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ANNUAL REPORT

OF THE DIRECTORS TO THE STOCKHOLDERS
FOR THE YEAR ENDING DECEMBER 31

1920

AMERICAN TELEPHONE AND TELEGRAPH COMPANY



NEW YORK
1921

GRAVE
YRABEL CLUB

Chairman Theo. N. Vail

Died April 16, 1920

WHEREAS, death has taken from us our beloved chief, Theodore Newton Vail, twice President and lately Chairman of our Board,

RESOLVED: That we, the Directors of the American Telephone and Telegraph Company, spread upon our records this acknowledgment of our indebtedness to him:

He has left our great company stronger and more useful than ever before.

He has given us this organization as an instrument of public service.

He has given us an outlook upon the wide fields of further scientific discovery.

He has given us a part in the conquest of time and space.

He has given us courage in seasons of stress and trial.

He has given us new ideals of business conduct.

He has given us a high mark for our ambition.

He has given us an example of the force that lies in honesty, fairness, patience and industry.

He has given to all of us his friendship, sympathy and whole-hearted affection.

He sought fellowship, knowledge and accomplishment and in that quest he won universal respect.

He has played an historic part in the progress of civilization.

He has brought the world in closer contact for the betterment of mankind.

His associates are able and proud to bear testimony that his chief ambition, to so lay the foundations that the work would live after him, has been abundantly realized, and that in the memory of his achievements his successors for all time will find their most impelling inspiration.



American Telephone and Telegraph Company

MARCH 1, 1921

OFFICERS

President

H. B. THAYER

Vice-Presidents

N. T. GUERNSEY	WALTER S. GIFFORD	JOHN J. CARTY
BANCROFT GHERARDI	E. K. HALL	EUGENE S. WILSON
ROBERT W. DEVONSHIRE	THOMAS D. BOWEN	

Secretary

A. A. MARSTERS

Treasurer

GEORGE D. MILNE

Comptroller

C. A. HEISS

Director, Long Lines Department

FREDERIC A. STEVENSON

DIRECTORS

ADAMS, CHARLES FRANCIS
 ALEXANDER, JAMES S.
 BAKER, GEORGE F.
 FORBES, W. CAMERON
 GARDNER, GEORGE P.
 GASTON, WILLIAM A.
 GREEN, GEORGE L.
 GREENE, EDWIN FARNHAM
 HOWE, HENRY S.

HUBBARD, CHARLES EUSTIS
 LYMAN, ARTHUR
 McCLENCH, WILLIAM W.
 PEARSON, WILLIAM C.
 PUTNAM, WILLIAM LOWELL
 STOCKTON, PHILIP
 THAYER, EUGENE V. R.
 THAYER, HARRY B.
 WATERBURY, JOHN I.

Subject: Central office

W. H. FORBES, President.

Geo. L. ADLEY, Vice President and Treasurer.

THEO. N. FAIR, General Manager.

THE NATIONAL BELL TELEPHONE CO.
No. 95 Milk Street,
P. O. BOX 346.

Boston, June 26 1879.

Dear Sir,

Before putting in any exchanges or starting in or even planning for a central office system I think it would be well for you to consult thoroughly with W. Watson, and examine minutely into our standard system for central office connections. What we want to do in every case is to adopt the best system, and that we think we have, when if there is anything better we should of course want to adopt that.

Please let me hear from you in regard to this.

Yours truly,

Thomas W. Fair

A. W. Pope,
699 Broadway.

**Report of the Directors
of
American Telephone and Telegraph Company**

New York, March 5, 1921.

TO THE STOCKHOLDERS:

It is the purpose of these reports to make clear to a large and steadily increasing body of stockholders not only the present financial status of their properties, but also such facts as to the broad and far-reaching extent of the Company's business, the insistent and steadily increasing demand for additional telephones and facilities, as will enable them to form accurate judgments as to the soundness of the structure which has been successfully created, and the assurance of continuing returns on their investments.

The telephone is, more than any other, a nation-wide utility. Telephone service to be adequate cannot be limited by any political boundaries narrower than the boundaries of the nation. It must reach across the continent and connect not only the cities and larger communities, but the cross-roads settlements and the scattered farms. No individual part of the development can be considered only with reference to itself, but each part must be considered in its relation to the whole. Does it add a proportionate value to the service of the whole? It is easy to understand that the development of the service anywhere adds to the value of the service everywhere. No subscriber to telephone service knows in advance the stations or locations he may at some time want to reach. Every increase in potentiality of service increases value.

**A Nation-
wide
Utility**

When forty-odd years ago the telephone was introduced to the American public, and when some of the great financiers and business men of that period looked upon it as an interesting curiosity with no great commercial value, the small group of Boston merchants who undertook its development, with wonderful vision and almost prophetic foresight laid the foundation and planned the business structure for the great nation-wide utility which the Company has become.

**Growth of
a Nation-
wide
Organization**

Starting with only a group of patents and an experimental model, from that time up to the establishment of the complete System, which has been of such value as to revolu-

tionize commercial and domestic life, the evolution has been broadly along the lines which they foresaw.

In the beginning they made short-term licenses to individuals or corporations for different territories, the parent company furnishing the telephones on rental. During the formative period it was necessary that development be through the enlistment of local capital. This plan fostered such development without surrendering the central control necessary to the ultimate creation of a nation-wide System.

It was foreseen that essential patents upon subsidiary apparatus would be developed, and in order that all licensees might have equally the benefits of such patents and upon a fair basis, the parent company undertook to acquire such rights as would prevent any interference with their use of the best apparatus and methods of operation.

Within ten years of the first public exhibition of the telephone, the working organization of the business had taken substantially the form which it has to-day.

The original scattered licensees had combined their territories and their organizations and permanent licenses had taken the place of the earlier temporary arrangements, and there was thus created a group of telephone companies operating under patents owned and controlled by the parent company in territories clearly defined and taken together covering the whole country. In all of these companies the parent company became a stockholder. Their payments to the parent company were based upon the number of telephones in use, and included a royalty for the use of patents, a rental for the use of the telephones and a payment for the services of the parent company.

The obligation to develop communication between the licensee companies devolved upon the parent company, and within the period named a beginning had been made by the construction of a line between New York and Philadelphia.

To provide a source of supply of apparatus of a uniform standard as to quality and type, a contract was made with the then largest manufacturer of electrical apparatus under which the manufacturer was obligated to furnish to all of the licensee operating companies its products at uniform and reasonable prices. In the manufacturing company, the parent company became a stockholder and in time the controlling stockholder.

Near the beginning of this first ten years the parent company established a central headquarters staff to advise its licensees as to apparatus and operating methods and to study, develop and standardize such apparatus and operating methods as experience or foresight might indicate to be necessary to meet the telephone requirements of the public.

See Letter
of June 26,
1879,
Opposite
Page 5

Thus by 1890, the organization described was in existence and functioning, with a total number of telephones in the United States one-fifth of the number in New York City to-day. It embodied the essential elements of the organization of the Bell System of the present, that is: central control—a central advisory staff—a central laboratory of development and research—a central department to promote progress in operating technique—a central source of supply of standardized material—local operating companies and a national network of lines connecting them. Neither results nor efficiency nor economy in nationwide service could have been achieved by unrelated local agencies.

The American Telephone and Telegraph Company is the parent company. The associated companies are the successors of the original licensees. Of their voting stock the parent company now owns directly and indirectly 89.5 per cent. The Western Electric Company, Inc. is the manufacturing and supply company, of which the parent company owns 98 per cent. The parent company owns and operates the interconnecting long-distance lines.

This organization protects the service from excessive profits that might otherwise be exacted by manufacturers, promoters of inventions, or engineering and construction concerns. It retains for the ultimate benefit of the System and the public, what the System itself has produced. It provides not only a point of nation-wide outlook but also a coördinating force and an impetus for and a means of progress.

With all of the complications of varying state legislation and supervision it has made possible the operation of the System through scores of companies as a homogeneous whole. It has kept this country constantly far in the lead in the development of the telephonic art. It has saved hundreds of millions in first cost of plant and tens of millions in annual cost of operating, of which the public enjoys the benefit.

License
Contract

It is this organization which made possible adjustment to war conditions and then readjustment to peace conditions without impairment of the integrity of the business.

The organization that has made all of this possible is founded upon the relationship set up between the various companies of the Bell System by the license contract.

The license contract is as old as the Bell System. The original contract has been continuously in force with only such modifications as have been necessary from time to time to adjust it to the development of the business.

According to the terms of this contract, the American Telephone and Telegraph Company provides for each of the licensee associated companies:

1. Telephone transmitters and receivers, with induction coils, including a surplus supply to cover current demands;

2. Rights under all patents owned or controlled by the American Telephone and Telegraph Company covering the use of telephonic devices, apparatus, methods and systems;

3. The right to use all standardized new and improved apparatus and methods developed through research and experimental work;

4. A guarantee of freedom from royalties, damages and expenses, on account of patents, arising out of recommended uses of apparatus, methods and systems;

5. An organization to prosecute continuously the fundamental work of research and investigation to the end that safety, economy and efficiency in the business may be promoted;

6. Advice and assistance in general engineering, plant, traffic, operating, commercial, accounting, patent, legal, administrative and other matters involved in the efficient, economical and successful conduct of the business;

7. Advice and assistance in the financing necessary in order to develop and enlarge its plant;

8. Assistance, coöperation and support in promoting the health and welfare of employees, including the Plan for Employees' Pensions, Disability Benefits and Death Benefits, with a provision for guaranteeing the integrity of the funds provided by the associated companies for this purpose;

9. The right to extend to its connecting companies, for the general betterment of the service, the benefits of such engineering and other technical advice and information as the

licensee may have received from the American Telephone and Telegraph Company.

Through this contract there is accomplished standardization of methods in all departments of work along the lines of economy and efficiency; it has made transcontinental service possible and provides the wire system for national service; it undertakes all system services—the things which one agency can do for the service of all, as, for instance, the negotiations, accounting and settlement with the government for the period of Federal control.

As to many of the services afforded by this contract it is impossible to determine exactly either the cost to the American Telephone and Telegraph Company or the value to the associated company. The extent of the services and their value have increased and are increasing year by year, as the extent and variety of service to the public grow. Of some values it is easy to get a fairly close approximation. The use of patents owned by the American Telephone and Telegraph Company, of which the use to the associated companies is exclusive, saved in cost of plant constructed in 1920 over \$19,000,000, and in use of plant previously constructed, over \$20,000,000 in annual charges in 1920. This value cannot be associated with the expenses of 1920. A large part of their cost was in earlier years, and conversely the patent expenses of 1920 are largely for the benefit of later years. No one can determine what value these patents of 1920 will have in succeeding years.

It is not an exaggeration to say that the services to the associated companies make it possible for them to furnish telephone service to the public at rates at least 25 per cent. less than would otherwise be possible.

The total receipts for these services in 1920 were \$17,675,695.51. No separate telephone system in a city or state could perform these services for itself. Because the Bell System is a single, nation-wide System, and because the services are general services in the direction of efficiency and economy resulting in the possibility of lower rates, the apportionment of charges by a percentage upon revenue ($4\frac{1}{2}$ per cent.) seems to be a logical one.

The cost which the rendition of these services imposes upon the American Telephone and Telegraph Company cannot be ascertained with entire accuracy, because it depends upon the elimination of that portion of general expense which

would normally be incurred by a company owning securities of other corporations, but not obligated to perform such services, as well as upon the consideration of other items, all of which must of necessity be estimated. Without including any provision for contingencies which may occur in the future, and which should ultimately be treated as part of the cost of 1920, careful estimates of the cost separately and independently made vary between \$14,770,918 and \$16,415,890. The margin between costs and receipts, whatever it may be after allowance for contingencies, contributes to the efficiency of the System by providing a broader latitude in the initiation of projects and by strengthening the financial credit of the System.

The important consideration is that this license contract is the backbone of the System. It establishes the relationships which have made a nation-wide service not only possible but a thing accomplished and well accomplished. It is what has given to the United States the cheapest, best and most widely-utilized telephone service in the world. It is what has made the standards of the Bell System in instruments, apparatus and methods standard the world over.

It furnishes the only way in which this can be accomplished under existing state laws.

RETURN ON INVESTMENT

Objection is sometimes made to increases in rates urged by an associated company on the ground that the American Telephone and Telegraph Company owning all of its stock is earning dividends with a margin.

The irrelevance of this objection should be fully understood by our stockholders.

A rate-regulating body can justly fix rates only for the service of a utility under its jurisdiction. Whether the owners of that utility have or have not revenue from without its jurisdiction is obviously irrelevant.

The reason why this Company can pay dividends when some of its properties are not paying is of interest.

The Company pays its dividend on a par value of \$100, but there is much more than one hundred dollars earning that dividend. Much of the Company's stock has been issued at more than par. The amount paid into the Company's treasury for stock exceeds the capitalization by \$36,684,237.

The Company has never paid out all of its earnings in dividends, but has consistently pursued the policy of employing some part of its earnings in extending and improving its property. So it comes about that through this cash payment of \$36,684,237 and the earnings upon that sum and the other earnings left with the Company, surplus and reserves of \$154,565,113, or \$35 per share, have accumulated which are invested for the stockholders.

Most of this capital and surplus is invested in stocks of associated companies. Many of them have had periods in which they paid no dividends, leaving all of their earnings in the business; and other periods in which they left a part there. This Company's interest in the amount so accumulated is equivalent to \$67 per share of its capital stock, which added to its own surplus and reserves (\$35 per share) makes over \$200 in assets to earn the dividend upon each \$100 par value of its stock.

In fixing the amount of return for rate-making purposes, the amount of capitalization or the rate of dividend to be paid upon it cannot properly or justly be taken as a basis, because that would penalize the company with conservative capitalization—which is for the benefit of the public because some portion of the surplus always works for the public without capital costs—and would put a premium upon stock-watering where the reverse is the case. The value of the property is the only legal basis as well as the only fair basis upon which to figure a return.

Rates for service to be fair must produce a fair return upon the value of the property.

A most important factor in fixing what may be a fair return is the market value of money at the time. Under present conditions a fair return would be not less than 8% or 10%. The assets of the associated companies so far exceed their capital that 8% on their investment as a whole, would produce enough to pay 10% dividends with a fair margin. No one of the associated companies pays more than 8% dividends.

It is clear therefore that this Company is entitled to considerably higher earnings without being subject to the criticism of earning more than a fair return. To give an adequate and economical service, our earnings should be large enough and stable enough to attract money freely to our securities

and to our stock. We believe that it is for the real benefit of the public we serve that earnings should be nearer to a fair return on the investment than they have been.

The interest of the public requires that our stock always be a very high-grade investment security, and that the return upon it should be always enough to make it attractive at a premium with margin enough to insure stability.

At the beginning of the past year it was realized that adjustments must be made to new standards of earnings. The wide margin between capitalization and investment, and the relatively low return on the total net assets necessary to pay the fixed charges and dividends, have permitted us in the past to do new financing on favorable terms even at times when such earnings were not all that the investment justified and when the Company's investments in some parts of the System were not earning their fair part of the revenue. Thus for the benefit of an adequate, nation-wide service the American Telephone and Telegraph Company has been in effect carrying in some sections of the country a part of the fair cost of telephone service. The larger earnings required by present financial conditions do not permit this to continue.

Our program for the past year has been to bring service uniformly up to standard, to make such increases in pay to telephone workers as would result in attracting and holding a skilled, loyal and hopeful army of employees, and to increase the revenue to an amount nearer what the investment of the stockholders justifies by bringing all sections to a basis of reasonably fair earnings so that as a final result this Company, which largely represents the investing public's ownership in the telephone business, would make the larger earnings which now are necessary to attract new capital at reasonable cost.

We believe that the soundness of this program cannot be questioned. Telephone service has become so much a vital necessity in the domestic and commercial life of the country that nothing should be omitted which can make it better or more reliable. There is no other employment which requires from the personnel more faithful and intelligent effort than telephone service, and it should be and we believe now is adequately rewarded. The public is willing to pay a fair price for a good service.

All parts of this program have been going on during the year.

The increases in revenue have naturally been slower than the increases in expenses because the former required the approval of rate-regulating bodies. Several of the companies during the period of rate revision earned their dividends only in part, but before the end of the year, with three exceptions, they had received favorable action and were fully earning their dividends.

At the end of the year some applications for increased rates were still pending (New York City is a notable case); but with the adjustments fully in effect in the majority of cases the rate of earned return on the companies' investment as a whole is substantially better than the average rate of the year.

COMMISSIONS AND RATES

During the past year many State Commissions have approved increases in rates in order to meet the increased expenses of the operating companies and to enable the companies in turn to meet the increased demands for telephone service. In only a few instances was it necessary to resort to legal action to secure sufficient rates, and in those cases where such action was necessary the companies were sustained by the courts. Apparently the rate-regulating bodies and the public realize as never before that good and adequate service is the matter of first importance, and that to secure it rates must be sufficient to make such returns as will attract the necessary additional capital. In practically every case where rates were raised, there was little or no opposition on the part of the public to the increases granted.

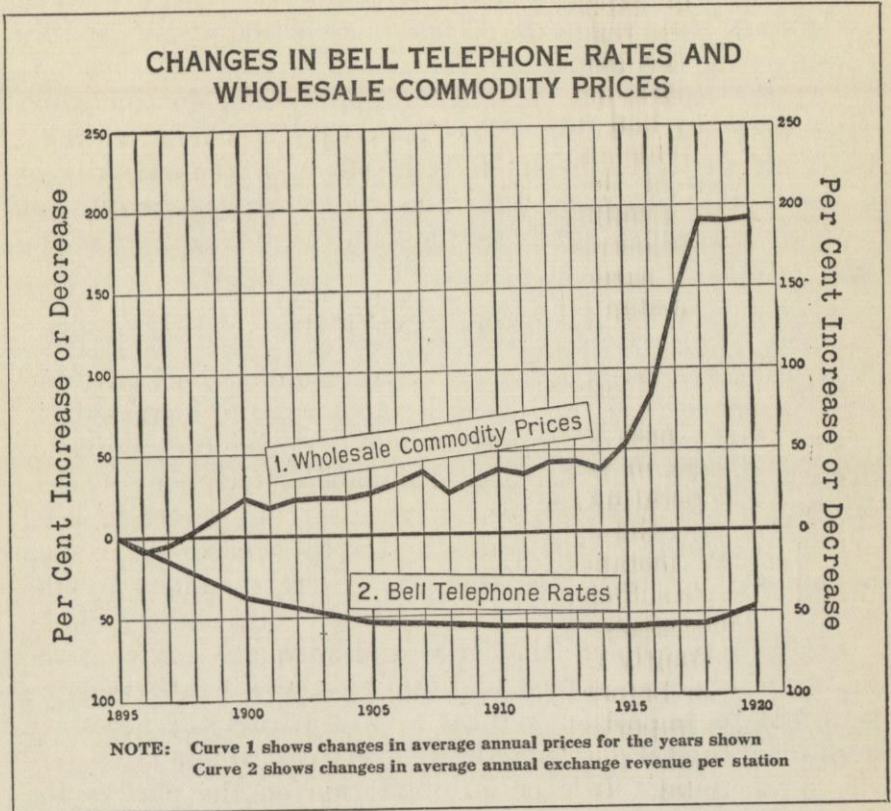
In a number of cases commercial and business organizations realized the necessities of the situation and, after investigation of the statements made by the companies, presented resolutions to the regulating bodies endorsing the application of the companies for increased revenue.

The recent experiences through which the companies have passed emphasize the fact that regulation to be permanently successful must be reasonably prompt in action.

It is reasonable that a public service should not be required to maintain losing rates during a prolonged investigation.

Also it is clearly equitable that with due safeguards to the public, living rates should be allowed pending investigation.

In some states provision has been made whereby utilities may, by giving bond to protect the public, collect rates pending investigation. This procedure is eminently fair to the public as well as to the company.



The utilities so-called, including transportation, have become a part of the essential machinery of industry and commerce. In most states the importance of their regulation by Commissions who can keep constantly informed as to the requirements of the public as well as to the problems of the utilities has been recognized. At this particular period, extension of the utilities is most important, and to provide it liberal and prompt treatment of rate questions is necessary. Generally speaking, the Commissions have not been provided with sufficient clerical and technical assistance.

We believe that there is nothing more important at this juncture than thorough support and understanding by the public of the work of the Commissions.

LEGAL

The pending litigation affecting the Bell System is small in volume and almost wholly of merely routine character.

Two suits have been brought by our companies in United States district courts in Texas, based upon the inadequacy of rates, in the one case fixed by the city of Houston and in the other by the city of Dallas. In the former the district court has rendered a decree in favor of the Company, from which the city has taken an appeal to the Supreme Court of the United States. The latter is now pending upon a reference to a master in chancery.

The activities of the Department of Development and Research are constantly enlarging the responsibilities of the patent division of the Legal Department. During the past year, the patent holdings of the Bell System have been increased by rights under more than a thousand patents and applications for patents, an increase of approximately twenty per cent. It now owns or controls, or is licensed under, more than six thousand letters patent of the United States and applications therefor. The larger proportion of this increase is represented by inventions made by our own engineers. Rights acquired during the year under other inventions have been acquired largely in exchange for rights granted under our own inventions.

A patent suit, based upon a claim against this Company for royalties, has been decided in favor of the Company. An appeal from this decision is pending.

EXCHANGE OF PATENT LICENSES

Pursuant to its policy of developing to the fullest extent all kinds of apparatus and operating methods which might be useful to the associated companies of the Bell System in rendering service to the public, and in order that the associated companies may at all times have available and be free to use the best apparatus and the most advanced methods of operation, the American Telephone and Telegraph Company secures the necessary patents or patent rights. During the course of its scientific researches and the development of the best methods of telephone transmission, both by wire and by radio, hundreds of valuable patents and patent rights have been

secured, many of them covering fundamental features of wire and wireless telephony and telegraphy.

In connection with its development of radio machinery and apparatus, the General Electric Company also secured a number of important patent rights useful not only in radio work but also applicable to wires.

In the course of these developments, numerous interferences in the Patent Office arose, and many others were to be expected. In such cases the relative patent rights of each company were involved in so much doubt that neither company was free to proceed in the proper development of its own special field with the certainty that it would not infringe upon the rights of the other.

The experience of the great war so emphasized the vital military importance of world-wide electrical communications that the Navy authorities urged upon the General Electric Company and upon this Company that some arrangement be adopted, by an exchange of licenses or otherwise, whereby this difficulty with respect to patent rights might be remedied, thereby making it possible for the Army and the Navy and the public to obtain the benefit of numerous new radio improvements of extraordinary importance which could not be obtained from apparatus built under the patents of either company alone.

In order to meet this situation, a contract was made between this Company and the General Electric Company, providing for an exchange of licenses whereby the General Electric Company and its associated company, the Radio Corporation of America, would have the benefit of our patent rights and development work in their field of radio telegraphy, and the Bell System should have the benefit of their patent rights and development work in the field of wire and wireless telephony and in wire telegraphy. By means of this arrangement, expensive and continuous litigation has been avoided, uncertainties and serious delays in the progress of the art have been removed, and the use of substantial improvements in all forms of telephone and telegraph service has been ensured to the public.

As a measure tending still further to foster improvements in all forms of telephone and telegraph communication, and to furnish to our scientific experts and operating staff still

greater facilities for obtaining practical experience in the radio art, this Company has taken a stock interest in the Radio Corporation above mentioned. That corporation at the present time has a number of high-power radio telegraph stations engaged in long-distance radio telegraphy between the United States and foreign countries, and is erecting or providing for the erection of new and most powerful stations for this service in this and in foreign countries, with the end in view of providing to the American public adequate international and world-wide radio telegraph service. It is believed that by our participation in the Radio Corporation, and by the exchange of licenses above referred to, progress in improving the present unsatisfactory position of the United States in international communications will be greatly accelerated.

ORGANIZATION

In our report for 1919 we described the division of duties and responsibilities among the different vice-presidents and other officers of the Company. There has been no change of importance since the issue of that report except in the enlargement in the scope of their functions which naturally follows the growth in the services of the Company in connection with the operations of the license contract.

THEODORE N. VAIL MEMORIAL FUND

Hardly a day has passed since the organization of the Bell System which did not record somewhere in the System some act that strikingly illustrated spirit of loyalty to public service. This thought of "service first" is more than devotion to an organization, inspiring as that may be. It comes from a sense of individual responsibility in the public service. It is devotion to the highest ideals of duty and obligation in that service. It comes in part from the intelligent recognition of the vital importance of telephone service in the lives of others and to the safety and well-being of the community. It is devotion to the whole telephone democracy—to the thousands of fellow employees whose coöperation, direct and indirect, makes individual accomplishment possible, and to the millions who form the telephone-using public and who have built up

their social and industrial fabric around and in reliance upon telephone service.

This type of loyalty and devotion is one of the finest traditions of the Bell System. Many times in the past there have been cases so noteworthy and so inspiring as to deserve some token of recognition more enduring than the spontaneous congratulations of associates and friends.

A fund has been established to meet this need, which will be known as The Theodore N. Vail Memorial Fund.

The income from this fund will provide medals to be awarded from time to time to employees of the Bell System in recognition of unusual acts or services which conspicuously illustrate the high ideals which governed the policy of Mr. Vail as to public service.

SERVICE

Good service is the foundation on which the prosperity of your Company rests, and our greatest effort during 1920 has been to restore the service in those places where it still suffered from the after-effects of the war. It is very gratifying to be able to report that the service throughout the System, both local and toll, has been brought up to substantially normal condition, as was predicted a year ago. It may be of interest to state in this connection that we make continuous and rigorous tests of our service, so that we know definitely what grade of service is being given at all times. The comments from subscribers bear out our own tests as to the marked improvement that has been made during the year.

The improvement in service has been accomplished by skillful and intensive work on the part of all the traffic forces, both those in supervising positions and the operators themselves. Throughout most of the year we were still confronted with difficulties in the way of shortages of plant and personnel, high labor turnover and a large percentage of inexperienced employees. By means of more intensive methods of training and supervision, it has been possible to improve the service steadily in spite of the many handicaps. Even in the face of discouraging conditions, the traffic forces have never worked more effectively and loyally than during the last year, and there never has been a period when greater progress was made.

During the last few months, there has been a distinct turn for the better in the employment situation. The shortages in the operating forces have been made up, but there is still a high proportion of new operators, who are, however, improving rapidly in their work.

There are good reasons to believe that our continued efforts will result in further improvement in the service and that during the year 1921, the Bell System will give the best and most uniform service it has ever given.

CERTIFICATE OF MERIT

The Company has been awarded by the War Department a Certificate of Merit for services of the Bell System in connection with the war. The citation which accompanied it was particularly gratifying in that it recognized the success of the efforts to keep up the standard of public service notwithstanding the sacrifices made for the benefit of the military service:

CITATION

“For especially meritorious service in the prompt and patriotic action of its organization and its associated companies, in placing its personnel, equipment, and facilities at the disposal of the War Department. Through its hearty coöperation, the Signal Corps of the Army was enabled to organize, with the splendid personnel contributed, sufficient battalions of signal troops to meet the early demands of the emergency. Its loyal support and the technical ability, intelligence, and superb qualities of the personnel furnished, aided in a high degree in the phenomenal results obtained by the Signal Corps in the part it performed in the World War. And, for the efficient and satisfactory manner in which it assisted in providing and maintaining the communication service at home, notwithstanding adverse conditions such as had never before existed in the history of our country and the depletion of its technical force for service in the Army.”

PERSONNEL

As noted in previous reports it was inevitable that the general esprit de corps of the organization should be adversely affected by the fact of Federal control and the uncertainties of its duration and by the depletion of our forces during the war.

During the past year the morale of the personnel of the Bell System has steadily improved until it now equals and in many cases surpasses the highest of any pre-war standards. Never have the relations between the management and the employees been more cordial or based upon better mutual understanding.

Not the least of the many factors which have contributed to bringing this about are the meetings which have been taking place during the year between the supervisory officials and employees or committees of their associations, at which many phases of the business have come up for discussion, as, for instance, the relation of different departments and the co-ordination of their functions, the relations between employees and supervisory officials, questions as to wages and working conditions, the relation of wages to production, explanations of routines, increase in efficiency, and the introduction of economies.

One result from these conferences has been constructive suggestions by employees many of which have already proved of value.

In some of the associated companies, the employees have themselves formed committees for the purpose of discussing ways in which they can in their respective spheres improve their relations with the public and meet the public's requirements in the most acceptable manner.

EMPLOYEES' BENEFIT FUND

The Plan for Employees' Pensions, Disability Benefits and Death Benefits, described in previous reports, has been in effect throughout the Bell System during the year, thus completing the eighth year of its operation. Provision has been made for an increase from \$20 to \$30 per month in the minimum pension provided by the Plan, this increase to be effective as of July 1, 1920.

In these eight years, 1913 to 1920 inclusive, the total payments to employees from the Benefit Funds of the Bell companies, including the payments made by the Postmaster-General during the twelve months of Federal control, August 1, 1918, to August 1, 1919, have amounted to \$17,228,399. The reserves for these Benefit Funds are maintained by the companies in accordance with the provisions of the Benefit Plan, and on December 31, 1920, aggregated \$9,363,215.

Analytical studies of the experience under the Plan are constantly being made to the end that the highest possible standards of health may be attained.

Pensions. There were 455 employees on the pension rolls on December 31, 1920, a net increase of 35 during the year. The average pension is \$48 per month.

Sickness. The number of cases of sickness which occurred during 1920 among employees eligible to benefits under the Plan was 29,249, an increase of 5,878 cases over 1919, due to the recurrence of the influenza epidemic in the early part of 1920. The aggregate sickness benefits paid during the year were \$2,427,206 and the average period of disability for completed cases was 35 days.

Accidents. There were 10,423 work accidents which occurred during the year, an increase of 1,504 as compared with 1919. Of the total accidents, there were 3,784 which involved little or no disability on the part of the employee. As a result of systematic efforts in respect of accident prevention, the number of accidents per 1,000 employees involving disability of one day or more has been reduced by about 25 per cent. from the number which occurred during the early years of the Plan. The total payments on account of accidental injuries were \$845,668, including \$220,390 for medical attention, hospital care, etc.

Death Benefits. A sum of \$309,521 was paid in death benefits during 1920 to the dependent relatives of 248 employees who at their death had been in service for five years or more. Burial expenses for 68 employees who left no dependents amounted to \$15,269, making total payments on account of deaths of employees \$324,790. It is interesting to note that the mortality among employees eligible to death benefits has been only about one-half as high as the corresponding mortality among the general population.

Summary. The total amount of payments from the Employees' Benefit Fund during 1920 was \$3,838,797, exclusive of the expenses of administration of the Plan.

As in previous years, financial assistance has been given in many cases of disability which did not come wholly within the provisions of the Employees' Benefit Plan. The amount expended but not charged to the Fund for this assistance during 1920 was \$357,213.

DEVELOPMENT AND RESEARCH

The year just closed has been one of remarkable activity in the Department of Development and Research. In this department, including the laboratories at the Western Electric Company, 2,800 employees are engaged exclusively in research and the development and improvement of telephone and telegraph apparatus and materials and methods. Of these, 1,100 are engineers, chemists, physicists, and other scientists, among whom are graduates of more than 100 American colleges and universities. The remainder are laboratory assistants, draftsmen, stenographers, clerks, model makers, and administrative personnel.

At the close of the year, upwards of 2,500 research and development projects were in hand, all these calculated to improve the service which the associated companies are rendering to the public or to make it more economical.

During the year, hundreds of new patents relating to the telephone and telegraph, issued in various countries, have been examined and studied; the latest discoveries in science have been followed with care by our scientific staff; and over 1,000 United States patents relating to telephony and telegraphy have been applied for by, or issued to, or acquired for the use of this Company. Not only has attention been given to fundamental improvements in transmission and in apparatus and materials, but minute care and study have been devoted to improvements in the thousands of diversified parts which are required for the most effective and economical operation of the Bell System. In the magnitude of its operations, the number of its personnel, and in the size and equipment of its laboratories, this research and development organization far exceeds that maintained by the telephone and telegraph administration of any government or by any other corporation engaged in similar or related work.

During the year, the department has actively continued its work in developing the radio art. Two experimental radio telephone transmitting and receiving stations have been erected on the Atlantic coast, one near Asbury Park in New Jersey, and the other near Plymouth in Massachusetts. By means of these stations, radio telephone communication has been maintained with two ships experimentally equipped, plying from Boston to southern ports on the Atlantic coast.

Radio telephone communication has been established from Santa Catalina Island, about thirty miles out in the Pacific Ocean, to the mainland near Los Angeles, and at that point making junction with the local and long-distance wires of the Bell System throughout the United States.

During the International Communications Conference held in December, a demonstration was given at New York for the benefit of the members of the conference, at which time the steamship *Gloucester* on the Atlantic coast communicated by radio telephone through the New Jersey station, and thence by wire across the North American continent to San Francisco and to Los Angeles, and thence by radio telephone to Santa Catalina Island, in the Pacific Ocean. This demonstration was successful, and the conversation between the ship in the Atlantic and the island in the Pacific was clearly heard at New York by the members of the conference.

This achievement well exemplifies the special field of radio telephony, which is particularly adapted to use between ship and shore; between ship and ship; between airplanes in flight; between airplanes and ships; and from airplanes to the ground. For such purposes, wires cannot be used. In the case of Catalina Island, a cable would carry the traffic from the island to the shore more economically and satisfactorily, but owing to conditions growing out of the war, it was impossible to have the cable manufactured as soon as required, so that the radio telephone was installed.

For all such uses, when so-called static disturbances are absent, and when other and interfering stations are not operating, good transmission by the radio telephone can be obtained; but for the above mentioned reasons, and for other causes, radio telephone service is not so dependable and economical as that supplied by wires.

Furthermore, it should be noted that the facilities of the ether for the simultaneous sending of numerous telephone messages are so limited that the ether itself can carry but a small part of the enormous volume of the telephone traffic required by the entire world. The right of way, therefore, must be given to ships, to aircraft, to radio compass stations, and to all other radio stations so situated that wires cannot be employed.

In order to reduce the interference in the ether and to provide the maximum opportunity for communication for mobile and other stations which cannot use wires, the International Communications Conference has proposed a regulation to limit the use of international radio telephony to cases where telephonic communication by any other means is impossible. While this proposed regulation rests on a sound basis and represents the consensus of opinion of the best radio experts in the world, it is, nevertheless, expected as time goes on that a large use of radio telephony will develop in its own special fields. It will play an important part in establishing telephone communication with otherwise inaccessible places and will make it possible for aircraft in flight and ships at sea to connect with the wires of the Bell System and thus hold conversation with any of its subscribers wherever located throughout the United States. The activities of a section of our development staff, therefore, are being devoted exclusively to wireless telephony.

It will be recalled that in 1915 our engineers, using the wireless telephone system which they devised, transmitted speech across the Atlantic Ocean for the first time in history. In view of this fact, and because no means have yet been found for talking across the ocean through submarine cables, it is desirable that development work in this branch of the radio art be continued.

With this in mind, representations were made to the International Communications Conference asking for the allocation of suitable wave lengths for transoceanic telephony. Owing to the limited number of wave lengths available for this purpose, and owing to the fact that the radio telephone requires from six to ten times as many wave lengths as are required for telegraphy, the desired number of wave lengths could not be obtained. It is hoped, nevertheless, that, without encroaching unduly upon the limited facilities avail-

able for telegraphy, the necessary wave lengths for experimental purposes may be allotted.

For issuing storm warnings to mariners at sea, for broadcasting weather reports and frost warnings to agriculturalists, and for other similar purposes where it is desired to send information broadcast to be picked up simultaneously by any number of receiving stations, the radio telephone has special fields of future usefulness. For these purposes, and for the purpose of sending out calls for help from a ship or aircraft in distress, the fact that the telephone conversation or message can be heard by all who have proper receiving stations, is a decided advantage.

On the contrary, however, when the telephone message is intended to be received by only one station, this lack of privacy is a defect, and in the case of radio telegraphy used for press dispatches where it is not intended that the news should be sent broadcast, but rather only to the subscribers of press associations which furnish news exclusively to their subscribers, the advantage of some method of secret communication is a substantial one.

In the transmission of news, speed is an essential factor, and while it is not impossible at the present time to encipher news dispatches by ordinary methods so that only subscribers who have the key can understand them, the time required for enciphering and deciphering makes these methods objectionable. Accordingly, the Department of Development and Research has worked on the problem of applying to radio telegraphy the quick cipher or secret method of wire telegraphy which our engineers developed and which was so successfully used upon wires by the Signal Corps during the war. This method has been mentioned in a previous annual report. It is a secret means of telegraph communication, and while the message may be heard at all radio stations, it can be interpreted only by those who have been provided with the cipher key and our automatic cipher apparatus. This instantaneously enciphers the message at the sending end, and decipheres it at the receiving end, where it appears immediately in printed page form in plain language ready for use.

During the past year our engineers have successfully used this quick ciphering method in radio telegraphy for short distances, so that the messages were received and instantly

deciphered at the station for which they were intended, yet they could not be read by any station not in possession of the key to the cipher and the deciphering apparatus. Our work upon this system has developed so satisfactorily that it is hoped that with further improvements in the radio art this secret method of telegraphy can be made available for greater distances and eventually for general employment in radio telegraphy.

The problem of attaining privacy in radio telephone transmission is peculiar and difficult. Nevertheless, in the solution of this problem we have also made important progress. Our engineers have carried on conversation by radio telephony according to a method which they devised whereby ordinary receiving stations can hear nothing but unintelligible sounds; yet at all stations equipped with the necessary special apparatus and in possession of the requisite operating information, the spoken words can be heard and understood. Our development in this direction is being continued.

Because of its peculiar nature, so much space has been required to give an idea of our development work in the radio art, that our many important advances in wire transmission must at this time pass with only brief mention. In the last report, mention was made of new methods of improving the transmission over the longest telephone wires. These methods have now been commercially applied to the transcontinental circuits and the predicted results have been completely realized, so that conversation between New York and San Francisco can now be carried on as satisfactorily as between such points as Boston and New York.

Great attention has been given to devising new methods for increasing the carrying power of the toll line plant of the Bell System in respect to the number of telephone and telegraph messages which may be transmitted over one circuit. The multiplex telephone and telegraph system which was developed by our engineers and referred to in the annual report of 1918 has been still further advanced and has been applied on a substantial scale to our plant, with satisfactory results. Our development work in printing-telegraph systems has demonstrated that the printing-telegraph machine has such an important place in the telegraph art that our work upon such apparatus is being continued and has resulted during the year in improvements of great value.

The continued expansion of electrical power and railway systems, and particularly the high-voltage transmission of power, has rendered the problem of avoiding interference with the telephone system one of increasing importance and complexity. Important work in this direction, involving further coöperation with public authorities and electric companies, has been projected and is now in progress.

All parts of the plant—wire, cables, switchboard, substation instruments, and all other apparatus affecting telephone and telegraph transmission and service—have been carefully studied, with the result that numerous important improvements have been made. Worthy of special mention are improvements in central office machine-switchboards, telephone substations, preservation of poles, cables containing increased number of wires, central office power plants, and new methods for telephoning and telegraphing through long overhead and underground cables.

ADDITIONAL PLANT

The continued commercial activity of the country extending well through the year 1920, and the consequent demands by the public for additional telephone service, both local and toll, necessitated a large construction program, the execution of which during the greater part of the year was rendered difficult by the material supply situation, fuel shortages and transportation difficulties. During the year we have constructed the necessary plant and installed a net increase of 563,430 stations, the largest number of stations ever added by construction to the System in any one year. Notwithstanding the larger number of stations added, the demands until the last few months of the year were so abnormal that the unfilled orders for service reached an unprecedented total. Considerable progress has been made in relieving that situation and it is hoped that it will be restored to normal in the not distant future. In general, the public and the public authorities have appreciated the steps which we have taken to maintain and extend the telephone service under the difficult conditions of the past year, and in those cases where there have been delays in providing new telephones, these delays have been accepted with good will, notwith-

standing the fact that the public, seeing only the telephone on the wall or desk, does not in general appreciate the difficulties in providing additional telephone plant to take care of large demands for additional service. In addition to providing the plant to add 563,430 new stations, during the year all of the shortages of plant which have interfered with the telephone service of the existing subscribers have been made up, so that to-day the switchboards, trunks and toll lines are generally speaking adequate to take care of the service of the existing subscribers and of such new subscribers as may be connected with the System.

In the last annual report it was noted that in coöperation with the Cuban Telephone Company plans had been made for the extension of telephone service across the Straits of Florida by means of one or more cables to be laid between Key West and Havana. The manufacture of these cables and the associated apparatus is completed. The cables are to be laid shortly and during the year 1921 service will be established between Cuba and the United States.

PLANT MAINTENANCE

The plant has been maintained up to the usual high standards of the Bell System and is in good condition. Reconstruction work has been done as needed and minor troubles and adjustments which temporarily interfere with service are taken care of promptly and so as to reduce their reactions on the service to a minimum.

There has been no abnormal damage to the plant from sleet storms, floods or other severe weather conditions, and such damage as has occurred has been promptly and thoroughly repaired.

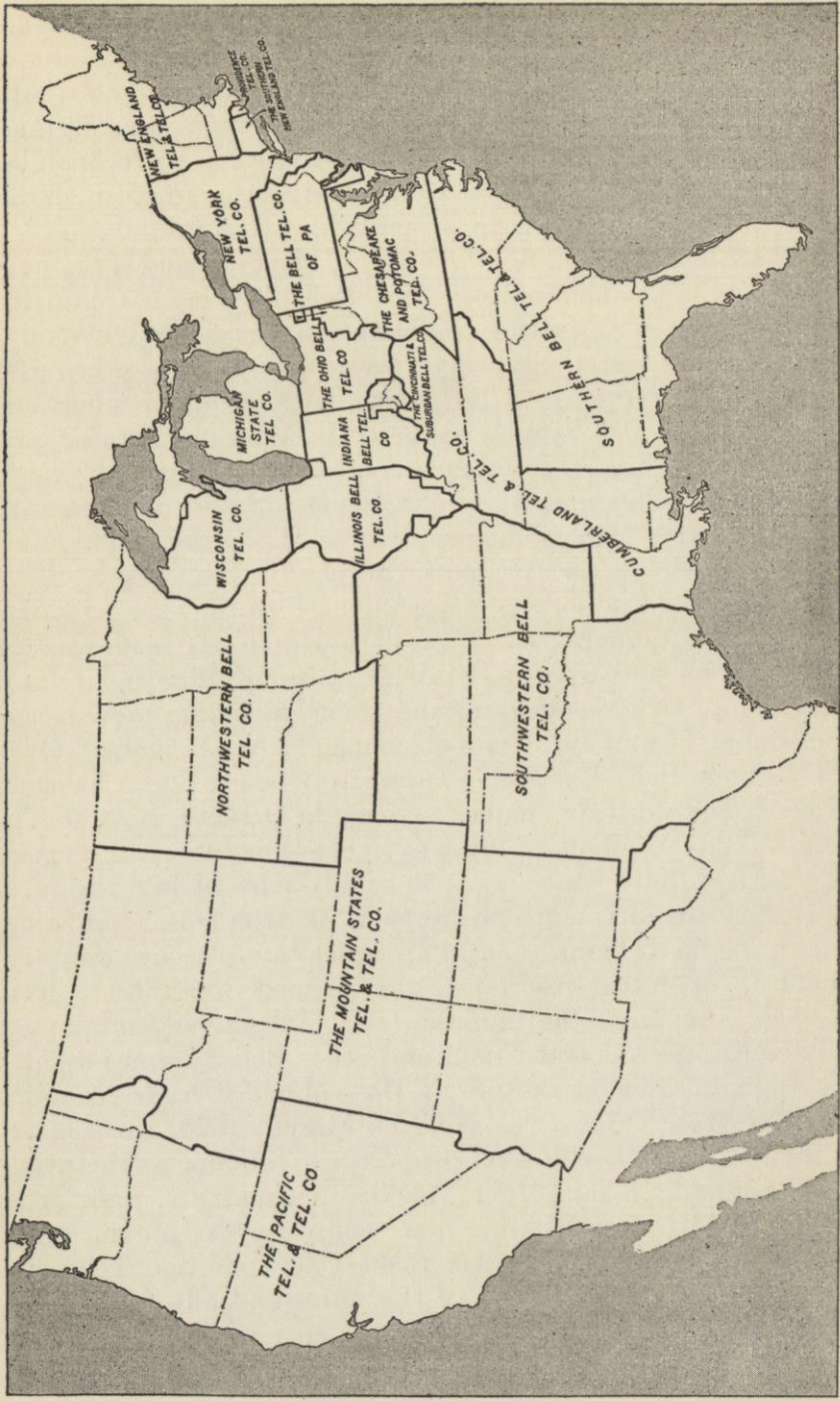
PRINCIPAL CORPORATE CHANGES IN THE BELL SYSTEM DURING 1920

During the year 1920 three important corporate changes, affecting a number of the associated companies, were made either better to meet the requirements of state laws or to facilitate better supervision and more economical operation of the properties. The first of these changes related to the Bell System property in Missouri, Kansas, Arkansas, Okla-

homa and Texas; which, for some years past, had been owned and operated by three separate companies with common executive management and headquarters at St. Louis, Mo. In order to bring about closer coördination, to eliminate duplication of organization, and to facilitate other economies, it was deemed desirable that a single company should own and operate these properties. Accordingly; as of March 31, 1920, The Southwestern Telegraph and Telephone Company and the Southwestern Bell Telephone Company; the Bell System operating companies in Texas and Oklahoma, respectively, sold their properties to the Southwestern Bell Telephone Company; a Missouri corporation owning and operating the Bell System property in Missouri, Kansas and Arkansas. These transactions combined the entire property in the five states under a single ownership and management, with the American Company owning the entire outstanding capital stock of the Missouri company.

The second important change related to the Central Union Telephone Company, which prior to March 31, 1920, was the Bell System operating unit in the states of Illinois, Indiana and Ohio. Other associated companies, including the Chicago Telephone Company (name changed in December, 1920, to Illinois Bell Telephone Company), and The Cleveland Telephone Company (name changed in October, 1920, to The Ohio Bell Telephone Company), also operated in certain sections of these states. In the early part of 1920, to meet statutory requirements in respect of telephone companies operating in Indiana, and in an endeavor to secure improvement in operating results, it was deemed desirable to form a new company—the Indiana Bell Telephone Company—to acquire the Central Union and other Bell System property in Indiana; the operations of the company to be confined to that state. This was done in March, 1920, the Central Union Company selling its property in Indiana to the newly incorporated Indiana Bell Telephone Company. In order to provide funds for the new company to purchase the property in Indiana, the American Telephone and Telegraph Company acquired certain of the notes and all of the issued capital stock of the company; the Central Union Company, concurrently with the proceeds from the sale of its property, liquidating indebtedness to the American Company of like amount.

ASSOCIATED COMPANIES OF THE BELL SYSTEM
LICENSEES OF THE AMERICAN TELEPHONE AND TELEGRAPH CO



With the territory of the Indiana Bell Telephone Company thus interposed between the remaining properties of the Central Union Company in Illinois and Ohio, it followed that the most economical and efficient operation of the Central Union properties would be secured by their sale to, and operation as a part of the systems of, other associated companies operating in Illinois and Ohio. At the same time, this procedure was deemed to be more satisfactory to the regulatory commissions in these states, and to ourselves, by reducing the number of associated companies operating in these states. Arrangements were accordingly made whereby the Illinois property of the Central Union Company was sold to the Illinois Bell Telephone Company as of December 1, 1920. In payment for its property the Central Union Company accepted the notes of the Illinois Bell Telephone Company maturing in December, 1923. Likewise, as of December 31, 1920, the Ohio property of the Central Union Company was sold to The Ohio Bell Telephone Company. The American Telephone and Telegraph Company purchased the notes and the additional capital stock issued by The Ohio Bell Telephone Company to enable the latter to buy the Ohio property of the Central Union Company, and from the proceeds of the sale the Central Union Company liquidated indebtedness to the American Company of like amount. The Central Union Company by these transactions sold all of its telephone property, but continues to own assets which consist mainly of securities of other companies.

The third change related to the Bell System property in the states of Iowa, Minnesota, North Dakota, South Dakota and Nebraska. In the past the properties in these states were owned and operated by three separate companies with common executive management and headquarters located at Omaha, Nebraska. In order to consolidate the operation of these properties into a single unit, to eliminate duplication in organization, and to effect other economies, arrangements were made whereby, as of December 31, 1920, the Northwestern Bell Telephone Company (formerly the Iowa Telephone Company), an Iowa corporation, purchased the property of The Northwestern Telephone Exchange Company—operating in Minnesota, North Dakota and South Dakota—and the property of the Nebraska Telephone Company—operating in Nebraska and South Dakota. These transactions place the

entire property in the five states under a single ownership and management, the American Company owning the entire outstanding stock of the Northwestern Bell Telephone Company.

In so far as the balance sheet of the American Telephone and Telegraph Company is concerned, these corporate changes and inter-company territorial rearrangements result merely in a change in the form of assets held without increasing the book investment. The map on page 30 shows the territories of the licensee companies as of December 31, 1920.

WESTERN ELECTRIC COMPANY, INC.

Under the contractual relationship between the American Telephone and Telegraph Company and the Western Electric Company existing since 1882, the control of inventions and patents relating to telephones and telephonic appliances developed or acquired by either company rests in the American Telephone and Telegraph Company.

The Western Electric Company is licensed to manufacture under such patents under conditions protecting the telephone companies as to price, quality and quantities.

This original arrangement has developed by natural stages into an intimate coöperation in development and research work, an increasing standardization of telephone equipment and a routinized procedure throughout the entire Bell System in the manufacture and construction of its plant. This has been one of the factors contributing to practicable telephone communication between all parts of the System and has saved many millions of dollars in cost of equipment.

The prices of telephone apparatus have until the past six years been steadily cut down by reason of quantity production and manufacturing economies. With the increasing costs of labor and material since 1914, telephone apparatus prices have necessarily been increased, but the increase has not been more than sufficient to meet the increased cost of manufacture. As compared with materials and supplies purchased of other manufacturers, the prices of which increased on an average 110 per cent. from 1914 to 1920, the prices of telephone apparatus sold by Western Electric Company to the Bell Companies increased an average of less than 67 per cent. during the same period.

In addition to its work for the Bell Companies the Western Electric Company has built up a large and profitable electrical jobbing business throughout the United States and an important export and foreign business.

Contrary perhaps to general opinion it does not make a large profit on its business with the Bell Companies. During the past five years it has averaged a net earning of approximately 5 per cent. on its capital devoted to this part of its business. In the earlier years the earning rate was larger. It is believed that the earning rate on this business should fairly be not less than 10 per cent. and that as conditions of manufacture again approach normal this can be reached without increasing prices.

Fortunately, during these less productive years on telephone apparatus, the general business with other customers has been profitable so that as a whole the company has earned its regular dividends with some margin.

The sales billed by the company during the year 1920 aggregated \$206,000,000, of which \$114,000,000 were to the Bell Companies and \$92,000,000, largely electrical jobbing business, were to other customers. This is an increase over the previous year of 62 per cent. to the Bell Companies and 41 per cent. to other customers.

The requirements of the Bell Companies on the Western Electric factory considerably exceeded those of any previous year, and until the latter part of the year its operations were conducted under the severe handicaps of transportation difficulties, shortage of labor and lack of essential materials common to the other industries of the country. In spite of these difficulties the company greatly increased its working forces and its output.

Important additions were made to the Hawthorne plant, chiefly for the purpose of providing facilities to produce machine-switching equipment in large quantities.

The company provided on its own credit all the necessary additional capital required to carry its increased volume of business.

Its unfilled orders on hand at the end of the year aggregated \$83,000,000 as compared with \$47,000,000 on December 31, 1919. Its estimates for 1921 as compared with 1920 indicate a larger volume of business in its own manufactures and a smaller volume in its sales of the manufactures of others.

BELL SYSTEM STATISTICS AND FINANCIAL DATA

The number of separate telephone companies in the United States is approximately 10,500. Of them 29 are associated companies of the Bell System, 9,231 independent companies whose telephone stations are connected with the Bell System, and about 1,200 independent companies whose telephone stations are not connected with the Bell System. There are also a large number of rural lines and associations operated mainly on a mutual or coöperative basis and not rated as companies. Of these lines and associations there are 26,032 which connect with the Bell System.

At the end of the year the number of telephone stations which constituted the Bell System in the United States was 12,601,935, of which 8,333,979 were owned by associated companies of the Bell System and 4,267,956 by local, coöperative, and rural independent companies or associations having sublicense or connection contracts, the so-called connecting companies.

The following tables set forth the development of the Bell System in the United States at the end of the year and its growth during the year:

TELEPHONE STATIONS

	Number at End of Year	Increase during Year
Bell Owned.....	8,333,979	594,820
Bell Connecting.....	4,267,956	211,368
Total.....	12,601,935	806,188

TELEPHONE CONNECTIONS—BELL-OWNED EXCHANGES

	Average Number Daily during Year
Exchange Connections.....	31,835,000
Toll Connections.....	1,327,000
Total.....	33,162,000

The daily average of 33,162,000 exchange and toll connections during 1920 exceeded by 2,700,000 the daily average during 1919.

EMPLOYEES—ASSOCIATED BELL COMPANIES

Number on December 31, 1920.....	231,316
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MILES OF WIRE AT END OF YEAR

	Aerial	Under-ground	Total	Increase during Year	Per Cent. of Copper Wire to Total Wire
Bell Owned					
Exchange....	7,220,333	14,384,135	21,604,468	960,978	95.8
Toll.....	2,409,538	1,363,398	3,772,936	253,427	91.1
Total.....	9,629,871	15,747,533	25,377,404	1,214,405	95.1
Bell Connecting					
Toll.....			449,167	21,597	

61.8 per cent. of the Bell-owned wire mileage—excluding submarine cable—is in underground cables, and this percentage is steadily increasing. The underground conduits represent a cost of \$129,300,000 and the cables in the conduits \$178,500,000, a total in underground plant of \$307,800,000.

NET PLANT ADDITIONS—BELL-OWNED

Real Estate.....	Added in 1920
Equipment.....	\$ 12,811,052
Exchange Lines.....	42,675,634
Toll Lines.....	31,047,561
Construction Work in Progress.....	32,987,380
Total.....	28,360,516
	\$147,882,143

The above amount of net plant additions compares with the additions of the previous nineteen years as follows:

NET PLANT ADDITIONS DURING 20-YEAR PERIOD

1901.....	\$31,005,400	1911.....	\$ 55,660,700
1902.....	37,336,500	1912.....	75,626,900
1903.....	35,368,700	1913.....	54,871,900
1904.....	33,436,700	1914.....	50,045,300
1905.....	50,780,900	1915.....	32,863,700
1906.....	79,366,900	1916.....	66,224,700
1907.....	52,921,400	1917.....	118,599,500
1908.....	26,637,200	1918.....	77,922,600
1909.....	28,700,100	1919.....	73,446,000
1910.....	53,582,800	1920.....	147,882,100
Total.....	\$1,182,280,000		

BELL SYSTEM EARNINGS AND EXPENSES

A consolidated Bell System income statement with all inter-company duplications eliminated follows and represents the telephone business of the System as a whole in its

relations to the public. Comparative figures for the year 1919 are not shown because of Federal control during the first seven months of the year 1919 and the necessarily different classification of earnings and expenses in that year as a result of such control.

This statement does not include data for connecting, independent, or sublicense companies, or The Bell Telephone Company of Canada and the Western Electric Company, Inc., except as interest and dividends from these companies are included in non-operating revenues.

BELL SYSTEM INCOME STATEMENT
FOR YEAR ENDING DECEMBER 31, 1920
(DUPLICATIONS EXCLUDED)

Exchange Revenues.....	\$301,282,599	
Toll Revenues.....	141,883,485	
Miscellaneous Revenues.....	6,276,031	
Total Operating Revenues.....		\$449,442,115
Depreciation.....	65,731,071	
Current Maintenance.....	69,665,080	
Traffic Expenses.....	145,848,181	
Commercial Expenses.....	45,075,272	
General and Miscellaneous Expenses.....	20,500,013	
Total Operating Expenses.....		346,819,617
Net Operating Revenues.....		\$102,622,498
Uncollectible Revenues.....	1,208,798	
Taxes.....	27,841,334	29,050,132
Operating Income.....		\$73,572,366
Non-operating Revenues—Net.....		11,692,610
Total Gross Income.....		\$ 85,264,976
Rent and Miscellaneous Deductions.....	5,755,808	
Interest Deductions.....	31,724,103	37,479,911
Balance Net Income.....		47,785,065
Deduct Dividends.....		39,999,579
Surplus Earnings.....		\$ 7,785,486

During the year \$135,396,151 was applied out of revenues for current maintenance and depreciation by the companies comprising the Bell System. The expenses for current maintenance represented 5.6 per cent. on the average plant in service, while provision for depreciation and obsolescence was made at the annual rate of 5.3 per cent. of the cost of plant. By means of these charges against revenue, the

property has been maintained in good condition and adequate provision has been made for the protection of the investment.

Traffic expenses amounted to \$145,848,181, of which amount over \$112,000,000 was paid in operators' wages.

Federal, state, and local taxes chargeable against the revenues for the year amounted to \$27,841,334. This amount is approximately \$3,000,000 in excess of taxes for 1919.

Interest and dividend payments were \$71,723,682, leaving as surplus earnings \$7,785,486 after meeting all expenses and capital charges. These surplus earnings remain invested in the telephone business, and to that extent interest and dividend payments are made unnecessary on an equivalent amount of new capital.

BALANCE SHEETS

The following are the combined balance sheets of the Bell System in the United States for the years ending December 31, 1919 and 1920:

BELL SYSTEM BALANCE SHEETS, 1919 AND 1920 (DUPLICATIONS EXCLUDED)

ASSETS:	Dec. 31, 1919	Dec. 31, 1920
Telephone Plant.....	\$1,215,944,184	\$1,363,826,327
Supplies, Tools, etc.....	38,035,034	47,442,043
Receivables.....	84,409,519	66,351,159
Cash.....	72,879,842	41,399,285
Stocks and Bonds.....	118,806,351	115,230,719
Total.....	\$1,530,074,930	\$1,634,249,533
LIABILITIES:		
Capital Stock.....	512,121,868	511,493,407
Mortgage Bonds.....	191,163,060	213,571,750
Collateral Trust Bonds.....	165,369,900	164,396,100
Convertible Bonds and Notes.....	63,983,700	80,495,900
Debentures.....	35,686,100	37,330,325
Three- and Five-Year Gold Notes....	90,000,000	90,000,000
Bills Payable.....	1,774,207	10,130,141
Accounts Payable.....	72,158,014	73,429,492
Total Outstanding Obligations...	\$1,132,256,849	\$1,180,847,115
Employees' Benefit Fund.....	9,244,081	9,363,215
Surplus and Reserves.....	388,574,000	444,039,203
Total.....	\$1,530,074,930	\$1,634,249,533

All intangible assets have been excluded in the above balance sheets so that the combined Surplus and Reserves are shown in an amount considerably less than the aggregate of

these items as they appear on the books of the separate companies.

Actual appraisals of the telephone plant of the Bell System which have been made from time to time by rate-making bodies for rate-fixing purposes have clearly demonstrated the conservatism of the book costs. The true value of this property greatly exceeds the book cost.

During 1920 surplus and reserves have increased \$55,465,203.

The capital stock, bonds and notes payable of the Bell System outstanding in the hands of the public at the close of the year 1920 were \$1,107,417,623, while the book cost of the net assets devoted to earning a return on these outstanding securities amounted to over \$1,551,000,000. The surplus and reserves of over \$444,000,000, or more than 27 per cent. of the total assets, have been invested in productive property, and on this amount it is not necessary to pay capital charges.

In April, 1920, the Southwestern Bell Telephone Company sold its Five-Year Seven Per Cent. Convertible Gold Notes of the amount of \$25,000,000 for the purpose of providing funds for new construction required by the growth of its business, and also for the reduction of current indebtedness incurred in the past in developing its property. These notes are convertible at par at the option of the holder into the Seven Per Cent. Cumulative Preferred Stock of that company.

During October, 1920, The Bell Telephone Company of Pennsylvania sold an issue of \$25,000,000 Twenty-five Year First and Refunding Mortgage 7 Per Cent. Sinking Fund Gold Bonds Series A. A part of the proceeds of this issue has been used for the purpose of repaying current indebtedness incurred for construction purposes, and the remainder will be used for new construction and extensions to its telephone plant.

These two issues comprise the only important new financing done by the Bell System during the year.

Financial Statements of the American Telephone and Telegraph Company

EARNINGS

A statement of the earnings and expenses of the American Telephone and Telegraph Company for the year 1920 is shown at the end of this report. To provide a more significant presentation of revenues and expenses for 1920 the form of statement used in former reports has been somewhat modified; also comparative figures for the year 1919 are not shown because of Federal control of a portion of the business of the Company in 1919 and the necessarily different classification of earnings in that year as a result of such control. The usual comparative table of net revenues, dividends, appropriations for contingencies, and additions to surplus account since 1900 is shown.

The financial and statistical statements of the telephone service of the Bell System are shown on page 34 and subsequent pages.

The earnings of the American Telephone and Telegraph Company for 1920 include, in addition to the earnings of the long-distance lines, dividends on the Company's investment in stocks of its associated companies, interest on bonds and notes of and advances to associated companies, interest and dividends from investments in other companies, earnings under the general service contracts with associated and other companies for the furnishing of instruments and services, and other miscellaneous revenues.

The disbursements under the head of Expenses comprise expenses incurred in operating the long-distance lines, conducting the general service organization whereby instruments and services are furnished associated and other companies under contract, taxes, and other items of expense incident to conducting the affairs of the Company. The disbursements of Interest and Dividends represent the charges on the securities issued by this Company mainly to finance the associated companies and the long-distance lines.

The Company, in 1920, after meeting all operating charges and making adequate provision for depreciation and obsolescence, and for Federal taxes payable in 1921,

had available for interest and dividends, \$70,686,904.10. Interest charges were \$18,865,688.44, an increase of \$3,018,-092.18 over similar charges for 1919, while dividends paid to stockholders at the usual rate of \$8.00 per share per year amounted to \$35,376,792.88. Of the resulting balance, there was appropriated for contingencies \$8,000,000, and the remainder, \$8,444,422.78, was carried to the Surplus Account.

The Company and its predecessor have paid dividends to the public at the rate of at least \$7.50 per share each year for the past thirty-nine years; during the past fourteen years the rate has been uniformly \$8.00 per share.

BALANCE SHEET

A comparative balance sheet of this Company for December 31, 1919, and December 31, 1920, is given at the end of this report. During the year investments in stocks of associated companies increased \$33,653,891.90. This increased stock investment represents for the most part merely a change in the form of assets resulting from the sale by the Central Union Telephone Company of its property and the corporate changes in connection with the Southwestern Bell Telephone Company described on page 29 of this report. Investments in bonds and notes of and net advances to associated companies increased \$28,411,910.42. This increased investment represents loans by this Company to the associated companies for the extension of their telephone properties, after deducting the amount of \$15,451,252.63 temporarily invested by this Company for associated companies until required by them.

Investment in stocks of other companies consists of stocks of the Western Electric Company, Inc.; The Bell Telephone Company of Canada; the 195 Broadway Corporation which owns the land and building in which this Company's offices in New York are located, and the 205 Broadway Corporation which owns real estate adjacent thereto; the Atlantic and Pacific Telephone and Telegraph Company, which was referred to at length in last year's report; the Cuban American Telephone and Telegraph Company now constructing telephone cables between Key West and Havana; and the Radio Corporation of America which is referred to on

page 16. During the year investments in the securities of these companies increased \$4,427,868.49.

Special Demand Notes amounting to \$7,587,935 are notes of the Atlantic and Pacific Telephone and Telegraph Company. Investment in these notes decreased \$4,412,065 during the year, due principally to investments held by that company maturing during the year.

The investment in Telephones, representing telephone receivers and transmitters which are furnished by this Company for the use of the associated companies, increased \$2,588,671.67 during the year.

The Company's investment in Real Estate, amounting to \$3,775,407.74, consists of a building in Indianapolis and real estate in New York City, the latter having been acquired in connection with the erection of an additional headquarters office building which is now in course of construction.

The Long Lines Plant increased \$12,957,754.89, representing additions made during the year to the plant of this Company to care for the growth of its long-distance telephone business.

The item of \$737,681.15, Trustees—Employees' Stock Purchase Plans, represents the balance owed this Company on capital stock in the hands of the Trustees for delivery to employees upon completion of their installment payments under the Employees' Stock Purchase Plans.

The item of Accounts Receivable from the United States Government, amounting to \$9,483,715.52, which appeared in last year's report and which represented the balance due this Company for the Bell System on December 31, 1919, as compensation during Federal control, was received in full, with interest, in June, 1920. Concurrently this Company made settlement with the associated companies for all amounts due them in respect of compensation during Federal control.

Accounts Receivable in Suspense, amounting to \$10,227,973.34 in the 1919 report, were paid to this Company during the year out of the proceeds of the sale of the Central Union Telephone Company property. This Company concurrently purchased the securities of the companies which acquired the property of the Central Union Company.

During the year outstanding capital stock increased \$844,200, the additional stock being issued in connection

with the conversion of bonds. The authorized share capital of the Company was also increased from \$500,000,000 to \$750,000,000.

\$829,300 of the convertible 4½ per cent. gold bonds of 1933 were converted into stock during the year at the ratio of \$120 of bonds, or \$100 of bonds and \$20 of cash, for one share of stock. There remained outstanding at the end of the year \$12,198,200 of these bonds out of a total of \$67,000,000 issued in 1913.

The seven-year 6 per cent. convertible gold bonds maturing August 1, 1925, became convertible into stock after August 1, 1920, and \$171,500 of these bonds were converted into stock on the basis of \$100 of bonds and \$6 of cash for one share of stock. Of these bonds, there remained outstanding as of December 31, 1920, a total of \$48,195,700.

The 5 per cent. collateral trust bonds maturing in 1946 were reduced during the year in the amount of \$973,800 by retirements through the sinking fund.

These conversions and retirements reduced the Company's long-term indebtedness by \$1,974,600. All discounts on bonds and note issues are deducted in determining the net surplus as shown in the balance sheet.

Notes of associated and other Bell System companies endorsed by this Company but not included in the balance sheet amounted to only \$1,000 on December 31, 1920, as compared with \$9,303,000 on December 31, 1919.

CAPITAL STOCK

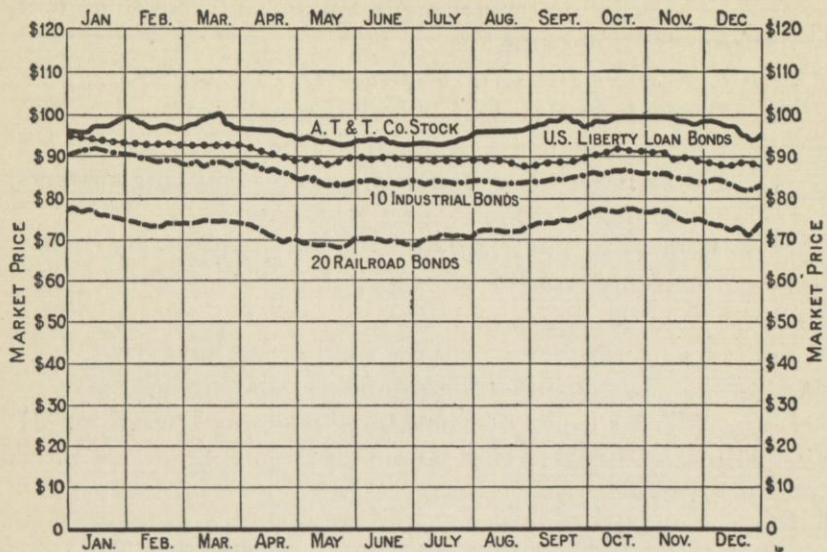
For the \$442,825,400 par value of capital stock \$479,509,637.97 has been paid into the treasury of the Company; the \$36,684,237.97 in excess of par value represents premiums on stock which are included as part of the Company's surplus.

The book cost of the assets underlying the capital stock of the American Telephone and Telegraph Company, including its interest in the assets of its associated companies, amounts to more than \$200 for each share of stock.

The stock of the Company as an investment security may be compared as to market stability with high-grade bonds of railroad and industrial companies, rather than with stocks as shown by the two charts following.

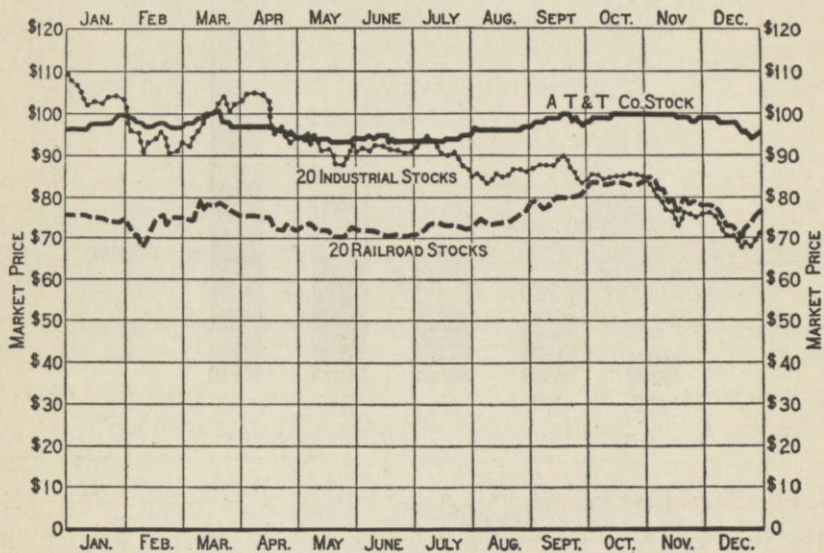
AMERICAN TELEPHONE STOCK COMPARED WITH REPRESENTATIVE BONDS

DAILY MARKET PRICES 1920



AMERICAN TELEPHONE STOCK COMPARED WITH RAILROAD AND INDUSTRIAL STOCKS

DAILY MARKET PRICES 1920



The number of shareholders, not including employees purchasing stock under the plan of easy payments, was 139,448 on December 31, 1920, an increase of 18,988 during the year. That the distribution continues to be more general appears from the following:

130,407 held less than 100 shares each;

8,741 held from 100 to 1,000 shares each;

274 held from 1,000 to 5,000 shares each;

13 held 5,000 shares or more each (omitting brokers, holders in investment trusts, etc.).

Of the holders of less than 100 shares each,

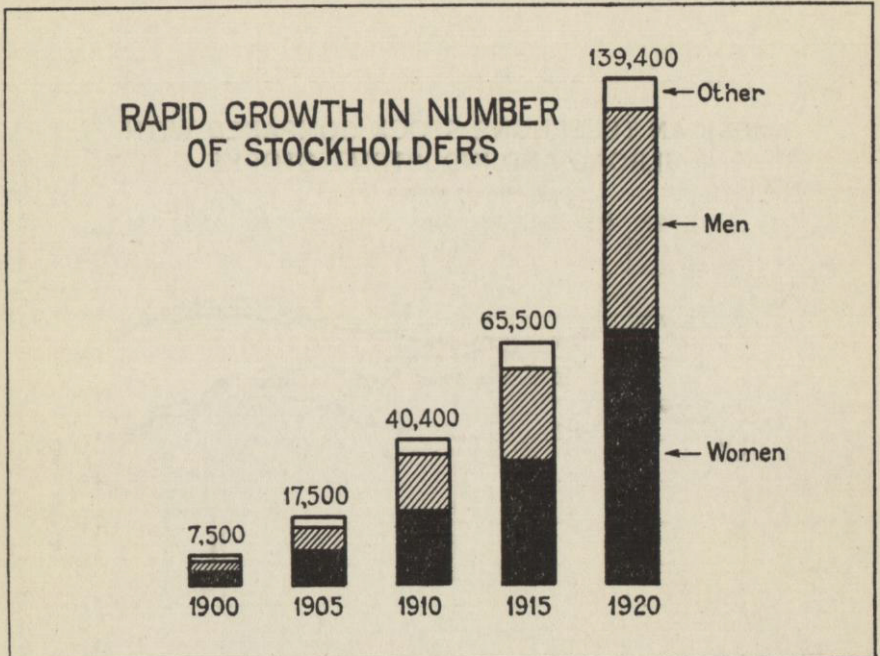
52,055 held 5 shares or less each;

109,080 held 25 shares or less each.

The average number of shares held was thirty-two.

There are more women shareholders than men.

About $3\frac{1}{2}$ per cent. of the stock was, on December 31, in the names of brokers and about 1 per cent. of the stock is held in Europe.



The Second Stock Purchase Plan was made effective early in 1920, by which employees of one year's service or more in the Bell System are aided to become stockholders

of this Company to the extent of a limited number of shares each, for which they are paying out of their wages at the rate of \$3.00 per share per month. Over 43,000 employees in all parts of the country are now paying for shares under this plan.

To the 139,448 stockholders of record, which number includes approximately 23,000 employees who already own stock of this Company, there should be added some 20,000 out of the total of over 43,000 employees who are now paying for stock at the rate of a few dollars per month. Counting these employees, and also those persons whose stock is held for them in investment trusts and the like, there were at least 165,000 actual investors in stock in this Company on December 31, 1920.

Of all American corporations this Company is third in the amount of stock outstanding, but it is first in the number of holders of common stock and has the widest distribution of ownership of any corporation.

The rapid growth in the number of stockholders of record is shown graphically on the preceding page.

The average number of shares held ten years ago was sixty-three; to-day it is thirty-two, or an average holding of \$3,200. These shareholders reside in all parts of the country and their investment has been applied by this Company to the building and extension of telephone plants in every section of the United States.

For the Directors,

H. B. THAYER,

President.

American Telephone and Telegraph Company

Statement of Earnings and Expenses

For the Year 1920

	1920
EARNINGS:	
Dividends.....	\$34,800,465.51
Interest.....	12,969,756.16
Telephone Operating Revenues.....	56,030,624.92
Miscellaneous Revenues.....	146,141.49
Total.....	<u>\$103,946,988.08</u>
EXPENSES.....	
	33,260,083.98
NET EARNINGS.....	
	\$70,686,904.10
Deduct Interest.....	18,865,688.44
Balance.....	<u>\$51,821,215.66</u>
Deduct Dividends.....	35,376,792.88
Balance.....	<u>\$16,444,422.78</u>
Appropriated for Contingencies.....	8,000,000.00
Balance, added to Surplus.....	<u>\$ 8,444,422.78</u>

C. A. HEISS, *Comptroller.*

Annual Earnings and Dividends

Year	Net Revenue	Dividends Paid	Appropriated for Contingencies	Added to Surplus
1900.....	\$5,486,058	\$4,078,601	\$937,258	\$470,199
1901.....	7,398,286	5,050,024	1,377,651	970,611
1902.....	7,835,272	6,584,404	522,247	728,621
1903.....	10,564,665	8,619,151	728,140	1,217,374
1904.....	11,275,702	9,799,118	586,149	890,435
1905.....	13,034,038	9,866,355	1,743,295	1,424,388
1906.....	12,970,937	10,195,233	1,773,737	1,001,967
1907.....	16,269,388	10,943,644	3,500,000	1,825,744
1908.....	18,121,707	12,459,156	3,000,000	2,662,551
1909.....	23,095,389	17,036,276	3,000,000	3,059,113
1910.....	26,855,893	20,776,822	3,000,000	3,079,071
1911.....	27,733,265	22,169,450	2,800,000	2,763,815
1912.....	32,062,945	26,015,588	2,800,000	3,247,357
1913.....	32,920,090	27,454,037	2,500,000	2,966,053
1914.....	32,334,814	27,572,675	2,500,000	2,262,139
1915.....	34,618,638	29,100,591	2,500,000	3,018,047
1916.....	38,013,277	31,122,187	2,500,000	4,391,090
1917.....	38,471,106	32,481,614	2,500,000	3,489,492
1918.....	43,901,322	35,229,699	5,000,000	3,671,623
1919.....	44,395,791	35,356,334	5,000,000	4,039,457
1920.....	51,821,216	35,376,793	8,000,000	8,444,423

C. A. HEISS, *Comptroller.*

American Telephone and Telegraph Company

Balance Sheet, December 31, 1919 and 1920

ASSETS

	Dec. 31, 1919	Dec. 31, 1920
Stocks of Associated Companies.....	\$490,792,063.02	\$524,445,954.92
Bonds and Notes of and Net Advances to Associated Companies.....	162,137,133.88	190,549,044.30
Stocks of Other Companies.....	53,562,188.73	57,990,057.22
Special Demand Notes.....	12,000,000.00	7,587,935.00
Telephones.....	21,287,848.93	23,876,520.60
Real Estate.....	3,138,119.01	3,775,407.74
Office Furniture and Fixtures.....	336,521.50	435,492.48
Long Lines Plant.....	82,178,606.58	95,136,361.47
Trustees—Employees' Stock Purchase Plans.....	8,812,799.03	737,681.15
Current Accounts Receivable:		
Due from United States Govern- ment Account Compensation....	9,483,715.52
Other Current Accounts Receivable.	8,737,763.55	8,697,431.03
Accounts Receivable in Suspense.....	10,227,973.34
Temporary Cash Investments.....	36,574,185.40
Cash and Deposits.....	27,512,170.11	26,636,360.24
	<u>\$926,781,088.60</u>	<u>\$939,868,246.15</u>

LIABILITIES

	Dec. 31, 1919	Dec. 31, 1920
Capital Stock.....	\$441,981,200.00	\$442,825,400.00
4% Collateral Trust Bonds, 1929.....	78,000,000.00	78,000,000.00
5% Collateral Trust Bonds, 1946.....	77,434,900.00	76,461,100.00
5% Western T. and T. Co. Bonds, 1932	9,985,000.00	9,985,000.00
4% Convertible Bonds, 1936.....	2,589,000.00	2,589,000.00
4½% Convertible Bonds, 1933.....	13,027,500.00	12,198,200.00
6% Convertible Bonds, 1925.....	48,367,200.00	48,195,700.00
6% 3-Year Gold Notes, 1922.....	50,000,000.00	50,000,000.00
6% 5-Year Gold Notes, 1924.....	40,000,000.00	40,000,000.00
Dividend Payable January 15th.....	8,839,612.00	8,852,072.00
Interest and Taxes Accrued not Due..	6,408,390.08	6,773,978.36
Current Accounts Payable:		
Compensation Due Associated Com- panies from United States Gov- ernment.....	7,858,620.83
Other Current Accounts Payable..	6,363,800.72	7,422,682.29
Employees' Benefit Fund.....	2,000,000.00	2,000,000.00
Reserve for Depreciation and Con- tingencies.....	47,262,123.43	57,915,152.06
Surplus (Including Capital Stock Pre- miums and excluding Debt Discount and Expense).....	86,663,741.54	96,649,961.44
	<u>\$926,781,088.60</u>	<u>\$939,868,246.15</u>

C. A. HEISS, *Comptroller.*

WILLIAM J. LYBRAND, C.P.P.A. N.Y.
T. EDWARD ROSS, C.P.A. PA.
ADAM A. ROSS, C.P.A. PA.
ROBERT H. MONTGOMERY, C.P.A. N.Y.
JOSEPH M. PUGH, C.P.A. PA.
WALTER A. STAUB, C.P.A. PA.
H. H. DUMBRILLE, C.P.A. CONN.
JOHN HOOD, JR., C.P.A. PA.
WALTER S. GEE, C.P.A. PA.
HOMER N. SWEET, C.P.A. MASS.
T. B. G. HENDERSON, C.A.

LYBRAND, ROSS BROS. & MONTGOMERY
ACCOUNTANTS AND AUDITORS
MEMBERS OF AMERICAN INSTITUTE OF ACCOUNTANTS
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LOS ANGELES
SEATTLE
KANSAS CITY
DALLAS
NEW ORLEANS
LONDON, ENGLAND

February 17, 1921.

MR. GEORGE B. HARRIS,
MR. WILLIAM J. LADD,

*Stockholders' Committee
American Telephone and Telegraph Company*

DEAR SIRs:

We have audited the accounts of the
AMERICAN TELEPHONE AND TELEGRAPH COMPANY
and of the Atlantic and Pacific Telephone and Telegraph Company for the year ended December 31, 1920, and we have reviewed the statements as at that date of the companies whose capital stocks are carried in the accompanying balance sheet at \$582,436,012.14.

The income, comprising dividends from investments in controlled and other companies, interest, earnings from telephone traffic and from other sources, aggregated, after deducting interest paid, the sum of \$51,821,215.66 for the year. This company's proportion of the combined earnings for the year of the companies whose securities are carried in the balance sheet was approximately \$9,000,000 less than the dividends received from those companies; but in all cases the surplus accounts created out of accumulated undistributed earnings were much more than sufficient to cover such dividends.

The balance sheet of the American Telephone and Telegraph Company as published herewith is in accordance with the books and in our opinion sets forth correctly its financial condition as at December 31, 1920.

Very truly yours,

LYBRAND, ROSS BROS. & MONTGOMERY,
Accountants and Auditors.