40,721,625	42,566,943	1,845,318
Accounts Payable	24,633,780	21,721,125	2,912,655*
Total Outstanding obligations	$605,944,807	$633,725,194	$27,780,387
Surplus and Reserves	95,700,385	119,598,526	23,898,141
Total	$701,645,192	$753,323,720	$51,678,528

*Decrease.

AVERAGE OPERATING UNITS OF ASSOCIATED OPERATING COMPANIES.

(*See table on next page.*)

The table on the following page shows average operating revenue and expenses per station, operating ratios, unit plant costs, etc., of the associated operating companies (not including the American Telephone and Telegraph Company's long-distance lines), for the years 1895, 1900, 1905 and 1910.

It will be noted that there has been a steady decrease both in expenses and revenue per subscriber's station, so that now the average subscriber pays for a higher grade, more comprehensive service, less than half what he paid fifteen years ago for the much less useful service that was then possible.

This reduction in cost of service has made it possible for every one who needs a telephone to have one and to get the great advantage of being within reach of everybody by telephone.

The greatly decreased plant investment per station to which attention was called in the previous annual report has been still further reduced during the year to $142, notwithstanding the extensive additions to toll lines shown on page 4.

There is a steady increase in the proportion of wires underground, as shown on page 63, which indicates a greater permanence of plant and decreases the maintenance costs. This low cost of plant and this decreasing maintenance cost are only made possible by the central supervision of engineering and manufacturing of the Bell System and the advance construction referred to at length under the head of Depreciation.

The percentage of net profits to capital stock, although not so good as in the earlier years of the business, shows for 1910 an improvement over recent years.

Average Operating Units of Associated Operating Companies, 1895 to 1910.

(THIS TABLE COVERS THE COMPANIES OWNING ALL THE EXCHANGES AND TOLL LINES OF THE BELL TELEPHONE SYSTEM EXCEPT THE LONG-DISTANCE LINES OF AMERICAN TELEPHONE & TELEGRAPH CO.)

Average per Exchange Station.

EARNINGS:	1895.	1900.	1905.	1910.
Exchange Service	$69.75	$44.68	$33.31	$31.28
Toll Service	11.35	12.60	9.95	9.47
Total	$81.10	$57.28	$43.26	$40.75
EXPENSES:				
Operation	$29.15	$21.63	$16.96	$15.14
Taxes	2.23	2.37	1.49	2.00
Total	$31.38	$24.00	$18.45	$17.14
Balance	$49.72	$33.28	$24.81	$23.61
Maintenance and Depreciation	26.20	17.68	13.91	13.46
Net Earnings	$23.52	$15.60	$10.90	$10.15
Per Cent. Operation Expense to Tel. Earnings	35.9	37.8	39.2	37.2
Per Cent. Telephone Expense to Tel. Earnings	71.0	72.8	74.8	75.1
Per Cent. Maintenance and Depreciation to Average Plant, Supplies, etc.	9.1	8.4	8.9	9.5
Per Cent. Increase Exchange Stations*	15.7	26.5	24.5	11.8
Per Cent. Increase Miles Exchange Wire*	15.9	33.2	27.2	12.0
Per cent. Increase Miles Toll Wire*.	21.3	25.2	12.4	11.5
Average Plant Cost per Exchange Station (including Exchange and Toll Construction)	$260	$199	$145	$142
Average Cost per Mile of Pole Line (Toll) (Including Wire)	$219	$348	$438	$688
Average Cost per Mile of Wire (Toll) (Including Poles)	$81	$71	$62	$66
Per Cent. Gross Telephone Earnings to Average Plant	33.4	31.7	31.7	29.3
Per Cent. Net Profits to Average Capital Stock	10.11	9.44	8.34	8.48
Per cent. Dividends to Average Capital Stock	5.07	6.19	5.75	6.31

*Increase during year shown, over previous year.

There has, consequently, been but little difficulty in working harmoniously with these Commissions in solving the problems which, in a growing business, constantly demand attention.

In Oklahoma, where our associated company felt compelled to disagree with the State Commission, the Supreme Court of the State in the so-called Enid case has fully sustained our claims. That Court in its opinion has made a very valuable contribution to the law, recognizing, as it does, that in the telephone business large expenditures must be made in the establishment and development of an efficient telephone service which do not appear in the plant, but which contribute to the value of the business when established. This "going value" must always be added to the value of the physical plant in determining the investment upon which the telephone company is entitled to an income. The Court also recognized the necessity in the telephone business of making a liberal provision for depreciation, not only to provide for the decay and destruction of plant, but also to make the changes required to meet rapidly growing demands and to furnish the public with the improved facilities which the great development of the art has made necessary.

Our associated companies have been quick to respond to the public needs with these improved facilities and advanced methods of operating. In consequence they have had very little litigation with their subscribers and have been uniformly successful in such as has arisen.

In the Western Union case the United States Circuit Court has affirmed the report of the Master and the case will be appealed. Nothing has developed in this case which changes our view that the earlier decisions in this case were correct and that we have fully accounted for all that was due the plaintiffs under the contract of November 10, 1879.

PENSIONS AND SAVINGS.

During the year a great deal of attention has been given to some scheme for Pensions and Savings which would be of the greatest possible benefit and assistance to the employees, and if possible a substantial improvement on any scheme now in force.

The problem is an intricate and complicated one and the solution not easy.

At a conference of all the associated companies it was agreed that any plan adopted by the American Telephone and Telegraph Company would also be adopted by them, making it comprehensive and covering the Bell System as a whole, so that all changes of employees between companies would not affect their Pensions or Savings benefits.

In the meantime all cases which would come under Pensions or Savings plans will be acted upon individually by the company, so that in effect so far as the employees are concerned the delay does not postpone any benefit to them.

INDEPENDENT AND OPPOSITION COMPANIES.

Our policy in respect to the opposition and independent telephone systems has been consistently followed through the year. Wherever it could be legally done, and done with the acquiescence of the public, opposition companies have been acquired and merged into the Bell System.

Independent companies have been added to the System through sub-license or connecting contracts.

There is no question but that the public are tired of dual telephone exchange systems, and that so fast as confidence in protection against the real or imaginary evils of monopoly increases, opposition against mergers will decrease.

This condition can only be brought about by putting before the public the fullest and most detailed information as to the company, its policy and purposes.

PUBLIC RELATIONS.

In all times, in all lands, public opinion has had control at the last word—public opinion is but the concert of individual opinion, and is as much subject to change or to education.

It is based on information and belief. If it is wrong it is wrong because of wrong information, and consequent erroneous belief.

It is not only the right but the obligation of all individuals, or aggregations of individuals, who come before the public, to see that the public have full and correct information.

The Bell System gained 740,027 subscribers last year. Of the total number of subscribers over 1,000,000 were new during the year.

The American Telephone and Telegraph Company gained 4,558 shareholders last year. Of the total number of shareholders many more were new last year.

The excuse for setting forth at great length the policy, facts, beliefs and desires of the Bell System and those administering it, even to the extent of repeating much that has already been said and explaining some things familiar to many, is to inform the new public, the new subscribers, and the new shareholders.

Every fact that is stated is correct.

Every argument or reason is believed to be well founded and based on facts and is intended to be impartial.

The position of the Bell System is well known.

It is believed that the telephone system should be universal, interdependent and intercommunicating, affording opportunity for any subscriber of any ex-

change to communicate with any other subscriber of any other exchange within the limits of speaking distance, giving to every subscriber every possible additional facility for *annihilating time or distance by use of electrical transmission of intelligence or personal communication.* It is believed that some sort of a connection with the telephone system should be within reach of all. It is believed further, that this idea of universality can be broadened and applied to a *universal wire system* for the *electrical transmission of intelligence* (*written or personal communication*), from every one in every place to every one in every other place, a system as universal and as extensive as the highway system of the country which extends from every man's door to every other man's door.

It is not believed that this can be accomplished by separately controlled or distinct systems nor that there can be competition in the accepted sense of competition.

It is believed that all this can be accomplished to the reasonable satisfaction of the public with its acquiescence, under such control and regulation as will afford the public much better service at less cost than any competition or government-owned monopoly could permanently afford and at the same time be self-sustaining.

The Bell System as at present constituted was evolved first through the local exchange.

In the beginning of the business it was impossible to get the necessary capital for development in any large amount. In the place of large capital, small capital and the optimism of individuals had to be utilized. Small capital, large hopes and individual effort brought about a development by limiting the size of the exchange territory given to each individual to his possibilities. In this way the country and smaller cities were largely developed before much

was done in the larger cities. The capital to develop New York was estimated at less than $100,000, yet it was a long time before even that could be raised. Even if it had been possible to raise capital to exploit the whole country through one company, it would have been impossible to use it properly. The business was new. Those who constructed and operated it had to be educated. The policy of small units and individual effort, with concentration, application and resourcefulness brought a more rapid development and education than could have been had in any other way.

In this formative period, when the business was new, before distant speaking possibilities were shown, all communication was local. No two exchanges were either equipped or operated on the same lines or under the same methods, nor did they need to be; service, judged by present standards, was poor, but satisfied the local use; better service was not known. Later development of the toll line, of lines connecting exchanges, and of long-distance service made the deficiencies of the service glaring and the necessity of improvement imperative.

It will be remembered by many when the long-distance service was first introduced special connections had to be built for the users; now every telephone station or line can be equally well used for long-distance speaking.

With the extension of the speaking limits of the telephone over connecting lines came also the necessity for the extension of the territorial limits of the exchange systems, the necessity of standardization, uniformity of apparatus and operating methods, and an effective common control over all. The necessity for system was the beginning of the Bell System. The combination of the separate exchanges and lines into larger aggregations or organizations followed. It was necessary to have more effective organization with more effective administration and management,

and with resources sufficient to make the changes which experiment and experience had found necessary.

It is impossible to define the territorial limitations of a telephone system because from every exchange center communication is wanted up to the talking limits in every direction.

This process of combination will continue until all telephone exchanges and lines will be merged either into one company owning and operating the whole system, or until a number of companies with territories determined by political, business or geographical conditions, each performing all functions pertaining to local management and operation, will be closely associated under the control of one central organization exercising all the functions of centralized general administration. But whatever may be the form of the operating organization, there is bound to be for legal purposes and the holding of franchises, some sort of subordinate state organization which will bring the business and property in each locality under the jurisdiction of the state in which it is situated and operated.

The American Telephone and Telegraph Company, which is the owner of all or part of each company forming the Bell System, is not simply a holding company. It is not a combination that has eliminated competition between the companies controlled by it. There can be no rivalry or competition between local exchanges in adjacent territory. Those desiring the service of exchanges in adjacent territory in addition to their own can get it much better and cheaper through their local exchange. To give direct individual wires from one exchange territory into another would be impractical from the multiplication of lines and prohibitive on account of cost. The American Telephone and Telegraph Company is a centralized general administration for all the

companies. It does the financing for the extension of the business. It furnishes the engineering, operating and other experts. It maintains a productive and protective organization so far as patents are concerned. It defends all the companies against all infringements. It undertakes to bring about improvements by working out the ideas and suggestions of others, both in and out of the business. Its agents keep each company fully informed of all that is going on in the field. It avoids all duplication of efforts, of experiments, of trial of new methods, apparatus, etc. It looks after the public relations of the companies. In other words, it performs all that service which is common to all, leaving to the local companies the local management. The organization is not unlike that of the United States, each local company occupying its own territory and performing all local functions, the American Telephone and Telegraph Company binding them all together with its long-distance lines and looking after all the relations between the local companies and between local companies and other companies. To have developed the telephone industry to its present state of efficiency would have been beyond the ability of any one of the local companies.

All independent systems which have been started have more or less followed the same lines, but within restricted areas, whether built by one company or interest, or by several. First, the local exchange, then the toll line to outlying points, and then the long-distance line connecting with other independent exchanges, tieing them together to form a system affording facilities for communication between the subscribers of one exchange and the subscribers of the other, but limited in scope, and without the community of interest necessary to a common system.

In other words we have the Bell System on the one side, developed on the lines of a universal, intercommunicating and interdependent service. We

have the opposition on the other side, segregated exchanges or limited systems without universality, incomplete and inefficient, neither interdependent nor intercommunicating, except to a limited extent.

Corporate Organization and Combination.

There is nothing of greater common interest, nothing which is exciting more comment and discussion at the present moment, than the questions of state control of corporate organizations and of combinations, especially of those controlling public utilities.

Corporate organization and combination are the necessary and logical solution of the problem of caring for the wonderful development which has been going on all over the world, and particularly in this country, in the recent past.

Combination only can cope with that industrial development of the present time which is far beyond the scope of individual effort or capital. In those good old times, one man, with his own capital, could carry on even the largest operations. The margin of profits due to low wages and large selling prices enabled the owners of such individual establishments to live and enjoy the best to be had in those times, and amass fortunes—fortunes relatively as large as any of the present—from an amount of gross business, the profits from which today would not be sufficient to pay the wages of a shop superintendent.

The development of the arts, the necessity of extensive laboratories and experimental departments, with technical staffs competent to keep abreast of modern progress and find out how to *utilize all of everything*, the large gross production at small margin of profit, the large capital requirements necessary to conduct business on these lines; all these place modern industrial enterprises either beyond the financial ability of any one individual, or far beyond

the amount that any one individual wishes to have in any one venture.

Without attempting to discuss the history or evolution of "Company," "Corporation," or "Monopoly," and similar organizations or combinations of trade, it can be said that the first and oldest step towards corporate organization was partnership. Corporate combination is but a partnership wherein the partners are represented by shares held in various amounts by the various investors.

These corporate organizations and combinations have become a permanent part of our business machinery; the public would not, if it could, abolish them.

Who would ever consent, or would the requirements of business allow, that the railroads between the great sections of our country revert to the independent lines that once existed, with all the consequential delays, inconveniences and disadvantages to traffic and travel? Who would be content if the telegraph business should be carried on by the transfer of messages from one to another of the numerous companies, formerly independent, but now combined and giving direct transit over the whole country?

That there has been in large measure reason or cause for the existing unfavorable public opinion as to corporations, trusts and combinations, is beyond question, but it does not follow that there is reason or cause for the wholesale denunciation and condemnation of all corporations, trusts and combinations. Nor does it follow that all that is bad is centered in or confined to those prominent in the public eye.

Many of the practices most severely condemned are but the amplification or continuance of practices or customs common in the current affairs of business, practices or customs which were not wrong in themselves, but wrong in the abuse of them.

Public utility corporations and other combinations

have too frequently assumed that new laws and regulations were disastrous and ruinous without first giving them a fair trial, and legislators too often have displayed an ignorance or disregard of existing laws, spreading the idea that new legislation was a cure-all for any undesirable condition, while it was often only a political play, and the enforcement of the existing laws was utterly neglected. The results have been bad. While business will adjust itself to any condition if given time and opportunity, sudden change of conditions will result in disaster to some interest, but not as a rule to those at which the change was aimed.

There is too little consideration given to the fact, based on all experience, that no one interest can permanently prosper unless all other interests are in a prosperous condition, and to the fact that any sudden change in existing conditions will always be taken advantage of by some one interest to the detriment of other interests in general.

The proper use of corporate organization or combination under proper regulation or control cannot be objected to.

What is and should be condemned, prevented and punished, is the abuse made of corporate machinery to the detriment of public welfare and such abuse as has been and is being practised so extensively for purely speculative and oftentimes swindling enterprises.

It is largely this abuse by professional speculative promoters and swindling security vendors, mostly on a comparatively small scale, not in any way associated or connected with the general business organizations or systems, that has been the cause of most of the popular odium surrounding this necessary machinery of business. It does not seem possible that the only way of reaching such offenders is through penalties for "misuse of the mails," but however or by whomever the remedy is applied, he who does it should re-

ceive the heartiest thanks and appreciation of the community.

The large corporate combinations which often in popular opinion are supposed to be owned or wholly controlled by some one man or some few men, are, in fact, made up of thousands and tens of thousands of silent partners, the shareholders, who are the real owners. The existence of these real owners, these shareholders, is often obscured in the shadow of some one or more individuals who dominate these companies, not by large ownership, as popularly believed, but by administrative and operating aggressiveness and successful management. The shareholding owners are in the aggregate very numerous and, in any other country than America, would be frequently in evidence and heard from, would always take an active participation in all meetings, annual or special, and would in that way protect themselves and their holdings by associating the corporation or combination in the minds of the public with the particular and separate individual ownerships, or interests in them. In this way that same protection, recognition or consideration, to which all interests, whether individual or corporate, are alike entitled, would be assured.

Public Utilities.

THE "SERVED" AND THE "SERVERS."

Under the existing conditions the corporations or combinations represent the "servers." To the shareholders, dividends represent good management and desirable investment, but to many of the community, the community that is "served," profits which in individual enterprise would be considered reasonable are unreasonable and forced out of their pockets by unscrupulous management or illegal or dishonest practices.

The contest between the "served" and the

"servers," the "producer" and the "consumer," between "he-who-has" and "he-who-has-not," has been going on from the dawn of civilization, from the time when some one had more of some one thing than he wanted, while another had none, or less than he wanted.

From time immemorial efforts have been made in some way to control or restrict any accumulation, in the hands or in the uncontrolled possession of any individual or set of individuals, of those things which had become necessary to public wants, and to prevent necessities from in any way getting outside that control which natural competition, or the law of supply and demand under normal conditions exercises.

There has always been and will always be the laudable desire of the great public to be served rightly, and as cheaply as possible, which sometimes selfishly degenerates into a lack of consideration for the rights of those who are serving.

On the other hand there has always been the laudable desire of the "server," or the producer, to get a profit for his service or production, which sometimes degenerates into a selfish disregard or lack of consideration for those who are served.

This conflict, which originated with the first commercial transaction or exchange, has continued ever since and will continue to the end of time.

Until the state, or conditions under which society was organized, began to be complex there were very few things which were not and could not be regulated by the law of supply and demand, the law of substitution of one article for another in case of scarcity, or by the laws of competition. In the simple life, which was with the masses of the people until very recent years enforced, and is with all laudable, there were few articles which were in themselves necessities, and of these very few which did not have alternative articles of use, or substitutes, and, in fact, there was little that was not produced by the local

community or by the family. Those few things which, in the growth of civilization, and particularly by the increase of urban population, were of general use and necessity for all, those few things in which the masses of the public had an interest in receiving regularly and reasonably, soon became the object of control or regulation, and here was the beginning of and reason for state control and regulation or state ownership.

Public Control.

Public control or regulation of Public Service Corporations by permanent commissions, has come and come to stay. Control or regulation exercised through such a body has many advantages over that exercised through regular legislative bodies or committees. The permanent commission will be a quasi-judicial body. It should be made up of members whose duty it will be, and who will have the desire, the time and the opportunity, to familiarize themselves with the questions coming before them. It should act only after thorough investigation and be governed by the equities of each case. It would in time establish a course of practice and precedent for the guidance of all concerned.

Experience also has demonstrated that this "supervision" should stop at "control" and "regulation" and not "manage," "operate" nor dictate what the management or operation should be beyond the requirements of the greatest efficiency and economy.

Management or operation requires intimate knowledge and experience which can only be gained by continuous, active and practical participation in actual working, while control or regulation can be intelligently exercised, after judicial hearing, by those who have not the knowledge or experience to operate.

State control or regulation should be of such character as to encourage the highest possible standard in plant, the utmost extension of facilities, the highest

efficiency in service, rigid economy in operation, and to that end should allow rates that will warrant the highest wages for the best service, some reward for high efficiency in administration, and such certainty of return on investment as will induce investors not only to retain their securities, but to supply at all times all the capital needed to meet the demands of the public.

Such "control" and "regulation" can and should stop all abuses of capitalization, of extortion or of overcharges, of unreasonable division of profits.

If there is to be state control and regulation, there should also be state protection—protection to a corporation striving to serve the whole community (some part of whose service must necessarily be unprofitable), from aggressive competition which covers only that part which is profitable.

Governmental control should protect the investor as well as the public. It should ensure to the public good service and fair rates. It should also ensure fair returns to the investor.

A public utility giving good service at fair rates should not be subject to competition at unfair rates.

It is not that all competition should be suppressed, but that all competition should be regulated and controlled. That competition should be suppressed which arises out of the promotion of unnecessary duplication, which gives no additional facilities or service, which is in no sense either extension or improvement, which without initiative or enterprise tries to take advantage of the initiative and enterprise of others by sharing the profitable without assuming any of the burden of the unprofitable parts or which has only the selfishly speculative object of forcing a consolidation or purchase.

State control and regulation, to be effective at all, should be of such a character, that the results from the operation of any one enterprise would not warrant

the expenditure or investment necessary for mere duplication and straight competition. In other words, the profits should not be so large as to warrant duplication of capitalization in the competition for the same business.

When thoroughly understood it will be found that "control" will give more of the benefits and public advantages, which are expected to be obtained by state ownership, than could be obtained through such ownership, and will obtain them without the public burden of either the public office-holder or public debt or operating deficit. It is conceded that as a rule private management is better, more economical and more efficient than public management, and much more advanced and enterprising. The economical margin between public and private management has been shown by experience to be more than sufficient to secure the best private administration.

When through a wise and judicious state control and regulation all the advantages without any of the disadvantages of state ownership are secured, state ownership is doomed.

State control of public utilities should not prevent progress, should be sufficiently unrestricting to encourage the introduction and demonstration of the value of any new or novel enterprise, and should allow sufficient reward for the initiative, enterprise, risk and imagination of the adventurers behind such enterprises. It should discriminate between the useful adventurers or promoters, pioneers in fact, and those pirates or sharks who, on the strength of other successes, extravagantly capitalize undeveloped ideas, and exchange the worthless securities for the savings of deluded and credulous investors. Corporate control and restriction should always exist to a sufficient degree to prevent such speculative promoting, and such stock-jobbing schemes.

The regulation or control of any new or novel thing

which is a mere convenience and not a necessity can be left largely to the laws of trade; such a thing, if offered, must be offered at a price acceptable to the public, who are the customers, at a price which in the opinion of the purchaser leaves him a margin of profit either in convenience or enjoyment. Under such control private initiative can be depended upon for the introduction of everything believed to have possibilities.

The combination of the promoter, investor and capitalist, with their imagination, personality, optimism and desire, has been at the bottom of every development of every kind or nature which has benefitted the human race in the way of utilities, and still is the only way in which new utilities can be developed. Whenever any great works have been undertaken by governments they have been on lines of old development, based on experience of that which has been developed by the persistent genius and application of some individual or group of individuals.

State control or regulation, to be effective, should when exercised, be accepted and acquiesced in by the public. If all the decisions not in exact accord with the desire or contention of the public are condemned, if it is expected and required that all decisions be against the utilities controlled, if politics and political effect are to govern decisions, if decisions go for nothing with, and are not respected by the public, failure and disappointment are bound to follow, self-respecting men will refuse to act, the standard of appointments will fall and state control and regulation will become a disgrace, and the evils which it was intended to correct will multiply.

If any company gives good service, meets all the reasonable demands of the public, does not earn more than sufficient to provide for the maintenance of its plant up to the latest standard and for reconstruction of plant when worn out or obsolete, pays

only fair dividends to its shareholders—if a company is only doing this its rates and charges to the public cannot be unreasonable.

Competition vs. Control or Regulation.

Effective, aggressive competition, and regulation and control are inconsistent with each other, and cannot be had at the same time.

Control or regulation, to be effective, means publicity; it means semi-public discussion and consideration before action; it means deliberation, non-discrimination; it means everything which is the opposite of and inconsistent with effective competition.

Competition—aggressive, effective competition—means *strife,* industrial warfare; it means contention; it oftentimes means taking advantage of or resorting to any means that the conscience of the contestants or the degree of the enforcement of the laws will permit. To make competition effective great and uncontrolled latitude of action is necessary; action must be prompt and secret.

Aggressive competition means duplication of plant and investment. The ultimate object of such competition is the possession of the field wholly or partially; therefore it means either ultimate combination on such basis and with such prices as will cover past losses, or it means loss of return on investment, and eventual loss of capital. However it results, all costs of aggressive, uncontrolled competition are eventually borne, directly or indirectly, by the public.

Competition which is not aggressive, presupposes co-operative action, understandings, agreements, which result in general uniformity or harmony of action, which, in fact, is not competition but is combination, unstable but for the time effective.

Competing Exchanges.

Two local telephone exchanges in the same community are regarded as competing exchanges, and the public tolerates this dual service only in the fast disappearing idea that through competition in the telephone service some benefit may be obtained both as to rate and efficiency. Competition means that the same thing, or a satisfactory substitute, is offered. In this sense there can be no competing exchanges unless each exchange has substantially the same list of subscribers, which is in itself inconceivable.

It is not telephone service *per se* that an exchange affords; it is a particular, definite telephone connection between two people which can only be given between two parties connected with the same exchange or the same system. Each of the several independent exchanges in the same community offers you telephone service, but telephone service only with its particular list of subscribers.

Opposition exchanges compete in the same way as do two street railway lines, each starting in the center of the city, running a short distance through the same main street, and then branching off, each supplying an entirely different district of the city. Those traveling only from point to point on the main street can use either line, pay one fare; there is to this extent competition—there is a choice. Beyond that, to reach the other districts, there is no choice, there is no competition; one line or the other must be taken, depending on the particular district wished to be reached.

In the case of the street car service, payment is made only to the line used, when used.

To be in a position to obtain full telephone service where there are opposition exchanges, subscriptions to all are necessary.

In all other opposition utilities, to get the full service one or the other is paid—not both.

As before said, the purpose and object of an exchange is to afford a direct speaking circuit between parties at points distant from each other, to afford a highway for personal communication between any two. The exchange gives nothing but that connection, does nothing but provide that highway of communication, and place it at the service of the two parties desiring to communicate. The actual communicating is done by the parties themselves over this circuit placed at their exclusive service for the time being. To get this service, however, both parties must be connected with the same system; if not, the telephone circuit between the two parties cannot be made.

In two exchanges each having 2,000 subscribers, Messrs. A, B, C, D, E, F, G, H, I, J, K, L, M, N are connected with one, and Messrs. A, B, C, O, P, Q, R, S, T, U, V, X, Y, Z, connected with the other. Messrs. A, B, and C can use either exchange to connect with each other, but to connect with each other one exchange with one subscription and with but one payment would be sufficient. This is not competition; this is duplication.

Messrs. A, B, C can connect with all the others on both exchanges only by two subscriptions and two payments. There is no choice; there is no competition.

Any competition between opposition exchanges is confined to obtaining new subscribers—to increasing their subscription lists. Neither the same thing nor what could possibly be called a substitute is offered. Each exchange affords that connection between the subscribers on its particular list and that is all—between Messrs. A, B, C, D, E, F, G, H, etc., or between Messrs. A, B, C, O, P, Q, R, S, T, etc. A subscription to only one exchange is of no benefit when a connection with the other exchange is wanted, subscription to the other exchange is also necessary. This is not competition in any beneficial or any other sense.

When anyone decides to become a subscriber to an exchange he does not go to the one which offers any other inducement than the ability to connect with the people with whom it is the habit or necessity of the person subscribing to communicate. If it is his habit or necessity to communicate with some or all of those on both exchanges, subscriptions to both exchanges are necessary; in other words to get the advantage of complete local telephone service in a community, subscription to every local exchange in that community is necessary.

The fundamental idea of the Bell System is that the telephone service should be universal, intercommunicating and interdependent; that there are *certain people* with whom one *communicates frequently* and *regularly*; there are a *certain few* with whom one *communicates occasionally*, while there are *times* when it is *most necessary to get* communication with *some other one*, who, until the *particular necessity* arose, *might have been unknown and unthought of. It is this necessity, impossible to predetermine, which makes the universal service the only perfect service.*

On the assumption that a perfect telephone system must afford this direct highway of communication between any two desiring to converse, this system must reach everyone; must be universal, comprehensive. To the extent that any system does not reach everyone it is not perfect; to the extent that any system does not reach everyone, it is not in competition with the one that does; and to the extent that both systems reach everyone it is merely duplication; it is not competition.

Two exchanges may compete for subscribers, but not by offering the same list of subscribers; it would be impossible to keep the list of subscribers to any two opposition exchanges the same. One may offer a more desirable list of subscribers from your point of view than the other, therefore you will subscribe to that

one, but if both offer an equally desirable list of subscribers to you then you must choose between them, or you must subscribe to both exchanges.

One may call the carriage industry and the automobile industry competing. They are in a sense, or one is a substitute in a very general sense for the other. One might say the wholesale or retail flour merchant and the rice merchant are competing, as one is a substitute for the other, but two exchanges offering different lists of subscribers are not competing even in that sense, as neither is a substitute for the other, in that on one you may have communication with certain people, and on the other with certain other people; therefore they are not competing.

Two exchange systems in the same place offering identically the same list of subscribers, if such a thing can be imagined, are as useless as a duplicate system of highways or streets in a village not connecting with each other, but each reaching all the residents.

Physical Connections.

Physical connection. What is meant by it? And what object is it intended to accomplish?

Where there are two or more so-called competing local telephone exchanges in the same territory, each offers a particular service; each offers a connection with its particular list of subscribers.

Physical connection would connect these separate exchanges by trunk lines the same as exchanges belonging to one system are connected.

This in itself would be an easy matter in many cases, and would allow the subscriber to one local exchange speaking connection with the subscribers to the other local exchanges. A fairly satisfactory service could be given if all of the exchanges had the same general style of equipment, uniform operating methods, and if harmony and concert of action between the

operators of entirely independent and rival exchanges could be assured.

But what has been accomplished? You have enabled any subscriber to any exchange to communicate with any subscriber to any other exchange. You have not avoided the objectionable duplication. You have not given service to all the exchanges for one subscription. This can only be done through merger or combination, not by physical connection. Physical connection implies separate and independent entities. For the privilege of this physical connection with the other exchanges the subscriber to any one of the exchanges must pay. This payment or toll must be more or less the equivalent of what the regular subscribers pay, otherwise there would be discrimination.

If the equipment and the operating methods of the opposition or independent exchanges physically connected are different, the service is bound to be unsatisfactory. No one of the exchanges can have any control over the operators of the other exchanges. There is bound to be strife and contention between the operators, resulting in delays and poor service. Each exchange must necessarily give preference and attention to its own service.

From the standpoint of local telephone exchange service, therefore, there can be nothing to gain from physical connection, either in economy or quality of service.

The most important matter to consider in connection with physical connection, the one that has the greatest bearing on the subject, is the character of such physical connection between telephone exchanges, and wherein it differs from regular exchange of service or physical connection between other public utility companies.

A telephone exchange does not furnish a commodity, does not transport goods, nor does it transmit messages.

What the telephone exchange does is to place at the disposition of any subscriber a telephone circuit, consisting of two wires, connecting such subscriber with another person at a distant point. This circuit enables them to carry on speaking communication with each other; it must be continuous and unbroken; it is for their exclusive use and while the circuit is at their service it cannot be used by any others desiring to communicate, or for any other telephone purpose. The employes of the exchange render no other service than selecting and connecting the wires together to form this circuit, and putting the parties in communication. To do this, and do it satisfactorily, the operators making up the circuit must have absolute control of the wires necessary for these circuits over the whole distance between the points of communication; that is, the operator at the starting point must have either control of or perfect working unity and harmony of action with all the operators of all the trunk lines and exchange lines necessary for this circuit.

These conditions can only exist where there is a strong, common interest or control.

Physical connection between independent or opposition exchanges means, therefore, the placing of the wires necessary to give it effect out of the control for the time being of the owning company and under the control of a competing, opposition company, to enable that competing, opposition company to give its subscribers the use of property, equipment, facilities, operating staff, other than its own, and for the time being depriving the owning company and its subscribers of the use of such facilities.

Physical connection demands the exclusive use of an integral part of the property and facilities and operating staff of one company for the customers of a competing company, no matter how urgent may be the owner's necessity for the immediate use of such property and facilities, nor how small the surplus facilities beyond the owner's requirements.

If the service consisted of carrying packages or transmitting messages along with other packages or other messages, or hauling cars to their destination, or accepting through tickets or transfers from connecting or cross lines of travel, it would be very different. In such cases the property, facilities and operation remain in the control of the owning company or its operating staff; no property intended for the benefit of the customers of one company is put to the exclusive use of another company; all that is done, is the same as is done with and for all comers. The package or passenger is carried, or the message transmitted, to its destination at the convenience of the company, along with other packages or messages.

So far we have considered only the local exchange. Physical connection between independent or opposition telephone systems or between an independent local exchange and a telephone system presents not only the same but many more complications, and is far more objectionable.

To better understand what is meant by physical connection and what it is meant to accomplish, a knowledge of the evolution and development and policy of the Bell System is necessary, and what that policy and belief is.

Repeating what has been said above, it believes that the telephone system should be universal, interdependent and intercommunicating, affording opportunity for any subscriber to any exchange to communicate with any other subscriber of any other exchange within the limits of speaking distance, giving to every subscriber every possible additional facility for *annihilating time or distance by use of electrical transmission of intelligence or personal communication.* It believes that some sort of a connection with the telephone system should be within reach of all.

This is what the Bell System aims to be—one system with common policy, common purpose and

common action; comprehensive, universal, interdependent, intercommunicating; like the highway system of the country, extending from every door to every other door; affording *electrical communication of every kind,* from every one at every place to every one at every other place.

To create this system has been the policy of the Bell interests from the beginning. It is the only way by which a satisfactory telephone service—satisfactory to the public or profitable to its owners—can be maintained.

The Bell System as established is as advanced and extended as the country as a whole will warrant. Its policy of extension carries it a little in advance of the public demands. In any effort to cover the whole country many unremunerative exchanges and toll lines have to be constructed and operated. Some of these will in time become remunerative; some never will, and those, for the benefit of the whole system, will have to be carried at the cost of the whole system.

Most of the opposition exchanges have been built up in a selected territory with capital obtained by the promise of, or in anticipation of large profits; as a rule capitalized far in excess of the plant value or construction cost. Subscribers have been obtained by promises of improved service at low rates. Many of such exchanges owe what success they have, where there is any success, to personal local influence or interest. Many, if not all, have been a disappointment. The day of local telephone exchanges or limited telephone systems has gone. This is recognized and fully appreciated by those who have exploited or are operating them.

The idea of physical connection is born of a desire to get for these local and isolated competing or opposition exchanges or these comparatively limited exchange systems, the advantage of the more extensive, comprehensive Bell System. To get for the subscribers of these so-called competing, opposition exchanges the connections which their own systems do not give them, to get for their subscribers all the advantages enjoyed by subscribers of the Bell exchanges by giving them the use of a part of the Bell System.

Physical connection would force the Bell System to place at the disposal of and under the control of any opposition company, Philadelphia for instance, for the time being, one of its circuits from Chicago to Philadelphia, to connect that Bell circuit with the circuits and system of the opposition company and disconnect it, for the time being, from the circuits of the Bell System.

This is not carrying packages or transmitting messages for the subscribers of the opposition Philadelphia exchange; it is turning over to that exchange for the use of its subscribers the property of the Bell System.

The fact that the opposition exchange could get such facilities would enhance its importance at the expense of the Bell System.

Physical connection would force the comprehensive Bell System, which has been built up with foresight and enterprise and is being maintained in its completeness at the cost of maintaining unremunerative exchanges and unremunerative lines, to turn over to, and put under control of, any opposition system for its use and benefit, for the time being, a physical part of the property of the Bell System and at the same time deprive the subscribers to the Bell System of the use of such property. Physical connection would oblige any system to construct and maintain surplus facilities and employ a surplus staff of operators for the benefit of any so-called competing or opposition—but less enterprising—company.

No possible compensation would be adequate for such service or such deprivation.

One of the arguments for physical connection is that

it will stop duplication. How? All agreements as to territory, rates or character of opposition; all arrangements which would come under the head of combination or pooling; all understandings or anything that would be equivalent to consolidation or combination, must be eliminated; this is not what is meant by and is not a part of, physical connection. Leaving all understandings out of consideration what effect would physical connection have on the local opposition exchanges? Neither exchange could stop competing for subscribers. The exchange that did would soon dwindle to a point of absolute undesirability; in other words, to a point where the subscription list would offer no inducements to others to join. Consequently activity must be maintained, each exchange making every effort not only to retain all on its list of subscribers but to add more. The same territory must be covered, the consequent duplication of conduits, pole lines, central and branch offices must continue; in fact the strife or competition would have to be more severe.

It is claimed that physical connection would bring about one system, where any one telephone subscriber could obtain connection with any other telephone subscriber within the limits of possible communication. With physical connection that would be the case, after a fashion, but what kind of a system would it be? It would be imperfect in that it would still be a dual system, with dual charges, made up of heterogeneous units of exchanges and lines, operated under independent managements with different operating methods and interests, with no common control over operators, without which service can not be satisfactory; in fact with all those imperfections that it has taken the Bell interests years to correct—imperfections which can be removed only by combination, agreement, understanding, which would be in effect consolidation.

Such demand as there may be for physical connection from opposition exchanges is a recognition of superior facilities and comes from a desire to get the benefits of those superior facilities.

So far as it comes from the public it is an expression of weariness with dual service or so-called competition.

Is there anything in practice, law or precedent that can compel one system, built upon a comprehensive basis, and trying to meet all the requirements of the public, to turn over its physical property for the use of so-called competitors—opposition exchanges built in selected territory with selfish views or motives? Is there anything to compel one to share the prosperity of a business created by enterprise and advanced policy with those who wish to appropriate the benefits of such work? Can any public utility company be compelled to divest itself of the operating control of its own property which was created for and may be needed at any time in the conduct of its own business? This is not the kind of interchange of business contemplated by the rules governing common carriers. It is not co-operation. It is pure and simple confiscation.

LEGAL.

The Legal Department reports that the relation of the company and its associated companies with the Public Service Commissions of the several states have continued to be of a very satisfactory character. Our companies have co-operated with the Commissions in the endeavor to provide the best possible service. There are now Commissions with jurisdiction over telephone companies in twenty-eight states. Some of the decisions of these Commissions are illuminating, and support what we consider to be the soundest policy.

In a recent case before the Board of Public Utility Commissioners of the State of New Jersey that Commission stated:

"Assuming that adequate regulation in the public interest is provided, this Board avows its conviction that unified and exclusive control and operation of telephones within a given area is preferable to a competing telephone system with its inevitable disadvantages of divided service and duplicate cost."

The Nebraska Commission has approved our plan for co-operating with the independent interests in giving universal service, and the legislatures of Ohio and Michigan have passed laws providing for the consolidation and merger of competing telephone companies under proper regulation.

In the so-called Rate Case, the Maryland Commission stated that everyone sees at once that the rule of fairness requires that every consumer should pay for his own actual use, and it is not easy to find a reason that would justify a different rule in the case of telephone service. The Commission thus sustained our position in regard to measured service in large cities as against flat rates.

The Board of Public Utility Commissioners of the State of New Jersey in the Camden Rate Case decided that it is not practicable at all, or would involve undue and unnecessary delay to segregate and isolate service

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and cost within restricted municipal areas. The Board is of the opinion that to reach a proper basis on which a reasonable return may be earned the entire property of the system of the telephone company inventoried will suffice. This decision is in line with our conception of a universal system and sustains our position that a basis of rates should not be confined to an exchange area.

We have not carried into the courts a large number of cases, but it has been our good fortune to be almost uniformly successful in those which have been submitted to their decision.

ENGINEERING.

The year 1911 has, as usual, been an active one for the general engineering staff maintained at headquarters for the benefit of the associated companies throughout the United States. For every one of these companies a large number of important problems have been studied and solved and further substantial progress has been made in the improving and standardizing of apparatus and in the development of improved methods of rendering the telephone service to the public.

In improving the transmission of speech a most important work has been the development of methods whereby the loading coil invention can be applied to the heaviest gauge wires and whereby such wires, when equipped with loading coils, can be operated on the phantom principle. By this means telephone service is now successfully accomplished between New York and Denver and the transmission of speech between cities less far apart has been greatly improved. By the application of the phantom principle to such circuits the available facilities have been largely increased so that between the important telephone centers notable improvements in service have been accomplished.

In long underground cables improvements have also been made so that the phantom principle may be em-

Under the Bell organization each associated company or group of companies is now, and each division hereafter will become an autonomous whole, with its own local control and identity, and within the limits of the general policy and authority, absolute on matters pertaining to or which affect only that territory.

Such an organization avoids that general tendency in all combinations to concentrate too much, or to become unwieldy and unmanageable, and thus lose all the economical or effective operating advantages.

There are limits of active usefulness beyond which the physical or mental capacity of individuals will not extend.

The organization as constituted will be flexible enough to enable any rearrangement to be made of the whole or any part, in any way which may be found necessary or advantageous from reasons of policy or from business or legal reasons, without affecting the business.

Future financing may be done locally, by the divisions or districts, or it may be done by the Central Administration, or partly by each, as best will meet commercial or business conditions at the moment. It will be necessary only to consult expediency.

But the great advantage is that each division and each sub-division within wide limits is an autonomous whole, there is life and responsibility in the administration and operations of every separate division and sub-division—such life and responsibility as will carry the business along as an independent entity for almost indefinite periods under any possible conditions which may arise. With such conditions, nothing can happen which would be disastrous to the business, for whatever might happen would autonomously right itself, or be righted by the concerted action of this army of individuals, or by some individual of the army, now being trained to action and to take responsibility by having responsibility put upon them.

With such a body of men, educated in technicalities and theories, which, by practical experience, they have subordinated to usefulness, with a trained capacity for taking responsibility—steadily moving upwards—there will always be a body of fit men to choose from in any emergency.

INDEPENDENT AND OPPOSITION COMPANIES.

We have, wherever we could do so legally and upon satisfactory terms, and acting with the acquiescence and consent of the local public and local authorities, purchased, merged or made connecting contracts with a large number of independent or opposition companies. Wherever these arrangements have been completed and put into operation there seems to be general satisfaction with the result.

Our policy in relation to independent companies was set forth in detail in the following announcement made early in the present year, but which has been in effect to a considerable extent for a long time:

"In order that the American Telephone and Telegraph Company and its Associated Companies may follow the same policy with respect to maintaining toll connections with independent companies, it seems wise to state just what that policy is in this regard, and to advise the Associated Bell Companies and ask them to adopt the same for their guidance.

"First. The Associated Bell Companies will extend toll line connections to any point or to any company where opposition exchanges do not exist, and where the result of such toll line connections would be a reasonable return upon the investment involved in the connection.

"The terms and conditions for transmitting or receiving toll or long-distance messages at such points shall be fair and equitable and as favorable as the terms and conditions extended to any other companies operating under similar conditions.

"Second. Should any Associated Bell Company acquire, by purchase or otherwise, any toll line which has connection with any independent exchange or toll line, all facilities enjoyed at the time of the acquisition by the independent exchanges or toll lines for sending or receiving messages shall be

continued. When increased facilities shall be needed from time to time, such facilities shall be subject to future contracts which shall be made fair and equitable to both parties.

"THIRD. Should any Associated Bell Company acquire, by purchase or otherwise, any independent exchange property which has toll line connections, the Associated Bell Company will not cut off or disturb in any way such connections.

"FOURTH. It is to be understood that all existing connecting contracts or arrangements between independent companies or between independent and Bell Companies shall continue without interruption should there be any change in the ownership, thus preserving the status of the situation.

"FIFTH. It is to be understood in all of the above cases that it is the wish and intention to preserve any facilities or connections which independent companies and their patrons may enjoy at the time the property of an independent company may be acquired, with such increase of the same facilities as may be necessary on account of future growth and extension of the business; but it is not the intention that by virtue of such acquisition, the range of facilities of any independent company or of the patrons of any independent company shall be increased.

"SIXTH. The Associated Bell Companies will not require connecting companies to use any special make of apparatus or equipment—the only requirement will be the use of such facilities and equipment as will give commercial service.

"SEVENTH. It is to be distinctly understood that this policy does not in any way contemplate physical connection between opposition exchanges, nor does it contemplate the interchange of messages between two or more exchanges located within the same town or community."

Statements are very freely made that whenever these combinations have been brought about rates have been increased to an unreasonable amount.

Rightly or wrongly—whether through ignorance or for other purposes—franchises for opposition exchanges were obtained on the promise of low rates and improved service, and capital was obtained on promises of large profits. These opposition exchanges were established as a rule in the cream of the territory and took in little or no

unproductive territory, and built up no outside connections except where a profitable business could be obtained. The financial results are well known—few, if any, of the inducements held out were realized or promises made fulfilled. Increases in rates fixed in the franchise were applied for on the ground that without an increase the companies could not continue operation—many could not and did not continue.

In the face of these conditions, and excepting a few places where competitive conditions made it impossible, the Bell System has substantially maintained standard rates, averaging considerably higher than the opposition rates, and notwithstanding the higher average rate, the Bell gain in places where there was opposition was much greater than the opposition gain in stations.

Wherever these combinations have taken place the rates not standard have been made standard, and frequently no increases in rates took place, except such as were consequent upon the increase in the size of the exchange, and in no case have the rates even approximated the combined rates of the two exchanges.

Wherever these rates have been increased, it has been done by and with the consent of the subscribers to the exchanges, and with the direct authority or acquiescence of the public authorities.

It does seem as though through the open public knowledge of so many failures on the part of opposition telephone companies to give lower rates and better service with profit, and the open acknowledgment of the impossibility of doing this, there might be a cessation of the assertions so freely and so often made that the Bell System is making unreasonable dividends out of excessive profits, derived from exorbitant charges for service, particularly those assertions originating, as most of them do, at places in territory in which the service of the Bell System has been operated without any profit for years.

There is no way of getting the profits out of the com-

pany except through dividends and interest, as all surplu has been put back into the plant, and the average divi dends paid on the outstanding stock of the associate Bell companies for 1911 were 6.3 per cent., while th average profits were 7.93 per cent., as shown on previou pages. The correctness of these statements has bee verified many times by the examinations made by offici bodies of control and regulation.

The telephone using public is willing to pay sufficien in the way of charges to maintain such a system as th Bell System, as against a cheaper but less efficient or les universal service, and the telephone using public is willin that fair and reasonable dividends should be paid.

What possible good can come from these mistaken as sertions of conditions, is hard to understand, and wh they should be made when it is so easy to ascertain th facts, is even harder.

We repeat what we have said in substance in previou reports:

If any company gives good service, meets all reasonab demands of the public as to rates and service, does no earn more than sufficient to provide for the maintenanc of its plant and reconstruction of worn out or obsole plant, pays fair wages to its operative force and sta *pays only fair dividends upon the capital invested—if company is doing only this, its rates and charges to the publ cannot be unreasonable*—unless the position taken by legislator in a certain state is to be endorsed by th public, which can hardly be the case.

This gentleman said: "If I found a telephone compan *had not been paying its stockholders anything*, I should s the company was a little hungry to ask for 8 per cent.

The final decision in these matters now large rests with bodies of control and regulation, and control and regulation of public utilities are to stan they can stand only because the results are of bene to all concerned, and permanently beneficial resul cannot come from one-sided or partisan action. Th

public cannot be benefited by destruction of the compa nies or by impairing the efficiency of the service rendered, while on the other hand too much latitude to the com panies might only reproduce the causes from which all are now suffering.

Centers of business, and of population, the collecting and distributing centers of commerce, exist for the con venience of the community as a whole. No community can remain prosperous if served by bankrupt or un profitable public service corporations.

"Sufficient" and "Efficient" facilities for intercourse and intercommunication between the commercial centers and the territory contributory or dependent, make the most effective instrument of prosperity that can exist.

PUBLIC RELATIONS.

Our views on the relations between industrial or utility corporations and the public, particularly our own rela tions, are so simple and direct as to seem almost common place, and to make reference to them seem like repetition. It is, however, only through repetition that we can be sure of a thorough understanding, and it is only by a thorough understanding that we can get that well-informed, in telligent public opinion that we desire.

We believe that our company has a most vital interest in, and that our future success and prosperity depend upon the working out of the telephone and telegraph prob lem in a way that meets with the approval of the public as a whole.

We believe, and we think the public is fast coming to believe:

That telephone service to be perfect must be universal, intercommunicating, interdependent under one control, and that no isolated section can be considered independently of any other or of the whole system, and that rates must be so

adjusted as to make it possible for everyone to be connected who will add to the value of the system to others.

That the highest commercial value of the telephone service depends on its completeness, on the extent and comprehensiveness of its possibilities of intercommunication not only between individuals but between aggregations of individuals, *i.e.*, communities.

We believe that we are working this problem out on the broad lines of the greatest benefit to the public, and that this is evidenced by the fact that our standards and lines of organization and operation are the standards the world over.

As a corollary to this—we recognize a "responsibility" and "accountability" to the public on our part, which is something different from and something more than the obligation of other public service companies not so closely interwoven with the daily life of the whole community.

But, in admitting this responsibility and accountability on our part, we must insist that the measure of it shall not be determined by impossible standards, *that equity and fairness shall be, and personal and political exigencies or partisan advantages shall not be*, the basis of judgments and requirements.

We cannot conceive of anything more unfair than was the spirit which actuated a minority—small, it is to be hoped—of a political club which stands for high purposes, when it was proposed to pass a resolution recommending,

"such action with regard to telephone rates and service as shall strengthen the party before the people of this state."

The same spirit actuates bodies or committees undertaking to legislate on service corporations when report after report of independent experts employed by those bodies to examine and report conditions on which to base action is objected to and rejected because the reports do not conform to their preconceived ideas of political desires or interests, and at the same time these

bodies openly demand a report that does conform to their ideas.

This is only illustrative of the tendency on the part of individuals or temporary bodies, without any, or at the best with a very superficial or partisan, knowledge, often prejudiced by their own interests, to attempt to pass on complex business questions.

In our relations with permanent bodies of control and regulation during the past year, we have had so little in the way of difference or difficulty as to be almost negligible. In presenting or defending our cases, we have tried to be governed by equity to ourselves and consideration to the public in every way, and have given such full reasons and such full facts to substantiate our cases that the only particular differences were those bound to exist between a public commission and a corporation, each trying to do what was best from its point of view.

Wherever we have had serious difficulties with representative bodies or the public, it has almost always been because those representing the public or legislative bodies were of temporary nature.

In all such cases we have presented our side with the same care as to the rights of ourselves and consideration for the public as in cases before permanent bodies. As a result our position and claims have been conceded and sustained, or if not, and it has been necessary to resort to the courts, we have in most instances been satisfactorily vindicated.

This only emphasizes the fact that all regulation and control of corporations serving the public should be by permanent bodies, judicial in their attitude, equitable in their purposes and actions, governed by a few simple laws based on the rights of the individual, the corporation and the community, and applied after the fullest examination and consideration.

The opinions and the facts that controlled or influenced the judgment should be matters of record, with the constitutional right of appeal in the corporation.

Temporary committees of bodies legislative in their functions, though trying to assume a judicial attitude, do act from an entirely legislative and sometimes political standpoint. Their decisions are frequently contradictory, irreconcilable and impossible, even when these committees are composed of fairly disposed men. Nor is this any reflection upon such committees. Their inability arises from the manner of their selection, the temporary nature and selfish interests of their positions, the engrossing nature of their many other duties, and the lack of time to familiarize themselves with questions involving years of practice and experience.

GOVERNMENT OWNERSHIP.

The discussion of the government ownership of the wire companies is not likely to become anything more than academic, at least for the present.

Even if the final conclusion should favor government purchase of all wire plants, there would be no unfavorable consequences to the shareholders of the wire companies other than the obligatory liquidation. Any possible award for the property which the security holders would be obliged to accept would give them better than current prices for their securities.

It is, however, highly desirable that if there is to be discussion, it should be on the right lines and that whatever be the conclusion it should be reached after a full consideration of conditions as they exist, and of the practical experience of other countries, and not be based upon theories, expectations, prophecies, promises with no power to fullfil, or wrong ideas of existing conditions.

It is only in comparatively recent years that the present prevailing theories of mail service have been evolved, and the free interchange of communication, of intelligence, ideas and personal information has become a fundamental necessity to our modern civilization with its scattered and widespread family and racial interests; it is now established as one of the obligations of modern government. Expense is the last consideration, while uniformity, extent of service, absence of discrimination and equal facilities for every one and every place are over and above every other consideration. No matter how much the costs in any particular service may vary, charges for the same classes of service must be uniform, moderate and within reach of all. Every one and every place must be on a plane of equality regardless of varying conditions.

The use of the mail service is so widespread and general, and its availability of such national importance, that whether it should be at the expense of the general revenue of the nation or of the specific revenue of the service is immaterial; even economy and efficiency are secondary to the inviolability, the freedom from espionage, from suspicion of private gain or benefit, from restrictions tending to limit its use.

It is a service that must be maintained by the whole for the common benefit of the whole.

Quite a different proposition would be the government operation of the telegraph.

Instantaneous and immediate transmission of communications is as yet a convenience or luxury, although under modern methods of business and commerce, it is an economical alternative to the cheaper mail service in business operations. The use of the telegraph may be a popular convenience, but it is not a necessity and is still confined to the comparatively few, and for that reason should be at the cost of the few that find benefit and profit in that use. The ratio of the use of the mails to the telegraph is nearly 100 to 1, and less than 5 per cent. of the whole population use the telegraph.

The Post Office Department is an organization for the operation of the mail service over and through transportation facilities under private ownership and operation. The mails are taken from and delivered at the post office by the transportation companies, and despatched on trains over which the Post Office Department has no con-

trol or concern whatever. The Post Office Department has its own problems peculiar to its service, many of them intricate and vexatious, but none such as are connected with the operations of a transportation company. There is no capital investment for transportation plant and relatively little for equipment. In the few instances in other countries where there is government ownership of transportation facilities, it is not because of or on account of the mail service.

Government operation of the telegraph would necessarily require the ownership, maintenance and operation of the transmission facilities and equipment, as well as the solution of many complex problems incident thereto, including that of profit and loss, all new to our form of government. Hundreds of millions must be invested in purchase or reproduction of facilities, all the charges on which, together with other costs, must be met out of the revenue from the service or become a charge on the general public revenue—all for the benefit of the comparatively few who would directly or indirectly profit by the use of the service.

The question of success or failure in any enterprise rests almost entirely with the organization. To create any new organization of such magnitude would be most difficult under favorable conditions, but the conditions which must control under government ownership would make doubtful the creation of an efficient and economical organization, or the profitable operation of a business which even under private operation has such a small margin of profit.

If the telegraph could take the place of the mails in popular use, all considerations other than public convenience might be brushed aside, but this it can never do; the great part of ordinary correspondence must be secret, it must be the written personal communication that is transmitted. The correspondence must not be limited in length or restricted in vocabulary, and in the ordinary affairs of life the time of transmission is relatively

unimportant. The telegram may be used as an alternative but never as a substitute for the mails in the uses peculiar to them.

Immediate or instantaneous transmission of communication will always be relatively expensive, in that transmission facilities must be adequate to the maximum requirements at any time, with idle, unused facilities most of the time as a consequence. Overloads can only be taken care of by delay, which takes away all there is of value in immediate transmission.

The only possible way in which a telegraph service intermediate in value and cost between the mail and the telegraph can be given is by maintaining rates on instantaneous business at a point which will meet the entire fixed charges of the plant, in addition to the other costs of that particular service. All who make use of such service can well afford such charges; dispatch and efficiency are the only considerations. The idle intervals can then be employed for particular services at popular rates, based on operating costs and a small margin of profit.

The inevitable tendency under government ownership towards reduction of rates and uniform charges for all classes of service, would be destructive of profit in operation, and would make possible any popular services only at the cost of the general revenue.

In the arguments and prophecies that are being used in support of government ownership, history is but repeating itself. The same undervaluation of existing plants, the same exaggeration of the profits, the same optimistic and exaggerated statements of what would be the results of government operation that were made in favor of government ownership in other countries are now being made.

The facts are, that there is hardly a telegraph or telephone system in the world now operated by any government which shows a profit, even under accounting methods employed, and not one that would not show a deficit under accounting methods obligatory upon private

enterprise. For authority, see any department report of any government telegraph system.

Another consideration, much misunderstood and often misstated, is the supposed superiority and cheapness of service in other countries.

Taking the kind and quality of service, the extent of territory covered and the wages to employees, there is no service in the world cheaper than the telegraph and telephone service of the United States. For authority, see statements made by departmental heads and reports of commissions of the various governments of Europe, and more recently of Manitoba, and the experience of travelers and business men the world over, and the statement of the Postmaster General of Great Britain who said in Parliament that if he could have the charges made in the United States, he could give as good service.

There is not a single instance of telegraph or telephone companies operated by private corporations in competition with government operation, where the private service is not better than the government and profitable, against unprofitable government operation, if untrammelled by government interference.

TELEPHONE AND TELEGRAPH.

The inter-operations of the telegraph and telephone systems are improving rapidly. The collection and delivery of telegraph messages by telephone is becoming popular. Telegraph facilities have been largely extended, and will soon be much further extended, by agency telegraph offices established at telephone toll stations, and by the connection of the telephone system with telegraph "all-night" offices. All these innovations have been of convenience and advantage, and in case of emergency a great benefit, to the public, but they have not as yet been productive of economy in operation or of profit.

The Western Union system is to the telegraph situation what the Bell System is to the telephone situation, in that

each tries to give a comprehensive universal service, but the comparison ends there.

The Western Union has over 25,000 offices in over 21,000 places, and in addition many thousand agency offices at the toll stations of the Bell System. From less than 2,000 of the 21,000 places, with an aggregate population of about 40,000,000, over 90 per cent. of its entire revenue is obtained. Nearly 17,000 of the 21,000 places have an average revenue of but slightly above $10 a month with a maximum of $50 a month. Some joint operating arrangement, generally with the railroad telegraph service, has been made for these and many other places where the revenue is insufficient to maintain an exclusive Western Union office. The increasing demand of the railroad telegraph service upon its operators, and because their first duty is to the railroad service, places the commercial telegraph service in a secondary place, which, with the best of intentions, is not conducive either to promptness or efficiency.

The Bell Telephone System has scattered over the whole territory exchanges or toll line centers from which radiate subscribers' circuits and branch toll line circuits. These centers are connected with each other by toll or long-distance circuits and constitute the telephone system. The toll circuits of the telephone system reach 70,000 places. At most of these places and upon substantially all of these branch toll circuits, and on many circuits connecting into the intermediate stations on trunk lines, there is not enough business to occupy fully either operators or wire facilities; were it not for the indirect advantage to the whole system few, if any, of them would have been established. While the telephone cannot be used interchangeably with the telegraph instruments in the transmission of messages over busy circuits by busy operatives, the "not-busy" operatives and circuits could be used for telephone and telegraph service "alternately" instead of "simultaneously," as there is not enough business to justify such circuits being "composited," *i.e.*, arranged

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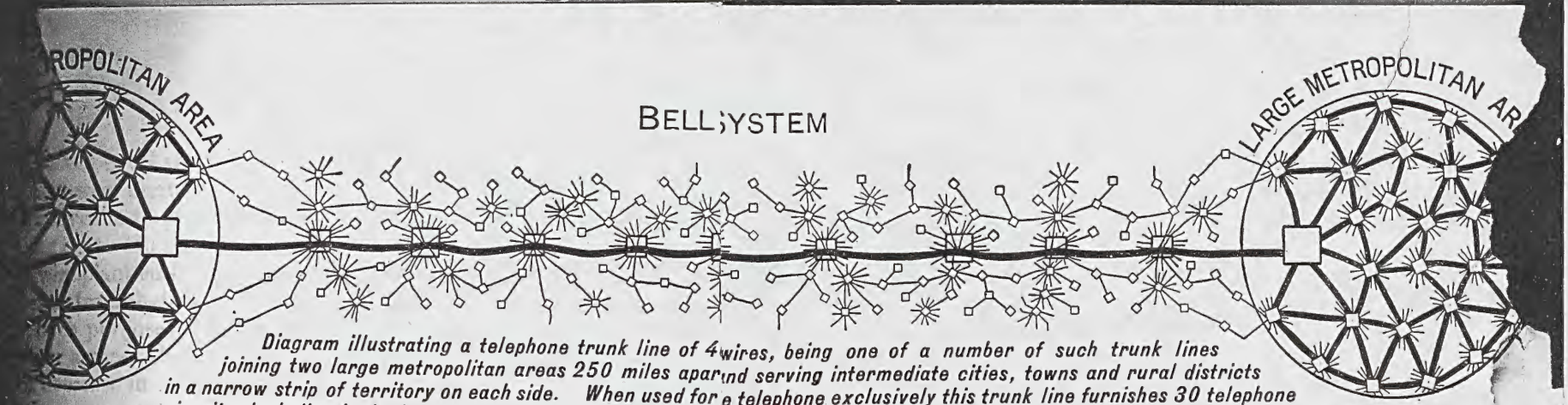

Diagram illustrating a telephone trunk line of 4 wires, being one of a number of such trunk lines joining two large metropolitan areas 250 miles apart and serving intermediate cities, towns and rural districts in a narrow strip of territory on each side. When used for telephone exclusively this trunk line furnishes 30 telephone circuits, including both phantom and physical, reaching 70,000 telephone stations.

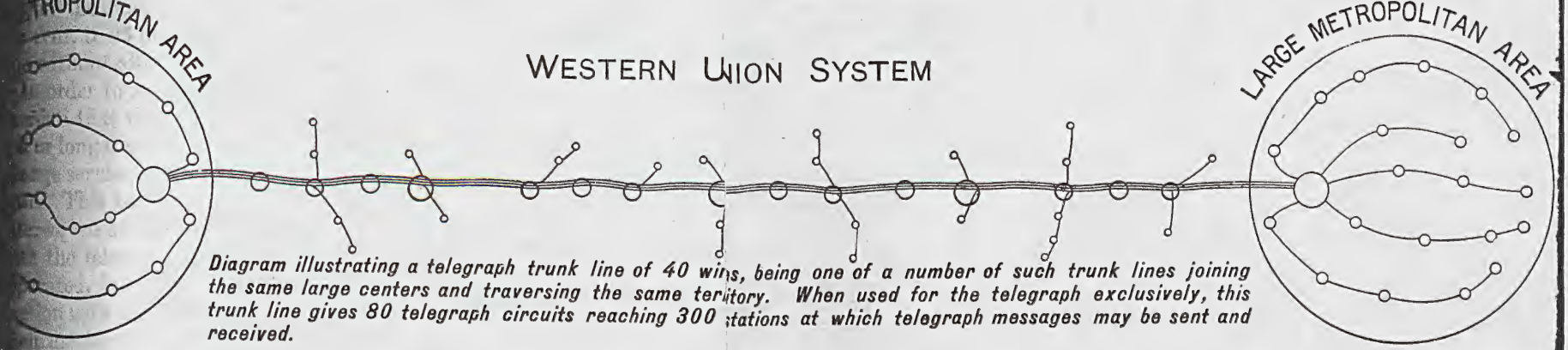

Diagram illustrating a telegraph trunk line of 40 wires, being one of a number of such trunk lines joining the same large centers and traversing the same territory. When used for the telegraph exclusively, this trunk line gives 80 telegraph circuits reaching 300 stations at which telegraph messages may be sent and received.

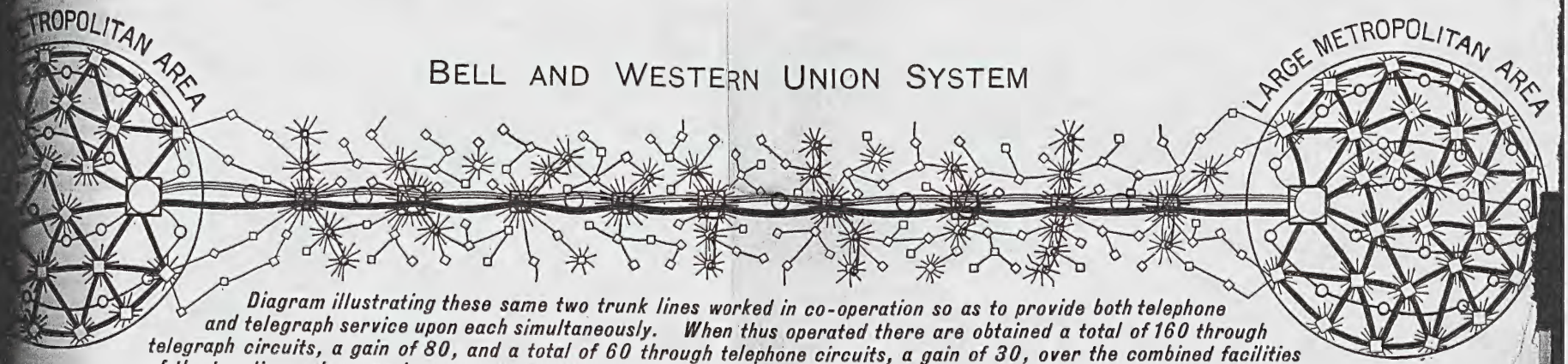

Diagram illustrating these same two trunk lines worked in co-operation so as to provide both telephone and telegraph service upon each simultaneously. When thus operated there are obtained a total of 160 through telegraph circuits, a gain of 80, and a total of 60 through telephone circuits, a gain of 30, over the combined facilities of the two lines when one is used only for the telephone and the other only for the telegraph. The number of stations where telegrams may be received and sent is increased from 300 to 700,000.

Telephone Central Office ▫ *Telephone Toll Station*

systems of equal size one plant were eliminated and both services were performed over the other, the percentage of joint revenue to plant would be substantially doubled, or 45 per cent. To put it in another way: The maintenance of a wire plant costs about 30 per cent. of the annual gross revenue from that plant. The simultaneous use of a plant for both purposes would mean maintenance of one wire system against the doubled revenue from both services, or a decrease in maintenance alone of about 15 per cent. of the gross revenue. In addition to these savings there would be the savings of the capital charges and of taxes on plant which would be made unnecessary. This brings within the realm of possibility a reduction of from 20 per cent. to 25 per cent. in the gross charges or gross revenue without affecting the profits of the business.

In order to avoid confusion it must be distinctly borne in mind that the telephone service referred to here is the toll or long-distance service and not the circuits of the exchange service which could not be used for any other purpose. This toll or long-distance service is so intimately interwoven and interdependent both in operation and use with the telephone exchange service that it could not be separated, but the operation of the toll circuits in connection with the exchange circuits would not interfere with their use for telegraph purposes by a regularly organized telegraph staff.

These are the possibilities, fraught with all sorts of advantage to the public. Some of them are so clearly without the "restrictions" of business operation that they can be put in operation as fast as the physical changes can be made in the plant, but those of the greatest advantage, prudence would dictate postponing until after these business restrictions are made clearer or more definitely interpreted.

For the Directors,

THEODORE N. VAIL,

President.

Although the total savings from such work as this are real and accrue from year to year and are much larger than any figures which have been set down here, it is in most cases impossible to trace them in the books of the companies for the reason that so often the result has been that the saving has appeared in the form of improved service without a corresponding increase in rates. Even where the savings are direct and tangible, it is often impossible to find them in the books. This is well illustrated in the case of the very substantial and definite saving resulting from the improvement in cable sheaths for overhead cables. An examination of the books would show that cables actually cost very much more even after this improvement than before. The explanation of this is found in the large increase in the cost of the other raw materials entering into the construction of the cables. The effect of such savings as this, therefore, is to prevent the total costs from rising as high as they otherwise would.

We too feel the high cost of living. The energies of the entire headquarters staff, not only of the Engineering Department, but the Administrative, Financial, Accounting and other departments, have been directed to this problem. The result is, up to the present at least, that while the costs of labor, raw material and commodities in general have been mounting higher and higher, telephone rates have not been increasing in proportion, but on the contrary, taking the rates throughout the country as a whole, the trend has been downward. This has been accomplished without restricting or impairing the service or cutting wages. On the contrary, we have done it at the same time that we have provided a greatly enlarged and more efficient plant and a more extended, efficient and amplified service, and in the face of increased wages and increased expenditures for welfare work.

LEGAL.

The Legal Department of the American Telephone and Telegraph Company is a centralized bureau for the record and dissemination of information on all legal subjects which are of special interest to the associated companies. It issues for their use periodical bulletins containing all new court cases of interest, and also other bulletins giving the orders, rulings and decisions affecting telephone and telegraph companies made by all the Commissions in the United States. It also issues, in book form, the telephone and telegraph cases decided by Commissions, and a volume for each State of the statutes relating to telephone and telegraph companies, which is revised as new legislation is enacted. It has experts on all legal matters which are of special interest to the associated companies, and furnishes information, briefs and documents to their counsel. These experts visit the associated companies and assist in the preparation and argument of difficult cases. In view of the size and extent of our system and operations, the amount of litigation in the State and Federal courts is small.

In addition to the Interstate Commerce Commission, there are now Commissions with jurisdiction over telephone companies in thirty-three States. Many matters involving our plant and business are brought before these bodies from time to time, and the legal and other representatives of the company are co-operating with the Commissions in an effort to meet all questions arising, in such a manner as to insure the improvement, development and extension of the service on terms just to all parties.

The relations of our companies with the public and with the supervising Commissions have continued, on the whole, to be satisfactory. It would be impracticable to review the many orders, rulings and decisions made

during the year, but most of them have been favorable and none, it is believed, will have the effect of permanently retarding the development of the business along the lines which have been adopted as the policy of the company.

The New Jersey Commission has sustained our rates in Camden, and elsewhere throughout southern New Jersey, as just and reasonable.

The Ohio Commission has sustained our objection to compulsory physical connection with another company operating in localities where we were already rendering service, and where the effect of such a requirement would be to make our facilities available to such other company, without the justification of a public necessity.

The Attorney General of the United States has, during the year, conducted an examination of our affairs, and, as a result of such examination, has suggested a thorough study, from the standpoint of the public, by the Interstate Commerce Commission, of the whole problem of the relation of government to the transmission of intelligence by telegraph and telephone. The company's policy, as already announced, will be to co-operate fully with and assist the Commission in every possible way.

The Interstate Commerce Commission has already issued a general accounting order, effective January 1, 1913, providing a uniform system of accounts for telephone companies. The order follows generally along lines which the accounting officers of this company have endorsed.

For your information, the letter of the Attorney General to the Interstate Commerce Commission, relating to the matters above referred to, and the order of the Commission with respect thereto, are here set forth in full:

 1912

OFFICE OF THE ATTORNEY GENERAL,
WASHINGTON, D. C., January 7, 1913.

HONORABLE CHARLES A. PROUTY,
Chairman, Interstate Commerce Commission,
Washington, D. C.

MY DEAR SIR:

This Department has been engaged for some time past in an investigation of certain complaints made on the part of persons interested in independent telephone companies against the American Telephone and Telegraph Company. There are said to be some 20,000 independent telephone companies, representing investments aggregating many millions of dollars, which together operate somewhat more than 4,000,000 telephones. No one of these companies represents capital or business comparable in size with that of the American Company or any of its principal subsidiary companies. The American Telephone and Telegraph Company, either directly, or through subsidiary companies whose stock it owns, operates what is known generally as the Bell Telephone System, which reaches upwards of 70,000 places, distributed among practically all the states of the Union, having some 4,500,000 telephones in use, and operating the principal long distance lines between the States. It has an invested capital of a book value, of nearly six hundred million dollars. It also is the owner of a large block of stock of the Western Union Telegraph Company, through which it practically controls the operations of the telegraph and cable lines of that corporation. The policy of the company is set forth in the annual report of its directors to the stockholders, for the year ending December 31, 1910, as follows:

"It is believed that the telephone system should be universal, interdependent and intercommunicating, affording opportunity for any subscriber of any exchange to communicate with any other subscriber of any other exchange within the limits of speaking distance, giving to every subscriber every possible additional facility for *annihilating time or distance by use of electrical transmission of intelligence or personal communi-*

cation. It is believed that some sort of a connection with the telephone system should be within reach of all. It is believed further, that this idea of universality can be broadened and applied to a *universal wire system* for the *electrical transmission of intelligence* (*written or personal communication*), from every one in every place to every one in every other place, a system as universal and as extensive as the highway system of the country which extends from every man's door to every other man's door.

"It is not believed that this can be accomplished by separately controlled or distinct systems nor that there can be competition in the accepted sense of competition.

"It is believed that all this can be accomplished to the reasonable satisfaction of the public with its acquiescence, under such control and regulation as will afford the public much better service at less cost than any competition or government-owned monopoly could permanently afford and at the same time be self-sustaining.

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"With the extension of the speaking limits of the telephone over connecting lines came also the necessity for the extension of the territorial limits of the exchange systems, the necessity of standardization, uniformity of apparatus and operating methods, and an effective common control over all. The necessity for system was the beginning of the Bell System. The combination of the separate exchanges and lines into larger aggregations or organizations followed. It was necessary to have more effective organization with more effective administration and management, and with resources sufficient to make the changes which experiment and experience had found necessary.

"It is impossible to define the territorial limitations of a telephone system because from every exchange center communication is wanted up to the talking limits in every direction.

"This process of combination will continue until all telephone exchanges and lines will be merged either into one company owning and operating the whole system, or until a number of companies with territories determined by political, business or geographical conditions, each performing all functions pertaining to local management and operation, will be closely associated under the control of one central organization exercising all the functions of centralized general administration. But whatever may be the form of the operating organization, there is bound to be for legal purposes and the holding of franchises, some sort of subordinate state organization which will bring the business and property in each locality under the jurisdiction of the state in which it is situated and operated.

"The American Telephone and Telegraph Company, which is the owner of all or part of each company forming the Bell System, is not simply a holding company. It is not a combination that has eliminated competition between the companies controlled by it. There can be no rivalry or competition between local exchanges in adjacent territory. Those desiring the service of exchanges in adjacent territory in addition to their own can get it much better and cheaper through their local exchange. To give direct individual wires from one exchange territory into another would be impractical from the multiplication of lines and prohibitive on account of cost. The American Telephone and Telegraph Company is a centralized general administration for all the companies. It does the financing for the extension of the business. It furnishes the engineering, operating and other experts. It maintains a productive and protective organization so far as patents are concerned. It defends all the companies against all infringements. It undertakes to bring about improvements by working out the ideas and suggestions of others, both in and out of the business. Its agents keep each company fully informed of all that is going on in the field. It avoids all duplication of efforts, of experiments, of trial of new methods, apparatus, etc. It looks after the public relations of the companies. In other words, it performs all that service which is common to all, leaving to the local companies the local management. The organization is not unlike that of the United States, each local

company occupying its own territory and performing all local functions, the American Telephone and Telegraph Company binding them all together with its long-distance lines and looking after all the relations between the local companies and between local companies and other companies. To have developed the telephone industry to its present state of efficiency would have been beyond the ability of any one of the local companies.

"All independent systems which have been started have more or less followed the same lines, but within restricted areas, whether built by one company or interest, or by several. First, the local exchange, then the toll line to outlying points, and then the long-distance line connecting with other independent exchanges, tieing them together to form a system affording facilities for communication between the subscribers of one exchange and the subscribers of the other, but limited in scope, and without the community of interest necessary to a common system.

"In other words we have the Bell System on the one side, developed on the lines of a universal, intercommunicating and interdependent service. We have the opposition on the other side, segregated exchanges or limited systems without universality, incomplete and inefficient, neither interdependent nor intercommunicating, except to a limited extent."

In carrying out the policy so frankly outlined in this statement, representatives of many of the independent companies have complained that the American Company has not contented itself with the normal extension of its system, but that it has purchased competing lines in such manner and in such circumstances as to destroy competition which would otherwise have furnished the public with better facilities at lower rates than have since obtained, and that it has refused, either directly or through competitive and originally independent lines acquired by it, to make connections between local lines not owned or controlled by it and its own long distance lines, and has terminated contracts and arrangements for the interchange of business between the lines so acquired, and lines of

companies not owned or controlled by the American companies. Complaints are also made that in cases where the American companies have assumed to make such connections and to interchange business with independent companies, they have done so in such manner, as in effect, to prevent a satisfactory exchange of facilities of communication between the American lines and those not controlled by that company, thereby intending to discourage the patrons of the independent companies and drive them to the American companies.

Complaints are also made that the American Company has discriminated between the lines of the Western Union Telegraph Company, in whose stock it owns a large interest as above mentioned, and the lines of the Postal Telegraph Company, in which it is not interested, in cases where subscribers to its telephone lines request to be put in communication with the Postal Company for the purpose of giving it messages to be transmitted by telegraph.

It is also complained that the rates maintained by the American companies for local and long distance telephone service are unduly high in places and between communities where there is no competition; that wherever independent companies have been established, rates have been greatly reduced, and that in every instance when the American Company has secured control of independent companies it has immediately increased the rates to an undue extent.

Representatives of independent companies contend that the American Company should receive and interchange business with them on a basis analogous to that on which transportation by railroad is conducted, while the American Company maintains that such interchange is not compelled by statute and is impracticable.

Many of these questions, it seems to me, cannot be appropriately dealt with by the law department of the government, but should be made the subject of regulation after a careful investigation of the whole subject by your honorable body. The powers vested in you by statute, appear to me to be ample to enable you to make a comprehensive and thorough investi-

gation of the matter. It may be that as a result of such investigation, you will conclude that additional legislation should be suggested to Congress. Quite a number of the States have enacted laws vesting in public utilities commissions or similar bodies, jurisdiction, which has been executed in some instances, with respect to the acquisition of telephone lines of one company by another, and with respect to the interchange of business and facilities between telegraph and telephone lines. State regulation, however, cannot be a satisfactory method of ultimate solution of the questions arising out of telephone operation. The value of a telephone service depends largely upon the facility of connecting every individual telephone user with any point upon any telephone line in the United States; but this should be attained under conditions which secure to the public the maximum of convenience upon the most reasonable terms consistent with a fair return upon the investment and under suitable supervision and control by your honorable body.

The Interstate Commerce Act as at present in force, makes telegraph, telephone and cable companies engaged in sending messages from one State, Territory or District of the United States to any other State, Territory or District of the United States, or to any foreign country, common carriers within the meaning and purpose of the act. It requires all charges for service rendered in the transmission of messages by telegraph, telephone or cable in interstate or foreign commerce or in connection therewith, to be just and reasonable, and makes it unlawful for any common carrier subject to the provisions of the act, to make or give any undue or unreasonable preference or advantage to any particular person, etc., or locality, or to any particular description of traffic in any respect whatsoever, or to subject any particular person, company, etc., or locality, or any particular description of traffic, to any undue or unreasonable prejudice or disadvantage in any respect whatsoever.

The 6th section of the act which requires common carriers subject to its provisions to file with the Commission and print and keep open to public inspection schedules of rates, fares and charges, is probably not broad enough to extend to telegraph

and telephone companies; but the 15th section confers upon the Commission ample power of investigation on its own initiative, and enacts that if the Commission shall be of opinion

> "that any individual or joint rates or charges whatsoever demanded, charged, or collected by any common carrier or carriers subject to the provisions of this Act for the transportation of persons or property or for the transmission of messages by telegraph or telephone as defined in the first section of this Act, or that any individual or joint classifications, regulations or practices whatsoever of such carrier or carriers subject to the provisions of this Act are unjust or unreasonable or unjustly discriminatory, or unduly preferential or prejudicial or otherwise in violation of any of the provisions of this Act, the Commission is hereby authorized and empowered to determine and prescribe what will be the just and reasonable individual or joint rate or rates, charge or charges, to be thereafter observed in such case as the maximum to be charged, and what individual or joint classification, regulation, or practice is just, fair, and reasonable, to be thereafter followed, and to make an order that the carrier or carriers shall cease and desist from such violation to the extent to which the Commission finds the same to exist, and shall not thereafter publish, demand, or collect any rate or charge for such transportation or transmission in excess of the maximum rate or charge so prescribed, and shall adopt the classification and shall conform to and observe the regulation or practice so prescribed."

Moreover, by the 20th section, the Commission is authorized not only to require annual reports from the common carriers subject to the act, but also, by general or special orders, to require them to file monthly reports of earnings and expenses

> "and to file periodical or special, or both periodical and special, reports concerning any matters about which the Commission is authorized or required by this or any other law to inquire or to keep itself informed or which it is required to enforce."

Under the provisions of the statute referred to, the Commission is, therefore, fully empowered to make the most thorough investigation into the rates and practices of the telephone companies to determine what are reasonable maximum rates to be charged for communication from one State to another, and the practice to be observed in all of the dealings of the telephone companies with the public and with other companies. No comprehensive investigation into the organization, management and conduct of telephone companies has, so far as I am aware, ever been had by governmental agency. The investigation of this Department has dealt only with certain suggested violations of the Sherman Anti-Trust Act, but the whole problem of the relation of government to the transmission of intelligence by telephone and telegraph is one of such far-reaching importance and so affects the welfare of the entire community, that it appears to me to be a subject which should be thoroughly studied from the standpoint of the public, in order that a governmental policy with respect to the telephone and telegraph business may be intelligently formulated and adopted. The Interstate Commerce Commission is clothed with the powers above referred to and the subject is one affecting such general public interests that I venture to suggest that you undertake this work. If these suggestions commend themselves to your honorable body, I beg to add that all of the information which has been collected in this Department bearing upon the subject, will be cheerfully put at your disposal.

Very respectfully,

GEO. W. WICKERSHAM,
Attorney General.

At a General Session of the INTERSTATE COMMERCE COMMISSION, held at its office in Washington, D. C., on the 13th day of January, A.D., 1913.

FRANKLIN K. LANE,
JUDSON C. CLEMENTS,
CHARLES A. PROUTY,
JAMES S. HARLAN,
CHARLES G. MCCHORD,
BALTHASAR H. MEYER,
} *Commissioners.*

DOCKET NO. 5462.

TELEPHONE AND TELEGRAPH INVESTIGATION.

Information having been lodged with this Commission to the effect that the American Telephone & Telegraph Company, by the operations of itself and allied companies, is attempting to monopolize the telephone and telegraph business of the United States and is fast driving out of existence independent competitors; and further, that this company and other telephone and telegraph companies are guilty of unlawful discriminations and are imposing unreasonable rates, rules, regulations and practices in the conduct of their business:

IT IS ORDERED, That a proceeding of inquiry and investigation be, and it is hereby, instituted into and concerning the history, the financial operations, the rates, rules, regulations and practices of telephone and telegraph companies subject to the Act to Regulate Commerce, with a view to the making of a comprehensive report and to the issuance of such order, or orders, as may be necessary to correct such discriminations and make applicable reasonable rates and practices.

IT IS FURTHER ORDERED, That this proceeding be set for hearing at such times and places, and that such persons be required to appear and testify, to afford such information, and to produce such books, documents and papers as the Commission may hereafter direct, and that investigation be carried on in the meantime by such means and methods as may be deemed necessary and proper.

By the Commission:

(SEAL)

JOHN H. MARBLE,
Secretary.

It will be noticed that the Attorney General in his letter to the Interstate Commerce Commission says:

"The value of a telephone service depends largely upon the facility of connecting every individual telephone user with any point upon any telephone line in the United States; but this should be attained under conditions which secure to the public the maximum of convenience upon the most reasonable terms consistent with a fair return upon the investment and under suitable supervision and control by your honorable body."

This is a clear and comprehensive statement of the fundamental policy upon which the Bell System has been evolved. In the annual report for 1911 in connection with this peculiarity of the telephone, different from that of any other public service, the company assumed a responsibility and accountability to the public, by the following statement:

"We believe that we are working this problem out on the broad lines of the greatest benefit to the public, and that this is evidenced by the fact that our standards and lines of organization and operation are the standards the world over.

"As a corollary to this—we recognize a 'responsibility' and 'accountability' to the public on our part, which is something different from and something more than the obligation of other public service companies not so closely interwoven with the daily life of the whole community."

It is impossible, and would be improper to attempt, to forecast the action of the Interstate Commerce Commission, but judging by the past record of that body we can but expect that it will be constructive rather than destructive.

As to the future of the company, it was never brighter. Business indications are normal, our relations with the public and with the public authorities on a mutually satisfactory basis.

The organization on the lines set forth in previous reports is about complete, and the division of the work is so clearly drawn and so closely correlated between the local administration of the associated companies and the central general administration of the American Telephone and Telegraph Company that there is no duplication of effort or conflict in administration.

Since the last report, the death of Mr. Francis Blake, a long-time director of the company, has occurred. Mr. Blake was the inventor of the Blake transmitter, which was in its time the best transmitting and most effective telephone in existence and was produced most opportunely for the company. The Edison carbon transmitter, which was superior to the magneto transmitter then in use by the Bell Companies, had been invented and acquired by interests antagonistic to this company. Mr. Blake's invention not only came opportunely, but was so superior to all other transmitters then in existence, that it soon became a very large factor in the upbuilding of the Bell System as it is today.

For the Directors,

THEODORE N. VAIL,

President.

In every other department of telephone development the work of the general engineering staff has been continuous and equally fruitful.

During the period of twenty-five years practically all of the switchboards have been changed several times. Millions of dollars have been spent on inventions and experimental development. We have designed, manufactured and installed all kinds of switchboards—automatic, semi-automatic and manual—and we have exhaustively studied the practical workings of every type of switchboard in use.

It has frequently been asserted that the Bell System did not employ automatic switchboards because of patents controlled by others. The Bell Company owns or has rights in every United States patent and patent application which would be necessary to operate its system upon the so-called automatic plan—which is not automatic for the subscriber as the subscriber does all the manipulation in the making of a connection. As yet it has not been demonstrated that the automatic system would give as good and dependable service as we now render to the public, when used in connection with the extensive and comprehensive suburban and interurban telephone system of the Bell.

At the beginning of the telephone industry there was no art of electrical engineering nor was there any school or university conferring the degree of electrical engineer. Notwithstanding this, the general engineering staff was soon organized, calling to their aid some of the most distinguished professors of science in our universities.

As problems became more formidable and increased in number and complexity, the engineering and scientific staff was increased in size and in its specialization, so that we now have working at headquarters on the problems of the associated companies 550 engineers and scientists carefully selected with due regard to the practical as well as the scientific nature of the problems encountered.

Among them are former professors and instructors of our universities, post graduate students and other graduates holding various engineering and scientific degrees from 70 different scientific schools and universities, 60 American and 10 foreign institutions of learning being represented.

No other telephone company, no government telephone administration in the world, has a staff and scientific equipment such as this.

The Bell Company recognizing at the outset that the problems of telephony would require for their solution the highest degree of scientific and engineering skill, has been foremost in the development of telephone engineering and in the encouragement of scientific research.

It can be said that this company has created the entire art of telephony and that almost without exception none of the important contributions to the art have been made by any government telephone administration or by any other telephone company either in this country or abroad.

LEGAL.

The work of the Legal Department includes not only the routine work incident to the business of the Company as an operating company, but also the rendition of service along legal lines to the associated companies. The department endeavors to keep advised upon all legal and collateral subjects which are of special interest to the associated companies, and to disseminate this information promptly and effectively. It has continued the issuance to the associated companies of periodical bulletins calling attention to current decisions of the courts which may be of value. It issues in book form the telephone and telegraph cases decided by commissions and a compilation of the statutory law relating to telephone and telegraph companies.

The department further co-operates with the legal departments of the associated companies in disposing of their questions of a general character, so as to aid in their solution along sound lines harmonizing with the general policy of the system.

In addition to the Interstate Commerce Commission, there are now commissions exercising jurisdiction over telephone companies in forty States. The jurisdiction of these commissions embraces many questions of the utmost importance, especially in connection with rates, service and the issuance of securities. Generally, the commissions have welcomed the effort of the Company to aid them in determining these questions along lines which tend toward efficiency and an extension of the service upon a fair basis.

The investigation by the Interstate Commerce Commission, instituted at the suggestion of the then Attorney General of the United States, Honorable George W. Wickersham, and referred to in last year's report, has been commenced. The Company is affording to the commission every facility for making this investigation complete and exhaustive.

The amount of pending litigation is relatively small. The suit brought by The Western Union Telegraph Company and some of its associated companies has been finally determined adversely to the Company, and the decree against the Company has been satisfied.

The United States has instituted a suit in the United States District Court in Portland, Oregon, charging that certain local transactions in which The Pacific Telephone and Telegraph Company and The Mountain States Telephone and Telegraph Company were most directly concerned, were in violation of the Sherman anti-trust law. The Company has aided the government in expediting

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this case. The testimony in chief for the government has been completed, and the taking of testimony in behalf of the defendants has commenced. *We wish to call attention to the fact that the suit is purely local, being confined to a few local transactions in the States of California, Washington, Oregon and Montana. It is not believed that its decision can in any event seriously affect the interests of the Company.*

Early in the year, William A. Read & Co. brought an action in Chicago involving the relations between this Company and the Central Union Telephone Company. It was impossible to adjust this matter upon any reasonable basis and it seemed that the ultimate outcome would render a reorganization of the Central Union Telephone Company necessary. The Company therefore consented to the appointment of receivers, and the court has appointed capable men who are now taking charge of the property and will operate it, pending the suit.

The Supreme Court of California has sustained the contention of the Company upon an important question, in a recent holding by it that there is not power to order a physical connection except upon provision for compensation for the use of the property of this Company which such a connection involves.

We were advised during the year 1913 that criticism had been directed against the Bell System with respect to certain matters which were national in their scope. We therefore entered into negotiations with the Attorney General of the United States for the purpose of adjusting such matters to meet the views and wishes of the Federal Administration. After a series of interviews and negotiations, all of the suggestions of the Attorney General were accepted by the Directors of the American Telephone and Telegraph Company, and the following correspon-

dence is here printed in order to show the attitude of the Administration and of the American Telephone and Telegraph Company:

December 19, 1913.

THE ATTORNEY GENERAL,
Washington, D. C.

SIR:

Wishing to put their affairs beyond fair criticism, and in compliance with your suggestions formulated as a result of a number of interviews between us during the last sixty days, the American Telephone and Telegraph Company, and the other companies in what is known as the Bell System, have determined upon the following course of action:

First. The American Telephone and Telegraph Company will dispose promptly of its entire holdings of stock of the Western Union Telegraph Company in such way that the control and management of the latter will be entirely independent of the former, and of any other company in the Bell System.

Second. Neither the American Telephone and Telegraph Company nor any other company in the Bell System will hereafter acquire, directly or indirectly, through purchase of its physical property or of its securities or otherwise, dominion or control over any other telephone company owning, controlling, or operating any exchange or line which is or may be operated in competition with any exchange or line included in the Bell System, or which constitutes or may constitute a link or portion of any system so operated or which may be so operated in competition with any exchange or line included in the Bell System.

Provided, however, that where control of the properties or securities of any other telephone company heretofore has been acquired and is now held by or in the interest of any company in the Bell System and no physical union or consolidation has been effected, or where binding obligations for the acquisition of the properties or securities of any other telephone company heretofore have been entered into by or in the interest of any company in the Bell System and no physical union or consolidation has been effected, the question as to the course to be pursued in such cases will be submitted to your Department and to the Interstate Commerce Commission for such advice and directions, if any, as either may think proper to give, due regard being had to public convenience and to the rulings of the local tribunals.

Third. Arrangements will be made promptly under which all other telephone companies may secure for their subscribers toll service over the lines of the companies in the Bell System on the ways and under the conditions following:

(1) Where an independent company desires connection with the toll lines of the Bell System it may secure such connection by supplying standard trunk lines between its exchanges and the toll board of the nearest exchange of the Bell operating company.

(2) When the physical connection has been made by means of standard trunk lines, the employees of the Bell System will make the toll line connections desired, but in order to render efficient service it will be necessary that the entire toll circuit involved in establishing the connection shall be operated by, and under the control of, the employees of the Bell System.

(3) Under the conditions outlined above, any subscriber of any independent company will be given connection with any subscriber of any company in the Bell System, or with any subscriber of any independent company with which the Bell System is connected, who is served by an exchange which is more than fifty miles distant from the exchange in which the call originates.

(4) The subscribers of the independent company having toll connections described above, shall pay for such connections the regular toll charge of the Bell Company, and in addition thereto, except as hereinafter provided, a connection charge of ten cents for each message which originates on its lines and is carried, in whole or in part, over the lines of the Bell System. The charges incident to such service shall be made by the Bell Company against the independent company whose subscriber makes the call, and such charges shall be accepted by the independent company as legal and just claims.

(5) Under this arrangement the lines of the Bell System shall be used for the entire distance between the two exchanges thus connected, provided the Bell System has lines connecting the two exchanges. Where the Bell System has no such lines, arrangements can be made for connecting the lines of the Bell System with the lines of some independent company in order to make up the circuit, but such connections will not be made where the Bell System has a through circuit between the two exchanges.

(6) Any business of the kind commonly known and described as "long lines" business offered for transmission over the lines of the American Telephone and Telegraph Company shall be accepted for any distance, that is, on such "long lines" business calls shall be accepted where the point of destination is less than fifty miles from the exchange where the call originates as well as where the point of destination is greater than fifty miles therefrom.

(7) Any business of the kind commonly known and described as "long lines" business offered for transmission over the lines of the American Telephone and Telegraph Company shall be accepted at the regular toll rate and no connecting charge shall be required. But such calls shall be handled under the same operating rules and conditions as apply to calls over the local toll lines.

Very respectfully yours,

AMERICAN TELEPHONE AND TELEGRAPH COMPANY,
By N. C. KINGSBURY,
Vice President.

OFFICE OF THE ATTORNEY GENERAL,
WASHINGTON, D. C., December 19, 1913.

MR. N. C. KINGSBURY, *Vice President.*
American Telephone and Telegraph Company,
15 *Dey Street, New York City.*

DEAR SIR:

Permit me to acknowledge, with expressions of appreciation, your letter of December 19, outlining the course of action which the telephone companies composing the Bell System obligate themselves to follow in the future.

Your frank negotiations in respect of these matters compel the belief that what you propose will be carried out in good faith; and it seems to me clear that such action on your part will establish conditions under which there will be full opportunity throughout the country for competition in the transmission of intelligence by wire.

May I take this occasion to say that the Administration earnestly desires to co-operate with and to promote all business conducted in harmony with law; and that, without abating the insistence that the statutes must be obeyed, it will always welcome opportunity to aid in bringing about whatever adjustments are necessary for the re-establishment of lawful conditions without litigation.

Very truly yours,

J. C. MCREYNOLDS,
Attorney General.

THE WHITE HOUSE,
WASHINGTON, D. C., December 19, 1913.

MY DEAR MR. ATTORNEY GENERAL:

Thank you for letting me see the letter from the American Telephone and Telegraph Company. It is very gratifying that the company should thus volunteer to adjust its business to the conditions of competition.

I gain the impression more and more from week to week that the business men of the country are sincerely desirous of conforming with the law, and it is very gratifying indeed to have occasion, as in this instance, to deal with them in complete frankness and to be able to show them that all that we desire is an opportunity to co-operate with them. So long as we are dealt with in this spirit we can help to build up the business of the country upon sound and permanent lines.

Cordially and sincerely yours,

WOODROW WILSON.

HON. JAMES C. MCREYNOLDS,
The Attorney General.

GOVERNMENT OWNERSHIP AND OPERATION.

The report for 1911 contains the following declarations:

"We believe that our Company has a most vital interest in, and that our future success and prosperity depend upon the working out of the telephone and telegraph problem in a way that meets with the approval of the public as a whole."

"We believe that we are working this problem out on the broad lines of the greatest benefit to the public. . . ."

"As a corollary to this—we recognize a 'responsibility' and 'accountability' to the public on our part, which is something different from and something more than the obligation of other public service companies not so closely interwoven with the daily life of the whole community."

That we have followed our declarations and fully recognized these obligations is evidenced by the fact that the Bell System has for efficiency, progressiveness, improvement and development become the standard for the whole world. The policy upon which it has been developed and the results accomplished are the strongest reasons put forth for government operation, and the only ones except those debatable ones of the superiority of government efficiency and economy of operation.

Our opposition to Government operation and ownership is not based on pecuniary, partisan, prejudiced or personal reasons. It is because of our interest in the upbuilding of a great public utility and its preservation. Our declaration quoted above is as much part of our policy as is the making of our dividends. We feel our obligation to the general public as strongly as to our investing public or to our own personal interests.

We believe that the efficient operation of every utility is necessary to the public, and we do not believe that any service efficient, progressive and permanent can be given by companies not making fair profits. No community can afford to be served by unprofitable or bankrupt companies which are bound to give inefficient, unprogressive service.

Prosperity follows trade and trade follows the line of least resistance. Efficient facilities have more to do with serving trade than any other single factor.

We are opposed to government ownership not on account of our property for we know that our property cannot be confiscated, and cannot be taken except for its just value.

We know that if our property is ever taken by the government it will be found to be in the very best possible condition of that of a going concern, and that any valuation, that will stand, will yield much more than the present market value of our shares.

We are opposed to government ownership because we know that no government-owned telephone system in the world is giving as *cheap* and *efficient* service as the American public is getting from all its telephone companies. We do not believe that our Government would be any exception to the rule.

GOVERNMENT PURCHASE.

The public has been much interested, and the shareholders in telephone and telegraph properties much concerned, about a report said to have been submitted to Congress by the Postmaster General, advocating and recommending the acquisition by the government of the wire systems of the United States.

This common impression is wrong. The Postmaster General has made no report or recommendation. A special committee of Post Office officials, designated by the Postmaster General for the purpose of gathering information, had prepared some more or less relevant material. Upon a request from the Senate for the information that had been collected, the Postmaster General forwarded the findings of this committee *without comment.*

It is not a departmental report; it is merely the personal conclusions of three minor officials of the Post Office Department.

The statistics and statements of fact are much the same as, and appear to have been collated in connection with, those gathered by the advocates of government ownership in Congress. Because of errors in their compilation and failure to take into account materially dissimilar conditions affecting comparisons, these statistics have little or no real value; and because of their many mistaken and misleading statements, conclusions predicated upon them are erroneous and misleading and necessarily unsafe. This criticism would have been unnecessary had more care been used in gathering the information, situations more analogous to each other been selected for comparison, and a little scrutiny been given to the sources.

It is interesting to note, however, that the investigators reached the conclusion that the telephone and telegraph business should constitute one system, using the wires in common—that the services were complementary. This was the contention of the Bell System, and the policy which it was attempting to carry out.

The report says:

"Unquestionably from the engineering viewpoint the attitude of the Bell Companies is proper, for it is very necessary in the interest of the most efficient service that the entire telephone network be under one management."

"The study of this subject has disclosed that the telegraph and telephone systems of the country are so inextricably *allied* that any consideration of one must necessarily include the other."

The introduction of bills for government ownership and operation is far from its accomplishment; this has been repeatedly done for many years past, some of them strongly favored by the heads of the Post Office Depart-

ment. If the government takes over any utility it will only be done after thorough consideration and examination and prolonged discussion, and if determined upon, *there is not at all likely to be either confiscation or destruction of existing systems.*

The recommendation of one of the advocates of government ownership to take over the telephone toll and long-distance lines, equip them for telegraph purposes and enter into a destructive competition with the existing telegraph companies for the purpose of destroying their market value and enabling the government to purchase at a low price, is so utterly at variance with any possible standard of public or private or commercial honor that it would seem as if the very suggestion would be repudiated.

SHAREHOLDERS SHOULD NOT BE INDUCED TO PART WITH THEIR HOLDINGS.

The proprietors of the American Telephone and Telegraph Company should rest quietly and not be scared or frightened into sacrifices of their securities.

Whether government purchase be ultimately decided upon or not the property is well worth more than the market price of its securities. This is not mere assertion, it is an established fact. Friendly and unfriendly appraisals of the various properties have been made; in no instance has the appraised value been placed below the book value, while in most instances it has been placed in excess.

This excess in value will continue so long as public utilities are allowed to earn fair returns on the value of their property or on their investments. The present distribution of profits by the American Telephone and Telegraph Company and associated companies averaging 6.05% on the par of their outstanding securities or less than 5% on the book value of their property (which as

above stated is less than the actual value) cannot be criticised as unreasonably high.

The charge is freely made that the stock of the American Telephone and Telegraph Company is watered. In another part of this report it is shown that "for the $344,616,300 capital stock, $369,136,414 has been paid into the treasury of the Company." Mr. Lewis, the principal Congressional advocate of government ownership, frankly says:

"Be it said for the Bell System that it is the one great corporation in our country that has not issued tons of counterfeit capital. Its stock and bonds today represent the actual contributions of its shareholders in money to a great common enterprise, and we will not have that unfortunate circumstance to deal with in the valuation of their properties."

RIGHTS OF PROPERTY OWNERS.

Those advocating government ownership say "that private claims or rights of owners (i.e. shareholders) of the existing systems *will not be allowed to stand in the way.*" It is neither contention nor resistance for the thousands of owners to claim "just compensation" based upon a fair valuation; the guaranteed rights of all give them this protection. Just compensation means that it must be "just" and represent full value of the property; this contention is very clearly upheld in the following extract from a United States Supreme Court decision in a case where it was claimed that just value meant full value of the property, including franchises:

"The language used in the 5th Amendment in respect to this matter is happily chosen. The entire amendment is a series of negations, denials of right or power in the government, the last, the one in point here, being 'Nor shall private property be taken for public use without just compensation.' The noun 'compensation,' standing by itself, carries the idea

of an equivalent. Thus we speak of damages by way of compensation, or compensatory damages, as distinguished from punitive or exemplary damages, the former being the equivalent for the injury done, and the latter imposed by way of punishment. So that if the adjective 'just' had been omitted, and the provision was simply that property should not be taken without compensation, the natural import of the language would be that the compensation should be the equivalent of the property. *And this is made emphatic by the adjective 'just.' There can, in view of the combination of those two words, be no doubt that the compensation must be a full and perfect equivalent for the property taken.* And this just compensation, it will be noticed, is for the property, and not to the owner. Every other clause in this 5th Amendment is personal. 'No person shall be held to answer for a capital, or otherwise infamous crime,' etc. Instead of continuing that form of statement, and saying that no person shall be deprived of his property without just compensation, the personal element is left out, and the 'just compensation' is to be a *full equivalent* for the property taken. This excludes the taking into account as an element in the compensation any supposed benefit that the owner may receive in common with all from the public uses to which his private property is appropriated, and leaves it to stand as a declaration *that no private property shall be appropriated to public uses unless a full and exact equivalent for it be returned to the owner.*"

It is neither contention nor resistance to defend the properties against mistaken assertions, freely made, "that the plants are rubbish and the securities represent little value." Values are not to be determined that way, such assertions cannot change cold facts. Sixteen millions of miles of wire, mostly copper, on poles or in cables and underground ducts, with the station and central office equipment of nearly five and one-half millions of telephone exchange stations, all in good physical condition, are not rubbish and do represent value. The addition of over 460,000 telephone stations during the past year could not

have been made without expenditure, and represents legitimate increase, not inflation of capital.

The final adjudication of a lower value than claimed for the private telephone plant in Great Britain has no bearing on the value of the Bell System. The private companies of England were operated under a limited license; it was known years in advance that the licenses would not be renewed and that the government would purchase the plants. The government and the owners could not agree as to expenditures upon the plants to be made prior to the purchase to keep them in any up-to-date condition; consequently as little was done as possible. This was a period of rapid improvement in telephone exchange equipment. The outside plant was largely overhead on buildings. To make it modern the old equipment and plant had to be largely replaced. The companies were paid 100 per cent. on the investment.

An appraisal of our properties upon the basis of the English valuation would give a result largely in excess of our present outstanding capitalization.

GOVERNMENT OWNERSHIP AND OPERATION: IS IT TO BE SELF-SUPPORTING?

Should government operation be self-sustaining in its full significance, entirely maintained and operated out of its own revenue, or should such properties be operated at a charge on general revenue at the cost of the whole public for the benefit of a part? Should they be regulated as to *efficiency* and *sufficiency* as private utilities are regulated, or should each department or utility regulate itself? If utilities are to be subsidized, that is, maintained entirely or in part out of public revenue for the benefit of the users, then the tendency toward government ownership is strong. There may be some things which should be made free and convenient for the whole public even at the expense of the

public revenues, but the telegraph and telephone are not of them.

The power or right of the Government to own and operate utilities need not be discussed. If such power is to be exercised it becomes of the greatest importance that a right decision, based on an exhaustive study and a thorough understanding of facts, conditions and possible results, should be reached.

The greatest embarrassment in dealing with many public or quasi-public questions is the difficulty of establishing a clear understanding unaffected by prejudice or partisanship; of offsetting erroneous impressions, created by mistaken or misleading statements and disputable and controvertible statistics, particularly when such statements are made by those who have the public ear.

Dickens said, when a parliamentary reporter: "Night after night I record predictions that never come true, professions that are never fulfilled, explanations that are only meant to mystify." It was so then, is now and probably ever will be the same.

GOVERNMENT-OPERATED TELEPHONE AND TELEGRAPH SYSTEMS.

A thorough study of all available reports and official information on the operations of government-owned and operated telephones and telegraphs shows that while in some countries the post office proper pays a revenue, the combined telegraph and telephone are without exception operated at a deficit. Every telephone system in the world adopts the Bell System as a standard, uses the Bell operating methods and either uses the Bell apparatus or copies it; yet there is not one that gives an approximation to the facilities that the Bell System gives the public, or gives as good or as cheap

service on the same basis of accounting, franchise conditions, and wages paid.

In England where the Post Office pays a very handsome net revenue, its telegraphs show a relatively much larger deficit, while the revenues and ordinary expenses of the telephone operations show a small balance, excluding, however, depreciation and obsolescence which have not yet become fully determined but which cannot be ignored.

These deficits are not the result of a definite policy to give a cheap service to individuals at the cost of all, but are due to errors in management such as under-estimates of values and cost of new construction; disregard of maintenance, depreciation and particularly of obsolescence; impossible theories of operation, and a mistaken policy founded on *promises, prophecies and assertions exactly the same in character as those now being used to bring about government ownership in this country*, and upon a failure to understand and appreciate the advantages of private as distinguished from government organization. The fallacies urged in Parliament to induce the government acquisition of the British telegraph system years ago are the arguments used by the advocates of government ownership and operation today.

FUNCTIONS OF GOVERNMENT.

The functions of government and the causes of its being are "*Control*" and "*Regulation*"—control of the individual and regulation of the community so far as is necessary to secure the enjoyment of life, liberty and happiness by all, and "control" or "regulation" of anything that might in any way become a menace to the social organization or to its individual members.

To the extent that anything *is a necessity* in its absolute sense to the enjoyment of life and health—the absence of which would endanger the community as a whole—it is a

proper function of the government either to provide it or to see that it is so provided as to bring it within the reach of every individual member of society; even to provide it for all at the cost of the general revenue.

To the extent that anything of a utilitarian nature is adopted by or assimilated into the habits of the public and contributes to their comfort, convenience, or even generally to their profit, it should become an object of *sufficient government regulation to prevent the public convenience being made the cause of private exaction;* the distinction between what should be furnished in whole or in part by the government and what should be regulated by the government being whether *the necessity is absolute* and the thing indispensable to the life, health and well-being of the individual and consequently of the community, or whether it be something contributing to or even important, but not indispensable, to the comfort, convenience and profit of the community or of the individual.

A sufficient supply of potable water available to all is a necessity. The street-car, the electric light, the telephone or telegraph are conveniences of the highest importance but are not necessities in the foregoing sense.

The control, and later the operation, of the mails and posts, for the interchange and dissemination of intelligence—letters, books, periodicals—have by general acceptance become a proper governmental function. The conveyance of packages and parcels has by custom been included with the mails.

GOVERNMENT OPERATION VS. GOVERNMENT REGULATION.

The step from government control and regulation to government ownership and operation is radical and fundamental; one which absolutely changes the character of government organization and functions. In this

country there is no organization or function of the government that in any sense approaches ownership or operation in the real, large way.

There are no sound reasons given or real advantages promised for government ownership and operation which do not apply to or cannot be secured by government regulation. Most of the "advantages" promised and arguments used are purely hypothetical, theoretical and uncertain; they are not vindicated by the experience either of this or of any other country.

Governments have in the past taken over or constructed and operated all kinds of utilities where political, national or strategic exigency made it necessary. Such operations, other than those to meet national crises, have properly been confined, wholly or in part, to such as were of a national character and where the risks and uncertainties or magnitude placed such operations beyond private initiative, enterprise and capital.

There is, however, no reason for government ownership and operation where private initiative and enterprise are not only competent to develop, but have actually developed, these utilities to the fullest extent. The government never has taken the initiative in the introduction of any new and untried utilities, nor any interest in them except so far as it has encouraged their development in private hands through the provisions of the "patent," "copyright" and "trademark" laws; and there is no reason why it should unless such utilities have become of such general use that their regulation is necessary.

The general stock arguments put forth for government ownership and operation are:

Extension of benefits to a larger public;

Abolition of selfish exploitation;

Control of monopoly;

Pecuniary advantages to the public through lower cost and consequently lower charges;

Greater efficiency;

Saving to general public rewards of private initiative.

SELFISH EXPLOITATION.

Private enterprise is rightly said to be based on personal interest. There is no doubt as to this, but incentive to achievement along individual lines could not be suppressed without great detriment to the community at large. What would be the result if government restrictions reduced the reward or profit on initiative and enterprise to that of certain and secure business ventures? Where would be the incentive to assume risk and uncertainty, or the larger profit necessary to recoup the individual and the community for the unsuccessful ventures?

The pecuniary reward to those who take the initiative and the risks of new enterprises must correspond to the labor and to the risk, but this reward cannot exceed the advantage to the public using the service, for the user must get in service, in some way at least, the equivalent of its cost to him. Private initiative, invention, enterprise, risk, spurred on by the incentive of reward, have changed the face of the world, and the resulting unearned increment largely constitutes the wealth of nations; without it many of the great scientific industrial developments would have remained scientific curiosities, even if they had been evolved at all.

MONOPOLY.

The general tendency in this country is to the "one system" idea of public utilities under regulation. Everyone knows the evil of duplication, no one wants two gas,

water or electric lighting systems, and there is a general acquiescence in the "single system" in each community. In no one of the utilities except the telephone, and the street-cars to a slight degree but for a very different cause, does the fact whether A, B or C residing in the same community is on the same or different "systems" make the slightest difference as to service, nor does it matter whether systems in different communities are connected or not.

With the telephone exchange the question of those connected is vital; your service depends upon one system connecting all telephone subscribers in the same community and upon all communities being connected with each other.

A telegraph system reaching all telegraphic points avoids physical transfers from one system to another, with the incidental delays and obstructions to good service.

Telephone and telegraph systems operated under common control can avoid duplication by making use of the same wires.

For practicability of management, economy of operation or efficiency of service there should be one combined telephone and telegraph system. This has been the Bell contention and this is the conclusion reached by the Post Office committee and by Congressional advocates of government ownership, who say in substance that the *telephone and telegraph should constitute one system and that a monopoly.*

Government regulation can effectually curb "monopoly" and "selfish exploitation" and make them useful without destroying them, by subordinating them to the public for the public advantage. Government ownership and operation would destroy individual initiative; they

would create monopoly and increase and strengthen its evils by placing it in the control of officials and servants, responsible only to themselves as a political party, and parts of the organization which made or unmade the chief executives.

OPERATION AND REGULATION.

Operation, economical and efficient, requires high organization continuously maintained, superior methods and efficient service. There must be supervision by able executives assisted by experts, all of long experience as executives as well as in the particular industry. They must have large discretionary powers, assume responsibility, and have undisputed directive authority over subordinates. It is purely administrative and executive in its nature.

There is a very narrow margin between efficient, economical operation and waste. It is possible to have efficiency accompanied by waste, but never possible to have efficiency without responsible organization and the individual initiative, watchfulness and continuing interest which only accompany permanency and expectation of reward.

Regulation is in the nature of a review, consideration, determination. It is judicial and advisory, not administrative or executive; a commission of regulation is analagous to a board of direction representing the public as well as the corporation, having no other object than the conservation and protection of the interests of all.

Operation is a methodical action upon lines of a determined policy, requiring expert knowledge, experience, training, and individual interest.

Regulation is common-sense, intelligent review and decision, based on presentation and examination of facts and conditions.

GOVERNMENT OPERATION AND EFFICIENCY.

Theoretically there may be no reason why government operation should not be as economical and efficient as private operation, but actual constructive performance runs up against actual conditions and tangible difficulties which only experience shows how, and responsibility develops the ability, to deal with.

Departmental officers taken from walks of life affording neither experience nor knowledge of the duties and responsibilities they are to assume, are expected to perform the various duties of their departments and also to incidentally look after their political obligations. As a rule their training better fits them for advocates than for executives, for judicial positions or as commissioners of regulation than directors of operation.

Every new head of a department is of necessity a reformer; his average incumbency is less than four years; there is seldom any continuity of departmental policy, and never any continuity of departmental staff. The important assistants come and go with the head. A review of the operations of his department shows much that could be changed to advantage; to eliminate all that is unsatisfactory and bring about effective results under the conditions and in the time available is impossible for the ablest. He starts in finding an incomplete attempt at accomplishment along a certain line of policy, and goes out leaving an uncompleted attempt along a different line of policy. The inevitable tendency is towards promise, not performance.

The departments are run by the minor officials and the clerical force who under ordinary conditions are permanent. The officials have no responsibility in the selection of and little directive control over their subordinates. There is a premium on that *finished mediocrity* which leaves much to be desired and furnishes nothing upon which to

base effective reprimand, enforce discipline, or cause for removal. Lack of responsibility is a handicap in the development of men; lack of accountability is a handicap on thorough efficiency; lack of opportunity is a handicap on initiative and enterprise.

A full average of the minor heads and clerks would normally have capacity, initiative, enterprise and ambition. If any one of them develops extraordinary efficiency, initiative or enterprise, he is either elbowed out of the way as disturbing the quiet, complacent habitude of the organization, or, if sufficiently masterful, develops to a point where he can go no farther, and is soon taken up by outside organizations. The higher positions, honorable as they may be, are not sufficiently compensated and do not afford the permanent and remunerative positions to be had in private enterprises for similar occupations and ability.

In European countries, where even the minor officeholders and government employees have a certain official distinction which also attaches to their families, there is something higher than the mere remuneration, something that does not attach to private occupation, and is not attached to government subordinate positions in this country.

Government administration is more or less a game of politics, and while with government operation it may sometimes be possible to have efficiency, it will always be impossible to have economy.

COMPARISONS BETWEEN THE UNITED STATES AND EUROPEAN TELEPHONE AND TELEGRAPH SITUATION.

Opposed to actual conditions and experience, statistics, theories, promises, prophecies go for naught, no matter how carefully they have been prepared or thought out or how strong and good the faith and intentions.

There is government operation on a large scale in Europe. In the larger states of Europe commercial conditions are more similar to those of the United States than elsewhere; in Great Britain, particularly, racial, commercial and social characteristics are more in common. Why New Zealand experience should be put forth so prominently as a reason for government operation is difficult to understand. It is a fringe of people on a narrow circumference of the islands. It is a country of recent settlement and many social experiments. It has one-thirtieth the area and one-hundredth the population and a debt already equal to one-third of that of the United States. If the so-called advantages of government operation are the cause of the debt, the United States wants none of it.

The government-owned European telephone plants, notwithstanding the low price of foreign labor, are carried at a much higher cost than those of the Bell System and yet every one of them uses the Bell System as a model. The book value of the plant of the Bell System *per station* is less than 60 per cent. that of Belgium; less than 75 per cent. that of Austria; about 85 per cent. that of Germany, Great Britain and Switzerland; and all of them government-owned.

The capital account of the Post Office telegraph system of Great Britain, upon which interest is charged against telegraph revenue, is about $54,000,000. The amount admitted to have been spent in the plant is about $85,000,000. The admitted cost of the Post Office telegraph, including deficits in operation but without interest on such deficits, is about $150,000,000.

The mileage of telegraph wires is a little under 320,000 miles. Based on interest-paying capital, the cost per mile of wire is $167; on actual cost of the plant, $267. The

Western Union carries its plant at $98 per mile of wire. The telegraph plants of the world, mostly government-owned and operated except in the United States and Canada, are estimated at $130 per mile of wire.

One reason given for higher cost per mile of wire in Europe was the cost of copper wire. The day this was written copper was the same price "spot cash" in Paris that it was "thirty days" in New York, a difference of about seven cents per one hundred pounds.

It is also stated that telephone rates are higher in the United States.

The policy of the Bell System is that the value of a telephone service is in direct proportion to its "universality" and "dependability;" that is, to the certainty of reaching promptly by telephone the greatest number of people. *This policy, which has been the strength of the Bell System and the cause of whatever supremacy in the telephone field it has, is now being made the strongest argument for government ownership and operation, ignoring the fact that the Bell System has extended or popularized its service to an extent far beyond that of any government system in the world.*

The Bell System makes rates for such kinds or classes of service as may be desired by, and will be acceptable to, each and every possible user. In this way it has made it possible for, and to the advantage of, every person to be connected with the exchange system who would add to the value of the service to others. The government could not do more even by giving free service.

There are higher individual rates for larger individual service in the United States than in other countries, but there are relatively much larger individual users of the service. There are also rates as low as or lower than in other countries. There is every economic reason why

large users of the telephone in their own business and for their own profit should pay for service according to use. If this policy is to be abandoned, low rates cannot be made for the small user.

The soundness of any policy, the "efficiency" and "sufficiency" and the reasonableness of charges for the use of any utility, are ultimately determined by the degree of its adoption by the public. In the United States there are 9.7 stations to each 100 population, more than double that of any other country, nearly six times that of Great Britain, over thirteen times that of France, more than four times that of Switzerland. There are nearly 2,500,000 telephones in rural habitations in the United States, nearly one to every two strictly rural habitations. It is probable that more houses are connected by telephone in the United States than are reached by rural delivery. The telephone goes to the house; the rural free delivery only to the nearest crossroads for a good proportion of the houses.

NOTE: The rural habitation of the United States Census includes villages of less than 2,500 population. The rural habitation in the telephone sense means segregated houses only.

That the Bell rates as a whole are reasonable and not excessive and are as popular as the rates of any government-owned plants is also shown by the telephone exchange revenue per station, which in the United States is but $30.45 against $32.63 for Great Britain.

The average wages paid to the Bell operators are double the lowest and about equal to the highest rates paid by those in Europe.

The following is an extract from the report of the Postmaster General of Great Britain:

"Telephones. The telephone revenue for the year *including the value of the service rendered to other departments* [*i.e.*, constructive revenue. Italics ours] was £5,785,701, an increase of £2,822,965. The telephone expenditure including payments in redemption of capital was £5,395,627, an increase of £2,652,987. The balance was £390,074."

The Bell System paid in taxes, over $11,000,000, 5% of the gross revenue in 1913. If the English government telephone had paid this, it would have reduced the so-called surplus to £100,000. No allowance is made for depreciation and obsolescence which in itself is a large percentage of operating costs in the telephone operation and must come out of revenue or out of plant.

It is claimed that telephone toll and long-distance charges of the Bell System are excessive as compared with government-owned plants of Europe. This is not the fact if the service given is considered. The *charge* for the *immediate* service which is the ordinary service given by the Bell System is higher than for the *ordinary* service, which is a *deferred* service, given by those systems, but it is not higher than their charge for *immediate service;* where *immediate* service is given, if at all, it is from two to three times that for ordinary.

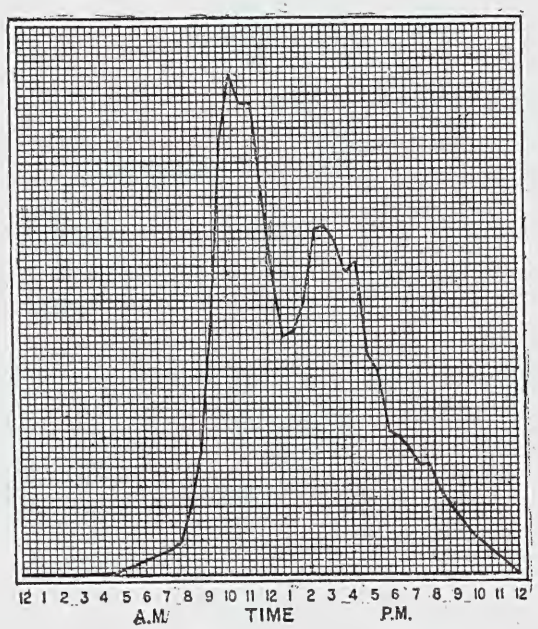
The use of any service determines its profitable value to the user. The average toll revenue per exchange station of the Bell System is $11.35; that of the British system is $6.46.

The possible use of toll lines based upon the number of minutes in the twenty-four hours is used as an argument for reduction in rates. Comparison is also made between toll-line and freight ton-mile rates. Telephone service is congested in the active hours of the day, and is very irregular. There are rush hours, and peaks of load. The telephone conversation requires the exclusive use of the telephone circuit for the time of conversation.

A telephone circuit from New York to Chicago costs $250,000. If it were used every five-minute interval of the ten active hours of the day, there could be only 120

conversations. As a matter of fact, it is not in use one-third of those intervals. (See chart.)

TYPICAL LONG-DISTANCE TRAFFIC RECORD



On a railroad from New York to Chicago trains of passengers and freight follow in rapid succession. What would freight or passenger rates be if only one train could be upon the whole line at one time? Yet that would afford a more proper basis of comparison.

In the Bell System the toll and exchange service is immediate; that is, the customer is given service when he calls for it and not put on a waiting list and made to await his turn. Sufficient operating facilities are provided for all the *normal peaks* of load. The foreign government-owned plants used for comparison only provide facilities

for the *average* load. Customers must await their turn, which during certain times of the day means hours, not minutes. *Such deferred service, causing an even and continuous load during active hours, more than quadruples the possible service which can be given by operators and plant.*

Deferred service bears to profitable operation of the telephone the relation of the "strap-hanger" or "stander" to transportation service, but with this difference: the "strap-hanger" or "stander" is getting some return for his discomfort, he is getting to his destination, that is, accomplishing his object. The deferred-service telephone user while waiting is not getting anything or anywhere; he is sacrificing his time and possibly jeopardizing the purpose for which he wants the connection.

Even at the higher wages paid in this country a deferred or waiting telephone service, more satisfactory and more dependable than the foreign service, could be given at rates more or less equal to the foreign rates for such service, notwithstanding that the companies here must pay capital charges, including dividends, all administration expenses, taxes and other charges. Deferred service is not given because our public demands a better service.

That the service in Great Britain and elsewhere in Europe is vastly inferior to that of the Bell System is conceded almost without exception by both Americans and Europeans who have had an opportunity to make an intelligent comparison.

TELEGRAPH RATES.

The words in the address and signature are counted and charged for in Europe, and sent free in the United States. The wages paid operators in the United States are double those paid in Europe. If these differences are considered, the telegraph rates in Europe for *short distances*

are little, if any, less than in the United States, while fo
long distances the rates in Europe are *decidedly higher.*

In England, where the conditions are most favorabl
for telegraph operation, with its concentrated populatio
and business, short distances and large traffic betwee
centers, cheap labor, untaxed franchises and rights o
way, and all the highly praised advantages of post offic
joint operation, the telegraph is operated at an acknow
ledged deficit.

Extract from the report of the Postmaster General
Great Britain, 1912-1913:

"Telegraphs. The telegraph revenue of the year *includi*
the value of services rendered other departments was £3,167,4
an increase of £19,705, and the telegraph expenditure inclu
ing the interest on the capital £10,867,644 expended in the pu
chase of the telegraphs was £4,124,976, a decrease of £309,3
upon the previous year. The net deficit was thus £957,5
or £329,602 less than last year."

NOTE: Value of service rendered other departments
purely constructive revenue, *i.e.*, in other words, paddi
Italics ours.

And the expenditure does not represent any cha
upon something over £20,000,000 which has been
pended on the telegraph service since its acquisition
the government.

The Western Union, to cover the widely extend
territory of the United States, with distances seven
eight times as great as the distances in England, has
maintain, to do a little over twice the business, a w
mileage five times as great, and transmit its messages
average of four times the distance.

The Western Union pays taxes, maintains its pla
out of revenue, pays double the wages to its employe
and pays dividends.

The acknowledged expenditure of the British telegraph of £4,125,000 as against a revenue of £3,170,000, a part of which is fictitious revenue, makes an admitted cost of four dollars for every three dollars of telegraph revenue. If to the acknowledged expense should be added interest on the £20,000,000 of non-recognized expenditure and the franchise and direct taxes lost to the public, the cost to the government for every message sent *was nearly twice what it received.*

These figures are official and can be verified from the various reports of the Postmaster General.

TELEPHONE RATES, COMPETITIVE AND NON-COMPETITIVE.

It is claimed by the advocates of government ownership that the Bell rates are excessive where there is no competition, and have been unduly raised after competition ceased.

Of 93 places of 10,000 population or over where opposition ceased prior to 1913, not including any places where the Bell exchanges were sold to the opposition, in 80 there was either no change in rates, no increase to be made within three years, or rates were decreased. Rates were increased in but 13 places.

It has been generally conceded by commissions of regulation that after the merger of two opposition exchanges higher rates were proper.

Competitive or opposition exchanges were built and rates fixed on the theory that the Bell rates were excessive. For a few years, while the plant was new, apparent profits were made on low rates, but after maintenance of old plant and reconstruction on account of depreciation and obsolescence had to be met, exchanges as a rule operating under competitive rates ceased paying divi-

dends and even interest, and many came to financial disaster. With the exception of a few limited exchanges in selected or favorable territory operated by the owners, no exchanges operating on so-called competitive rates are giving satisfactory results to their owners, and few if any but would like to liquidate if it could be done at not too great a loss.

The percentage of *reduction in rates* made because of the improvement in methods of operating and improvement of equipment and apparatus *was greater in Bell exchanges* which had *no opposition* than the reduction made in exchanges which *had opposition.*

Bell rates are generally higher than the opposition rates in places where there are opposition exchanges.

That the Bell rates are not excessive should be acknowledged, for as before stated the Bell companies as a whole are paying an average of but 6 per cent. on their outstanding securities and less than 5 per cent. on a conservative value of their property, and are paying to the communities in which they operate nearly $11,000,000 in the way of local taxation.

THE CHICAGO & MILWAUKEE TELEGRAPH LINE. THE TRUE STORY.

The Chicago & Milwaukee telegraph has been set up as an example of the evils of private operation. Why this single line of some fifty miles in length should have been selected is difficult to understand. Any line situated under such favorable conditions, doing business only between two large cities, should and could be operated at rates which could not apply to lines or systems which take business from and to all points, *while the peculiar conditions* under which this particular line operated put

it absolutely outside of comparison whether with other lines or with any system. The history of this company is well known, and if not known to those who have used it as an illustration, it could have been obtained with little effort.

Built in 1878 by some linemen as a speculation, it was sold to some members of the boards of trade of Chicago and Milwaukee and incorporated with a stock of $50,000. *The business of this line was confined almost exclusively to messages from floor to floor of the two boards,* to news service and to leasing private lines. While it accepted other service, *it had no organization to, and did not, deliver or collect messages except by telephone.* The company apparently made large profits, but it must have been at the expense of maintenance and depreciation, for later on the company was reorganized with a capital stock of $50,000 and $50,000 of bonds, and the lines reconstructed. This new company operated until 1905, *when it went into receivership* and the lines were operated by the receiver until 1907, when it was offered for sale, and the Chicago and the Wisconsin Telephone Companies needing additional lines, purchased it in connection with the American Telephone and Telegraph Company, for toll and long-distance telephone business. This was five years before an interest in the Western Union was acquired or contemplated.

The lines are now used for telephone business principally. The commercial experience and history of this line are not such as make it a good argument for lower telegraph rates, either under private or government operation, and even under such favorable auspices its experience was certainly not such as would encourage private enterprise in another attempt although the field is open to all.

DEPARTMENTAL EFFICIENCY.

POST OFFICE AND ITS ORGANIZATION: IS IT ADAPTED TO TAKE OVER THE TELEPHONE AND TELEGRAPH?

Can the same efficiency and economy be expected under government ownership?

Various committees—Congressional and departmental—have investigated the administration and operation of government departments in recent years. Without exception the reports found that the organization and administration of our national departments and bureaus and other various enterprises were extravagant, wasteful and inefficient. That there was duplication of effort and work not only between the different departments but between the different bureaus of the same department. That large economies in expenditures could be made, and greater efficiency could be had. This is not criticism from outside sources but from inside.

Is there anyone who doubts that if the Post Office department had the organization, the management that many of the large private industrials have, it would be possible to give at least the present efficiency and at a much less cost of operation?

The Post Office is not an organized operating entity. There is no organization such as characterizes a large industrial or commercial enterprise. It is made up of a large number of independent, separate assemblages, co-ordinated and made co-operative by certain rules and regulations. The duties are confined to collecting, assorting and distributing the mails from and to the public in localities, and dispatching them from post office to post office. The transportation and conveyance of the mails from and to and between post offices are by facilities owned and operated by private companies whose conveyance and transportation of the mails are but an incident to larger business. Even over the hours of dispatch or the

time of transit the department has either no, or at best a limited, control. The Post Office department has only to maintain a balance between appropriation and expenditure, none to maintain between revenue and expenditures, which constitutes the only check on waste and extravagance; it has no problems of finance, except to get appropriations; no concern about surplus revenues to meet taxes, interest charges, dividends. It has no plant and there is no provision to be made for inevitable maintenance, construction and re-construction and obsolescence out of revenue. There are no pension, sickness and disability provisions for its employees. The property, considering the size of its operations, is negligible in amount. There are no problems of organization methods and systems, no engineering and technical problems, none of the thousand and one problems and perplexities arising in the operation of a transportation system, compared with which the operation of the mail service is simplicity simplified.

As to the efficiency, the general consensus of expressed opinion is that there is much to be desired in the service.

When the night and the day letters were inaugurated by the Western Union, failure was prophesied, because an "over-night" mail reached or should reach fully 60% of the total population of the United States. Yet many millions of these telegraph letters are dispatched.

The success of the parcels post has been set up as a reason for the government operation of the telephone and telegraph. Why it should be is hard to understand. The two services have nothing in common and are in no way comparable.

The parcels post is not in any sense a new service; it has merely increased the volume of the mails by removing some limitations as to size and weight of packages mailed, and making some reduction in rates of postage for mer-

chandise. There has been no change in the organization or in the workings of the post office but merely an increase in the number and the work of the lower grade clerical force. There is no doubt that the parcel post is popular and meets some real demands based on real wants, but sufficient time has not elapsed and conditions have not been sufficiently adjusted to determine whether it will be profitable or whether the service will be entirely satisfactory in *certainty, security and promptness.*

There may be, as stated by the advocates of government operation who should know, 64,000 offices including branch offices and stations. The inference this statement carries is that 64,000 different places have post offices; but on July 1, 1913, according to the report of the Postmaster General, there were only 58,000 postmasters. There are about 58,000 places which have post offices, as against over 70,000 places reached by telephone toll lines of the Bell System. If we should count branch offices and pay stations the number would be largely increased. From most of these places telegrams can be sent *at all hours of the day or night.*

The postmasters of over 50,000 of these offices are paid a commission on the receipts, which amounts to an average of about $285 per annum; this is their entire compensation, and is inclusive of office rent, heat, light and all services. Nearly everyone is familiar with this type of country offices, and can judge of the possibility of a general telegraph and telephone business receiving the attention absolutely necessary to an efficient service. It would not be a question of capacity; the experiment would be disastrous principally because the postmasters are not fitted by experience or training for the telegraph or telephone business, but also because it would be secondary to their grocery-drygoods-notion shop, their principal business. In the larger cities and towns, how many of the post offices, even in leased or government

buildings, have room for a telephone or telegraph office and for the necessary equipment?

MAKING TELEGRAPH OUT OF TELEPHONE LINES.

Upon whose estimate or experience is based the "negligible cost" of superimposing the telegraph on the telephone and equipping the circuits with telegraph instruments, and the taking over of the interurban and long-distance lines, divorcing them as to common control from the exchange system, putting them into these post offices, and equipping them to do all the telegraph business? It is impossible of performance at any cost. The interurban toll lines and the exchange trunk lines and their equipments are necessarily so interwoven and used so interchangeably that it would be next to impossible to segregate them. While it is perfectly feasible to use wires for both telephone and telegraph service, and either the telephone circuit or the telegraph circuit could be looped into any office, the arrangement and distribution of the lines for both purposes must be under common control, and that the telephone. The manipulation of the lines is a telephonic proposition, not a telegraphic. The only practicable way for the Post Office to use the telephone lines for telegraphic service would be to lease the telegraph rights, much as the Post Office Department now uses the railroad facilities for the mails. No other separated operation or control of the same wires for telegraph and telephone services would be practicable from either standpoint.

WESTERN UNION.

Under the understanding with the Department of Justice this Company's holdings of the Western Union stock had to be disposed of. While that company was in good condition and would undoubtedly increase its dividend to 4% for the current year, yet the agitation for government ownership and competition made a very

unfavorable market which would not improve so long as there was some $30,000,000 of stock to be distributed and absorbed. Under all conditions the price obtained, $60 per share, was good, and was fully as much as it was thought it would be possible to obtain during any period likely to be allowed for its disposal.

The loss to the Company is considerable, but the public has been greatly benefited by the connection. In order to make the fact of the absolute disposal of the stock beyond question by an extended distribution, and also to give to the Western Union shareholders the opportunity of acquiring it, the sale was conditioned upon its being offered to the other shareholders and to the employees of the Western Union. The Company would have made this offer direct but by so doing it would have taken the chances of a large part not being taken, in which case it would have been impossible for the Company to make any favorable sale of the balance. The outright purchase and the distribution proposed established a price and removed the other depressing influences from the market.

The connection between the two systems has been conducted on lines of complementary service, each having its distinct office and service to perform, and its distinct organization.

There has been no intermingling of plant. The operation of each company was distinct and the change of ownership of the shares should in no way affect the service or the business of either company.

The American Telephone and Telegraph Company ceases its connection with the Western Union after three years association. During this period as compared with the previous three years the gross revenue of the Western Union increased 45 per cent. Wages to operators, not including cable construction, reconstruction or maintenance wages, were increased 55 per cent.; there was set aside for renovation and reconstruction out of revenue

during that period nearly $9,000,000 in excess of the normal expenditures for these purposes; of this sum nearly $2,500,000 could have been and from now on under the new interstate regulation will have to be charged to construction. These abnormal expenditures, it may be reasonably expected, will be completed in less than three years, when the revenues of the company now being expended for those purposes will be available for other use.

The suit of the Western Union and associated companies against the American Telephone and Telegraph Company on the interpretation of the 1879 contract, which has been pending thirty years and which was originally decided in favor of the American Telephone and Telegraph Company, has been finally settled largely according to the contentions of the Western Union and of the amount paid $3,300,000 was paid to the Western Union.

The financial condition of the Western Union, with some $15,000,000 net of liquid assets, never was better.

It has been asserted that destructive competition and unfair methods have been resorted to as against rival telegraph companies. The policy of the Bell System is that destructive competition is an economic waste; that permanence and continuity of good service can only be maintained by profitable operation; that no service can be given at less than cost, but where there is a potential business, unutilized facilities can be made profitable by the introduction of additional services. Adopting this policy, the Western Union introduced at popular rates some new services of vast importance with profit to the company and benefit to the public, and the company had in contemplation further extensions of facilities of like character. Whether under the changed conditions brought about by the severance of relations between the two companies these expectations can now be fully realized is doubtful.

CONCLUSIONS.

Theories are at best only unsatisfactory substitutes for facts established by experience. Only such theories as have stood the test of practical experience may be finally accepted. In a field where experience is abundant, to assert theories contradicted by this experience is to invite disaster.

The policy of the Bell System—*one telephone system—under one control*—has been appropriated as their policy by the advocates of government ownership. They assert the desirability of monopoly as their fundamental premise.

They say the government should *attempt to do* what the world concedes the Bell System *has done.*

The American public has been educated to depend on the most efficient, most extended telephone service in the world. The relative number of the people reached is the largest, and the average cost to each is the lowest of any important system in the world. It will not tolerate less; under private ownership it will not pay more.

The outstanding obligations of the Bell System represent actual money properly invested; its physical plant and property are far in excess of these obligations.

All monopolies should be regulated.

Government ownership would be an unregulated monopoly.

From all wrongs of privately owned utilities, appeals may be taken to state and national commissions and to municipal and legislative bodies; from the wrongs of publicly owned utilities administered through the dominant political party, no effective appeal is possible.

There are fundamental economic laws which make it impossible for either publicly or privately owned utilities to furnish service without being paid from some source what it costs.

All government-operated telephones and telegraphs in the world have *two* sources of revenue—*the payment by those who use* and *the payment of the deficit of operation out of general revenue.*

The *price* of a thing to the *user* is what it *costs him. Part payment as a user* and *part payment as a taxpayer* is fallacious and absurd and the direct cause of waste and extravagance in operation.

All government reports upon government operations disclose wasteful and unscientific methods; it is these facts which justify the announcement by every new public official of the necessity for new and better methods.

The steady reductions in rates made by the Bell System have been made possible by its improvements in methods and apparatus; they are not due to competition. They have been as great without competition as with it.

At most of the so-called "competitive points"—places where there is an opposition system—the Bell rates are higher than the opposition rates.

No monopoly or great combination in any industry or utility open to competition can be maintained except at a profit so small as to discourage competition. Small profits are a benefit to the public both directly in the price and indirectly by increasing the employment of labor.

That "decrease in price will increase profits" is fallacious and causes much misunderstanding if stated without qualification.

Wherever there is a potential market "decrease in price will increase output;" increased output will, to a certain extent, decrease cost.

A proper adjustment of the relations between cost, price and output will increase aggregate profits.

The development of telephone uses, and the decrease of cost through continued improvement in equipment and methods of operation and service, have opened up the potential market for telephones in the United States as it has been in no other country—sixty-five per cent. of the world's telephones are in the United States.

Regulation by commissions of high standing composed of individuals of ability and integrity, and good impartial judgment, is the greatest protection to the public interests as against private exactions that ever was devised; its effectiveness depends upon "the standing with the public of the Commission as a whole and the Commissioners as individuals."

Unless commissions have the confidence and respect of the public, unless their decisions are accepted by all even if not entirely acceptable to all, unless they mete out exact justice to corporations as well as to the public by decisions characterized by thorough investigation and impartial conclusions, the value of these commissions to the public will be destroyed and regulation by commission will in time be destructive of public service as well as of public morals.

Individuals, public or private, may obtain temporary notoriety by unjust demands and unjust attacks on public utility companies, but no permanent reputation can be made, nor can any permanent public advantage be gained.

For the Directors,

THEODORE N. VAIL,

President.

CONDENSED STATISTICS.

	Dec. 31, 1895.	Dec. 31, 1900.	Dec. 31, 1905.	Dec. 31, 1910.	Dec. 31, 1912.	Dec. 31, 1913.	Increase, 1913.
Miles of Exchange Pole Lines	25,330	30,451	67,698	120,175	143,842	151,497	7,655
Miles of Toll Pole Lines	52,873	101,087	145,535	162,702	171,161	171,554	393
Total Miles of Pole Lines	78,203	131,538	213,233	282,877	315,003	323,051	8,048
Miles of Underground Wire	184,515	705,269	2,345,742	5,992,303	7,804,528	8,817,815	1,013,287
Miles of Submarine Wire	2,028	4,203	9,373	24,636	30,301	31,833	1,532
Miles of Aerial Wire	488,872	1,252,329	3,424,803	5,625,273	6,775,984	7,261,363	485,379
Total Miles of Wire	675,415	1,961,801	5,779,918	11,642,212	14,610,813	16,111,011	1,500,198
Comprising Toll Wire	215,687	607,599	1,265,236	1,963,994	2,189,163	2,333,541	144,378
Comprising Exchange Wire	459,728	1,354,202	4,514,682	9,678,218	12,421,650	13,777,470	1,355,820
Total	675,415	1,961,801	5,779,918	11,642,212	14,610,813	16,111,011	1,500,198
Total Exchange Circuits	237,837	508,262	1,135,449	2,082,960	2,576,789	2,812,944	236,155
Number of Central Offices	1,613	2,775	4,532	4,933	5,182	5,245	63
Number of Bell Stations	281,695	800,880	2,241,367	4,030,668	4,953,447	5,415,209	461,762
Number of Bell Connected Stations*	27,807	55,031	287,348	1,852,051	2,502,627	2,717,808	215,181
Total Stations	309,502	855,911	2,528,715	5,882,719	7,456,074	8,133,017	676,943
Number of Employees	14,517	37,067	89,661	120,311	140,789	156,928	16,139
Number of Connecting Companies, Lines and Systems				17,845	24,013	25,679	1,666
Exchange Connections Daily	2,351,420	5,668,986	13,543,468	21,681,471	25,572,345	26,431,024	858,679
Toll Connections Daily	51,123	148,528	368,083	602,539	737,823	806,137	68,314

*Includes Private Line Stations.

PUBLIC SERVICE.

THE MOST VITAL OF ALL PRESENT ECONOMIC PROBLEMS ARE THE RELATIONS BETWEEN THE PUBLIC AND PUBLIC SERVICE UTILITIES, PARTICULARLY THOSE OF INTERCHANGE AND INTERCOURSE—WHAT CONSTITUTES *PROPER* REGULATION AND CONTROL—WHAT IS THE BEST METHOD OF SECURING THEIR PROPER MAINTENANCE AND FURTHER EXTENSION.

Movement is life—intercourse and interchange are the basis of civilization and commerce.

The quantity, quality and convenience of the means of intercommunication determine the prosperity of the community, for on them depend the degree of interchange of thought and of commodity—the degree of civilization and of commerce.

The demand for any production creates its value. The demand depends upon available fields of consumption made accessible and convenient by adequate and efficient facilities of intercourse and interchange.

The United States of today, in all its magnificence, has been created—its latent possibilities made tangible, its prosperity maintained, its growth continued—by or because of these means of intercourse and interchange. The maintenance and continued growth of this prosperity will be in a great measure dependent upon the maintenance and continued growth of the utilities which furnish these facilities. All other utilities or industrial or commercial enterprises are subordinate to and dependent upon them.

Until proper relations are established between the public and the public utilities, there cannot be too many repetitions of their importance, no effort should be spared to emphasize it and guide the public to

right conclusions. Until some popular misunderstandings are corrected it will be difficult to establish proper relations.

It is the generally accepted belief that utilities are dependent on the public rather than the public dependent on them; while neither could exist without the other, means of intercourse and interchange are the *advance agents*. Competition, control, regulation and legislation have been looked upon as the causes or forces which have enabled or compelled industrial enterprises to improve and extend their service; to increase production; to pay increased wages and taxes; and at the same time to decrease charges for service rendered. While these have been to some extent a stimulus, the wonderful improvement which has been made has been coincident, and indissolubly connected with the replacement of the old "rule of thumb" methods, by methods of scientific operation. *Investigation, research, and the application of the results to both operation and production have produced "much more" and "much better" from the same or less effort and expenditure, and have obtained valuable products from what had heretofore been wasted; much to the benefit of the worker, the public served, and of those responsible for the work.* There is a lack of consistency in the understanding respecting enterprise and initiative, and the relations between capital and labor, the employer and the employee. There are many ideals and beautiful theories which in time we hope may be realized. But commerce and industry are dependent upon the purchaser and consumer and so long as the human factor of self interest as it now exists controls them in their dealings, so long must the effect of that *same* existing human factor be taken into consideration by commerce and industry in their relations with both producer and the worker.

The situation in the past has been aggravated, public indignation aroused, and public action influenced, by misleading and wilfully mistaken statements

of irresponsible demagogues and impractical theorists. There may have been some lack of a sense of reciprocal obligation on the part of some corporations and their servants to the public. There may have been some abuses, but even if the worst that has been asserted was true, they were not of the kind that could have brought about existing conditions, which arise from an imposed reduction in revenue and an imposed increase of expenses. The public in turn has attempted to bring about ideal conditions through the power of control and regulation. This power has resulted in some cases in the impairment and even in the destruction of property rights and of the physical property involved.

Happily, those abuses that existed are passing, and there is evidence of better understanding and appreciation, and more substantial justice on both sides. The public, and particularly those dependent on employment, will soon realize that the wealth of this country does not consist of tangible tokens of value that can be realized upon at will, but that it largely consists of property, or certificates representing property, which has been created by the investment of their savings in these enterprises of utility and industry. The returns from and the intrinsic value of these enterprises, depend on the activity caused by demand for the products or service produced by the employment of workers. Without that activity, employment ceases, returns disappear and values are dissipated.

Public service enterprises when prosperous are large employers of labor and large purchasers and consumers of all varieties of products and manufactures. Their activity means employment and circulation of money which in turn means further consumption of products and manufactures, and the further employment of labor. Employment means ability to purchase. Ability to purchase means consumption. Consumption means production, and production for which there is a demand means prosperity. Abundant employment makes the worker his own master. He can afford to purchase and consume production. Without employment he is a burden on his savings, his friends or on the community.

It is a great revolving circle of civic and industrial conditions, no beginning, no ending. So long as it is unbroken, so long as each condition is balanced by the others, so long as all changes in conditions are allowed to take place by evolution from old to new, or so long as these changes take place with sufficient deliberation to allow other conditions to become adapted to the changes, so long all will go well and there will be peace, prosperity and progress.

In such times and such conditions everything goes so smoothly that economic life seems commonplace and monotonous; then come the revolutionary changes brought about through those who are too indifferent, careless and unthinking to resist the influence of too radical theorists.

When the balance is broken by these changes, and the relations between the conditions are changed faster than any adjustment between them can take place, then will come disturbance. Continued disturbance is inevitably followed by disaster.

To maintain present conditions only, or even obtain actual though not normal increase, does not mean progress and is not a sound economic position. It is the normal increase that must be had if we are to maintain our relative position and provide for the millions yearly added by new generations and new immigration.

The entire public, working or investing, will all stand by and uphold a control and regulation which will be thorough and effective and at the same time equitable, just and practical. *But has the public ever remained complaisant when it is brought face to face with disturbance, uncertainty and unemployment, caused by too drastic action or too radical legislation upon economic conditions or industrial enterprises?*

Control and Regulation can make unnecessary demands upon the time of those who are responsible for operation; they can become destructive instead of constructive; they can by delay paralyze commerce; they can through the inexperienced in operation impose unnecessary burdens and unnecessary expenditure upon corporations; they can impose or require too many regulations and theories of operation and too many undeveloped experiments in plant and equipment; they can very easily run into operation. Demands of labor for increased wages and shorter hours, and demands of the public for increased service, must be met by increased revenue produced by increased rates. The application of scientific and improved methods to operation produced great results in reduction of expenses because it had an unworked field to start with, but it cannot be expected that the same ratio of progress will be indefinitely maintained. *The irreducible minimum in unit expense has been reached in some industries and soon will be in all.*

A corporation, no more than an individual, can be bound hand and foot and yet be active or give good service.

If too many burdens are put upon corporations, and no relief given them, it will be impossible for them to properly operate or maintain their plants. Poorly constructed, badly maintained and inefficiently operated utilities cannot give good service. Inadequate revenue would make it impossible to meet capital charges. Capital would avoid any enterprise which had to do with public service. Without capital, employment in any large way would cease, extension and improvement would be stopped, values would be destroyed, and the enterprise would become bankrupt.

When service is rendered by starved or bankrupt corporations in the hands of receivers, results must follow which will be disastrous. The indirect losses to

the public will be far greater than the direct loss to the investor. Decline in prosperity will come to any community dependent upon such corporations. No community with inadequate and inefficient facilities for intercourse and interchange can compete with communities with adequate and efficient facilities.

Bankrupt public service, in time, means bankrupt communities.

It will not then be the mythical money trust or the prominently rich that will have to be dealt with, but it will be the power of the nation, the millions dependent upon their daily employment, whose savings are invested in that which represented progress and prosperity, and who are brought suddenly face to face with destruction of values, loss of savings and unemployment.

DISTURBANCE OF STABILITY AND CONDITIONS.

There are three principal creative divisions of industrial enterprises:—"Industries producing from the Earth," of which agriculture is the most important—"Manufacturing"—and "Public Service" which is very largely transportation and intercommunication. All other industries or professions are subordinate to or dependent upon, these principal industries; and their rise and decline directly connected with them; they are creative only to the extent that they organize, develop or promote trade and commerce, production and consumption.

Production from the earth is the primary industry, but is dependent upon the broad distribution only to be obtained through means of transportation and other facilities of intercommunication.

Manufacturing is the barometer which indicates the improvement and decline of the conditions of commerce and trade.

"Transportation" and "Intercommunication" are the most important of all in their creative effect. They are the industries upon which depend all interchange and movement, all commerce and trade except that which is purely local. Transportation and intercommunication change local stagnation into world-wide interchange and prosperity. Their relative economic importance as to other industries is many times their relative capital.

During the quarter of a century just past these three principal industries increased about two times and now represent about $100,000,000,000 of invested capital. This development and this new wealth of $65,000,000,000 in these enterprises alone, was made possible by, and was coincident with the development of transportation.

The capital invested in Public Service and Manufacturing increased during the quarter of the century at the rate of nearly $1,500,000,000 per year; the number of employed increased about 100% and their yearly compensation over $3,500,000,000 or 130%. In enterprises of transportation and intercommunication the capital increased over $15,000,000,000 or an average of $600,000,000 per year; employees over 175%, with an increase in yearly compensation of $1,350,000,000 or over 200%.

Prior to the quarter century agricultural products were largely in excess of domestic consumption; agriculture in the Atlantic States was suffering. At the end of the period, because of increased employment and purchasing power, the domestic consumption of agricultural products had about overtaken production, which had more than doubled in average yearly value. The agricultural interests of the Atlantic States were rapidly reviving.

The normal employment in the public service and manufacturing industries alone should be at the present time nearly if not quite 12,000,000 with annual earnings of from $7,200,000,000 to $7,500,000,000.

All employment is far below normal. There are fully 2,000,000 unemployed, whose yearly earnings should be at least $1,250,000,000. These unemployed are now living at the expense of their savings, their friends, or the public. If they were employed, normal conditions would be restored, the circle of interdependent conditions would be balanced, prosperity would be restored.

Capital invested in "Transportation" and intercommunication constitutes one-half the combined capital of Public Service and Manufacturing. It is entirely in the form of negotiable securities, while a large part of the other capital is closely held or not readily realized on. Transportation securities have been for years a favorite investment for capital by the small investor, the trustee, the savings bank; by the most conservative in good times and by the wise investors in bad times; *any cause that disturbs these enterprises disturbs all*, both industrially and financially.

The disturbance, uncertainty, and timidity about "Transportation" due to legislative requirements and the increased payments to employees, without any corresponding increase of gross revenue to meet them, have caused increase in expense of operation which can no longer be met by reduction of operating expenses or by scientific methods, for the irreducible minimum has about been reached.

The decrease in the surplus operating revenue has cast doubts upon the safety and certainty of not only the charges on the capital but the capital itself. Except for a few favored lines the safe margin has been so reduced that investors have become frightened.

Extension and improvement of our transportation facilities for which capital is required, are necessary. Money in sufficient quantities or on reasonable terms cannot be obtained. Nothing that can be postponed is being done. Unless soon made, the increasing demands

of the country as a *"going"* concern cannot be satisfied, to say nothing of our country as a *"growing"* concern.

If there could be a restoration of conditions which would inspire confidence in their securities sufficient to command the capital with which to begin the expenditure of even a part of the $1,000,000,000 a year needed to put these enterprises in a position to meet the demands of the country both as a *"going"* and as a *"growing"* concern, it would soon restore the normal conditions of employment, expenditure, consumption, production. The circle of industrial conditions would be again balanced, shops and factories would be filled, and instead of the bread line there would be a working line night and morning between places of employment and homes.

During the past quarter century progress was steady and continual, except when the over-sanguine or overgrasping were buying, on credit or small margin, intangible though possible future values, or when attempts were made to improve existing conditions by sudden changes.

The public mind which has been excited and influenced by exaggerated, misleading and mistaken statements of irregularities, realizes that most of them had no foundation in fact. Those that did exist cannot be repeated; business conscience and public morals, as well as regulatory laws will not permit. Other irregularities will creep in, for where there is abundance produced by labor, there will be many who want a part of it without labor. Take the fetters and restrictions off the employment market, keep a good watch on those who do not want to labor, and punish those who betray confidence. Wealth never will be distributed equally nor always employed wisely, but where it exists in abundance there is always a chance for those who are willing to exchange their labor for some of it.

THEODORE N. VAIL.

March 15, 1915.

which should be toll operating centers and those which should be tributary to such centers. They show the toll line routes and whether they are to be conduit, aerial cable or open wire. They show the number of toll circuits that will probably be required and their arrangement and the approximate gauge. They indicate the most effective general toll operating method to handle the different classes of business.

Constant work has been done and substantial results accomplished by the Department in improving the standards of construction and operating methods. In cables, switchboards and apparatus substantial advances have been made and the results placed at the disposal of the associated companies.

During the year the Department has done important and confidential work with representatives of both the Army and the Navy in the matter of new methods of wireless and wire communications, with special reference to naval and military uses. In addition to this, and for the benefit of the Army and Navy authorities, studies and investigations have been made into the wire communications and connections of our plant throughout the United States. This work, which is still going on, has made it clear that the comprehensive wire network of the Bell plant, by a simple plan of co-operation, will supply to the scheme of National Defense a working system of communications unequaled by that of any other nation.

LEGAL.

The work of the Legal Department naturally divides itself into two classes. There is first the service which is incidental to the operation of the Long Distance Lines Department of the Company. The routine features of this service include matters pertaining to rights of way and franchises, the adjustment of claims, and the negotiations

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of contracts, especially those intended to minimize interference due to high tension currents of other companies.

The second and broader and much more important class of service rendered by the Legal Department is in connection with the general functions of this Company and the work of the associated companies. It is not practicable to give a concise definition of the nature and extent of this general service. It is the purpose of the Legal Department to act as counsel for each of the associated companies, and beyond this, to do whatever may be necessary in order to supplement and facilitate the work of their legal departments. To better qualify it to act as advisor to the associated companies, the Legal Department endeavors at all times to keep closely in touch with all questions of a legal, or quasi legal, or economic nature which may in any way become pertinent to the business of the Bell System or to any one of its associated companies.

To make available for the use of the associated companies such information as is of general interest, the Legal Department issues various publications. These include bulletins published periodically calling attention to current decisions of the courts throughout the United States, which are intended to include references to all decisions in the United States which may be of special value to the legal departments of the associated companies, and also the publication, first in pamphlet and later in book form, of the telephone and telegraph cases, and other cases of general interest, decided by the public utility commissions in this country and in Canada. The statutory laws relating to telephone and telegraph companies are also compiled and published. In addition to these regular publications, there are printed from time to time and distributed special memoranda upon or discussions of questions which are thought to be of particular interest.

In addition to this general service, special service is rendered to the associated companies whenever it is

believed by the associated companies or by this Company that such service will be of value to the associated company. It is the effort of the Legal Department in a general way to supervise and direct the legal affairs of the entire system, not through an attempt to transact the legal affairs of the associated companies, but by keeping closely in touch with the transaction of these affairs by them. It is the purpose to render the experience of the entire system available for the benefit of each part of it, to the end that the best possible results may be obtained and that all questions of a general nature involving matters of policy in which the system as a whole is interested, may be disposed of along consistent and sound lines.

Commission regulation continues to present many of the most important questions with which the Legal Department has to deal. In addition to the Interstate Commerce Commission, there are now commissions in all but four of the states, which have jurisdiction, more or less complete, over telephone companies, including rates, service, accounting, financing and capitalization. Commission regulation has not progressed beyond the development stage. The Company has consistently maintained what has heretofore been its policy in endeavoring to co-operate with the various commissions in establishing their regulation upon the sound basis which is necessary if it is to be justified either in the view of the public or of the public utilities. In endeavoring to accomplish this purpose, the Legal Department is constantly working, first, to accurately define and clearly establish the fundamental propositions, both legal and economic, which must be the basis of proper rate regulation, and secondly, to see that these propositions are well and clearly presented to the various commissions.

The amount of pending litigation is entirely unimportant. It is true now, as it was when the last report was

made to the stockholders, that no suit is pending against this Company or any of its associated companies charging any violation of any state or federal anti-trust law. No such suit has been brought since the making of the last report.

The suit of William A. Read and Company, referred to in the last two preceding reports, has not yet been finally disposed of. It is now being tried in the circuit court of Cook County, Ill., and it is hoped that a decision in the case will be reached by that court prior to its adjournment for the summer.

The arrangement with the attorney general of the United States, which is set out in detail in the correspondence printed in the report for the year ending December 31, 1913, is still in effect. A careful adherence to it, coupled with entire frankness as to all of the matters in which the Company has been concerned, has resulted in a continued avoidance of misunderstandings and disagreements with the federal authorities.

Since the last report was issued, Mr. George V. Leverett has compelled the Company to yield to his persistent request that he be relieved of his active duties in the Legal Department. His advice and counsel will continue to be available to the Company. Mr. Leverett was the Company's general counsel while the vitally important patent litigation which determined the validity of the Bell patents was in progress, and also during the transactions which culminated in the acquisition by the present Company of the assets of The American Bell Telephone Company, in which he had a most important part. His wise counsel and painstaking attention to its affairs have been essential elements in the Company's success, and his unfailing kindness and courtesy, and consideration for others, with his lovable personality, have endeared him to all of his associates.

GENERAL.

The formal opening of the transcontinental telephone line extending from Boston and New York on the Atlantic seaboard to San Francisco on the Pacific, on January 25, 1915, has been followed by the extension of "extreme distance" transmission into all of the states of the Union, by applying these new improvements to the plant of the Bell System. It is now possible to talk from points in any one state to some points in every other state of the Union, while over a very large part of the territory covered by the Bell System it is possible for any subscriber to talk to any other subscriber regardless of distance.

The necessary changes in plant and equipment will be continued, wherever there is found to be potential commercial traffic, until telephone intercommunication is established over the whole system, in all of the states of the Union.

During the year very notable development in radio telephony, the transmission of speech without wires, was made.

On April 4 we were successful in transmitting speech from a radio station at Montauk Point on Long Island to Wilmington, Delaware.

On the 27th of August, with our apparatus, installed by permission of the Navy Department at the Arlington, Va., radio station, speech was successfully transmitted from Arlington, Va., to the Navy wireless station equipped with our apparatus at the Isthmus of Panama.

On September 29 we successfully transmitted speech by wire from the headquarters of the Company at 15 Dey Street, New York, to the radio station at Arlington, Va., and thence by radio or wireless telephony across the continent to the radio station at Mare Island Navy Yard, California.

On the next morning, at about one o'clock Washington time, we established wireless telephone communication

between Arlington, Va., and Pearl Harbor in the Hawaiian Islands, where our engineer, together with United States naval officers, distinctly heard words spoken into the apparatus at Arlington.

On October 22, from the Arlington tower in Virginia, we successfully transmitted speech across the Atlantic Ocean to the Eiffel Tower at Paris, where our engineers, in company with French military officers, heard the words spoken at Arlington.

On the above day, when speech was being transmitted by our apparatus at Arlington to our engineer and the French military officers at the Eiffel Tower in Paris our engineering representative at Pearl Harbor, Hawaii, together with an officer of the United States Navy, heard the words spoken from Arlington to Paris.

While milestones mark progress made, steps make the progress. During the past year transcontinental telephony, radio transmission of the speaking vibrations, and the transference of the electrical speaking vibrations from space to wire or from wire to space, have been the "milestones" of progress of electrical transmission of speech. The improvements which have marked the progress of telephony appear to be revolutionary, when observed at intervals of years or by the onlooker, but to those in the march, or taken from month to month, they are only advance or evolution.

> Inventions of wondrous analytical subtlety have marked epochs in the progress of the telephone service, but in an art or industry or system made up of many interdependent operations and services; each new idea, no matter how controlling, must be adapted to what already exists to make it serviceable; any great or small invention is only useful when moulded into the mass so that its service becomes an undeterminate part of the service of the whole system. (American Telephone and Telegraph Company annual report, 1914.)

Study of needs and requirements, development of apparatus, methods and practices, demonstration of usefulness and practicability, application to the existing or potential demands, account for the very high state of efficiency and great usefulness attained by the Bell System. Every part of the equipment and plant construction and the operating methods have been raised to higher efficiency and usefulness. The radius of dependable commercial speaking transmission has been very greatly increased, and it is now certain beyond any question that as fast as developed or potential business and social requirements indicate commercial practicability, every section of the country can be put in speaking transmission with every other section, and every subscriber to the Bell System will be able to speak to every other subscriber regardless of distance.

Many scientists and inventors in this country and abroad had sought to accomplish long-distance transmission by the employment of special and powerful telephone transmitters and batteries and other auxiliary apparatus installed at subscribers' stations. By such methods it is true that the range of telephone transmission could have been extended, but only by immense expenditures of capital to cover the obsolescence and reconstruction of subscribers' stations, and the necessitated reconstruction of subscribers' lines and switchboards to overcome the increased interference or cross-talk, induced by the increased intensity of the currents and powerful instrumentalities used.

By the plan which has been worked out and adopted in the Bell System, the existing instruments and subscribers' lines and switchboards are made effective for the practical transmission of speech over any distance. At a cost only slightly exceeding that which would have been required in the ordinary routine of maintenance and reconstruction,

many and important changes in equipment have been made which have increased the availability of the system. Without any radical reconstruction costing hundreds of millions of dollars, the effective talking range of every subscriber's telephone in the entire Bell System has been greatly extended and the service rendered, made more useful.

The method adopted can best be described as perfecting transmission by clearing and smoothing the way by lowering grades, straightening curves and removing obstructions, making a passage for the transmission of all telephones, rather than by using great power to overcome imperfect conditions.

These events mark an epoch in the history of telephony, and are but a part of the results from the work of our research and development staff.

The results are particularly noteworthy in the emphasis they place upon the tremendous advantage of the Bell System, of its central administration and its centralized control of operating policy and methods, and the work of its departments of operation, construction and manufacturing, and of research demonstration and development, in the field of economics, practice and science. They could not have been obtained without this central co-operative, co-ordinating control of the entire system. The independent efforts of segregated systems would have failed to produce satisfactory results; the duplication of work would have involved confusion and disturbance beyond endurance, and would have called for immense expenditure.

As illustrating the efficiency of the routine work, under the practice evolved by this mutual co-operation: it frequently becomes necessary to transfer some thousands of subscribers from one switchboard to another. One second before a certain hour all the thousands will be

connected with one switchboard, and one set of operators, and at the stroke of the hour all will be connected with another switchboard manned by another set of operators, without any subscriber realizing what has happened.

In the development of the radio transmission of speech, after its possibility had been demonstrated at our own experimental stations, relations with the Navy and War Departments were established. The use of the wireless towers of those departments was placed at our service, and every possible courtesy, convenience and assistance in the conduct of the experiments was given to our staff by all connected with these departments. Besides these radio experiments, the departments were given demonstrations as to the availability of the Bell System and its wonderful potentiality in case of any emergency which would require quick and satisfactory intercommunication between the different departments of the Government and its scattered stations and officers throughout the whole country.

In case of any trouble requiring any such service, because of the central control of the Bell System, the Government could have at its immediate disposal a plant, equipment and operating staff which for completeness and efficiency would not be possible in any other way.

The announcement that wireless or radio telephony was an accomplished fact aroused much interest not only among those who had possible uses for it but those who desired to profit by it personally and financially, and many of our shareholders were apprehensive as to the possibility of its supplanting the wire system. To answer queries and allay apprehensions, a circular letter was given out explaining the scope and uses of the radio telephone, and also stating that whatever might be its future, that future would be as a part of the Bell System. The circular was full and explicit, and recent developments do not in any degree change it. One amplification which will possibly

make it clearer, is:—At the transmitting station the power used depends entirely upon and increases rapidly with distance to be covered, and for very long distances is very considerable. The vibrations which are transmitted have great amplitude, volume and intensity. The intensity and volume of these vibrations as they pass outwards and onwards, diminish rapidly in every respect except as to definiteness, and at the distant receiving station they are very faint, but however faint, providing the static conditions permit and there are no artificial electrical disturbances, they can be picked up and transferred to a receiving instrument or to a land wire, to be transmitted further. If, however, the radio receiving and transmitting stations were at the same point, as they are on land lines, so long as transmission was going on, creating artificial electric disturbances of great intensity, these receiving or incoming radio vibrations would be entirely destroyed by the intensity and volume of the outgoing vibrations. Conversation such as is carried on over land lines is only possible by having the radio receiving station situated at a place free from artificial electrical disturbances, miles distant from, and connected by wire with, the transmitting station. In this way the radio incoming vibration could be picked up, transferred to wire, and thus transmitted to the party conversing at the transmitting station.

In answer to the query, will the wireless ever take the place of wire systems in the transmission of speech? So far as any present knowledge or any present indications govern, the answer may be an emphatic "No."

The importance of the subject, together with the lack of exact information and the great amount of misunderstanding of the subject is the excuse for the length of this explanation.

Everything in the way of invention or development must conform to natural laws and subordinate itself to

natural forces. Success has only resulted where these laws have been respected; failure has always followed wherever they were not.

In this truism lie the possibilities and impossibilities of wireless transmission.

In the discussion of wireless telegraphy and telephony there may be assumed to be a universal, invisible, imponderable ether or wave conductor, enveloping the earth and extending indefinitely into space, through which the electrical signaling waves of the telephone or telegraph pass in all directions. In this ether there prevail "static" disturbances which are active at all times to a greater or less degree, but ordinarily perceptible to us only through lightning storms. These static phenomena, so far as can be judged, are of the same nature as the radio vibrations, but of greater intensity, amplitude and volume at times, and when in action seem to be universal so far as they affect the earth; they produce noises in the wireless receiving instruments, and for months at a time make conversation, and even transmission of signals impossible except for very short distances. There have been several methods proposed by scientists, the most promising of which may eliminate or nullify some of the interference, but will in no way extend the possibilities of the wireless.

In wireless or radio transmission there can be no secrecy, for although the wave lengths of the vibrations vary and a certain number of "selective" transmissions can be had, any receiver can be adjusted to any "selective." The number of simultaneous conversations which may take place by the wireless telephone is so limited that its utility is practically restricted to use between points or objects which cannot be communicated with in any other way, and then for dependable connection only over short distances. Even with these limitations, much difficult engineering work yet remains to be done before the wireless telephone can practically fulfill the limited functions we may reasonably expect of it.

CONTROL AND REGULATION.

The relations of this and the associated companies with the various boards of control and regulation and the national, state and municipal officials, have continued to be most satisfactory, and generally are on a basis of mutual confidence and co-operation. Many if not most of the questions which are sent to these bodies are settled by informal discussion and adjustment. Of the questions which have come to formal hearing and determination the decisions have been, with few exceptions, such as the company concerned could accept.

Control and regulation have done much to clear away the dangers of arbitrary action and unreasonable demands both on the side of the public and of "public services." The experience of the past, however, reveals dangers that menace its success.

There is danger in the possibility of "control and regulation" usurping the functions of management, and that the multitudinous questions of detail, trivial and negligible, for the most part simple questions of operation, will crowd out, and make it impossible to give full consideration to other and more important questions. Deliberate consideration is impossible in an overworked body.

Even the unsatisfactory practice of allotting questions to individual members for consideration, opinion and report, to be adopted as the opinion of the whole body, will not properly take care of the work. The inevitable tendency is that opinions and decisions are strongly influenced by, if not made by minor officials and the clerical force.

Many questions that come before these bodies are of such notoriety and are surrounded by so much sensational and mistaken assertion, misleading information and erroneous belief, that it is difficult for one not to be influenced in the formation of his opinion by a partial and often distorted presentation of the facts. In the settlement

of such cases it is most important, therefore, that there should be abundant opportunity to get at the real facts, and ample time for deliberate consideration.

Other menaces are: the division of jurisdiction—too many independent boards having jurisdiction over the same questions—and the re-assumption of delegated jurisdiction by legislative bodies.

These dangers not only menace "control and regulation," but they also menace the work of the "public utilities." These multitudinous questions and multiplied bodies are the cause not only of great expense to the "utilities" which sooner or later the public pay, but they occupy the time of the operating officials, to the detriment of the real work of management. Many detailed reports are called for, and prepared at great expense, that cannot possibly be examined and digested, even if the whole force of the commissions gave all their time to them alone.

Commissions of control and regulation act under delegated authority from legislative bodies and were formed to protect the individual members of the public against corporate aggression or extortion and the "corporate members" of the public against public extortion and aggression.

That public is an interested party in the controversy and just as susceptible of wrong notions or wrong impulses as any individual.

These bodies have neither the power of the legislature nor the jurisdiction of the court, but are interposed between the two to give these questions of public relations the time and semi-judicial consideration which legislative bodies cannot give, and to lessen the number of cases in which appeal to the courts might be necessary. The sole cause of their existence was to control and regulate, under the legislative power delegated to them. Their operations should be strictly confined to control and regulation

and never invade the province of management. *Management is inherent in the ownership and is inseparable from the responsibility of ownership.* The boundary line between management and regulation in many cases may be hard to define, but in a large majority of cases it can be determined with definiteness and precision.

This Company and its associated companies have been foremost to establish, and propose to continue their efforts to maintain good wages, good working conditions and relations of the most cordial kind for and with their employees—a fact which has been of the utmost importance to the efficiency of their service to the public. It is believed that discussion and suggestions looking to a fair and reasonable regulation of such relations between "public utilities" generally and their employees may fittingly come from a company which has had so satisfactory an experience with those engaged in its own service.

One of the most important of the functions of control and regulation is fixing the charge for service and prescribing the character of that service. The revenue of "public utilities" depends upon these charges. That revenue must be sufficient for all costs of operation. Costs include wages, maintenance, depreciation, reconstruction, and capital charges. Wages are about, and for purposes of discussion can be considered to be, 50 per cent. of costs of operation.

While each factor of cost is in fact as important as the other, and upon the whole expenditure depends the ability of the "public utilities" to perform their functions, wages are directly personal and to them attaches a superior importance over the others. Wages and conditions of employment should be such as will command the very best service at all times, and should be so adjusted that there could be no dispute in respect to them that could not be settled without disturbance of the service.

Wages in each class of employment should bear proper relation to the whole, and there should be no temptation, no opportunity or no power on the part of any class of employees to obtain an undue share.

The only excuse, which at one time was a good excuse, for using the power and force of combination to obtain increase of pay, recognition of rights or bettering of conditions, was when increased net profits, due to low wages, all went to the employers.

There is no longer such excuse. It has long been recognized that good work can only be obtained from, and waste and extravagance avoided by, interested and satisfied employees. Safeguards of many kinds have by statute been thrown around the employee; he is protected against danger and compensated for damage.

Where earnings are controlled, where surplus operating revenue after a reasonable return on capital goes back to the public, in reduction of charges, in construction of plant for which no capital securities are issued, in improvements in quality or quantity of service, wages also should be controlled.

Under existing practice, the question of wages is a matter of internal arrangement, or in extreme cases a matter of arbitrary power or of reference to the arbitration of temporary bodies.

When bodies of control and regulation consider costs and sources of revenue, they consider wages not primarily as to their sufficiency or equity, but in an inclusive way with other expenses to assure themselves that costs are not excessive. If these bodies were authorized to intervene in disputes where wages and working conditions were concerned, they would consider them concretely, both as to sufficiency and equity, and as a dominant factor in adjusting revenue.

To gain objects, or to enforce demands by combination and arbitrary action causing suspension partially or

wholly of service, to the great inconvenience of the public, should not be possible. Such action on the part of the employees of a "public utility" is as unjustifiable and unpardonable as would be an arbitrary suspension of service by the utility. It is an exercise of arbitrary power, a disregard of the interests of the public, which should not be allowed in these days.

Restraint has been put upon the corporation side, which is effectual so far as public service enterprises are concerned.

The causes which have made improved wages and labor conditions possible will be found in the application of the results of investigation, research and general study of all questions concerning management and operation; in the activity of invention and in the introduction of labor-saving machines, all of which have combined for greatly increased efficiency and improvement of methods and greatly increased production per unit of labor or effort. These causes have made it possible to greatly improve and cheapen production and service, and at the same time decrease the hours of labor, improve conditions and meet the continually recurring necessity and demands for better wages.

"Society has never allowed that which is necessary to its existence to be entirely controlled by private interests."

In the present state of public opinion, which has almost if not quite the force of common law, there is no reasonable dispute that should not be settled by common agreement, and when that fails the side which is disappointed and believes that it has a good case, should be willing to leave its case to a body having power of control and regulation and possessed of a knowledge of and jurisdiction over *all* the essential elements necessary for reaching an equitable decision.

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obligations; the effect that attitude may have upon the employment, on the service or on the public served, are vital public questions.

Whatever may be the facts with ordinary industrials, the position of the employees of public service enterprises, particularly those of transportation and intercommunication, is as distinct and separate from that of the employees of an ordinary industrial, as the position of any public service enterprise is distinct and separate from that of an ordinary industrial enterprise.

Public service employees, nominally the employees or servers of the corporation, are the employees or servers of the public. It is the "service," not of any particular employee but of every employee, that the public pays for. Service is rendered by the employee directly to the individual. The quality of the service rendered depends upon the interest of the employee in the service and the attitude toward the public. Employees who come in direct contact with the public can, in whole or in part, nullify or make objectionably inferior the efforts or service of the best organized and most comprehensive system or of the most efficient methods. No system can give good service, unless there be a direct recognition on the part of the employee that he has a duty and obligation to the public served; and following that duty and obligation, there must be some accountability of some kind to someone, if that obligation is evaded and the service is not rendered in the way it could and should be.

Good service requires expertness, which can only come from experience acquired through continuity in position; it requires efficient system and method, enforced and carried out; it requires not the servile, but the respectful and implicit subordination of the employee to the system, the method, and necessarily to the officials of the organization; it depends upon co-operation and the co-ordination of the efforts of all, employer and employee.

Continuity of service requires at all times a sufficient number of trained employees to take care of the demands of the service, and it should be beyond the power of any part of the organization to lightly cast aside even an implied obligation.

There are two "parties" in all public service—the organization with its plant and facilities for giving service, and the employees who give the service. The employee is by tradition regarded as a part of the organization and subject to its discipline and control. To a certain degree in some cases this has been nullified by combination. If this combination or the possibility of it is to be admitted, then so far as is necessary to preserve the right of the public to a continuous and dependable service, it should be under the same control and regulation by the same bodies that the corporation itself is under.

If the fundamental laws would permit it and public sentiment could be created to enforce it, it would be very desirable to work out some practical plan to accomplish this result.

"Public services" are of such a nature as to create a dependency upon some one system. It is impossible to suspend or interrupt these services even temporarily without putting the public to great inconvenience and to much suffering. To cripple or destroy such services or the means or facilities for rendering such service would be a calamity, something that nothing could justify. The obligation on the system to give a continuity of service is so strong that no excuse except *force majeure* can be recognized. No argument or accumulation of causes could possibly justify those, who in any way controlled the situation, in doing anything either wilfully or through negligence which would result in suspension or interference with service.

Conversely, if employees are to be controlled they should also be protected. What, then, is the method of

protection? In the past, boards of arbitration have been a resort when matters have come to an *impasse*. Special and independent arbitration bodies are temporary, do not possess and cannot appreciate all the factors, and what is most important, have no responsibility for the effects of their decision on other interests.

To adjust properly any question involving expenditure for any part, every factor in connection with the whole business should be considered—the revenue, costs or charges, and everything that affects these. This can only properly be done by one and the same body, which must have jurisdiction over all factors involved—and therefore the only logical body to regulate and protect public service employees is that which regulates the "public utility" itself and has the responsibility to the public for this regulation.

On the other hand, it is both unreasonable and impossible to expect the employee to admit or appreciate this unless at the same time the individuals of the public recognize and observe their obligation or duty towards these employees. Courtesy on the part of the public is too often overlooked or forgotten, and too often the public fail to recognize in their bearing and action towards these employees any direct relation or any of those obligations which all employers should have towards those who serve them, and towards those who are, at least for the moment, in a subordinate position. Too often the attitude of those demanding service towards the employees giving them service, is in unreasonable and undignified contrast to that which they should give and which they do give to the employees of their immediate personal establishments.

CONCLUSION. 1915

It is perfectly within bounds of conservatism to say that the American Telephone and Telegraph Company and associated companies were never, as a whole, in a more satisfactory, if as satisfactory a position financially, physically, and particularly from the point of mutual relationship with their employees and with the public.

The underlying policy of the Bell System was formulated at the beginning of the business, by those who had the perception and imagination to realize the potentialities, and more important, had faith in the possibilities and courage to undertake their development.

That policy was in effect, "one system" under common control, interdependent, intercommunicating, by which every one at every place could converse with every other one at every other place.

This policy has been consistently and persistently pursued. So far as the whole country is concerned, such a system may now be considered an accomplished fact. It has been tried and tested by experience. It has been proved good and has been accepted by the telephone-using public as the only one under which they can have satisfactory service. No matter what the technical objections or negligible differences of opinion or theory, it has been, if not formally approved, substantially accepted by all national, state and municipal authorities and boards of control and regulation, and has been adjudicated upon by courts of high jurisdiction, throughout the country, as the only policy or plan by which can be given a service such as the commercial and social requirements now demand.

There have been many and grave dangers confronting the American Telephone and Telegraph Company and associated companies. The most difficult to control was that arising from the intimate, exacting and delicate re-

lations with the public, inherent in any "public necessity," but peculiar to the telephone service because of the confidential personal relations with its users. The menace of this danger is happily averted in a great degree. The employees of the service who come in close relation with the public recognize that courtesy and patience make their task pleasanter and their relations more agreeable, and the public are fast responding to this silent appeal.

The greatest danger now safely past and never again possible, was in the promoting speculative boom, which existed in the abundant years which closed the last century.

It was only the policy of one universal interdependent system, persistently followed, and the advantage of the service due to it, that enabled the Bell to maintain itself.

The desire for cheaper and greater service, the fear of monopoly, allegations of enormous profit were used by promoters, some wilfully and intentionally misleading, some mistaken, who appealed to the selfishness, covetousness and prejudices of the investor and the public. There was a wild investment in inflated securities sold to the unthinking public on the promise of big profits and dividends. Failure in performance brought a sad experience to these mistaken promoters and investors. The fallacy of cheaper service than that given by the Bell System, and of superior service from any different apparatus or operating methods, was demonstrated beyond question.

The necessity of the existing opposition companies, now growing old, to care for depreciation and obsolescence and to maintain a local service at least equal to the Bell service, even to hold their existing position, makes existing duplicating enterprises negligible so far as they affect the present or may affect the future of our business. Under reasonable restrictions, necessary to avoid discrimination against the Bell subscribers, these duplicating companies are now given the use of the toll and long-

distance lines of the Bell System to connect their subscribers with the subscribers of all Bell exchanges beyond local and circumadjacent ones. (See correspondence with the Department of Justice, in this Company's annual report for 1913.)

Our policy toward them is and will be unchanged. If in any case it becomes the desire of the telephone public that we should, and the public and all authorities acquiesce and it can legally be done, we stand ready to make any reasonable arrangement which will protect the service and the public, and which will not discriminate against the subscribers of the Bell System.

The financial experience from past efforts; the general sentiment of the public that one interdependent universal system under control and regulation, is sufficient, and more than one a nuisance; the ability of the Bell to furnish any type or style of apparatus, establishes the absolute futility, even if it were physically or financially possible, of any attempt to duplicate the Bell System. Less than a complete duplication would be useless; a complete duplication would be a nuisance.

There have been serious apprehensions that rate-adjusting bodies might bear hard on rates and reduce them to an unprofitable point. There have been disputes over what were reasonable rates, but not a single instance where there was a tendency or inclination to make any but fair ones.

In rate making, whether legislative or competitive, there is a general tendency towards uniform rates for all like public services. Uniform rates are necessarily based on average costs over the territory to which the rates apply. These costs may be either determined, accepted or assumed.

No two systems or independent enterprises of any nature, and particularly of "public service," are like conditioned as to construction, operating, density of

traffic and other factors which control cost of operating; consequently there are in large territories, great variations in the causes which affect the numerous costs from which the average costs are deduced.

Extensive combinations or systems favorably situated or well balanced combinations of units even of wide variation, prosper under uniform rates and will even show good results at "unit" rates no greater than the unit cost of operating on other combinations or systems unfavorably situated or badly balanced.

Extensive systems badly balanced or independent enterprises unfavorably situated, may be fairly prosperous under uniform rates during periods of great commercial activity, but will be barely self-sustaining in normal times and are in the hands of a receiver in subnormal times.

This is most forcibly demonstrated in transportation, where there are such extremes in the unit cost of operation on differently situated or conditioned systems and independent enterprises.

The Bell System is a well balanced, comprehensive system of intercommunication, in which each exchange district is a center of an intradependent system, each of which is superimposed in part over the other, and each of which must be considered in rate making as a whole.

It is recognized that the value of the telephone service is dependent upon the available service of the entire intradependent system to be reached from any exchange center; that there is and must be great variation in the revenue-producing ability of each separate exchange district and connecting line making up the system; that in rate making all these elements creating this value of service must be recognized and taken into consideration.

To the extent that these conditions are within the jurisdiction of any rate-making body, they are now generally

taken into consideration, and may be considered to be well established principles.

There is no public service which is in a better position as to its future revenue than the Bell System, and its strength lies in the fact that it is a well balanced, intradependent, aggregated system made up of many units, interdependent as to service and policy and operation, but intradependent as to common interest and support.

The underlying basis of rate making is the "value of the plant." On this the Bell System has nothing to fear. The actual value of its plant—the only value that can be used for rate making—is many millions in excess of the book value. The book value is many millions in excess of the par of all outstanding capital obligations.

Its capital obligations are conservative. All discounts on bond issues have been charged off. There has been paid in on account of capital stock of the Company over $31,000,000 in excess of the par of that stock, or for every share of outstanding stock, par $100, $108 in cash has been paid into the treasury.

Our situation is due entirely to the conservatism of the past; and to the making of ample charges against current earnings for depreciation and obsolescence as should be and must be done with any regard for the future. This is now authorized and directed to be done by all bodies of "control and regulation."

The recognition of these principles and factors as controlling in rate making, guarantees and protects the American Telephone and Telegraph Company and associated companies in reasonable rates, which will enable them to maintain good service by having a satisfied, well paid and interested operating staff; will enable them to maintain and extend their system, increase its universality to the greatest possibility and to place its service within reach of the greatest possible number, although in so doing there will be lines and exchange systems constructed and main-

tained in advance of the development or even the potentiality of a business that would support these sections independently.

"Those advocating government ownership say 'that private claims or rights of owners (*i.e.* shareholders) of the existing systems *will not be allowed to stand in the way.*' It is neither contention nor resistance for the thousands of owners to claim 'just compensation' based upon a fair valuation; the guaranteed rights of all give them that protection. Just compensation means that it must be 'just' and represent full value of the property; this contention is very clearly upheld in . . . a United States Supreme Court decision in a case where it was claimed that just value meant full value of the property, including franchises." (American Telephone and Telegraph Company annual report 1913.)

So long as the policies which now control the companies are followed, so long as there are fair rates and good service, there is little danger of public ownership.

The public are recognizing the fact that in the rates charged for telephone service in the United States there is no exaction, and are beginning to believe that these charges are the cheapest in the world, and the service the best and the total cost to the public less than it would be under government ownership.

The amount now paid in dividends and charges on the outstanding capital obligations is no greater than the government would have to pay for the purchase money. In addition to its dividends the Company is paying over $13,000,000 in taxes which would be lost to the community under government ownership.

The report of 1911 contained the paragraphs:—

"We believe that we are working this problem out on the broad lines of the greatest benefit to the public, and that this is evidenced by the fact that our standards and lines of organization and operation are the standards the world over.

"As a corollary to this—we recognize a 'responsibility' and 'accountability' to the public on our part, which is something different from and something more than the obligation of other public service companies not so closely interwoven with the daily life of the whole community."

In this policy, in this belief, in all our acts there has been a consistency of purpose, an absolute frankness of statement, and so far as confidence can be had by any corporation which is dealing with a vital necessity to the public, we believe we have public confidence.

With a reasonably satisfied public; with a reasonably liberal public; with a reasonably inclined federal, state and municipal control and regulation; without any onerous or unreasonable demands in sight or probable; with a normal business requiring only normal amounts of future capital; with a system sufficiently in advance of existing conditions to meet all possible demands or emergencies; with a business of such a nature that it makes the most economical "servant" for social or commercial intercourse, the first to be employed, the last to be discharged; with an operating staff from office boy to senior executive, from the newest to the oldest, who look upon the system as their system, who are jealous of its reputation and zealous in support of it; who have a keen interest in its improvement and development; who believe that their success and the Company's success are inseparable, who are never satisfied except with something better and who recognize their obligations to the public—with all these, we should look forward with confidence to the future.

For the Directors,

THEODORE N. VAIL,

President.

December 31, 1913, is still in effect. A careful adherence to it, coupled with entire frankness as to all of the matters in which the Company has been concerned, has resulted in a continued avoidance of misunderstandings and disagreements with the federal authorities.

Universal service vs ownership

1914

GENERAL.

BELL SYSTEM.

It is not inappropriate to restate clearly the attitude of the Bell System towards the public. Repetition of facts prevents misunderstanding, as misunderstanding is based on either misleading, mistaken or meager information.

There is no utility or public service upon which the public is more dependent; no utility whose quality of service is of more importance. It has become one of the dependencies of modern life and may be correctly termed, as it has often been, the nervous system of social and economic organization. The character of these relations, their intimacy, are apt to give rise to criticism and cause agitation for national, state or municipal operation or for competition.

This relation involves many delicate conditions and obligations, some incumbent upon the public, some upon the operating associated companies comprising the system, as an organization, some upon the employees as part of the organization, and as individuals so far as they can be considered independently of the organization.

The prerequisite of a telephone service is that it should be a continuous, immediate service; free as possible from any interruptions, and it must be possible for any one in any one place to get into personal conversational communication with any one in any other place; any other service would be a limited service.

The first essential to an understanding is to realize the peculiarities of the telephone service. There is no other utility or public service in any way analogous. Electric light, gas, water, are from a common supply; your service is obtained by turning a key. Personal transportation is conveyance in a vehicle in common with others running

on a schedule between definite points. Transportation of commodities or transmission of messages is the forwarding or transmission of the package or message from point to point by the employees of the utility. Each package or message can be forwarded singly or in quantity, and at the convenience of the utility.

The telephone service consists in placing a telephone circuit at the use for personal conversation of parties personally present at distantly separated terminals. To get this service the parties must each be connected with the same system, either through a toll or subscriber's line. It is further unique in that it has no alternate, nothing can take its place. Each circuit is put to the exclusive use of the parties talking and cannot be used for any other telephonic purpose, and the time at which it is used is determined by the convenience of the parties.

The speaking circuit must be a continuous one. The telephone current is a delicate one, a disturbance at any one point putting the whole circuit out of commission, and as only a small part of the connections is between those connected with the same central office and there are relatively few places between which there is sufficient business to maintain special circuits, these circuits must be made up by connecting circuits and parts of circuits passing through the various exchange districts, which necessitates uniformity in the operating methods and the equipment, principal and auxiliary. All employees engaged at terminal or junction points in making up the circuit must work in perfect harmony and co-operation and take their directions from one source; in fact there must be that absolute co-ordination of plant, apparatus, employees and methods that can come only from common interest and common direction.

The telephone system to give perfect service must be one in which all parts recognize a common interest and a common subordination to the interests of all, in fact

it must be "One System," "universal," "intradependent," "intracommunicative," and operated in a common interest.

Such is the Bell System.

The original telephone exchange service and the unit of the "Bell System" is the "Exchange District" by which and over which the local service is given without toll charge to every one desiring service within the area comprised in that district. The "Exchange District" is made up of sub-units of central office districts and through the switchboard every subscriber within a given district is connected by subscriber lines. All the central offices in an "Exchange District" are connected with each other by trunk lines. To connect all subscribers in any "Exchange District" with one central office would be a physical impossibility in any considerable district, for the reason that no central office building large enough could be constructed and equipped; the cost of the extra length of wire to carry all to one central office would be prohibitive and the congestion of wires would make it impossible, whereas the number of trunk lines to take care of inter-central office calls is relatively small as compared to the number of subscribers' lines.

For the same reasons "Exchange Districts" or central office districts do not overlap each other, nor do the subscribers' lines of one district extend into the territory of another district. Any party desiring service can be connected with any subscriber, in a distant or even adjoining district, more economically and efficiently through the central office of his own district and thence by trunk lines through the central office of the desired subscriber.

The district exchange systems are connected with each other by, and form the terminals of, the toll or long-distance lines which are directly connected with their central offices.

Without terminals the toll or long-distance lines would

to service, cost of plant, its depreciation and obsolescence, that have been made by all promoters and are being made by all public ownership advocates; and in addition had they recognized that the telephone service had become something besides a local exchange system; that a comprehensive system was becoming a recognized necessity and finally that to hold their position with the public they must give as comprehensive service as the Bell System did.

Why did the public retain their connections with the Bell System, when local operating companies identified and capitalized and organized and operated by local people known to every possible subscriber and every probable subscriber a possible shareholder, were urging and pushing their own organization and service against what was alleged to be a foreign, greedy, selfish monopoly, built up on watered stock and exacting enormous revenues for inadequate, ineffective service? What could stand up against such a canvass except a service which had some superior qualities, some advantage which no other could give?

The qualities which created the Bell System were self-interest subordinated to public spirit, initiative, vision, imagination, courage and energy in creating a new, serviceable utility, developing all its potentialities, and making all possible improvements.

The only advantage the Bell interest ever had was through creative work in developing the potentialities of the telephone service by incorporating with advance construction advanced ideas; placing those facilities for service before the public in advance of all others.

The Bell System was something good, and always something better than any other. It was never resting and always developing something better for the Bell System.

Was the building of a long-distance line from Boston to New York when every dollar in the Company's treasury

had a hundred uses, and when no one had confidence in its practicability, entirely selfish or to be condemned? Was building lines to Philadelphia and Washington and from New York to Chicago before any certainty of their ultimate advantage to the public a grievous sin?

The long-distance construction was years ahead of everything like use or demand. It took years for the public to become educated to its possible advantages. For the first three years the long-distance lines were operated at a loss, and the gross receipts from long-distance service for its first 16 years were less than for the single year 1916.

The Bell idea did not contemplate a monopoly; it contemplated a system and went about the building of it in the only possible way. Telephone service and the telephone system are an evolution; the beginning was the local exchange, following was the connecting of adjacent exchanges, the building of toll lines, the long-distance lines; all interconnecting. What difference could there be whether the separate district exchanges were built directly by the Bell or indirectly through affiliated district companies, organized for local reasons, working in co-operation, harmony, all subordinated to a common interest? Why should it not manufacture for these affiliated associated companies, either directly or through an associated affiliated manufacturing company, its own highly special and technical plant, and in this way have absolute control over quality and character?

The idea was a great public utility for the public advantage and benefit; the advantage to the originators to come through the doing of this public service.

Whatever has developed of a "monopolistic" aspect about "one system" is inherent in the telephone service and is created by the public demand educated to the advantages of universal service.

The field is open and practically has been for twenty-

five years. Since the expiration of the fundamental patent, Bell interests have never relied upon their patents—upon which they have expended millions, about $6,000,000 in the last ten years paid to outside parties—except as protection in the pursuit of their business. These patents are broad and comprehensive enough to cover any kind of apparatus used in any telephone service in the world.

If there is a public demand for competition in the telephone service or for opposition exchange, there is nothing to prevent the building, but if opposition companies are built in the particularly "fat" districts of the Bell System, is there any reason why the deficiencies of the limited service of such opposition should be supported by the Bell System from the facilities it constructed for and needs for its own service, or is there any reason why the Bell System should raise capital to build additional facilities not needed for its own service, often unprofitable, to supply such deficiencies?

The Bell System was created by the public, and by the peculiarities of the service. It exists because the public patronized it, and the public patronized it because they received a service such as they wanted at a price which was reasonable considering the service; at a price which made it advantageous and profitable to the public.

The Bell System has no monopoly. One system, universal service, do not mean monopoly of ownership—organized co-operation does not mean monopolistic control.

There are about 11,300,000 telephone stations in the United States, 6,500,000 Bell owned and 4,800,000 owned by independent companies or associations.

There are nearly 10,000,000 stations connected with the Bell System, 6,500,000 Bell owned, and over 3,300,000 owned by independent companies.

About two-thirds of the independently owned stations are connected with and form an important part of the Bell System.

The Bell System does not make undue profit. Allowing for taxes paid by the system and by the holders of its outstanding securities, the net annual cost to the public for the use of the property of the Bell System is about the same percentage on a fair valuation of that property as the interest return on high-grade railroad or industrial bonds, and is far less than the legal rate of interest in any state. At the same time investors in the Bell System realize a fair return because the outstanding capital obligations are many millions of dollars less than the value of the property.

The Bell System's charge for service is not exorbitant. The average revenue per station to the Bell System has been reduced 55 per cent. in the last 20 years, and is less than the average charge of any other exchange system that gives continuous and immediate service anywhere in the world and less than that of most of those that give any service. Seventy-five per cent. of the subscribers to the Bell System get their service for less than the average charge. The service of the Bell System is within reach of the small user; the large user pays for his service according to his use.

The Bell System cost of construction is not extravagant. The average cost per station is less than that of other systems of a similar nature in this country or elsewhere. The cost per station, including toll lines but not long-distance lines, is $135. The average annual gross revenue per exchange station including toll service is $39.62; the operating expenses, including taxes and depreciation, are $30.75; leaving the net revenue $8.87 on an investment of $135. Out of each dollar of revenue 48.3 cents are paid to labor; 20.3 cents for expenses and supplies; 5.6 cents for taxes; 19.8 cents for dividend and interest; leaving for surplus against the future 6.0 cents.

Two notable epochs mark the progress of the telephone service.

At the Exposition of 1876, Bell of few friends and little encouragement, alone, waiting in the hall of the Centennial. The body of examiners, all notable men, tired at the end of a busy summer day, picked up the crude instrument in a perfunctory way, and the exclamation, "My God! It talks!" electrified the commission and announced the coming of an instrument which revolutionized social and commercial intercommunication. At that time, with those instruments, it was with difficulty that conversation could be carried on between two adjacent rooms.

The other epoch when the spoken voice was transmitted through the very same instruments from shore to shore and back again across the great continent, soon to be followed by the transmission of the spoken voice from the wireless towers of the United States, through space, to Hawaii on one side and Paris on the other.

From epoch to epoch, note the improvement. What made it possible for the same instruments to do at one time, the impossible at the other? It was the creation of instrumentalities and auxiliaries, the removal of obstacles, the building up of a system for transmission over and by which that delicate current, so delicate that it would have to be multiplied 5,000,000 times to light an incandescent lamp, could be either transmitted or when it became attenuated could be picked up and given new life for another distance until its destination was reached.

There are few inventions or discoveries that are fundamental—only one in a generation or so. The innumerable inventions and discoveries which have so changed our arts and industries are built up around those fundamental ones, and generally are the result of defects shown in practice and suggestions through close and intimate association with, and study of, the working of the system.

In the evolution of telephony, the telephone is a small

part. It is not due to the force generated by the telephone that transcontinental or any distant speech is possible, it is the eliminating of obstacles and the assistance of auxiliary apparatus, it is the making of an easy path. You cannot increase the force at the telephone except to a limited extent, the current of minute volume but great intensity has a disposition to dissipate itself, which destroys its own and confuses all adjacent transmission. It is not the telephone apparatus, central office equipment or wires that independently afford or can afford any service. It is the machine as a whole; all the telephones, all the equipment, all the central offices are vital and necessary parts of that machine. That machine is the Bell System.

Those who recall the rattling and crackling noises of the early telephone service, when reliable commercial conversation was difficult between adjacent offices and impossible between adjacent cities, when transcontinental or intra-continental conversation was but a dream and wireless conversation an hallucination, can realize what these improvements have been, but those who knew not of those days cannot be criticised for lack of appreciation because of lack of information. It is to those that this statement is presented.

GOVERNMENT OWNERSHIP.

There are, in various quarters, movements to nationalize or municipalize the telephone service. In favor of these movements, the advocates are using the same arguments and promises, the same statements of possible cheaper service, lower cost of construction, cheaper capital because of low interest on good securities, the same cry of monopoly and extortion, that have been used in the past in favor of public ownership, all of which have over and over again been proved to be fallacious and impossible.

There is no reason why any individual or public offi-

pay for the operation during slack hours, in other words, the average load must bear the costs of operation.

If in any utility some plan can be devised which will create, for the sparse hours, a *new traffic* and thus increase the average by utilizing facilities otherwise idle, for such service large reductions could be made; but such traffic must not occupy the plant during the busy hours, only during the otherwise idle hours. It must be a new character of traffic, not requiring any addition to either facilities or operating force.

Compare the telegraph and the telephone service. The telegraph business is a very fluctuating one; the equipment and plant must be sufficient to take care of the maximum load.

Telegrams are written communications handed in for transmission by the employees of the company over its lines, and ordinarily require immediate transmission, but with that transmission the sender has no part. For anything not requiring immediate transmission, or which will not bear the expense, the mails and other facilities are open, unless special inducements are offered. Although the operating force is adjusted as far as possible to the fluctuating load, the facilities cannot be and there are therefore many hours of idle facilities and some of idle force. There are in correspondence all sorts of communication, the imperatively urgent, the urgent, and that in which a few hours make little difference. Deferred and night messages, day and night letters, at special rates create a new business, which can be deferred and dispatched at the convenience of the company at a time when immediate business does not demand the facilities.

A telephone connection is for a personal communication between two people personally present at the terminals of the talking circuits. The service, as given by the Bell System, is as nearly immediate as is physically

possible. It is a service which must meet the convenience of those wanting the service, not the convenience of the Company. The calls for service are made during the active hours of the day and come in the most varying, fluctuating frequency during those hours.

If by some way not yet devised, there could be a telephone business developed which would be a waiting business to utilize these otherwise idle intervals, a much higher efficiency could be got from force and facilities and a lower price for that business might be made, but people do not want to attend at hours unseasonable to their personal convenience or comfort, nor could the parties wanted be found, for the unseasonable hours are the hours of recreation, rest, and sleep, and unfortunately the unseasonable hours for the public are the idle hours of the telephone system. If a deferred service could be spread over these idle hours a lower price would be possible. Such a business would have to be waiting business and, although the conversation might stand the waiting, the parties necessary to the conversation would not.

BUSINESS AND BONUS.

General business which from 1909 had followed normal lines rather closely, began to decline in 1913 and fell very rapidly causing great uneasiness and much disturbance and suffering among those dependent upon their work from day to day. The latter part of 1914 improvement set in in certain lines, prices of our export commodities commenced to rise, business soon rose well above normal lines and still continues so. The telephone business which fluctuates less sharply and more deliberately than general business followed in a degree the course of general business.

In the construction policy of the Bell System it is the aim to have surplus facilities to meet emergencies; in

1918 telegraph statistics

the decision of Judge Dever in the superior court of Cook County. Under the Illinois law this appeal must go first to an intermediate court and cannot be taken directly to the court of last resort in Illinois. It will be some time before an authoritative and final determination of this controversy can be had.

The arrangement with the Attorney-General of the United States which is set out in detail in the correspondence printed in the report for the year ending December 31, 1913, is still in effect. A careful adherence to it, coupled with entire frankness as to all of the matters in which the Company has been concerned, has resulted in a continued avoidance of misunderstandings and disagreements with the federal authorities.

GENERAL

Shortly after the declaration of war, at the request of the Council of National Defense, a committee on communication was formed. Upon this committee are representatives of the various telegraph and telephone interests. By and with the consent of the respective interests a preferential service was proffered to the Government, which has worked exceedingly well. There has been entire harmony and co-operation between the various interests and it can be said that the service has been performed to the satisfaction of the Government, without any particular or serious disturbance to the general business of the country.

It was through no chance that the Bell System was prepared to meet our national emergency, not that any such emergency was anticipated. It was the result of the policy upon which the system is founded; that policy under which the Bell System has grown to what it is, the only policy which could have developed the telephone service as it has been developed. "Advance," in every meaning of the

word, has been the slogan. The essential feature of the Bell service is preparedness, the essential characteristic is dependency.

No business or service analogous to the telephone service, as we know it, existed previous to Bell's invention. Not only the business, but the system, the instrumentalities, the methods of operation and the "services" had to be created and developed.

Step by step the business was built up by the construction of facilities before the "services" could be developed and their advantages demonstrated; the facilities over which "services" had first to be given, their defects pointed out and their remedies suggested.

Each step in advance was followed by improvement in quality of service and by additions to kinds of service.

To make "services" acceptable and of their greatest value the facilities for them and the availability of them had to be abundant and dependable.

To avoid piecemeal construction and frequent reconstruction, and also to anticipate and encourage growth, the future was studied, the probabilities determined, the development planned, and the construction to take care of the future was completed or partially completed in advance of the requirements.

This advance construction has justified itself many times in the past two years.

Step by step as the telephone art has been unfolded has the telephone service been developed from the limited service of an isolated local exchange to a system practically without boundaries; from an interconnecting toll service of limited extent and uncertain performance, to wire communication which is bounded only by continents, and wireless communication which is serving a great purpose in our national emergency, and which will, when normal conditions make it possible, be made world-wide in its availability.

To the engineering, manufacturing and construction

organizations of the Bell System large credit is due for the progress and development which have taken place. Around these organizations are centralized and co-ordinated all the research and experimental, scientific and mechanical studies and work, all the development and practical application of new ideas, and all manufacturing and construction. From a start of modest proportions these organizations have grown apace with the growth of the system until today they are foremost in the world of their kind in size, in importance and standing of their personnel, and certainly foremost in the world in accomplished results.

The telephone service has become such a vital factor in the daily activities of the public, such a dependence of all social and business movement that nothing possible to be done to ensure good service should be left undone. Education, organization, co-operation and the co-ordination of every factor that enters into the giving of service are indispensable requirements.

To give good service, there must be three parties, the caller, the called, and the telephone system. There must be a perfect system, perfect co-operation and a co-ordination of action in which the caller and the called have their parts.

Telephone service in its relation to the public is entirely different from any other utility. In all other utilities the users are passive, accepting such service as is at their disposal. In transportation at certain hours at certain places service is at the acceptance of the public. In light, heat and water, the service is as it were on tap, the user accepts what is placed at his disposal. In the mail service the letter is deposited and sooner or later delivered at its destination. In neither case does the user actively participate in rendering the service.

The telephone system furnishes the transmission of the speaking voice. It puts the caller in connection with the distant party; the connection can be made only after both parties are present at their telephones. If the party called fails to respond, if the party calling fails in any part, keeps the connection waiting after being made, if the parties have not good telephone voices, the utmost perfection on the part of the telephone system will not overcome their shortcomings; nor will absolute perfection on the part of the users give good telephone service if there is imperfection in the transmission facilities.

This necessity of co-operation, of the co-ordination of the parties speaking and the system, is no creation of the system, it is the inherent characteristic of the service which constitutes its greatest value. There is no form of communication so complete, so satisfactory, as personal conversation. All that the telephone system does is to extend the range at which personal conversation can be carried on by making a path for the voice over the wires, by supplying in effect a direct circuit from any one of the hundreds or thousands, or hundreds of thousands of subscribers in any exchange territory to any other in the same exchange territory, or to any of the millions within range of speaking transmission.

In any exchange the circuits radiate from a particular position of some particular operator at a switchboard in a central office. That immediate service may be given, every other circuit in that exchange and every telephone circuit on the whole system must be within reach of every operator. This necessitates an involved, intricate, bewildering arrangement of trunk and connecting lines, signals, switches, connecting cords, magnets, relays, secondary switches, selective devices, repeaters, amplifiers, and operators, automatically, as it were, set in motion by each call.

Such are the conditions under which all telephone serv-

ice is given; the larger the exchange, the greater the distance, the greater are the complications.

Every word or act of every individual, instrument, current or device concerned in the operation must be regulated and controlled. Employees and apparatus must act automatically, instinctively, and be free from all other obligations or duties. For these reasons all conversation or inquiry from subscribers not required by or pertaining to a particular connection, is referred to special employees whose sole duty it is to take up all such questions. To attend to such matters would burden and divert the line operators' attention and delay other subscribers. With these conditions in mind it is easy to understand the absolute necessity for a strict observation of the rules of standardization, the subordination of the individual to rule and regulation, and the absolute impossibility of having any outside or independent control of the operating force. Loyalty to the service and to the public must come first.

Some may think that this destroys individuality and initiative; quite the contrary. Every act being thoroughly standardized becomes instinctive, does not exhaust and leaves the mind active and observant. This is the reason why there are so many instances of telephone operators rendering incalculable service by calling attention of the proper authorities to departures from the standard, to irregularities that indicate something unusual. It is a well established fact that there are no other employees in the world who so quickly and efficiently respond in emergency and do the right thing and do it from no other impelling cause than a conception of duty.

Service such as our public demands could not be given by or through a number of separate systems without close and dependent relations. Imagine the chaos of the employees of each separate company neither owing nor owning any allegiance, except to their own system and their own subscribers, fighting for precedence and for circuits.

The problem of wire communication is quite different from that of any other utility. To be understood, its inter-relations, its relations to the Government and to the public must be made clear.

There are for telegraph and telephone operation entirely separate and distinct systems, each covering the entire country with close working arrangements beyond the borders. Each of these systems is an aggregation of separate sectional systems which by contractual relations, common ownership or connecting contracts has been brought into one operating system under common control. Each of these systems forms a universal, interdependent, intercommunicating system; over the telegraph system any telegram can be transmitted, and over the telephone system personal conversation can be had between practically any two points in the United States and Canada.

Besides these there are other telephone and telegraph systems of greater or less extent, which in the territory they serve are of equal importance and efficiency.

The great advantage of any comprehensive system is the ability to give continuous service from origin to destination and to route traffic so as to avoid any local congestion or the more serious delays caused by storm or flood.

The *economic advantage* to come from the merging of the telephone and telegraph systems, as we have advocated, could come only through the *gradual* concentration of plant upon common routes and ultimate utilization of the lines for both purposes. To use the telegraph systems for telephone purposes, the lines would have to be *substantially reconstructed.* This could be done under normal conditions, as *maintenance, depreciation and obsolescence called for reconstruction,* without additional cost and would save in capital investment to the extent of the plant utilized. To do this in any way which would give immediate service or service in the near future would far exceed in cost, time and labor, any advantage to be gained; therefore would be unwise, and under present conditions prohibitive because

of interference with operation. The economies would be plant economies and the advantage to the public would be only such as would arise in the development during slack periods of new deferred services at lower rates.

No matter how closely the systems might be merged, the telephone and telegraph *would require separate and distinct service-operating organizations*. There is nothing in common in the two systems except the wire plant.

The situation of the telegraph and telephone services is in this respect entirely different from that of the transportation companies. The transportation facilities of the country are operated by a large number of independent companies each controlling a system independent of all others. A number of them cover large sections of the country, and in many instances serve more or less the same sections of the country, but none of them gives continuous service from origin to destination to more than a part of its traffic.

These transportation systems, due to increase in wages and costs of material, have been laboring under the disadvantage of increasing cost of operating, which has reduced the net operating revenue in spite of the tremendous growth of business. In consequence, the traditional and customary high credit which our railroad securities enjoyed has been so impaired in recent years that few of the systems have been able to procure the capital with which to make additions and extensions to plant and equipment needed to meet the growing demands of a growing country.

Insufficient or ineffective utilities are directly and indirectly costly to the public. The experience the country is now passing through only emphasizes this oftentime overlooked and frequently ignored economic law.

Although the railroad systems were quick to respond when the national emergency arose, it is common knowl-

edge that transportation has been seriously handicapped. There is little doubt that had the railroad systems been able to provide fully in the years immediately past for adequate maintenance, depreciation, and for normal growth and expansion, as they had been able to do before the great increases in operating expense had impaired their credit, they would have been able to take care of the emergency traffic so efficiently that the damage and loss would have been almost negligible.

Our national emergency together with the vast increase in general business has made almost overwhelming demands upon the facilities of intercommunication, *i. e.*, transportation and communication, of our country.

The demands upon our service the past two years have been unprecedented. Surplus facilities had been practically exhausted by the end of 1916, but the preparation in plant and equipment and the training and education of additional operating forces in anticipation of the demand for the year 1917 enabled the system to respond readily to the demands of the Government, and with very little retardation or delay to the demands of the public.

To appreciate the difficulties of quick response to sudden emergencies, the *inelasticity* of telephone service must be understood. To meet emergencies, over any railroad system additional trains can be passed, additional cars can be put on trains, and all know that the capacity of an ordinary car is very elastic; there are few street cars which pass your doors which would not hold an additional passenger. The quantity of electricity or gas which can be passed through the mains and the number of lighted lamps can be largely increased, though the light may sometimes be dimmed. In the telegraph the messages are handed in and are transmitted in due course by the employees.

In the telephone service each circuit is exclusive in its

use. Only one conversation can be had over any circuit at a time; it occupies that circuit of two wires exclusively from end to end.

The only elasticity in the telephone service is in an abundance of facilities to take care of the greatest possible business with the least possible delay.

While elasticity in other services is of great advantage in emergency, overburden is neither economical to the public nor to the companies as a permanent condition. For economic operation, plant and traffic must, under the same conditions, bear a nearly constant relation.

CONCLUSION.

Only under stress of emergency is the absolute, inherent strength of individuals, policies or laws shown or developed.

Business will adjust itself to any condition, or to variations of condition which come gradually.

In this time of great national emergency we find our country waking up from the delusions, and breaking loose from and disregarding many of the economic fallacies, which have been imposed upon the community by misled and mistaken public opinion.

How much of a revision of the laws or of their interpretation pertaining to all industrial, commercial and utility enterprises under which we are now working will be made, time only can determine. There is no question, however, but that public opinion, the final resort and arbiter, is changing very rapidly upon these questions. There is nothing so convincing as "example" or "exhibit" backed by complete, clear and full information; argument is then unnecessary.

There is, however, a large and serious public, which genuinely fears the evils of that combination or monopoly essential to the highest efficiency and most economical operation. The traditional fear of exacting corporations

arrogantly disregarding public feelings or opinions is still controlling in their minds. No service, however beneficial, rendered to the public will balance an arrogant, high-handed manner of administering it.

This is our reason, not excuse, for again repeating much that we have many times said about the fundamental policies which underlie the developm nt of the Bell System, and which are in our opinion indispensable to that efficient and sufficient public service necessary to future progress and the continuity of public prosperity.

The underlying principles of public service which should guide in its regulation and control are:

Any particular utility "Service," which to be complete depends for its performance upon the facilities of several independent or distinct systems, over or by which part of the particular "Service" is performed, can be more efficiently and economically performed if all the systems participating in such "Service" are combined into one co-operative, co-ordinated system, operating under one policy. Such a system should be co-extensive with the territory over which the service extends.

When any system is giving or can be made to give a complete, sufficient and efficient "Service," it is uneconomical and both directly and indirectly detrimental to the best interests of the public to allow any duplication or partial duplication of that system.

We have repeatedly and constantly contended that competition, so far as the public utilities are concerned, is costly, unsatisfactory, undependable. That as an incentive to development or improvement it has passed its period of usefulness, if indeed it ever had any.

We have also contended with equal constancy, that with combination of like utilities under proper control and regu-

lation the service to the public would be better, more progressive, efficient and economical than competitive service given by the separate systems.

Without entirely abandoning "competition," "control and regulation" have been established.

These two are absolutely inconsistent. If the public is getting the fullest advantage of control and regulation, no competition except destructive competition can exist. No *properly* regulated charge for utility service could be high enough to cover the cost of duplication and the increased cost incident to competition. Competition involves duplication of plant, equipment, administration and investment, with the consequent duplication of overhead charges, operating costs, and the greatly increased commercial expenses peculiar to competition and necessary to maintain the existence and continuity of the enterprise, to self-preservation.

Under proper control and regulation, complete, co-extensive competition could not exist. The charges allowed for service would not be high enough to support complete, co-extensive duplication, let alone attract it. Rates are necessarily based on average costs. Partial competition selecting always the choice parts of the territory without assuming obligations as to the whole, shares all that is beneficial without assuming any of the burden.

Regulation and control should not permit partial duplication.

That all may be able to benefit by, as well as contribute toward, the prosperity and well-being of the whole, each individual must have all the material comforts and enjoyments of life so far as possible. As a considerable part of any public service must be rendered either directly or indirectly without profit, such service must be maintained by the system as a whole, not alone for the advantage of the utility, but upon the well-founded principle that public service must be maintained, *not* by the public

as a whole, *but* by the beneficiaries as a whole; the cost of such service to be distributed as equitably as possible according to use and benefit.

If any other principle than this were to govern, fully half of the area of this country would be without transportation, telegraph or telephone, and many sections of every city without street cars, gas or electric light.

Control and regulation should provide the best service at the lowest possible cost. It should eliminate duplication of plant, encourage combination so far as combination produces efficiency and economy, and encourage development, even that extension of service toward which the more remunerative part of business must be contributory.

Control and regulation should be "control and regulation" and not operation. It should not handicap initiative and enterprise by too great limitation of that possible reward which alone makes risk attractive. It should be sufficiently liberal to encourage development of latent resources, and not so restrictive as to impede or retard the extension and expansion needed to meet the wants of a growing country. It should allow a sufficient revenue to provide fully for operation and maintenance, depreciation, development and obsolescence, for all reasonable overhead and capital charges, and leave a surplus sufficient to establish such credit as will make it possible to provide capital for expansion and extension at reasonable cost, and at all times.

Only through the application of these principles can the public get the best service. Best service can be rendered only by prosperous enterprises. Any contest for corporate existence consumes the capital and human energy which could be better devoted to quality and economy of service.

Any public control and regulation that does not do this is in the end destructive, not constructive. It is not even

protective, for the public will some day realize that inadequate, inefficient public service is tremendously costly —directly, in the lack of value; indirectly, in discomfort and inconvenience to the public and in the insidious deterioration of prosperity and progress, of the individual and of the community.

To those who look upon government operation as the only remedy for existing or fancied evils of private operation the following assumptions, based on experience, are respectfully submitted.

If from the net revenues of private operation are deducted all paid in taxes, directly by the corporation and indirectly on the securities by the holders, the balance would be no more than sufficient, if sufficient, to pay government rates of interest on the actual investment.

The financial credit, that is the balance sheet, and the service credit, that is the dependence of the employee on his employment and the sufficiency and efficiency of service, are the controlling factors in private enterprise.

The financial affluence and credit of the Government and its immunity from direct control, and the lack of dependence of the Government employee upon his employment, are inseparable, inherent and preponderant factors in government operation. Therefore the desirable factors of economic and efficient operation are wanting.

Whatever can be done by the Government through direct operation can be done more certainly through control and regulation of private operation, thus combining the potency of the sovereign with the initiative and interest of the subject.

The attention of the public interested in a proper telephone service is respectfully called to these general statements, which should be fully considered, appreciated and understood.

For the Directors,

THEODORE N. VAIL,
President.

BELL TELEPHONE SYSTEM IN THE UNITED STATES

CONDENSED STATISTICS

	Dec. 31, 1895.	Dec. 31, 1900.	Dec. 31, 1905.	Dec. 31, 1910.	Dec. 31, 1915.	Dec. 31, 1916.	Dec. 31, 1917.	Increase
Total Miles of Pole Lines	78,203	131,538	213,233	282,877	330,602	337,289	351,222	13,933
Miles of Underground Conduit (length of single duct)				30,165	44,510	47,120	51,208	4,088
Miles of Underground Wire	184,515	705,269	2,345,742	5,992,303	10,536,837	11,468,525	13,451,121	1,982,596
Miles of Submarine Wire	2,028	4,203	9,373	24,636	36,314	41,172	46,868	5,696
Miles of Aerial Wire	488,872	1,252,329	3,424,803	5,625,273	7,932,394	8,340,618	9,112,498	771,880
Total Miles of Wire	675,415	1,961,801	5,779,918	11,642,212	18,505,545	19,850,315	22,610,487	2,760,172
Comprising Toll Wire	215,687	607,599	1,265,236	1,963,994	2,453,483	2,682,910	3,088,808	405,898
Comprising Exchange Wire	459,728	1,354,202	4,514,682	9,678,218	16,052,062	17,167,405	19,521,679	2,354,274
Total	675,415	1,961,801	5,779,918	11,642,212	18,505,545	19,850,315	22,610,487	2,760,172
Miles of Phantom Circuit				115,506	196,841	221,994	281,016	59,022
Total Exchange Circuits	237,837	508,262	1,135,449	2,082,960	3,174,271	3,459,069	3,706,682	247,613
Number of Central Offices	1,613	2,775	4,532	4,933	5,300	5,397	5,676	279
Number of Bell Stations (Owned)	309,502	835,911	2,282,378	3,933,056	5,968,110	6,545,490	7,031,530	486,040
Number of Bell Connected Stations		20,000	246,337	1,949,663	3,183,111	3,301,702	3,444,148	142,446
Total Stations	309,502	855,911	2,528,715	5,882,719	9,151,221	9,847,192	10,475,678	628,486
Number of Employees	14,517	37,067	89,661	120,311	156,294	179,032	192,364	13,332
Number of Connecting Companies, Lines and Systems				17,845	28,306	30,358	31,428	1,070
Exchange Connections Daily	2,351,420	5,668,986	13,543,468	21,681,471	25,183,799	28,530,073	30,845,153	2,315,080
Toll Connections Daily	51,123	148,528	368,083	602,539	819,030	889,860	1,009,205	119,345

COMPANY'S ESTIMATE OF NET REVENUE TO GOVERNMENT FROM BELL SYSTEM PROPERTIES, AUGUST 1, 1918, TO DECEMBER 31, 1918

1918

Gross Telephone Revenue Bell System Experience 1908-1917, inclusive, shows first 6 months of year ..... 48.87% of year last 5 months of year ..... 42.79% 42.79% is 87.56% of 48.87%				
Gross Telephone Revenue first 6 months Associated Companies and Long Lines—See CR 62 June	$155,140,501	87.56% is	$135,841,000	
Add Estimate of increased gross from rate increases and adjustments as planned prior to July 22, 1918— The part of this expected August 1—December 31, 1918 from other than Eastern and New England Groups which had not reported			3,700,000	
Additional now expected			617,000	
			$140,158,000	
Deduct 4½%—4¼% method. Under contract 4½% does not apply to all gross revenue. The payment averages about 4¼% to entire gross			5,973,000	
				$134,185,000
Telephone Operating Expense except Depreciation— First 6 months (excluding American Tel. and Tel. General)	$82,806,000			
This is 53.4% of $155,140,501. June ratio was 54.5%. Average ratio 5 years 50.1%. Average ratio last half 1917, 53.3%. Considering that last half year gross is normally 8% over first half, also the campaign to reduce expenses, I believe it is safe to estimate expense at 54% of normal revenue	135,841,000		73,354,000	
Depreciation August 1 Tangible Fixed Capital except Right-of-Way and Land		$1,031,000,000		
Add one-half expected additions 5 months 5/12 of 5.7% of		17,500,000		
		$1,048,500,000	24,900,000	98,254,000
				$35,931,000
Uncollectible Operating Revenue— First 6 months $654,291—0.42% of $155,140,501 0.42% of 140,158,000			588,000	
Taxes—Assignable to Operations— First 6 months Bell System	$10,692,911			
Deduct American Telephone and Telegraph General	936,021			
	$ 9,756,890	5/6ths	8,130,000	8,718,000
				$27,213,000
As taxes represent each month 1/12 of estimate for year no increase here included. It is to be remembered that taxes may materially change as result of pending revenue bill.				
Add—Rent Revenue first half .... $375,900 5/6ths $313,250 Less Rent Expense first half 140,900 5/6ths 117,400				196,000
				$27,409,000
Deduct— Rent Deductions first half $1,764,681 5/6ths				1,470,000
				$25,939,000
Balance Estimate of Government Revenue— Less Rental for 5 months as calculated to begin August 1, 1918			$ 29,342,800*	
Add Interest on Average additional capital August 1—Dec. 31, 1918 5/12 of 6% on $17,500,000			438,500	29,781,300
Deficit				$3,842,300
[*Note: Compensation asked for by company as shown here was at rate of $29,342,800 for 5 months, or for year				$70,422,700
Compensation granted was				65,148,641]

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COMPANY'S ESTIMATE OF NET REVENUE TO GOVERNMENT FROM BELL TELEPHONE PROPERTIES JANUARY 1, 1919, TO DECEMBER 31, 1919

Telephone Operating Revenues— Normal Revenues for 1918 on basis of first six months would be 155,140,501—.4887 $317,450,000. Normal increase in revenues 1919 over 1918 would be average past increase over previous year 1914 5.1% 1915 6.4% 1916 12.9% 1917 11.5% 1918 six months 7.1% Average 8.6% over $317,450,000 is				$344,750,000
Add Estimate of increased gross from rate increases and adjustments				30,775,000
				$375,525,000
Deduct 4½%—4¼% method				15,960,000
				$359,565,000
Telephone Operating Expense except Depreciation— First six months 1918	$ 82,806,000			
July 1918 Estimated	14,293,000			
Last five Months 1918 estimated	73,354,000			
	$170,453,000			
+8.6%	14,660,000			
Deduct Reductions under Federal Control			$185,113,000	
			4,000,000	$181,113,000
Depreciation— Tangible Fixed Capital 8-1-18		$1,031,000,000		
Add Estimated Increase 8-1 to 12-31-18		35,000,000		
Add Average of Increase Year 1919		50,000,000		
5.7% on		$1,116,000,000		63,600,000
				$244,713,000
Uncollectible 0.42% of Gross			$ 1,577,000	$114,855,000
Taxes Assignable to Operations on the basis heretofore estimated for 1918 ...	$20,000,000			
Add increase pro rata to property, say	2,000,000		$ 22,000,000	23,577,000
Add Rent Revenue 1918 Basis			$ 750,000	$ 91,278,000
Less Rent Expense 1918 Basis			280,000	470,000
				$ 91,748,000
Deduct Rent Deductions, say				3,748,000
Balance Estimate of Government Revenue				$ 88,000,000
Less Rental as calculated to begin Aug. 1, 1918			$ 70,422,700*	
Add 6% Interest on additional capital Aug. 1—Dec. 31, 1918		$35,000,000	2,100,000	
Add 6% Interest on average additional capital during 1919, say		50,000,000	3,000,000	$ 75,522,700
Estimated Profit to Government 1919				$ 12,477,300
[*Note: Compensation asked for by Company as shown here was			$ 70,422,700	
Compensation granted was			65,148,641]	

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the decision of Judge Dever in the superior court of Cook County. Under the Illinois law this appeal must go first to an intermediate court and cannot be taken directly to the court of last resort in Illinois. It will be some time before an authoritative and final determination of this controversy can be had.

The arrangement with the Attorney-General of the United States which is set out in detail in the correspondence printed in the report for the year ending December 31, 1913, is still in effect. A careful adherence to it, coupled with entire frankness as to all of the matters in which the Company has been concerned, has resulted in a continued avoidance of misunderstandings and disagreements with the federal authorities.

GENERAL

Shortly after the declaration of war, at the request of the Council of National Defense, a committee on communication was formed. Upon this committee are representatives of the various telegraph and telephone interests. By and with the consent of the respective interests a preferential service was proffered to the Government, which has worked exceedingly well. There has been entire harmony and co-operation between the various interests and it can be said that the service has been performed to the satisfaction of the Government, without any particular or serious disturbance to the general business of the country.

It was through no chance that the Bell System was prepared to meet our national emergency, not that any such emergency was anticipated. It was the result of the policy upon which the system is founded; that policy under which the Bell System has grown to what it is, the only policy which could have developed the telephone service as it has been developed. "Advance," in every meaning of the

word, has been the slogan. The essential feature of the Bell service is preparedness, the essential characteristic is dependency.

No business or service analogous to the telephone service, as we know it, existed previous to Bell's invention. Not only the business, but the system, the instrumentalities, the methods of operation and the "services" had to be created and developed.

Step by step the business was built up by the construction of facilities before the "services" could be developed and their advantages demonstrated; the facilities over which "services" had first to be given, their defects pointed out and their remedies suggested.

Each step in advance was followed by improvement in quality of service and by additions to kinds of service.

To make "services" acceptable and of their greatest value the facilities for them and the availability of them had to be abundant and dependable.

To avoid piecemeal construction and frequent reconstruction, and also to anticipate and encourage growth, the future was studied, the probabilities determined, the development planned, and the construction to take care of the future was completed or partially completed in advance of the requirements.

This advance construction has justified itself many times in the past two years.

Step by step as the telephone art has been unfolded has the telephone service been developed from the limited service of an isolated local exchange to a system practically without boundaries; from an interconnecting toll service of limited extent and uncertain performance, to wire communication which is bounded only by continents, and wireless communication which is serving a great purpose in our national emergency, and which will, when normal conditions make it possible, be made world-wide in its availability.

To the engineering, manufacturing and construction

organizations of the Bell System large credit is due for the progress and development which have taken place. Around these organizations are centralized and co-ordinated all the research and experimental, scientific and mechanical studies and work, all the development and practical application of new ideas, and all manufacturing and construction. From a start of modest proportions these organizations have grown apace with the growth of the system until today they are foremost in the world of their kind in size, in importance and standing of their personnel, and certainly foremost in the world in accomplished results.

The telephone service has become such a vital factor in the daily activities of the public, such a dependence of all social and business movement that nothing possible to be done to ensure good service should be left undone. Education, organization, co-operation and the co-ordination of every factor that enters into the giving of service are indispensable requirements.

To give good service, there must be three parties, the caller, the called, and the telephone system. There must be a perfect system, perfect co-operation and a co-ordination of action in which the caller and the called have their parts.

Telephone service in its relation to the public is entirely different from any other utility. In all other utilities the users are passive, accepting such service as is at their disposal. In transportation at certain hours at certain places service is at the acceptance of the public. In light, heat and water, the service is as it were on tap, the user accepts what is placed at his disposal. In the mail service the letter is deposited and sooner or later delivered at its destination. In neither case does the user actively participate in rendering the service.

The telephone system furnishes the transmission of the speaking voice. It puts the caller in connection with the distant party; the connection can be made only after both parties are present at their telephones. If the party called fails to respond, if the party calling fails in any part, keeps the connection waiting after being made, if the parties have not good telephone voices, the utmost perfection on the part of the telephone system will not overcome their shortcomings; nor will absolute perfection on the part of the users give good telephone service if there is imperfection in the transmission facilities.

This necessity of co-operation, of the co-ordination of the parties speaking and the system, is no creation of the system, it is the inherent characteristic of the service which constitutes its greatest value. There is no form of communication so complete, so satisfactory, as personal conversation. All that the telephone system does is to extend the range at which personal conversation can be carried on by making a path for the voice over the wires, by supplying in effect a direct circuit from any one of the hundreds or thousands, or hundreds of thousands of subscribers in any exchange territory to any other in the same exchange territory, or to any of the millions within range of speaking transmission.

In any exchange the circuits radiate from a particular position of some particular operator at a switchboard in a central office. That immediate service may be given, every other circuit in that exchange and every telephone circuit on the whole system must be within reach of every operator. This necessitates an involved, intricate, bewildering arrangement of trunk and connecting lines, signals, switches, connecting cords, magnets, relays, secondary switches, selective devices, repeaters, amplifiers, and operators, automatically, as it were, set in motion by each call.

Such are the conditions under which all telephone serv-

ice is given; the larger the exchange, the greater the distance, the greater are the complications.

Every word or act of every individual, instrument, current or device concerned in the operation must be regulated and controlled. Employees and apparatus must act automatically, instinctively, and be free from all other obligations or duties. For these reasons all conversation or inquiry from subscribers not required by or pertaining to a particular connection, is referred to special employees whose sole duty it is to take up all such questions. To attend to such matters would burden and divert the line operators' attention and delay other subscribers. With these conditions in mind it is easy to understand the absolute necessity for a strict observation of the rules of standardization, the subordination of the individual to rule and regulation, and the absolute impossibility of having any outside or independent control of the operating force. Loyalty to the service and to the public must come first.

Some may think that this destroys individuality and initiative; quite the contrary. Every act being thoroughly standardized becomes instinctive, does not exhaust and leaves the mind active and observant. This is the reason why there are so many instances of telephone operators rendering incalculable service by calling attention of the proper authorities to departures from the standard, to irregularities that indicate something unusual. It is a well established fact that there are no other employees in the world who so quickly and efficiently respond in emergency and do the right thing and do it from no other impelling cause than a conception of duty.

Service such as our public demands could not be given by or through a number of separate systems without close and dependent relations. Imagine the chaos of the employees of each separate company neither owing nor owning any allegiance, except to their own system and their own subscribers, fighting for precedence and for circuits.

The problem of wire communication is quite different from that of any other utility. To be understood, its inter-relations, its relations to the Government and to the public must be made clear.

There are for telegraph and telephone operation entirely separate and distinct systems, each covering the entire country with close working arrangements beyond the borders. Each of these systems is an aggregation of separate sectional systems which by contractual relations, common ownership or connecting contracts has been brought into one operating system under common control. Each of these systems forms a universal, interdependent, intercommunicating system; over the telegraph system any telegram can be transmitted, and over the telephone system personal conversation can be had between practically any two points in the United States and Canada.

Besides these there are other telephone and telegraph systems of greater or less extent, which in the territory they serve are of equal importance and efficiency.

The great advantage of any comprehensive system is the ability to give continuous service from origin to destination and to route traffic so as to avoid any local congestion or the more serious delays caused by storm or flood.

The *economic advantage* to come from the merging of the telephone and telegraph systems, as we have advocated, could come only through the *gradual* concentration of plant upon common routes and ultimate utilization of the lines for both purposes. To use the telegraph systems for telephone purposes, the lines would have to be *substantially reconstructed.* This could be done under normal conditions, as *maintenance, depreciation and obsolescence called for reconstruction,* without additional cost and would save in capital investment to the extent of the plant utilized. To do this in any way which would give immediate service or service in the near future would far exceed in cost, time and labor, any advantage to be gained; therefore would be unwise, and under present conditions prohibitive because

of interference with operation. The economies would be plant economies and the advantage to the public would be only such as would arise in the development during slack periods of new deferred services at lower rates.

No matter how closely the systems might be merged, the telephone and telegraph *would require separate and distinct service-operating organizations.* There is nothing in common in the two systems except the wire plant.

The situation of the telegraph and telephone services is in this respect entirely different from that of the transportation companies. The transportation facilities of the country are operated by a large number of independent companies each controlling a system independent of all others. A number of them cover large sections of the country, and in many instances serve more or less the same sections of the country, but none of them gives continuous service from origin to destination to more than a part of its traffic.

These transportation systems, due to increase in wages and costs of material, have been laboring under the disadvantage of increasing cost of operating, which has reduced the net operating revenue in spite of the tremendous growth of business. In consequence, the traditional and customary high credit which our railroad securities enjoyed has been so impaired in recent years that few of the systems have been able to procure the capital with which to make additions and extensions to plant and equipment needed to meet the growing demands of a growing country.

Insufficient or ineffective utilities are directly and indirectly costly to the public. The experience the country is now passing through only emphasizes this oftentime overlooked and frequently ignored economic law.

Although the railroad systems were quick to respond when the national emergency arose, it is common knowl-

edge that transportation has been seriously handicapped. There is little doubt that had the railroad systems been able to provide fully in the years immediately past for adequate maintenance, depreciation, and for normal growth and expansion, as they had been able to do before the great increases in operating expense had impaired their credit, they would have been able to take care of the emergency traffic so efficiently that the damage and loss would have been almost negligible.

Our national emergency together with the vast increase in general business has made almost overwhelming demands upon the facilities of intercommunication, *i. e.*, transportation and communication, of our country.

The demands upon our service the past two years have been unprecedented. Surplus facilities had been practically exhausted by the end of 1916, but the preparation in plant and equipment and the training and education of additional operating forces in anticipation of the demand for the year 1917 enabled the system to respond readily to the demands of the Government, and with very little retardation or delay to the demands of the public.

To appreciate the difficulties of quick response to sudden emergencies, the *inelasticity* of telephone service must be understood. To meet emergencies, over any railroad system additional trains can be passed, additional cars can be put on trains, and all know that the capacity of an ordinary car is very elastic; there are few street cars which pass your doors which would not hold an additional passenger. The quantity of electricity or gas which can be passed through the mains and the number of lighted lamps can be largely increased, though the light may sometimes be dimmed. In the telegraph the messages are handed in and are transmitted in due course by the employees.

In the telephone service each circuit is exclusive in its

use. Only one conversation can be had over any circuit at a time; it occupies that circuit of two wires exclusively from end to end.

The only elasticity in the telephone service is in an abundance of facilities to take care of the greatest possible business with the least possible delay.

While elasticity in other services is of great advantage in emergency, overburden is neither economical to the public nor to the companies as a permanent condition. For economic operation, plant and traffic must, under the same conditions, bear a nearly constant relation.

CONCLUSION.

Only under stress of emergency is the absolute, inherent strength of individuals, policies or laws shown or developed.

Business will adjust itself to any condition, or to variations of condition which come gradually.

In this time of great national emergency we find our country waking up from the delusions, and breaking loose from and disregarding many of the economic fallacies, which have been imposed upon the community by misled and mistaken public opinion.

How much of a revision of the laws or of their interpretation pertaining to all industrial, commercial and utility enterprises under which we are now working will be made, time only can determine. There is no question, however, but that public opinion, the final resort and arbiter, is changing very rapidly upon these questions. There is nothing so convincing as "example" or "exhibit" backed by complete, clear and full information; argument is then unnecessary.

There is, however, a large and serious public, which genuinely fears the evils of that combination or monopoly essential to the highest efficiency and most economical operation. The traditional fear of exacting corporations

arrogantly disregarding public feelings or opinions is still controlling in their minds. No service, however beneficial, rendered to the public will balance an arrogant, high-handed manner of administering it.

This is our reason, not excuse, for again repeating much that we have many times said about the fundamental policies which underlie the developm nt of the Bell System, and which are in our opinion indispensable to that efficient and sufficient public service necessary to future progress and the continuity of public prosperity.

The underlying principles of public service which should guide in its regulation and control are:

Any particular utility "Service," which to be complete depends for its performance upon the facilities of several independent or distinct systems, over or by which part of the particular "Service" is performed, can be more efficiently and economically performed if all the systems participating in such "Service" are combined into one co-operative, co-ordinated system, operating under one policy. Such a system should be co-extensive with the territory over which the service extends.

When any system is giving or can be made to give a complete, sufficient and efficient "Service," it is uneconomical and both directly and indirectly detrimental to the best interests of the public to allow any duplication or partial duplication of that system.

We have repeatedly and constantly contended that competition, so far as the public utilities are concerned, is costly, unsatisfactory, undependable. That as an incentive to development or improvement it has passed its period of usefulness, if indeed it ever had any.

We have also contended with equal constancy, that with combination of like utilities under proper control and regu-

lation the service to the public would be better, more progressive, efficient and economical than competitive service given by the separate systems.

Without entirely abandoning "competition," "control and regulation" have been established.

These two are absolutely inconsistent. If the public is getting the fullest advantage of control and regulation, no competition except destructive competition can exist. No *properly* regulated charge for utility service could be high enough to cover the cost of duplication and the increased cost incident to competition. Competition involves duplication of plant, equipment, administration and investment, with the consequent duplication of overhead charges, operating costs, and the greatly increased commercial expenses peculiar to competition and necessary to maintain the existence and continuity of the enterprise, to self-preservation.

Under proper control and regulation, complete, co-extensive competition could not exist. The charges allowed for service would not be high enough to support complete, co-extensive duplication, let alone attract it. Rates are necessarily based on average costs. Partial competition selecting always the choice parts of the territory without assuming obligations as to the whole, shares all that is beneficial without assuming any of the burden.

Regulation and control should not permit partial duplication.

That all may be able to benefit by, as well as contribute toward, the prosperity and well-being of the whole, each individual must have all the material comforts and enjoyments of life so far as possible. As a considerable part of any public service must be rendered either directly or indirectly without profit, such service must be maintained by the system as a whole, not alone for the advantage of the utility, but upon the well-founded principle that public service must be maintained, *not* by the public

as a whole, *but* by the beneficiaries as a whole; the cost of such service to be distributed as equitably as possible according to use and benefit.

If any other principle than this were to govern, fully half of the area of this country would be without transportation, telegraph or telephone, and many sections of every city without street cars, gas or electric light.

Control and regulation should provide the best service at the lowest possible cost. It should eliminate duplication of plant, encourage combination so far as combination produces efficiency and economy, and encourage development, even that extension of service toward which the more remunerative part of business must be contributory.

Control and regulation should be "control and regulation" and not operation. It should not handicap initiative and enterprise by too great limitation of that possible reward which alone makes risk attractive. It should be sufficiently liberal to encourage development of latent resources, and not so restrictive as to impede or retard the extension and expansion needed to meet the wants of a growing country. It should allow a sufficient revenue to provide fully for operation and maintenance, depreciation, development and obsolescence, for all reasonable overhead and capital charges, and leave a surplus sufficient to establish such credit as will make it possible to provide capital for expansion and extension at reasonable cost, and at all times.

Only through the application of these principles can the public get the best service. Best service can be rendered only by prosperous enterprises. Any contest for corporate existence consumes the capital and human energy which could be better devoted to quality and economy of service.

Any public control and regulation that does not do this is in the end destructive, not constructive. It is not even

protective, for the public will some day realize that inadequate, inefficient public service is tremendously costly —directly, in the lack of value; indirectly, in discomfort and inconvenience to the public and in the insidious deterioration of prosperity and progress, of the individual and of the community.

To those who look upon government operation as the only remedy for existing or fancied evils of private operation the following assumptions, based on experience, are respectfully submitted.

If from the net revenues of private operation are deducted all paid in taxes, directly by the corporation and indirectly on the securities by the holders, the balance would be no more than sufficient, if sufficient, to pay government rates of interest on the actual investment.

The financial credit, that is the balance sheet, and the service credit, that is the dependence of the employee on his employment and the sufficiency and efficiency of service, are the controlling factors in private enterprise.

The financial affluence and credit of the Government and its immunity from direct control, and the lack of dependence of the Government employee upon his employment, are inseparable, inherent and preponderant factors in government operation. Therefore the desirable factors of economic and efficient operation are wanting.

Whatever can be done by the Government through direct operation can be done more certainly through control and regulation of private operation, thus combining the potency of the sovereign with the initiative and interest of the subject.

The attention of the public interested in a proper telephone service is respectfully called to these general statements, which should be fully considered, appreciated and understood.

For the Directors,

THEODORE N. VAIL,
President.

BELL TELEPHONE SYSTEM IN THE UNITED STATES

CONDENSED STATISTICS

	Dec. 31, 1895.	Dec. 31, 1900.	Dec. 31, 1905.	Dec. 31, 1910.	Dec. 31, 1915.	Dec. 31, 1916.	Dec. 31, 1917.	Increase
Total Miles of Pole Lines	78,203	131,538	213,233	282,877	330,602	337,289	351,222	13,933
Miles of Underground Conduit (length of single duct)				30,165	44,510	47,120	51,208	4,088
Miles of Underground Wire	184,515	705,269	2,345,742	5,992,303	10,536,837	11,468,525	13,451,121	1,982,596
Miles of Submarine Wire	2,028	4,203	9,373	24,636	30,314	41,172	46,868	5,696
Miles of Aerial Wire	488,872	1,252,329	3,424,803	5,625,273	7,932,394	8,340,618	9,112,498	771,880
Total Miles of Wire	675,415	1,961,801	5,779,918	11,642,212	18,505,545	19,850,315	22,610,487	2,760,172
Comprising Toll Wire	215,687	607,599	1,265,236	1,963,994	2,453,483	2,682,910	3,088,808	405,898
Comprising Exchange Wire	459,728	1,354,202	4,514,682	9,678,218	16,052,062	17,167,405	19,521,679	2,354,274
Total	675,415	1,961,801	5,779,918	11,642,212	18,505,545	19,850,315	22,610,487	2,760,172
Miles of Phantom Circuit				115,506	196,841	221,994	281,016	59,022
Total Exchange Circuits	237,837	508,262	1,135,449	2,082,960	3,174,271	3,459,069	3,706,682	247,613
Number of Central Offices	1,613	2,775	4,532	4,933	5,300	5,397	5,676	279
Number of Bell Stations (Owned)	309,502	835,911	2,282,378	3,933,056	5,968,110	6,545,490	7,031,530	486,040
Number of Bell Connected Stations		20,000	246,337	1,949,663	3,183,111	3,301,702	3,444,148	142,446
Total Stations	309,502	855,911	2,528,715	5,882,719	9,151,221	9,847,192	10,475,678	628,486
Number of Employees	14,517	37,067	89,661	120,311	156,294	179,032	192,364	13,332
Number of Connecting Companies, Lines and Systems				17,845	28,306	30,358	31,428	1,070
Exchange Connections Daily	2,351,420	5,668,986	13,543,468	21,681,471	25,183,799	28,530,073	30,845,153	2,315,080
Toll Connections Daily	51,123	148,528	368,083	602,539	819,030	889,860	1,009,205	119,345

Western Electric--A Brief History

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

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

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

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

Lucent Technologies's consumer products line renews a Western Electric tradition. In its early days, Western Electric made communications equipment and other electrical devices-including alarms. Western Electric later carried on an extensive line of household appliances, from sewing machines to vacuum cleaners, until selling off its consumer goods segment in the 1920s, After a long absence, Western Electric returned to consumer markets in the 1970s through its offerings in Phone Center Stores. Lucent Technologies now sells phones, answering machines and other electrical devices-including alarms.

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

Gray and Barton

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

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

Gray and Barton's company had roots in the telegraph business. In 1856, twelve years after Samuel F.B. Morse opened his first telegraph system, various scattered telegraph companies consolidated into the Western Union Company. The various manufacturing shops associated with those telegraph companies were also consolidated into two shops, one at Cleveland, Ohio, the other one in Ottawa, Illinois. George Shawk purchased the Cleveland shop, which made working models of inventions, and manufactured telegraph instruments. Enos Barton, who had been chief telegraph operator for Western Union at Rochester, New York, became Shawk's partner for a brief period in 1869, until Gray bought out Shawk.

Later that year, Western Union general superintendent General Anson Stager became a third partner with Gray and Barton, and convinced them to move the shop to Chicago. Stager's career in telegraph had already spanned more than two decades, beginning in 1846 as a telegraph operator in Philadelphia. In the early 1850's, he helped organize some telegraph

lines, which later became part of Western Union. During the Civil War, Stager served General George McClellan as Chief of United States Military Telegraph.

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

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

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

Less than a year after the cash-strapped Bell's patent was approved, Hubbard offered to sell the telephone patent to Western Union for one hundred thousand dollars--and Orton turned him down because he saw little future for the telephone. A year later, Orton changed his mind, and Western Union established the American Speaking Telephone Co., and Western Electric agreed to manufacture telephones for the new company. Western Electric brought divided allegiances to that arrangement because they had already become a distributor of telephone equipment for Bell. For some time, Western Electric straddled the fence, acting as distributor for Bell and as captive supplier to its only competitor. Western Union finally won undivided allegiance--just as a battle for control of the telephone erupted between the deep pockets of Western Union and the thinly capitalized Bell.

The battle lasted just over a year. Its brief duration was not a surprise; the outcome, however, was. The upstart Bell won. How did David slay Goliath this time? Bell's principal ammunition was his 1876 patent. In September 1878, Bell Telephone Co. sued to protect Alexander Graham Bell's patents from infringement by Western Union; by June 1879,

testimony in the patent suit was complete, and it did not look good for Western Union. Five months later, Western Union abandoned the field. Western Union also faced attack from another front.

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

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

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

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

In 1882, Western Electric and Bell signed an agreement that made Western Electric Bell's exclusive manufacturer of telephones in the United States, while Western agreed to sell only to the American Bell Telephone Company (which in 1899 became AT&T), which then

leased the phones to regional "operating" companies, who in turn leased the phones to end users. Those two contracts combined with AT&T's agreements with its licensees to form the three pillars of the nascent Bell System, and provided the system's organizing principle for the next century: long distance service--inaugurated in 1881 between Boston and Providence--was handled by the parent company, local service by the operating companies, and manufacture by Western Electric.

Research and the Bell System

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

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

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

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

Transcontinental Telephone Line

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

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

In 1912, Dr. Lee DeForest provided that technology, developing the audion, a three-element vacuum tube that could not only send radio waves more effectively than existing devices, but could amplify them. Western Electric's Dr. Harold Arnold , who had the training in electron physics DeForest lacked, quickly grasped scientifically how the audion worked. Arnold thus knew how to turn it into a practical electrical amplifier, which is what Carty knew was needed. The result was development of a "high-vacuum tube" for amplifying sound in telephone cables in April 1913--and AT&T's purchase of the audion patent from DeForest. The new tube allowed Western Electric to span the continent in 1913 and 1914. The circuit was successfully completed in June 1914, and successfully tested on July 29. Carty's challenge had been met.

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

Loudspeakers

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

The Hawthorne Plant

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

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

1925 Restructuring

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

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

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

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

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

equipment in the world, and as its offspring our company has a glorious heritage. That is why we have sometimes been called 'the Western Electric of the Far East.'"

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

Graybar

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

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

The Great Depression

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

At the time, telephones were not "articles in general demand." The 1930's were the only decade in the twentieth century when the number of telephones in the United States decreased. During the depths of the Depression, the number of telephones in use fell from 16 to 13 per 100 population; by the late 1970's, the number had surpassed 75 per 100 population. In the 1930's, then, telephones were still a luxury enjoyed by a minority rather than a necessity available to most. The 1936 Presidential election provided an indication of the nature of phone

demand at the time. The *Literary Digest* conducted a telephone poll asking respondents which presidential candidate--the Democrat Roosevelt or the Republican Landon--they preferred. The poll's respondents chose the Republican challenger; President Roosevelt--whose criticisms of "economic royalists" were not designed to curry favor with the upper middle class who had telephones--won in the greatest landslide in history. In a time of great economic distress, spending on anything but necessities usually falls, and the telephone had not yet attained the status of necessity in America--hence Western Electric's hard times.

World War II

World War II revived America's economy, including demand for Bell System services. During the first year of American involvement in the war, 1942, the number of telephones in the United States had increased about 50 percent from 1933 levels. From 1939, when the telephone was first employed as a "weapon of preparedness," until 1945, the number of Bell System long distance calls quadrupled. The nature of demand had changed significantly. Most of Western Electric's products for the Bell System during this period were radio and wire communications equipment for war use at Army and Navy bases and defense contractors across America. Western also created the communications nerve center used to direct the entire defense effort, installing the world's largest private branch exchange (PBX) at the Pentagon in 1942, with 13,000 lines of dial PBX equipment and 125 operator positions.

The company also produced equipment for overseas use. New telephone centers sprang up in previously sparsely populated areas all over the world, to keep up with the needs of America's far-flung military installations. The company manufactured cable and wire, switchboards, and other equipment to meet Lend-Lease commitments in foreign countries. Western Electric also produced specialized communications equipment for observation of the enemy, most notably in the area of radar.

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

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

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

Cold War Communications Systems

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

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

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

The most challenging of all the projects was done during an earlier volatile and dangerous phase of the Cold War--the mid-1950's. Western Electric acted as general contractor for the erection of one of the biggest military engineering jobs in history--a 3,000 mile system of radar outposts across the Arctic to detect approaching bombers, called the

Distant Early Warning Line (DEW Line). Awarded the contract in December 1954, Western Electric used the development work of Bell Telephone Laboratories and the Massachusetts Institute of Technology, and enlisted the assistance of 2,700 U.S. and Canadian suppliers and contractors.

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

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

The 1956 Consent Decree

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

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

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

The Affluent Society

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

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

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

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

Electronic Switching & the Transistor

The boom in telephone use required other innovations which were not as visible as the Princess phone. By the 1960's, projected phone use was so great that the existing network

might soon be unable to keep up with demand. In 1963, the Western Electric's first electronic switching system, a private branch exchange (PBX) was introduced at Cocoa Beach, Florida. Two years later, at New Jersey Bell's Succasunna exchange, the first commercial electric central office appeared. By 1970, there were 120 such offices, servicing nearly two million customers.

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

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

Cellular Phones

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

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

AT&T out of the telephone market in 1986, and left the company as a leading supplier of the phone company equipment, which it remains today.

In the early 1990's, however, an astonishing thing happened with respect to cellular phones. AT&T conducted a survey, asking respondents whose cellular phone they preferred to use. AT&T placed second, although the company no longer made such phones! The company got back into the market, and is now one of the leading cellular phone manufacturers, a rapidly growing market of more than 25 million in the United States alone.

The 1984 Breakup

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

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

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

AT&T also abandoned two names which had been associated with the company for more than a century: Bell and Western Electric. The government ordered that AT&T forfeit use of the Bell name and logo to the operating companies (excepting the name Bell Laboratories). Western Electric disappeared as a separate entity when AT&T restructured according to its

new competitive situation. One of the two primary parts of the new, smaller, AT&T was the old company's long lines department, now called AT&T Communications, which offered regulated long distance service. The second part of the new company, called AT&T Technologies, inherited the other two segments of the old Bell System: equipment manufacture and supply (the old Western Electric) and research and development (Bell Laboratories).

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

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

Going Global (Again)

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

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

In February 1991, AT&T displayed a spectacular example of its growing international capabilities. A convoy of AT&T employees and equipment followed US troops into just-liberated Kuwait to restore telephone service: Operation Desert Storm was followed by what later was dubbed "Operation Desert Switch." Using a seven-meter satellite dish, AT&T switch and phones, the company restored outgoing international service less than 48 hours after

Kuwait's February 28 liberation. A few months later, AT&T delivered two switches and an earth station to restore full service.

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

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

Today Lucent Technologies sells phones in Russia and Ukraine, marking the latest chapter in the company's roller-coaster relationship with Russia and the Soviet Union. Before the 1917 Russian Revolution, Western Electric had a manufacturing facility in St. Petersburg. The superintendent of the plant was murdered in his living room by revolutionaries, and the operation was nationalized. Western Electric's next contact with the Soviet Union came when the company produced telephone systems for America's ally during World War II. The subsequent onset of the Cold War changed Western Electric's relationship with the Soviets again.

In 1990--before the crumbling of the Soviet Union--the company reached an agreement to provide switching and transmission equipment to Armenia, which became the first Soviet Republic to establish independent international phone service. Previously, all of the Soviet union's international calls routed through Moscow--where central authorities determined which calls had priority, and where limited capacity created overload problems. In January of 1992, only 44 days after Ukraine declared its independence, AT&T, PTT Telecom of the Netherlands, and the Ukrainian State Committee of Communications formed a joint venture to build, operate, and own a long-distance network for the new republic. At the system's February 1993 inaugural, Ukraine Minister of Communications, Oleh Prozhyvalsky, said: "This marks a milestone in the modernization of our telecommunications infrastructure." It was, however, much more than that. By offering communications services to Armenia, the Ukraine, Russia, Kazakhstan, Poland, and Czechoslovakia, AT&T helped usher in the new post-Cold War world.

Consumer Products

For AT&T, the New World Order was both an international one, and a very competitive one--especially in consumer products. In the first couple of years after divestiture, AT&T reached a low point in the residential telephone equipment market. FCC regulations once allowed telephone companies to dictate to customers whose equipment they could use. This meant that the vertically integrated Bell system could assure that their manufacturing branch, Western Electric, would have the same market share providing equipment that the phone

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

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

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

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

Western Electric and the Quality Movement

In October 1994 AT&T Power Systems became the first U.S. manufacturer to win Japan's Deming Prize, which salutes companies for successful dedication to the concepts of Total Quality Management. Two years earlier, AT&T Transmission Systems had won a Malcolm Baldridge Quality Award. While some saw these awards as evidence that American business had finally caught on to Japanese management principles, Western Electric had long been a seedbed for the modem quality movement. Andrew J. Guarriello, chief operating officer

of AT&T Power Systems noted that "the roots of today's Total Quality Management can be traced to the work of three AT&T scientists and quality pioneers--Walter Shewhart, W. Edwards Deming, and Joseph Juran. This award tells me quality in manufacturing has come full circle."

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

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

Dr. Shewhart's work had limited impact beyond Western Electric manufacturing until the late 1930's. W. Edwards Deming of the War Department--and briefly an employee of Western Electric--invited Shewhart to give a series of talks, which Deming later edited for publication. In 1947, the newly-formed American Society for Quality Control began recognizing individuals with the Shewhart Medal for contributions to the field. The first recipient of this annual award: Dr. Walter Shewhart. By then, Joseph Juran of Western Electric and Harold Dodge of Bell Labs had made major quality control contributions to the federal government's quality efforts. During World War II, they and other engineers and statisticians from Western Electric and Bell Labs worked for the War Department, creating a series of sampling inspection plans that were published as the MILSTD (military standard) series. MILSTD set the standards that are still used in America and throughout the world.

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

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

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

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

Motion Picture Sound (Sidebar #1)

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

By 1923, a number of companies were working on sound developments, but Craft was undaunted by the competition. He wrote Frank Jewett, vice president in charge of research, "it seems obvious that we are in the best position of anyone to develop and manufacture the best

apparatus and systems for use in this field." Craft turned out to be right. Western Electric developed an integrated system for recording, reproducing and filling a theater with synchronized sound. By 1924, Western Electric was ready to sell its system to Hollywood.

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

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

The Hawthorne Experiments (Sidebar #2)

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

The most involved of the experiments, the relay assembly test room experiment, involved isolating six women, then measuring their production, health, and social interactions in response to changes in working conditions, such as the number and duration of rest periods, length of the work day, and the amount of food they ate. Productivity increased as each improvement was introduced, until the crucial twelfth test, in which researchers removed the special conditions. Productivity increased again! One of the researchers called the twelfth test

"the great eclairissement, the new illumination, that came from the research." The experiments raised the possibility that, as Thomas J. Peters and Robert Waterman put it, "it is the attention to employees, not work conditions per se, that has a dominant impact on productivity."

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

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