The BELL TELEPHONE SYSTEM

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by

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FOREWORD

IT HAS been the philosophy of the management of the Bell System for a long time that as it conducted a public business it should tell the public about its conduct. It has endeavored to do this by official reports, public statements, pamphlets, advertisements, movies, by opening the central offices to public inspection, and in many other ways. This book is an addition to what has been done before. There is little in it which is not available in some form or other elsewhere, but bringing it together may be a convenience to those who are interested.

As the time which the author owes the American Telephone and Telegraph Company is not limited, the book is written on company time, and such royalties as may come from its sale will go to the Company.

The figures in the book have been checked by the various departments of the Company having knowledge of them. The book represents in general the Bell System's policies and practices. But it is not official in the sense that it has been approved by the heads of all departments of the Company or the Board of Directors. And, of course, the opinions in it are the author's. I do not think that they are far different from those of my associates, but I am sure that no two of us would either think exactly alike or express our opinions in the same way.

The book is not an attempt to be an exhaustive study of the Bell System, but is primarily an effort to give anyone interested some insight into its philosophy and practices and something of its problems and achievements.

New York, March 30, 1941

BELL SYSTEM PROGRESS, 1925–1940
A Brief Summary of Policy and Performance

BELL SYSTEM POLICY

To furnish the best possible telephone service at the lowest cost consistent with financial safety.

BENEFITS TO PUBLIC

More and Better Telephone Instrumentalities

The investment in telephone plant and equipment increased from $2,300,000,000 at the beginning of 1925 to $4,750,000,000 at the end of 1940. This increased investment reflects not only the addition of telephone facilities to serve the public, but the transformation of physical instrumentalities, as a result of systematic research, into improved forms more efficient, more dependable, and more convenient to use.

Extension of Service

At the end of 1940, 21,860,000 telephones in the United States could be interconnected, an increase of 6,100,000 over the number at the beginning of 1925. Telephone communication, confined to this continent in 1925, has become world-wide in its scope. New auxiliary services, such as teletypewriter service, have been introduced.

Reduction of Rates

During the ten years ended in 1940, there were decreases in telephone rates aggregating a saving of more than $300,000,000 to telephone users.

Improvement in Quality of Service

Since 1925 there have been outstanding improvements in the speed, accuracy and clarity of telephone communication, in the reduction of equipment troubles and in all business relationships with customers, to the end that the best technical service will be given in the most satisfactory and pleasing manner.

Tax Payments

Taxes in 1940 took 15.7% of each dollar of telephone revenue, as compared with 7.9% in 1925. A total of $1,637,000,000 of taxes have been paid into public treasuries during the period.

BELL SYSTEM PROGRESS 1925–1940
(Continued)

BENEFITS TO EMPLOYEES

HIGHER WAGES	Wages of Bell System employees have risen substantially. As a result of all factors affecting employees' earnings, the average weekly pay envelope contained 40% more money in 1940 than in 1925.
SHORTER HOURS	In 1925, hours of work averaged about 45 per week. In 1940, the work week was 40 hours or less.
BETTER WORKING CONDITIONS	Improvements in methods, tools and working quarters have contributed to better and safer working conditions.
SECURITY	The provisions of the plans for employees' benefits and pensions have been liberalized and strengthened. Payments under these plans increased from $5,100,000 in 1925 to $16,000,000 in 1940. Force turnover, both involuntary and voluntary, has been reduced and programs designed to promote stability of employment have been amplified.

BENEFITS TO INVESTORS

STRONGER FINANCIAL STRUCTURE	The financial structure of the Bell System has been strengthened. The ratio of debt to total capital obligations has been reduced from 36% at the beginning of 1925 to 32% at the end of 1940. Interest charges on debt were lower in amount in 1940 than in 1925.
REGULAR DIVIDENDS	Reasonable regular dividends have been paid on A.T. & T.Co. stock at a constant amount per share. These dividends have averaged 6.5% on the stockholders' investment, including surplus, over the period.
SECURITY	The property has been fully maintained and adequate provision made for depreciation. The financial integrity of the Bell System stands unimpaired.

Chapter I

THE MAKE-UP OF THE BELL SYSTEM

THE United States is a big country and big companies have grown up to serve its needs. They are a natural result in a big country with a single currency, good transportation and communication and no trade barriers. The economies and efficiencies which come with such a national market have been achieved by industrial enterprises in large enough units to serve such a market.

In other words, the very fundamentals of our political structure seem adapted for the particular purpose of encouraging large scale enterprise. This structure has, in fact, facilitated such enterprise, and the country has had the benefits.

Nevertheless, the public is not at any time altogether satisfied with big business, and from time to time is seriously dissatisfied with it. Sometimes it is dissatisfied with one aspect, sometimes with another. Sometimes the criticism is against individual companies, sometimes against large enterprise in general.

This is not surprising, for history is full of examples of organizations built up to serve mankind and getting large enough and powerful enough to breed fear or envy in the individual. Through most of history, mankind has struggled to free itself from the too great power of government, and it has at times also feared the organization of business and of the church. It is just as natural for the public to look with a critical eye upon the power of business organizations as it

is for it to look critically at the power of government or any other agency that serves the individual.

This attitude of the public is not new. It is about as old as history. It is not confined to business. It affects all concentration of power and responsibility. Being a human reaction, it cannot have a static or final solution. It can be handled to the greater or lesser benefit of business and the public together, according to the amount of wisdom, understanding and responsibility applied to it.

What, then, should be the relationship between a large business enterprise and the public in the United States today? What are the responsibilities of big business? How can it best serve the public? What are its functions in a nation such as the United States? There are probably almost as many answers to these questions as there are big corporations, for history and circumstance give each corporation particular responsibilities of adjustment to the public.

This book is an attempt to show how one big business has endeavored to answer these questions.

In discussing the Bell System's endeavors to adjust itself to and serve an ever changing American democracy, there seems little reason to go back into early telephone history, for the conditions of telephony were very different then and probably the same could be said of the public state of mind. The present general relationship of the Bell System to the public has been much the same for twenty years. In the early 1920's the competitive era in telephony was largely over —that is, by that time most cities and towns in the United States had ceased to have two competing telephone companies, with all the inconvenience to the public that such dual service caused. In 1921 the Graham Act was passed by Congress; this, in effect, exempted telephony from the Sherman Anti-Trust Act as far as consolidation of competing companies was concerned. By that time the public had

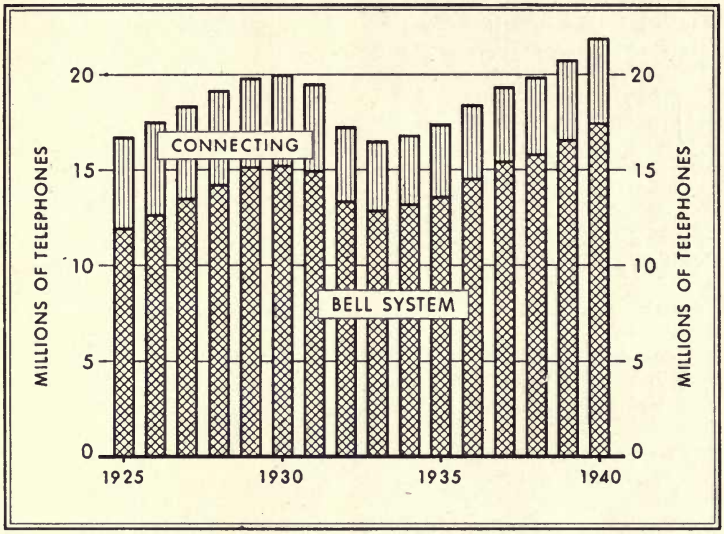
decided to have one telephone service—a monopoly in each area.

As the public became convinced that competition in telephony was against the public interest, it felt the need of some other control of prices and service to take the place of that which competition was supposed to have afforded. By 1919, 45 states and the District of Columbia had commissions whose duties included the regulation of telephone rates and service. Interstate telephone traffic was already under the jurisdiction of the Interstate Commerce Commission. The public had also given the Bell System one other indication of the conditions under which it expected the System to function. In 1913 the United States Attorney General reached an agreement with the American Telephone and Telegraph Company, parent company of the Bell System, by which the Company gave up what amounted to control of the Western Union Telegraph Company. In layman's language that means that while the public by the Graham Act indicated a willingness to have telephony itself a monopoly, it wants, up to now at any rate, the telephone and the telegraph services to be separate.

By the time these conditions for the conduct of the telephone business were crystallized by the public, the Bell System had come to have much the same organization as at present. Within the System are seventeen regional operating organizations which give service in every state in the union. These organizations do not furnish all the telephone service in the country. There are about 6,400 telephone companies outside the Bell System. These 6,400 companies and more than 60,000 rural or farmer lines connecting directly or indirectly with the Bell System own about 20 per cent of the telephones in the country. The seventeen Bell operating organizations manage the rest.

Besides these operating organizations there is in the Bell

System the largest industrial laboratory in the world, devoted to research in the communication field, and the Western Electric Company, which manufactures equipment and purchases supplies for the operating companies.



BELL SYSTEM AND CONNECTING TELEPHONES
IN THE UNITED STATES

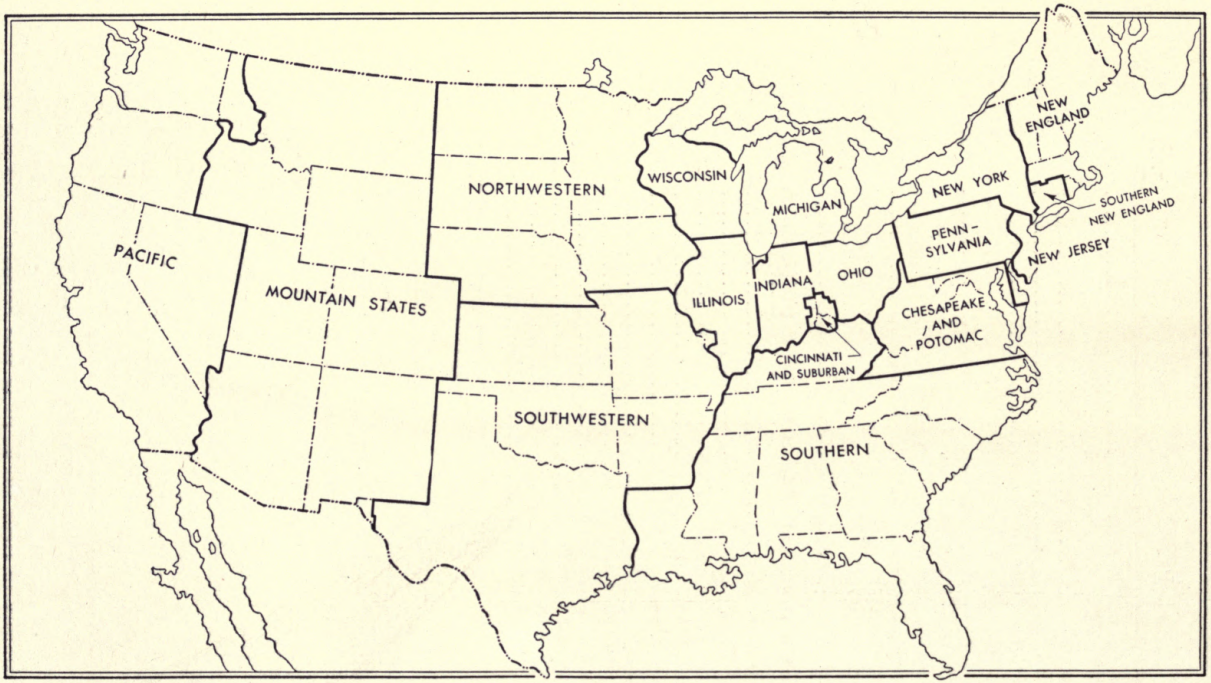
Number of telephones owned and operated by the Bell System and by the 6,400 other telephone companies and more than 60,000 rural or farmer lines which connect with the Bell System to make a national service.

The American Telephone and Telegraph Company coordinates the whole enterprise in five ways: (1) by stock ownership in the operating companies, (2) by functioning as a general staff for the operating companies, (3) by furnishing interstate service over its long lines between the different operating companies, (4) by ownership of the Western Electric Company, which manufactures and furnishes apparatus to the operating companies, and (5) by ownership in conjunction with the Western Electric Company of the

Name of Company	Telephones Jan. 1, 1941
New England Tel. and Tel. Co.	1,294,557
The Southern New England Tel. Co.	383,338
New York Tel. Co.	2,710,161
New Jersey Bell Tel. Co.	773,097
The Bell Tel. Co. of Pennsylvania	1,357,055
The Diamond State Tel. Co.	51,593
The Chesapeake and Potomac Tel. Co.	275,326
The Chesapeake and Potomac Tel. Co. of Baltimore City	303,976
The Chesapeake and Potomac Tel. Co. of Virginia	235,064
The Chesapeake and Potomac Tel. Co. of West Virginia	149,310
Southern Bell Tel. and Tel. Co.	1,350,927
Christian-Todd Tel. Co.	5,343
The Cincinnati and Suburban Bell Tel. Co.	198,862
The Ohio Bell Tel. Co.	827,157
Michigan Bell Tel. Co.	820,088
Indiana Bell Tel. Co.	259,008
Wisconsin Tel. Co.	393,753
Illinois Bell Tel. Co.	1,549,539
Northwestern Bell Tel. Co.	717,604
The Tri-State Tel. and Tel. Co.	145,521
Dakota Central Tel. Co.	32,336
Southwestern Bell Tel. Co.	1,628,208
The Mountain States Tel. and Tel. Co.	544,916
The Pacific Tel. and Tel. Co.	1,254,064
Bell Tel. Co. of Nevada	15,118
Southern California Tel. Co.	790,235

THE PRINCIPAL OPERATING TELEPHONE COMPANIES OF THE BELL SYSTEM

The Bell Telephone Company of Pennsylvania and the Diamond State Telephone Company (of Delaware) are separate companies with the same chief officers, both owned by the American Telephone and Telegraph Company. The same is true of the four Chesapeake and Potomac Companies. The Southern Bell Telephone and Telegraph Company owns the Christian-Todd Telephone Company. The Northwestern Bell Telephone Company owns and manages the Tri-State Telephone and Telegraph Company and the Dakota Central Telephone Company. The Pacific Telephone and Telegraph Company owns and manages the Bell Telephone Company of Nevada and the Southern California Telephone Company. The Southern New England Telephone Company and the Cincinnati and Suburban Bell Telephone Company are both operated as integral parts of the Bell System, but because the American Telephone and Telegraph Company does not own a majority of their stock, these two companies are not included in Bell System statements which consolidate the accounts and statistics of the American Company and its principal telephone subsidiaries.



THE OPERATING DIVISIONS OF THE BELL SYSTEM

The territories of the seventeen operating organizations are shown in the map above. The long distance lines of the American Telephone and Telegraph Company interconnect these territories and thus cover the country with a long distance network. Within the territories shown on the map are also some 6,400 telephone companies and more than 60,000 rural or farmer lines which are not owned or operated by the Bell System, but which connect with it to furnish a national service.

Bell Telephone Laboratories, which does the research for the improvement of telephone plant and operations.

The seventeen operating organizations function within the areas shown on the map on page 6, and the table on page 5 gives the corporate names of the companies and the number of telephones which each operates. To people in the business, these seventeen organizations and the Long Lines Department of the A. T. and T. Company are the operating units of the Bell System. However, for the statistically minded or those who are interested in the names and numbers of corporations, it is fair to point out several technical matters. In the first place, many state laws make it necessary as a practical matter to have property in the state owned by a corporation chartered by that state. Consequently, the Long Lines properties of the American Telephone and Telegraph Company are owned by separate state corporations in many states, which corporations are also owned by the A. T. and T. Company. Added to these are a few companies, such as the Tri-State Telephone and Telegraph Company and the Christian-Todd Telephone Company, which, because of particular circumstances in each case, have not yet been consolidated with their controlling companies. The four Chesapeake and Potomac companies have the same top officers and this arrangement holds in several other cases. And perhaps it should be noted that the American Telephone and Telegraph Company owns less than a majority of the voting securities of the Southern New England and the Cincinnati and Suburban Bell Companies and that these two companies are not included in Bell System statements which consolidate the accounts and statistics of the A. T. & T. Company and its principal telephone subsidiaries.

However, this situation does not change the fact that there are seventeen operating groups, plus the Long Lines organization of the A. T. and T. Company, which run the service of the Bell System with the advice and assistance of the

general staff of the A. T. and T. Company. Their equipment is largely supplied by the Western Electric Company and its quality is constantly improved by the research of the Bell Laboratories. Since the inclusion or exclusion of certain of the smaller financially affiliated telephone companies has no significant effect upon overall statistics relating to the Bell System, the data and charts used throughout this book relate to the American Telephone and Telegraph Company and its principal telephone subsidiaries as consolidated in the current Annual Reports of the Company to its stockholders and other System publications. Although the companies consolidated in these publications are not in all cases identical with the organizations listed in the foregoing table and map, this practice thus avoids any confusion which might arise from the use of statistics differing slightly, though unimportantly, from those which may be found in such other sources.

The Bell System, being about four-fifths of the telephone industry in the United States, is a large enterprise. At the end of 1940, including the Western Electric Company and the Laboratories, it employed about 322,000 people. That is about as many as are employed by General Motors and Chrysler combined, more than twice as many as are in the half-dozen largest American oil companies, more than are engaged in producing and distributing electric power, and nearly a third as many as work on the country's railroads.

The assets of the Bell System are over five and a half billion dollars—about three times those of General Motors or the United States Steel Corporation. The total yearly income is a little more than a fifth of the assets. By the nature of the telephone business, the money invested is turned over very slowly. While the Bell System's annual gross income is about a fifth of its assets, there are many businesses—and large ones—which do an annual business several times their

invested capital. In other words, they turn their money over ten or fifteen times as fast.

The Bell System is then a "big business" with, however, a simple set-up. A natural process of evolution has brought forth the present operating companies in their respective territories. The American Bell Telephone Company, the predecessor of the American Telephone and Telegraph Company, owned the original Bell patents. Companies locally organized throughout the country were licensed by the American Bell Company to rent its telephones to their local subscribers. Thus, the American Telephone and Telegraph Company through its predecessor first acquired its present function of owning the operating companies because of ownership of the Bell patents. However, this ownership has been retained since the early days much more because of the necessity of financing the expanding operations of these companies and at the same time discovering and introducing improvements in the art of telephony to assure the best and cheapest universal service. The Western Electric was bought by the A. T. and T. Company because it was the best manufacturer of telephone apparatus and a good and dependable source of supply was essential to the business. The Bell Laboratories grew out of the shop where Thomas A. Wat son made Alexander Graham Bell's first telephone.

The Bell System has, therefore, grown naturally into its present form of an integrated business furnishing service to the public under general rules and conditions fairly clearly laid out by the public.

The System as now organized, and these general rules laid down by the public, have been pretty much the same for more than twenty years, but there are two reasons for confining to a shorter period this study of how the System meets its responsibilities to the public. The first is that the men and materials which the Bell System furnished to the American Expeditionary Forces in 1917 and 1918

curtailed its ability to serve the public at home, so that for several years after the war the main task of the System was to re-create good and adequate service. The second reason is that the present management of the business came in in January, 1925. Policies did not fundamentally or suddenly change with the new management, but the sixteen years, 1925-1940 inclusive, are a better basis for discussion of the policies and practices of the present management than the years before it came into office could be.

Chapter II

BELL SYSTEM POLICIES

IN THE year 1927, after a comparatively short period as President of the A. T. and T. Company, Mr. Walter S. Gifford went to Dallas, Texas, to the meeting of the National Association of Railroad and Utilities Commissioners. The state commissions represented at this meeting had among other duties the duty to see that telephone rates within their respective states were just and reasonable. The Interstate Commerce Commission, also represented at the meeting, had the same duty toward interstate rates. It seemed, therefore, most appropriate for the Bell System to outline to this body what it believed its fundamental relationship toward the public should be. This is what Mr. Gifford did on October 20, 1927 in the following words:

> Broadly considered, you as Public Utility Commissioners and we in the telephone business, are engaged in a common enterprise; our success must depend upon mutual confidence and understanding. In the current performance of our daily tasks it is possible to lose sight of the ultimate aim and goal of our endeavors. With the thought in mind that it may prove helpful, I wish to state very briefly the principles that guide the management of the Bell System.
>
> There are today over 420,000 stockholders of the American Telephone and Telegraph Company and no one of them owns as much as one per cent of the capital stock. The business of this Company and its Associated Bell Telephone Companies, whose common stock is largely owned by this Company, is to furnish telephone service to the nation. This business is from its very nature carried on without competition in the usual sense.

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

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

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

The margin of safety in earnings is only a small percentage of the rate charged for service, but that we may carry out our ideals and aims it is essential that this margin be kept adequate. Cutting it too close can only result in the long run in deterioration of service while the temporary financial benefit to the telephone user would be practically negligible.

Our policy and purpose are the same as yours—the most telephone service and the best, at the least cost to the public. Without overlooking the fact that we lack the big money incentive for maximum profits and the drive for improvement that results from

active and strong competition, we believe the telephone company is organized to make continuous and effective progress. . . .

Undoubtedly a very great factor in the continued progress and improvement of telephone service is the intangible but quite real spirit of service that has become a tradition in the telephone business, but the results of the Bell telephone business have a broader foundation. . . . It is fundamental in our plan of organization to have at headquarters and in our laboratories several thousand people whose sole job it is to work for improvement. They are engaged in studying what is used in the telephone business and how it is used and endeavor to find a better thing or a better way. Of course, the people who are engaged day by day in trying to maintain a high standard of telephone service are doing their part, and a most important part, in increasing the quality and keeping down the cost of service, but progress is assured by having a large group of scientists and experts devoted exclusively to seeking ways and means of making the service better and cheaper.

It is now nearly 20 years since the State Commissions generally took over the duties of regulating the telephone companies. During those 20 years the physical results of your regulation and our operation are impressive. In 1907 there were about 6,000,000 telephones in the United States but they were only partially interconnected, while today there are over 18,000,000 telephones in the United States so interconnected that it is possible for practically any one of the 18,000,000 to be connected with reasonable promptness with any other one of the 18,000,000. Thus, today, practically any one anywhere can talk by telephone with any one else, anywhere else in the country. Moreover, any one in the United States can now converse by telephone with any one in Great Britain, Canada, Cuba and the principal cities of Mexico. This is real progress in extent and facility of communication, but we realize we are still far from our ultimate goal.

With your sympathetic understanding we shall continue to go forward, providing a telephone service for the nation more and more free from imperfections, errors or delays, and always at a cost as low as is consistent with financial safety.

There were several unusual things about this speech. In the first place, I think it was at that time, and perhaps is still, one of the few instances in which a "big business" publicly stated the bases on which it hoped to serve the

public. In the second place, the procedure was so uncommon that the press of the country and the general public missed its significance. Even the financial world, which usually is quickly conscious of the policies of all large companies, did not grasp the meaning of this statement.

The policy outlined committed the Bell System to furnish the best telephone service that it could, to render that service as economically as possible, and to limit its charges to an amount sufficient to keep the company financially healthy—that is, enough to attract new capital to insure the company's ability to give the increasing service the public needs. The laws of most of the states provide that rates are to be just and reasonable. The Federal Constitution provides that rates cannot be confiscatory; in other words, they cannot be so low that capital is deprived of a reasonable return and is, therefore, in effect confiscated. The Bell System policy is that the rates shall be sufficient to operate the business adequately in the long run. That amount must, of course, be higher than the confiscation level. It might well be that just and reasonable rates would be higher than the rates of the Bell System. The method of keeping Bell System rates at the proper level in the long run is further described in the statement—"earnings in excess of these requirements (i.e., to run the business adequately) must either be spent for the enlargement and improvement of the service or the rates charged for the service must be reduced." There are to be no extra dividends or "melons."

This is a pretty specific overall definition of what the Bell System thinks it is reasonable and proper to charge the public for the best service it can give. Moreover, this definition was given when rates held to be just and reasonable by the several commissions were temporarily sufficient to allow the A. T. and T. Company to raise its dividends if it had wished to do so. This situation had led many people in the financial community to voice their expectation that the Com-

pany would increase the dividend and try to cover up the process by splitting the stock, or that it would vote some kind of extra dividend. But nothing of the sort happened. The policy of the Company made it plain—to those who would believe—that earnings beyond the normal necessities of the business would either go into the plant to render more or better service, or else the rates would be reduced. The action of the Bell System in keeping the dividend at the usual level showed that its stated policy was a governing factor in regulating the price asked the public for service.

However, the results of the announcement of the policy were, to begin with, more important inside the Company than outside. The phrase "best possible service" became the basis of an accentuated attention to improving the service. That became more than ever the first duty of management.

Another important result flowed from the announcement of the policy. That was a significant increase in the information given employees about the business. The policy statement was distributed generally to the employees and its implications as applied to their jobs were discussed. This stimulated a system of education designed to give all employees a better understanding of the business and therefore more capacity to do their parts well. This was an essential part of a process of decentralization in operating the business which, while maintaining direction at the top, aimed to give everybody enough background to enable them to use their brains and initiative.

There was in the statement another important element which applied to both rates and service and to the conduct of the business in general. The statement said, "This policy is bound to succeed in the long run and there is no justification for acting otherwise than for the long run." This means that operations are based on an orderly process of achieving long-term efficiency and economy, without interruption by

efforts to make particular showings in this, that or the other six-month period. If expenses in one year will bear fruit two years later, they are made regardless of the effect on the first year. The mental conception of "the long run" is essential to the most effective and economical operation. But along with the mental conception, as the policy points out, adequate financial strength is also necessary. Nothing reduces economy and efficiency more than stop-gap decisions based, not upon the long-run needs of a business, but upon lack of available cash to do what should be done.

The policy of the Bell System as announced at Dallas gave the public an assurance of the System's intention to provide the best possible service, an indication of the philosophy of the management toward this end, and some of the methods for achieving it. It also explained to the public the basic considerations which the System believed should govern the charges for the service.

Besides the general public, there are two other groups particularly interested in Bell System policy—the stockholders and the employees.

The statement at Dallas said, "The fact that the ownership (of the Bell System) is so widespread and diffused imposes an unusual obligation on the management to see to it that the savings of these hundreds of thousands of people are secure and remain so."

At first sight, a policy which voluntarily limits the amount of dividends to be paid the owners of the business might seem adverse to their interest, but actually "in the long run" that would not be true. Capital is due a reasonable return in the long run. If it gets too much at one time, the public will insist on too little at another, so that in the end the stockholder will receive no more. On the contrary, both the stockholder and the public will probably do worse because the unsettling effect of ups and downs would interfere with the orderly conduct and efficiency of the business.

The general policy toward the employees is perhaps best stated in a paragraph from the annual report for 1929—

> While the Bell System seeks to furnish the public the best possible service at the least cost, the policy which recognizes this obligation to the public recognizes equally its responsibilities to its employees. It is and has been the aim to pay salaries and wages in all respects adequate and just and to make sure that individual merit is discovered and recognized.

These policies, while general in statement, have the same influence as the beliefs or creeds or platforms of other organizations in providing a common faith, a common objective and a cohesion and unity immensely valuable in any enterprise requiring the effective cooperation of many men and women.

Chapter III

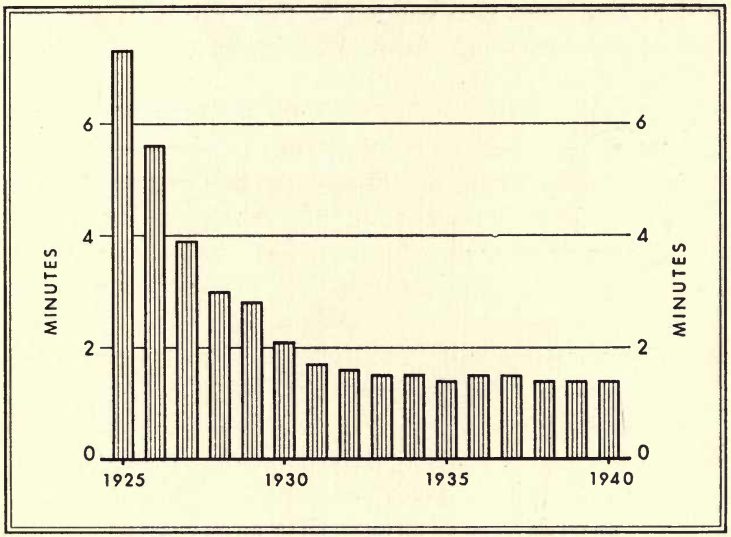
GOOD SERVICE

IF YOU should go to any office of the Bell System and talk to the operating people, they would tell you that good service ranks first of all requirements. It ranks above profits. This seems to imply that the Bell System goes contrary to the fairly common idea that the first duty of the management is to make money for the stockholders—all the money it can. As a matter of fact there is no real conflict between service and profits if the business is conducted for the long run. For a short time it might be possible to neglect service and increase profits. But certainly in the telephone business —and I suspect in most others—over any reasonable period you are not likely to make a good profit on a bad service.

Over any considerable time the best possible service is likewise the best possible protection of the stockholders' investment and income. It is and has been the belief of the management of the Bell System that its first duty is to provide the public with good service. The word "good" in this connection is an all-embracing word, but for the moment it may be easier to confine it to some of the technical aspects of the business. Good technical service requires apparatus and operating forces that will allow anyone anywhere to pick up a telephone and talk to anyone else anywhere else, clearly, quickly and at a reasonable cost. That ambition was stated in those words in the annual report for 1926, and was present for all the period which we are examining.

There is a phrase current in the Bell System that the

only good service is an ever-improving service. As a test of the way this theory has been applied, let us glance at some of the records of the business.

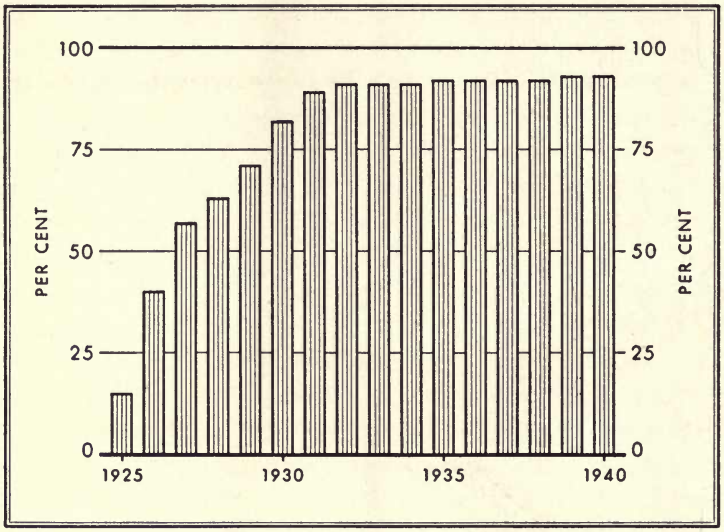


AN IMPROVING SERVICE

Showing, for the Bell System, the average number of minutes required to establish a long distance connection.

In 1925 when a new customer asked for a telephone, the average time that elapsed before he got it was nearly five days. During that time a good many things happened in different parts of the telephone company. A pair of wires was selected running out to the customer's house and a telephone number assigned. In the central office, the wires were connected with this number on the switchboard. The name, address and number were sent to the information operators of the exchange, and the operators who answer misdirected calls to unused numbers were also informed that this number would now represent a working line. Similar information

went to the telephone directory division for the next edition. Repair service forces set up a card record for instant reference in case there should be any trouble with the service, and the customer's name and a description of the type of service sold to him were also entered in the records of the commercial and accounting offices. All this was in addition to the



THE NO-HANG-UP LONG DISTANCE SERVICE

Showing, for the Bell System, the percentage of long distance calls handled while the customer remains at the telephone.

visit of the installer to the customer's home to install or connect the telephone there.

Between 1925 and 1929 the time for these operations was cut down by two days. Meanwhile it began to appear that there was another way to meet the customer's convenience; the companies began making specific appointments for the installation of telephones, so that the customer would know just when to expect the installer to call and could more conveniently arrange to be there to let him in and show

him where to locate the telephone. By 1934, 95 per cent of the orders for telephone service were handled on an appointment basis and 98 per cent of the appointments were met by the telephone companies.

Paralleling this progress, the average time for doing all the installation work was gradually cut down so that in 1934 it required only about two days on the average and in 1937 only a day and a half. If a customer orders a telephone today, he can usually have it tomorrow if he wishes. In a good many cases, in fact, he can have it the same day.

There has been a marked improvement in the reliability of telephone service in the last sixteen years. In 1925 the average telephone, which with its connecting wires and switchboards is a very delicate mechanism, needed some repair or attention, large or small, once every thirteen and a half months. Today it goes more than twice as long without trouble. In fact it is in working order more than 99.98 per cent of the time. In the same period the number of errors in telephone directories decreased from an average of about thirty errors per 10,000 names to less than six. The frequency of operators' errors on the manual exchange switchboards decreased fifty per cent to the present low frequency of seven errors in a thousand calls.

At the beginning of 1925, about 9 per cent of the telephones in the Bell System were dial telephones. At the end of 1940, about 60 per cent were dial. Customers who have dial service are generally appreciative of its speed and accuracy. Equally important is its dependability, because it is instantly capable of handling a full load of calls at any hour of the day or night. A sudden, unexpected demand for service at a time when there are normally few calls can be met without difficulty. Like any mechanism the dial equipment works imperfectly once in a while, but in the last sixteen years the small percentage of calls which go wrong for this reason has been almost cut in half.

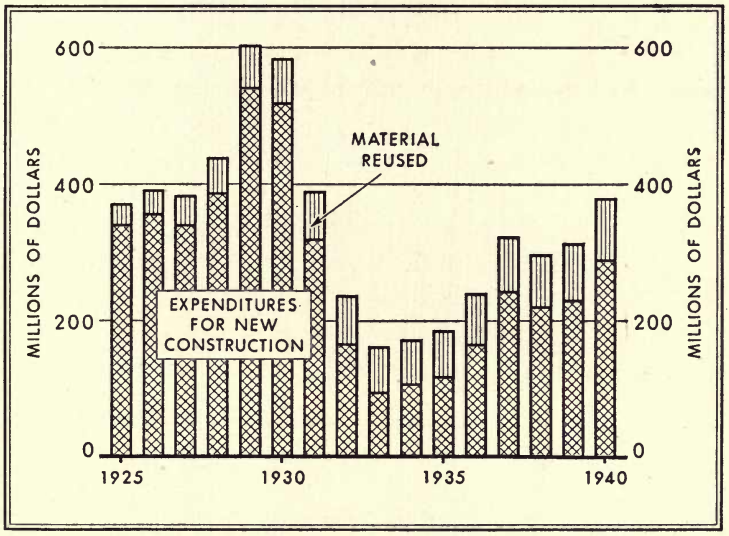
Perhaps the most important improvement in telephone service in those sixteen years is in transmission, that is, in "hearability," if one may use such a term. Sixteen years ago, to make yourself understood on the average local call, you would have to talk over the telephone about as you would talk face to face with someone about 20 feet away from you in a quiet open field. Now you get the same result if you talk as though he were not more than 10 feet away. This large improvement has come gradually, as if the other person had moved slowly toward you during the years. For that reason, while the improvement has been of the greatest importance, there has been no particular moment when it was very noticeable. On long distance calls, the improvement in average transmission has been even greater. It has been so marked, in fact, that it has been easily appreciated by the public.

The same kind of constant scrutiny which produced these improvements has been applied to every aspect of the business.

Billing service to customers, for example, has been constantly improved through the development of more efficient methods and the study and application of modern billing machines and other mechanical office equipment.

There is another way to make an estimate of the degree to which the Bell System has succeeded in its obligation to give the public good telephone service. That is by looking at the overall extent of what it has done to improve the plant through which this service is rendered. Wires, cables and switchboards do not render service by themselves. People—employees—use the plant to render service, and the organization, training, and performance of the people are the most important elements in the conduct of any business. But reserving discussion of that to a later chapter, we can take the plant improvements of the last sixteen years as one measure of the effort to render an improved service. In spite

of the fact that half of the period in question has been subnormal from a general business standpoint, three-quarters of the present plant—buildings, pole lines, cables, switchboards, telephones and the thousands of things to go with them—is new within these sixteen years. It is not only new, but different and better. I think it is true that there is hardly



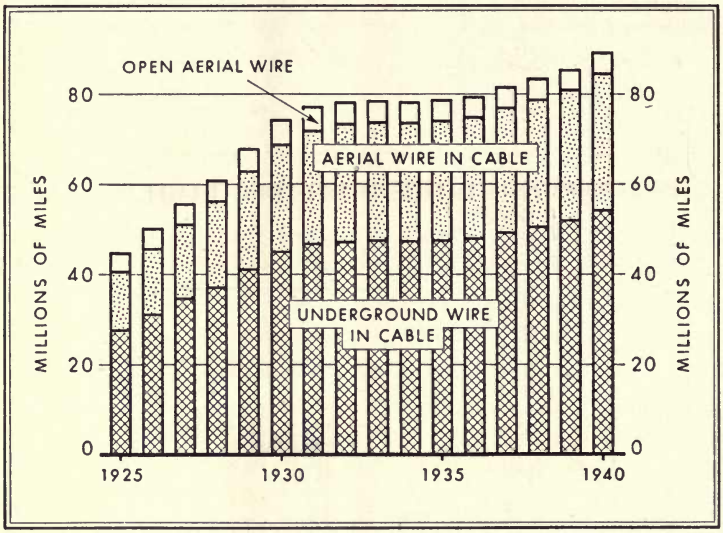
BELL SYSTEM CONSTRUCTION

Showing the amount of construction in the last sixteen years.

any piece of telephone apparatus now standard in the Bell System for new installation that is the same as it was sixteen years ago. That does not mean that if an old switchboard needs repairs there are not parts available to do it. It means that if it is replaced it will be replaced by a better apparatus perfected in the meantime.

At the beginning of 1925 about 11 per cent of the wires of the Bell System were exposed open wires. That percentage has gone down until now it is 5.2 per cent. The great bulk of the wire is enclosed in compact, storm-resisting cable. In

those sixteen years 29,932,000 miles of wire have been added in underground cables and 19,384,000 miles in overhead cables.



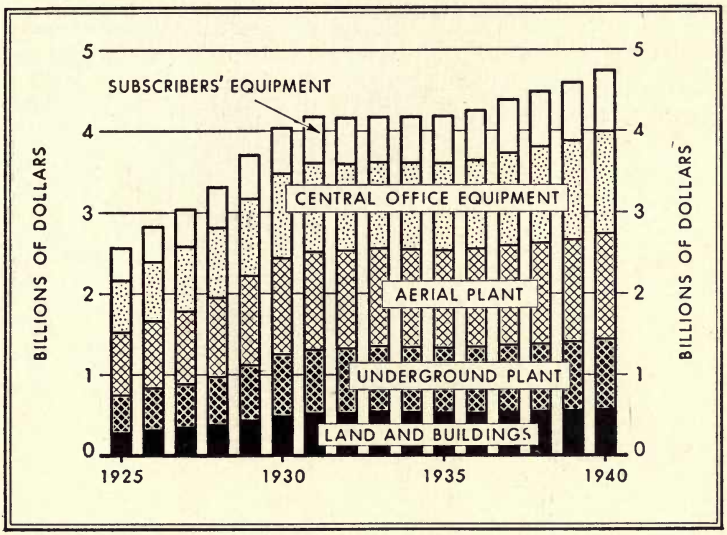
WIRE MILEAGE IN THE BELL SYSTEM

Showing the great proportion of telephone wire which is in cable, either underground or aerial, and the small proportion which is on open wire lines.

In this period about two-thirds of the present switchboard capacity in the System has been put in, most of it dial. Practically all telephone instruments have been changed in one way or another, and more than three-quarters of those now in use are new types, such as the handset. The headsets the operators use, the chairs they sit in, the trucks, cars and tools of the construction crews, installers and repairmen have all been changed. Practically all of the commercial offices that serve the Bell System's customers have been transformed in sixteen years for the customers' greater comfort and the more efficient handling of orders, bills and complaints.

The total plant in service in the Bell Telephone System

at the end of 1940 cost when new about $4,700,000,000. Of this, about $3,500,000,000 worth has been put in during the last sixteen years. Only the remaining $1,200,000,000 worth is older than that.

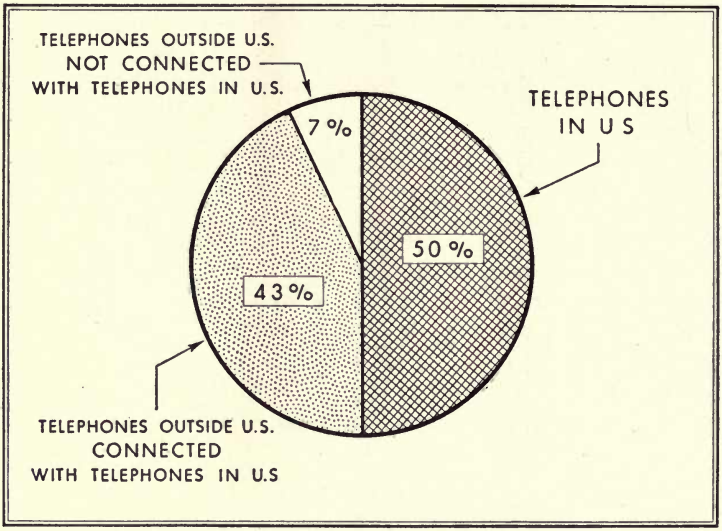


PLANT INVESTMENT OF THE BELL SYSTEM

Showing the relation between the investment in telephone instruments and other equipment on the subscriber's premises to the investment in central office equipment, poles, overhead wires or cables, underground cables and land and buildings.

The plant of 1941 not only gives better service to more people than the plant of 1925, it also permits important additional services. Transatlantic radiotelephony began in 1927 with one circuit to London. Now, except for war restrictions, a call from the United States can reach practically any telephone in the world. Russia and New Zealand are the only countries with 100,000 or more telephones to which service has not yet been extended. They have, as yet, not desired connection with this country. Broadcasts, news and pictures come from abroad over radiotelephone circuits, as they do in the United States over telephone wires.

Radiotelephony is also used for ship-to-shore service and on routes where wire lines are not feasible. There are also portable radiotelephone units for emergencies. Whether open wire, cable or radio is used depends upon the conditions. All



THE EXTENSION OF TELEPHONE COMMUNICATION WITH OTHER PARTS OF THE WORLD

Except for war restrictions, one-half of the world's telephones in the United States can reach—by wire to Mexico and Canada, by cable to Cuba, and by radiotelephone to other parts of the world—all but 7% of the world's telephones. The extension of telephone communication overseas began with the opening of service between New York and London in 1927. This radiotelephone development is the result of Bell System research.

are a part of the same art and all are available if conditions require their use.

In 1931 another service was added to those furnished the public by the Bell System. At that time teletypewriters were in use on private wires which customers leased. The teletypewriter machine at one end of the wire would receive and write down just what the machine at the sending end

wrote down as the operator played the keys. The teletypewriter service offered in 1931 connected Bell System teletypewriter machines to switchboards, just as telephones are, so that any machine in the network could be connected with and write to any other anywhere in the country. There are now about 13,300 teletypewriter stations listed in the national teletypewriter directory—serving mostly business houses. Many other teletypewriters, of course, are used on private wires not connected to the exchange network.

The technical and commercial problems of one business usually differ considerably from the problems of all others, and it is not possible to judge except by general observation whether these improvements make as good a showing for the telephone business as the improvements in the chemical business, for example, make for it. Nor can we say whether or not more might have been accomplished under the circumstances. But these improvements do show that the intention of the management to improve service continuously has produced results.

Moreover, I think, the record would prove that it was that intention which did produce the results. There was no competition. At no time were there better results elsewhere to lead the public to demand improvement. The public had no visualization of what improvements might be made. Nor was there any specific demand for improvement. I do not mean to imply by this that the management felt that if it made no progress for sixteen years the public would have remained satisfied. It had no such idea. If service had not improved, the public would not have been satisfied. But what I want to bring out is that I believe this to be one of the cases in which an industry of its own motion anticipated the public desires and delivered the results without pressure. And by and large, the improvement in this business seems to compare well with the improvement in the best competitive businesses.

Chapter IV

OVERTONES OF GOOD SERVICE

THE effort to provide good service to the public fits in naturally with the effort to provide good jobs in the telephone industry. Good workers at good wages working with good tools under good conditions give good service. And the refinement of good service known in the Bell System as personalized service, or service from the customer's point of view, likewise fits in with a refinement of the conception of a good telephone job. This is a conception of a worker who knows not only the rules and routines of the job, but also the reasons, experience and policies behind them. A personalized service to the public means a thoughtful and responsible job for all who come in contact with the public. The day-by-day relations of the telephone business with the people of the United States are conducted chiefly by the commercial office force, the operators, installers, repairmen, etc. A company may have the best overall policies in the world, but if this spirit is not translated into acts by those who have contact with the public, they will be largely discounted.

Consequently, whatever the policies are, everybody must know them. To make policies effective it is necessary to give employees an understanding of them so they can be reasonable and polite. In order to be reasonable, a person must know the reasons for what he does. If a customer objects to something and is told it is a rule of the company and nothing more—that seems arbitrary; and yet if the employee does not

know the reason for the rule, or cannot readily find out, he can't explain it. Moreover, by instinct the public feels that if the employee can't find out what it is all about, it will be impossible for the public to find out and there must be something unreasonable in it.

On the other hand, the more an employee understands, the more likely he is to grow in his job, so that the all-around level of performance improves, not to mention his satisfaction in life and capacity for advancement.

Along with this kind of reasonableness, and an integral part of it, is politeness. I mean by this, as near unfailing courtesy as human nature allows, plus a genuine desire to make the company a friendly and helpful institution. This means giving employees some latitude and encouraging initiative. No routines and instructions can fit all cases. Employees who know what the objectives of the routines are can safely depart from them in exceptional cases to the great benefit of the service to the public.

It takes time and money and the patient effort of supervisors to inform employees of the reasons behind routines and about the fundamental policies of the company, and about anything else which they are likely to be asked by the public. Yet without adequate knowledge to answer, they cannot make the company appear reasonable and it is more difficult for them to be polite and helpful. To have such knowledge spread down through the ranks of an organization means that from the foreman up to the top management, all supervisors must look upon the process as one vital to the success of the business. Being reasonable and polite to the public must be done by the company as a whole. It is not a gesture—it is a way of life.

Perfection, of course, is impossible in anything, but a rather considerable degree of reasonableness and politeness ought to be easily achieved because these qualities are natural to most people, if not diminished by the pressure of routines,

techniques and ratings on other aspects of the job. If it is clear to the employee that politeness and reasonableness are rated high by the management, they come to their proper place. Moreover, the employee himself has a better life if his relations with the public are pleasant, and he is justified in having a better opinion of his job and a greater satisfaction in it if all who mention the enterprise of which he is a part—and an understanding part—speak well of it.

In discussing politeness and reasonableness, I do not mean something employees can be trained to put on like a cloak. I am not talking about stage management. I am talking about character—running a business so that the more the employees know about it the better they feel about it, and running it with people who know what they are doing, have a pride in their profession and want that profession held in high esteem by other people because it deserves to be.

Some of the concrete methods of letting the employees in the Bell System know what they are doing and why they do it are:

1. Explanation of Bell System and company policies to new employees along with their training for their particular jobs.
2. Group discussion of company policies and results. In the discussion groups which meet all the year round, any question about the business may be asked and all phases of the business are discussed.
3. Information about the business in company magazines.
4. Information bulletins, sometimes issued to all employees, sometimes issued to supervisors for discussion with employees.
5. Executives meeting with employees in large groups.

There is a constant variety of use of different methods, but in one way or another the main facts of the business and its policies are brought to everyone's attention. In this process an opportunity is given to everyone to find out any particular thing about the business he wants to know, from such matters as why there is a service connection charge

to why the Bell System has increased the proportion of equity money (represented chiefly by stock) in its capital structure and decreased the proportion of debt. All this is to inform the employees why the business is run as it is and where his activity fits in the picture.

Personalized service has been dramatized by Bell System employees who have participated in "Service Skits" given before employee audiences to show how and how not to handle certain situations which come up in the business.

Test cases are also used in which a situation is presented and employees describe what in their judgment are the best procedures.

Employees in groups are asked what aspects of service bring good results with the public and what aspects seem unsatisfactory.

Out of all this work come not only more competent and understanding employees, but a constant stream of information to help management in its tasks.

Added to these and other methods of improving and personalizing service, in many companies there are interdepartmental committees at various levels of the organization which watch for and appraise all manifestations of public approval or disapproval. These committees have been responsible for many changes in practices or routines and for specific decisions to give the public service more nearly as it wants it. In one area some 42 changes in methods and practices for the improvement of service came out of these discussions in a year. Most of these were small matters and applied to only one or two places but some were of larger application. To apply an ever-changing art to an ever-changing public needs constant and careful scrutiny.

This process of spreading information through the System, from management to the employees and from the employees to the management—this effort to use the brains and capacities of everyone in the business in an orderly way, takes a

vast deal of time and energy. It is infinitely harder than just giving or taking orders. Giving or taking responsibility always is. But the time and effort are put into the process because the Bell System believes that:

1. It makes every employee abler as an employee and a bigger person generally.
2. It helps train the next groups of supervisors and those who will ultimately manage the business.
3. It gives a better and more satisfactory service to the public.
4. It keeps the management closer to the public desires.

In the policy speech at Dallas Mr. Gifford said, "Undoubtedly a very great factor in the continued progress and improvement of telephone service is the intangible, but quite real spirit of service that has become a tradition of the telephone business." This is a spirit which makes men and women forget their comfort, their own interests, even their safety to see that the public's messages get through. Perhaps it is the nature of the business which produces this, for most communication and transportation businesses have it in large degree.

This spirit of service and adventure is a normal complement to the reasonableness and courtesy of well informed people who are free from too much restraint.

The kind of service which results from all these factors is perhaps best explained by half a dozen instances.

Following the hurricane of September, 1938 in the northeast part of the country, a newspaper writer who lives on Long Island and who was in the thick of the storm wrote:

> I want to write a letter that gives me more pleasure than anything I have written in many years.
>
> My family was caught, literally, in the vortex of the hurricane . . . I . . . was elected to go down to Westhampton to see what could be salvaged . . . after the storm.
>
> What I found . . . would be only a useless repetition of what has appeared in the newspapers. But I was conscious, as I threaded my

car through the howling gale and ripping rain, that an inspiring drama was going on all around me.

All along Jericho Turnpike, with the lashing storm still wresting trees from the earth, still hurling branches, boughs, and buildings through the air, I saw little groups of men huddled around small gray trucks. All the way from Cold Spring Harbor to Westhampton and beyond I saw men clinging to precarious perches on tall poles. No crow's nest watch in a storm at sea ever took worse beatings than these men. Where poles had fallen, they were cutting them away; putting new ones back and putting on the gamest fight against the elements that it has ever been my pleasure to watch. . . . These boys, apparently, never got tired . . .

When I reached Westhampton, the telephone building there was a welter of mud and muck. . . . But upstairs, girls were virtually glued at their posts—trying to get calls through—while trouble shooters downstairs were trying to clear water-soaked wires.

In the midst of all their own trouble, these harassed telephone workers were courteous and kindly. They asked me to wait until they could clear a wire through to Brooklyn and then gave me a headset to permit me to report to the worried people back home that the storm had torn everything in Westhampton to shreds. . . .

It drove home to me, more thoroughly than ever before, what a terrific social necessity and link the telephone is. And more important, the well-trained, loyal, heroic and courageous morale of the telephone company's employees were an inspiration. . . .

When I reached home, my phone rang, and a girl's voice said: "We're just testing. Your line is back in service again."

Maybe I sounded a little silly to the girl, but I said: "Thank you . . . and God bless you!"

Here are two short stories from two widely separated areas. They are taken from telephone company magazines or memoranda.

Citizens of Snyder, Texas, couldn't quite understand it when they saw a local business man sitting in a parked car at the curb talking over a telephone. The facts, as revealed later, were these: He had been injured in an automobile accident and was about to be taken to a hospital in a nearby town. He had wished to place some long distance calls to relations to give a first-hand explanation of his injuries. This was an easy one for Telephone Wire Chief Bailey. He placed the calls for him and connected an extension

cord to the man's own office telephone which was directly above the injured man's car. The telephone was lowered out of the window to the automobile below.

A family in Shadyside, Ohio, ordered a new telephone but the baby arrived before the telephone installation could be completed. Seconds being precious, Installer George L. Michel climbed a pole outside the house, tapped a line and called the doctor. The father stood at the foot of the pole, called information up to Michel, it was relayed to the doctor and the required medical instructions came back over the same route.

The following is a Philadelphia operator's report:

One Saturday evening, about 8 P. M., the operator at the Adelphia Hotel called and said that an elderly man had registered and was pacing up and down the lobby in a state of excitement. She wanted to know if we could help him.

He had been traveling all day from upstate, together with a niece who had been placed in his care to be taken South for a visit to relatives. At Lock Haven, Pa., the girl left the train to buy candy. He fell asleep. The train left before the girl returned. He did not miss her until the train had pulled out.

He remembered that she had left the train at Lock Haven and he called the railroad station and his niece answered. She said that the Station Agent had left several hours before and she was alone. It was so dark that she could not see a thing. He asked if we thought that a hotel would lend her the money for train fare. I advised him to go to the Superintendent's office at Broad Street Station and pay her fare. The office would then notify their trainman to pick her up. He consented.

After disconnecting, I wondered if there were not something I could do for the girl. I called the station and the girl answered, crying hysterically. I asked her if there were a house near by. She replied that it was so dark that she could not see anything. She had been there since 1 P. M. and had not had anything to eat. I asked her to stay at the telephone and do as I would tell her.

I suggested she work her telephone hook up and down. Lock Haven operator answered. I related the story and asked her if she could recommend anyone near the station to look after the girl until the next train arrived. She replied that Mrs. Brown, a good friend of hers, lived near the station. She called Mrs. Brown and

explained the story to her. The latter said that she would send her husband to the station and have him bring the girl to their home until train time, 11:55 P. M.

We held the telephone open until Mr. Brown reached the station. The operator talked with him to make sure of his identity and told him when he reached home to call her back. I called the Adelphia Hotel and explained all. Meanwhile, the patron had returned from the Superintendent's office and had made arrangements as I had suggested. We told him of the girl and how she was being cared for by Mrs. Brown. He was very grateful to all concerned and said that he would like to talk to the good woman and thank her.

On Sunday morning the Adelphia Hotel reported that the girl had arrived safely and that she and her uncle had checked out for the south. The patron assured us that he would never forget the excellent service we had rendered him.

The following paragraph is from a letter written by the President of the New Jersey Company to a subscriber:

. . . Our people have to give telephone service very frequently under onerous conditions both in central offices and outside. It is only necessary to see what they confront in storms, disasters and other emergencies to appreciate this. No money payment nor mere approval of officials within the organization is adequate to compensate for, or to secure, the services rendered by our employees under these conditions and others of less spectacular character. Let me give only one specific instance to illustrate what I have just said. Last week there occurred a disastrous explosion at Woodbridge, N. J. Within *ten minutes* of that explosion *every single off-duty operator* of our Woodbridge exchange had called the Chief Operator to see if she was needed to help out in the inevitable overload on our service. Operators are not trained or instructed to do this and are under no obligations to the Company to do so. They evidently regard themselves under obligations to the service and to the public. . . .

This kind of thing is happening all the time, sometimes in heroic form when the telephone workers brave fires, floods and hurricanes, more often in instances where telephone workers use telephone equipment and their knowledge and experience to help people, but more often still in

just thoughtful, courteous handling of millions of day-by-day contacts with the public. A group of people who have this habit will naturally rise to helpfulness on the larger occasions when they happen. The compensation is in such letters as this:

> May I express my sincere appreciation of the courtesy and kindly service which we received from the telephone staff . . . not only during these last few months of my mother's final illness, but also for the thirteen years we have lived here.
>
> Although I have never seen any of the operators, I know that when I take down the receiver I shall hear the voice of a friend.

How well adapted to each community is the service of the Bell System now? What degree of courtesy and consideration prevails in handling every contact with the public? And to what extent can these qualities become part and parcel of the service?

No one knows the answers to these questions on a statistical basis, for certain kinds of human affairs are not translatable into figures.

But we do know that in every rank in the Bell System it is the consensus of opinion that the effort to give the best technical telephone service we know how, in the most reasonable, friendly and considerate way we know how, is as satisfactory to the people who give it as to those who receive it.

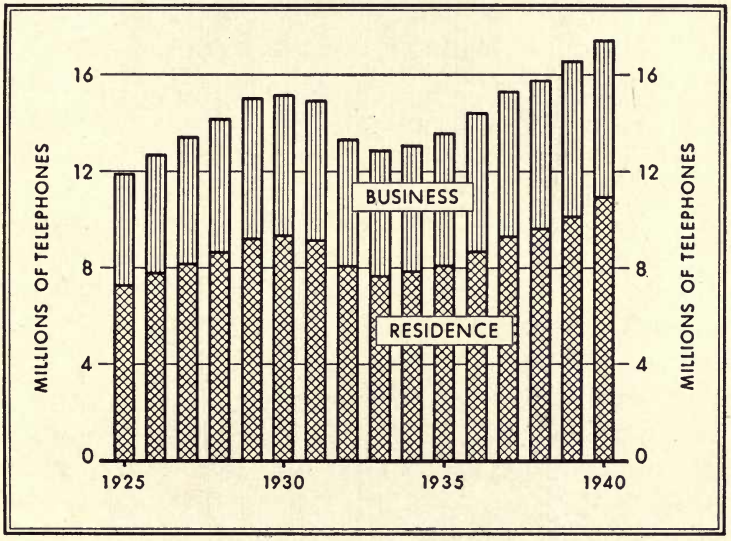
Of course, the people in the Bell System, like those out of it, differ. Some are more polite by nature than others. Some are of a more generous spirit than others. Some have more intuition than others. A program depending much on individual initiative and spirit cannot be standardized. The results must vary and they do. And by the same token, the possible degree of improvement in making the service genuinely personal is unpredictable. Nevertheless, while this process resists accurate measurement, it is as important as technical knowledge or improved apparatus or any other element necessary to public satisfaction.

Chapter V

AT REASONABLE PRICE

THE Bell System is under the law instructed to render service at reasonable prices.

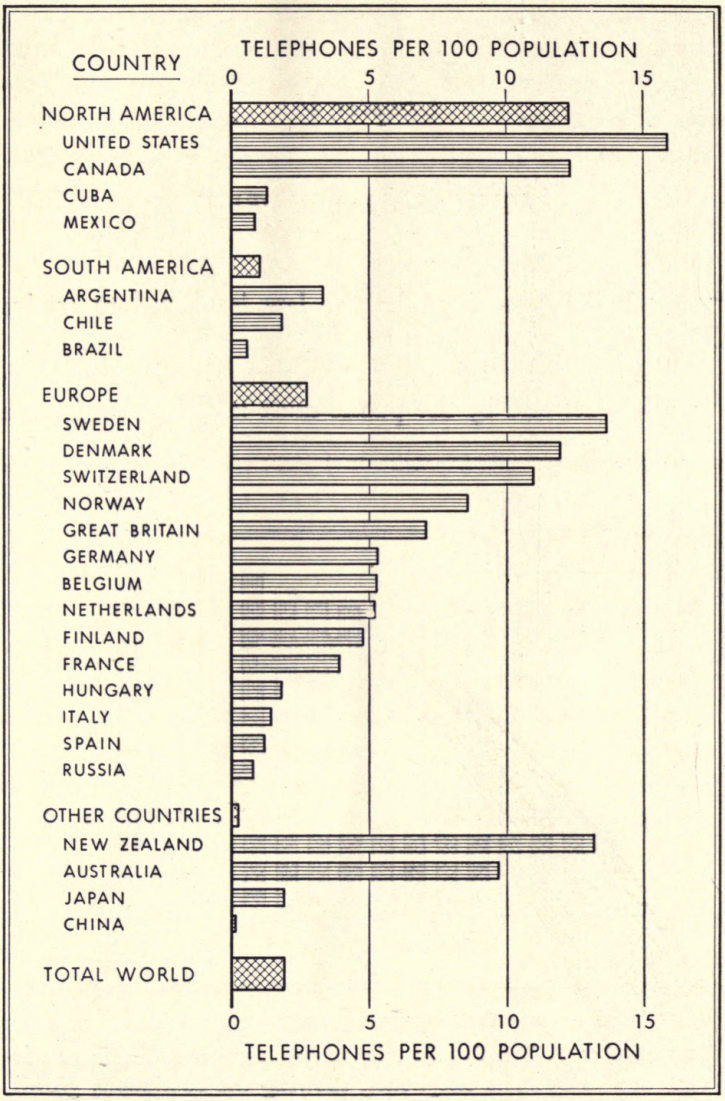
What is a reasonable price? A price that produces an ever-increasing demand by the public must in the general sense



BELL SYSTEM TELEPHONES—BUSINESS AND RESIDENCE

The number of Bell System telephones classified as residence telephones and as business telephones, showing the continuous growth except in the depression.

of the word be reasonable for it means that the service appears to more and more people to be worth what it costs



TELEPHONE DEVELOPMENT IN THE WORLD

Showing the relative number of telephones per hundred of population in the principal countries of the world, as of January 1, 1940.

them. On this basis the growth of the business indicates something of the reasonableness of the price of the service.

At the beginning of 1925 there were 11,168,062 telephones in the Bell System. At the end of 1940, after a period which included the great depression, there were 17,483,981. In 1925 the telephone conversations handled by the Bell System averaged 50,141,000 a day. In 1940 the average was 79,303,000. This is an increase of 56 per cent in the number of telephones and an increase of 58 per cent in daily conversations.

The proportion of telephones to the population in various countries in the world is shown in the chart on the opposite page.

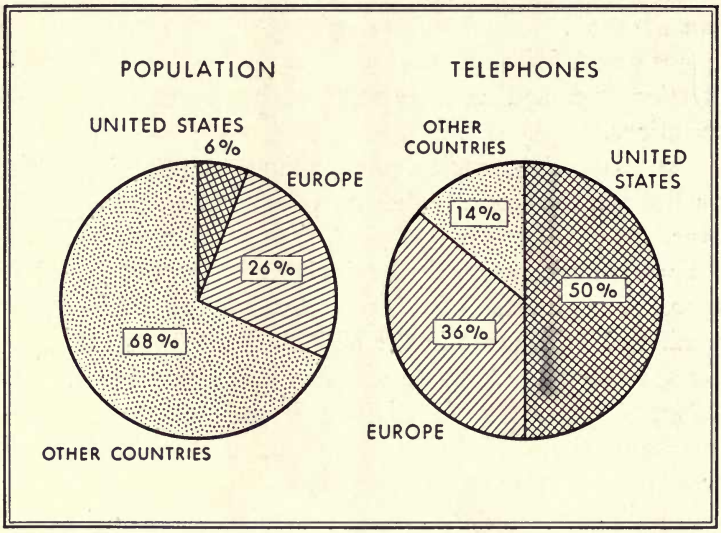
For the period from the beginning of 1925 to the end of 1940, although much of this period was in a depression, the number of telephones in the United States increased at an average rate twice the rate of our population growth.

Not only does the United States have half of all the telephones in the world—it also has more in proportion to population than any other country.

The difference in telephone development here and abroad is not due entirely to the difference in rates and service, because the United States is more used to modern appliances and services, and the people have more money to buy them than people in other parts of the world. Such businesses here prosper from the very condition they help to create. But it is clear enough from these figures that the telephone rates have been reasonable enough in relation to service to make the telephone industry a significant contributor to this aspect of American life.

Another indication of the reasonableness of prices of telephone service to the American public might be a comparison with the charges to the public in other countries. A true comparison, however, is difficult to make because the scope and quality of the services as well as the types of rate schedules vary so much from country to country. The purchasing

power of national currencies also varies. Nevertheless, it is true that when relative wage levels are taken into consideration, the American service is generally cheaper than that anywhere else in the world. In this country a telephone lineman or telephone operator could buy more telephone service



THE WORLD'S POPULATION AND TELEPHONES

Showing that the United States, with only 6 per cent of the population, has half of the world's telephones.

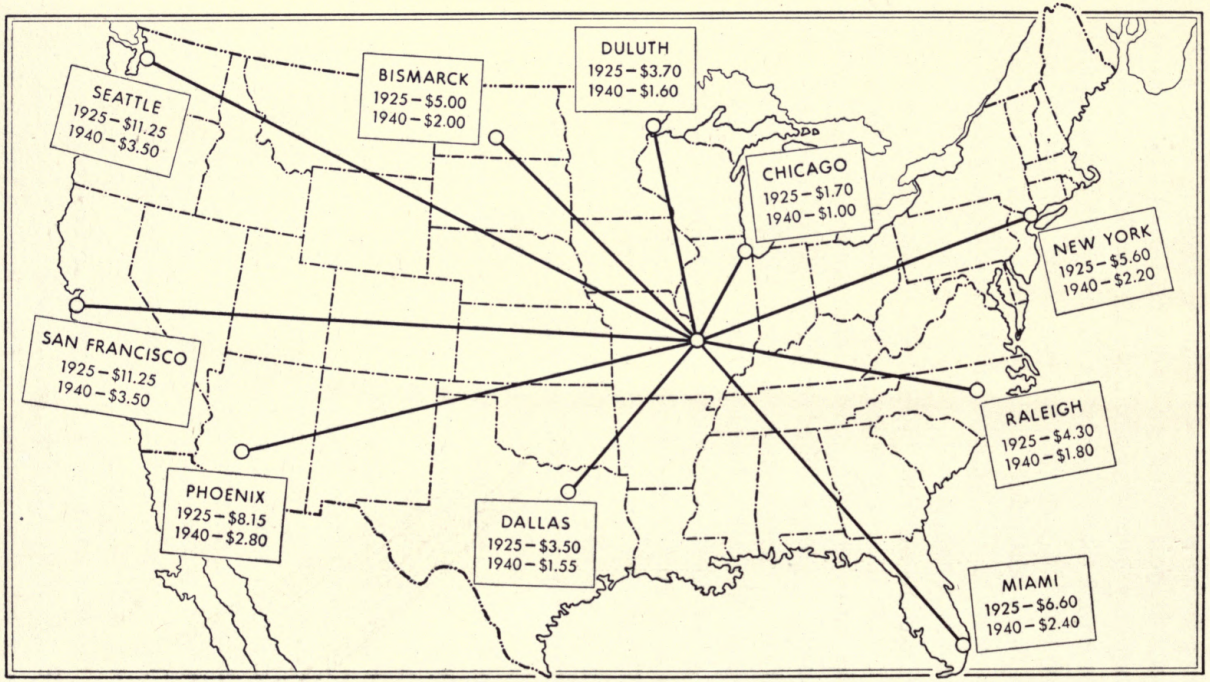
with his or her hourly earnings than could similar workers in other lands.

From the early days of the telephone to the beginning of the first World War there was a general downward trend in telephone rates. In the earlier periods the reductions were large, but the longer the process continued the lower the resultant price, and the harder it became to cut it further. Then, with the World War, the general price level of the country, as evidenced by the cost of commodities and salaries and wages, began to rise. The Bell System was able to meet part of its increasing cost of operation by more efficient

operating technique and economies resulting from technological advances in the art. However, the Bell System was faced not only with increased costs for the things it bought, whether it were material or labor, but also with increased unit costs of providing service for the larger number of telephones in its individual exchange areas. This latter situation is more or less peculiar to the telephone industry as explained in Chapter X.

This situation was recognized by regulatory bodies, and increased rates were granted to the telephone companies. These increases were not granted all at once, but were spread over the years, and continued during the period 1925 through 1930. In the last ten years, however, there have been decreases in Bell System telephone rates aggregating a saving for the ten-year period of more than $300,000,000 to its customers and amounting currently to about $100,000,000 a year. This saving has been about equally divided between local and toll services. It includes not only lower rate levels, but also charging for millions of calls as local calls which formerly were short-haul toll calls. And there is another difference. In Chicago, for example, in 1925 a subscriber could call any one of 750,000 telephones in that city under his local rate. In 1940 he could call any one of more than a million. That is quite a different service. Moreover, the handling of the calls is much faster and more accurate and the transmission is better. The telephone companies have many rates and services to satisfy a variety of requirements and tastes. Sometimes it is possible to serve the public best with increased value, sometimes with decreased cost, sometimes with both. On the whole, the local exchange subscriber has gotten both. So has the toll user.

The toll user has given evidence that he believes the service is increasingly valuable as shown by the fact that the number of toll conversations per day, allowing for the large number of former toll calls which are now local, has in-



TYPICAL REDUCTIONS IN LONG DISTANCE TELEPHONE RATES

This chart shows the daytime rates for three minute "station-to-station" calls on week days between St. Louis and certain other cities in December, 1925, as compared with the corresponding rates in December, 1940.

creased over 50 per cent in 16 years. The improvement in the speed and clarity of the service has probably been the largest factor in this. But the reductions in rates during that time have been important also. As an indication of the degree to which rates have come down the map on the opposite page shows some sample toll rates, in all directions from St. Louis for the two dates 1925 and 1940. The reductions range from about 41 to 69 per cent.

This picture of reducing prices and increasing values in the telephone business is comparable to such results in the highly competitive oil business. In 1925 the average service station price of "First Grade" gasoline to the customer, exclusive of the direct tax, was a bit over 20 cents per gallon. In 1940 it was only 12¾ cents per gallon. But the word gasoline does not mean the same thing in the two sentences. It was a far better engine fuel in 1940 than in 1925. The 1925 gasoline would not do at all for modern cars. The buyer now not only pays less money per gallon, but he gets far more power per gallon.

In the manufacturing field which produces small type sedans, such as the Ford and Chevrolet, the factory price of the lowest-priced sedans increased from about $640 in 1925 to about $710 at the end of 1940. The difference in price is only about 11 per cent but the difference in quality is great. The 1940 cars are heavier, longer, contain more powerful engines and much more extra equipment. The public is served either by putting more in the product or taking less in the price or both. Companies that have made enough money to be able to plan and build ahead have made most economies for the country. Unquestionably all these industries give more for the money than they did sixteen years ago and there is no indication that telephony, although a fairly old industry, is not still improving quality and cutting prices with the leaders.

These accomplishments and similar objectives for the

future are somewhat beclouded by the fact that telephone regulation, having grown up largely under the confiscation clause of the Constitution, has tended to emphasize what earnings the telephone companies make as the main indication of the reasonableness of costs to the public. The Constitution only protects the companies from rates so low as to be confiscatory. But the lowest earnings for the company that are not confiscatory are not necessarily the rates most in the public interest.

But if we accept this method of judging reasonable costs, the essential facts are that from 1925 through 1940 the American Telephone and Telegraph Company paid $9 a year on its stock, which dividend has averaged 6½ per cent on the stockholders' investment, including surplus. If the dividends on stock and the interest on bonds are combined, total dividends and interest during the last sixteen years amounted to approximately 6 per cent on total capital obligations, including surplus, of the Bell System. So much for the rate at which money was paid out. The only other place where net earnings could go would be to surplus. At the beginning of 1925 the System surplus applicable to A. T. and T. stock was $229,000,000 or 8.4 per cent of the assets. At the end of 1940 it was $360,000,000 or 6.6 per cent of the assets. The System assets grew 101 per cent in these sixteen years. The surplus grew 57 per cent. No one has made a great fortune in the business, there have been no "melons," bonuses or special dividends. Regular dividends at a reasonable rate have been paid on capital stock and interest at a declining rate has been paid for borrowed money. While this was going on, the surplus applicable to A. T. and T. stock in what is now a five billion dollar business has come up from $229,000,000 to $360,000,000, but it has gone down from $25.77 per share to $19.29 per share.

The path of safety in rendering an essential public service would not be in the direction of less earnings or less finan-

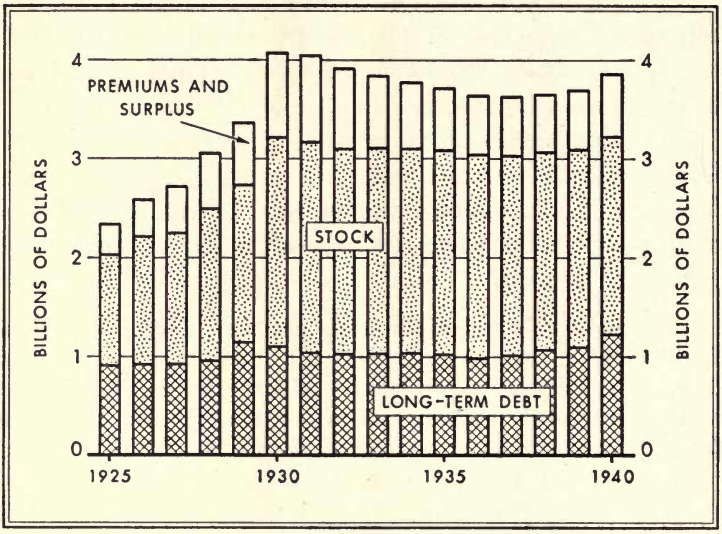
cial strength. The emphasis on low earnings rather than on reasonable rates and service is a little as if a farmer bought a mule mainly on the basis of how little the mule could live on rather than how much he could pull if properly fed. The amount the mule eats, although not the most important matter, is important. Too much will make him lazy and too little will make him weak.

In this connection it is interesting to compare the Bell System financial record with the prescription for proper financing of Mr. Joseph Eastman, then Federal Coordinator of Transportation, given in 1934 after the railroads were fairly well starved:

> Never incur debt unless absolutely necessary. Confine capitalization to common stock, so far as possible, and issue no more than need be of that. Endeavor to pay liberal dividends, but in normal times well below what the earnings will permit. Never declare stock dividends. Issue new stock at a premium, if possible. Establish sinking funds for indebtedness and seize every opportunity to pay off debt.
>
> If a long-term indebtedness must be incurred, let it take the form of debentures, and mortgage neither fixed property nor equipment. Plough back surplus earnings into property and provide amply for depreciation in one way or another.

The Bell System in the last sixteen years has reduced its ratio of debt to total capital obligations, including premiums and surplus, from 36 to 32 per cent. It has paid reasonable dividends regularly in normal times somewhat below earnings. It has not declared stock dividends. It has converted bonds to stock at a premium. It has reduced its debt and put the surplus earnings into the property and provided for depreciation. As Mr. Eastman implies, a reasonable and safe rate of earning is one that will enable it to finance itself on stock. And that is sensible for no company ought to have to go in debt to do business. On the other hand, a moderate debt may be advantageous because bonds tap pools of money in banks and insurance companies which are artificially re-

strained by law from stock ownership. There is not a free flow of money from debt securities to ownership securities and large enterprise may well need to tap both pools.



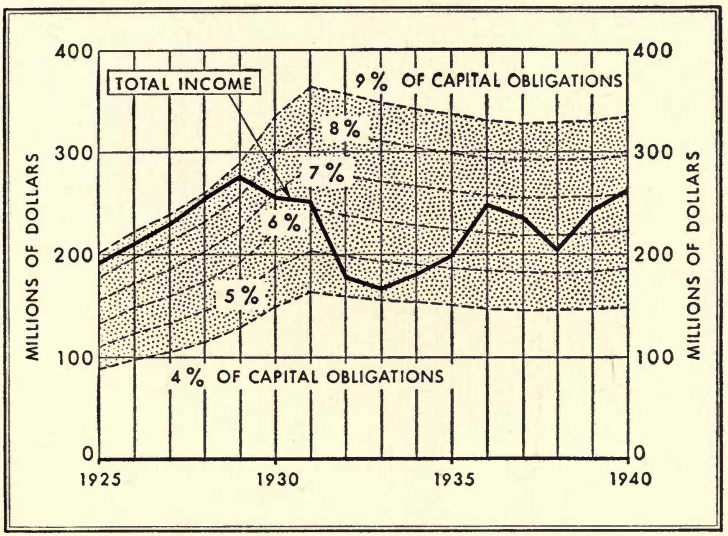
THE CAPITAL STRUCTURE OF THE BELL SYSTEM

Showing, in the bottom segment of the columns, the money borrowed from bondholders and noteholders; in the middle segment, the money paid in by stockholders to the equivalent of the par value of the stock; and in the top segment, the money paid in by stockholders in excess of the par value of their stock, together with surplus. The long term debt is less than a third of the capital obligations.

Both the reasonable rates as defined by state regulation and the Bell System policy of the best service at the least cost consistent with financial safety must mean in the long run an earning record that will attract money to the business. The first criterion of safety for the telephone business as it continues to grow is the ability to attract money by the sale of common stock to finance that growth.

All businesses, no matter how different they are in other respects, must, if they want capital from the public, compete

with each other in the same money market for the public's dollars. The Bell System must offer prospective investors an expectation of yield which will induce them to invest in sufficient amounts to provide for the growth of the business. The Bell System does not necessarily have to offer as high a

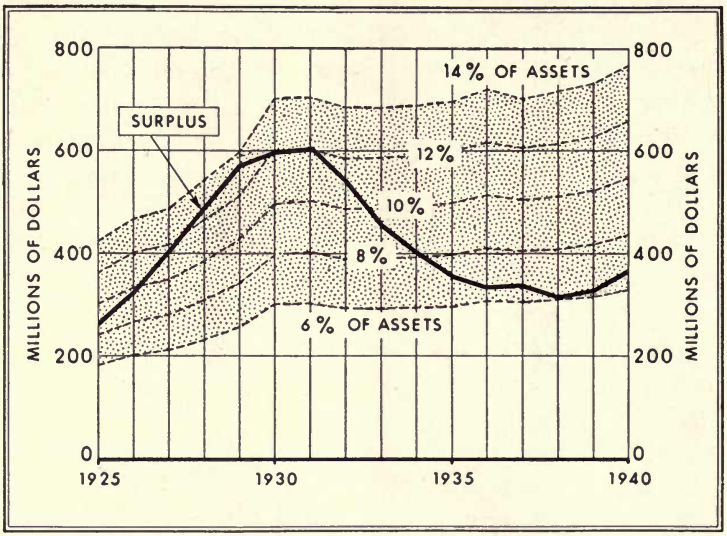


BELL SYSTEM INCOME IN RELATION TO CAPITAL OBLIGATIONS

From 1925 through 1929 the income available for interest and dividends was nearly 9 per cent of the capital obligations outstanding, including premiums and surplus. In the period 1932-4 it fell below 5 per cent. In 1940 it was up to 7 per cent.

yield to investors as the most profitable other business, but what it does offer of yield and security must be sufficiently attractive to insure the great stream of capital necessary for the continued growth of the business. Without an assurance of that flow of capital, the business can not provide the service the public demands and runs the danger of being cramped from time to time by lack of money, which interferes with the economies and improvements which a well-financed enterprise can make.

From the beginning of 1925 through 1940 the Bell System raised approximately $2,625,000,000 of new capital. Of this sum, approximately $1,100,000,000 was used to pay off indebtedness and the balance was used principally to build plant to render service to the public. The debt which the Bell



THE RISE AND FALL OF BELL SYSTEM SURPLUS

The solid line on the chart shows the surplus in millions of dollars; and the relationship of surplus to assets may be seen by reference to the secondary scale. In 1940, the surplus was 6.6% of total assets.

System had at January 1, 1925, was 36 per cent of the total capital obligations including surplus, and the interest on it averaged about 5.2 per cent. At the end of 1940 the debt was 32 per cent of the capital obligations and the interest averaged 3.7 per cent.

For the sixteen years 1925 through 1940 the combined interest and dividends paid averaged approximately 6 per cent per year when related to the amount which investors had put in the business over the years, including surplus.

Whether or not this rate of approximately 6 per cent was the absolute minimum which would bring into the business the new capital needed or whether it contained a small "safety factor" is perhaps a matter of opinion. But if there is any safety factor in it at all, it is a far smaller factor than the Bell System experience indicates is wise in the other aspects of its undertaking to serve the public in good times or in emergencies. Certainly any "safety factor" there is could have very little effect on the amounts paid by customers for service. If, over the period, investors in the business had received only 5½ per cent on their investment including surplus, a rate which would certainly have incurred serious risk and danger to the business, and this saving to the System had been applied to reduce telephone rates, the saving to telephone users would have been less than two cents on the dollar which they paid for service. In other words, a margin of less than two cents on the dollar of telephone charges might well mean the difference between good service expanding to meet the country's requirements and inadequate service. It might mean something much more serious than that. The less than two cents on the dollar saved by the consumer at one time might well cost him far more than that in the future by jeopardizing the investment in improved plant and methods from which the savings come.

There are infinite possibilities of indoor sport in hindsight calculations of how cheaply money could theoretically have been raised. But these are not very useful for practical judgments either of the past or the future if they assume that all the efforts of all the people who have been raising money for the last generation have been poor. If the interest and dividends paid by the Bell System averaged, for the last sixteen years, only 6 per cent of the amount invested in the business, and a small margin was set aside for surplus, and the immense sums needed for expansion were raised, it is rea-

sonable to expect that the cost for the future will be much the same, unless the conditions of the two periods differ.

In the last ten years two differences have appeared which may affect the situation. There has been a trend downward in interest rates reflected in the lower cost of money obtained through the sale of bonds. If these low interest rates continue over a long period it may be that the System can go in debt at a lower rate of interest than in the past—if it is profitable in the long run to go in debt to any large degree. On the other hand, there is an element of risk in the business which is much more apparent than it was sixteen years ago. From 1876 to 1931 there had never been a shrinkage in the annual number of telephones. The growth in the business was enough to offset depressions and bad business conditions. There seemed to be no risk of a falling volume of business. But in the three years 1931 to 1933, inclusive, the System lost some 2,500,000 telephones, or about one-sixth of those in service at the end of 1930. While these losses have now been recovered, the fact that they occurred indicates that there is an element of risk in this connection which cannot be ignored.

Another element of risk is regulation. The Bell System has done well under regulation in the past. In general, however, the regulated industries are not too well off. Any regulatory desire to pay the stockholder less will have in the long run a tendency to make the credit of the companies less secure and money higher priced to them. And unquestionably, the risks of regulation are the largest risks in the minds of stockholders, as distinct from lenders.

Stockholders in the Bell System now own 18,686,794 shares of the American Telephone and Telegraph Company common stock.

The public also owns approximately $85,800,000 par value of common stock of the New England, Illinois, Mountain States and Pacific Companies. In addition, there is out-

standing in the hands of the public nearly $46,000,000 par value of common stock of two non-controlled companies—The Southern New England Telephone Company and The Cincinnati and Suburban Bell Telephone Company. In ordinary times the dividends of these companies average nearly $8 on $100 par. During the depression all paid dividends regularly, but in many cases the amount was reduced.

Some of the operating companies also issued preferred stocks. All of these have been retired, with the exception of the preferred stock of The Pacific Telephone and Telegraph Company which is not callable.

While all stockholders—common and preferred—have received dividends every year and most of the time at a reasonable return on their investment, none has received more than a fair return on his equity.

What a particular stockholder receives may be quite different from what money costs the company. A stockholder who bought 100 shares of American Telephone and Telegraph Company at the low price of the depression—70—would have had something better than 12 per cent on his investment. One who bought at the high price of the boom—310—would have had less than 3 per cent on his original purchase, and if he exercised his rights in the 1930 stock issue, he would have a return now of 3.21 per cent on the entire investment.

A stockholder who sold 100 shares in 1929 at 300 and bought 420 shares at 70 in 1932 would have made a tremendous profit. Speculation on the rise and fall of the market can be done in telephone stocks, although not as well as in the stocks of businesses with greater fluctuations. But in speculation, what is one man's loss is another man's gain. The company pays a reasonable return on the equity money given it by the public. It has no control of the market and makes no attempt to influence it.

On the whole, the American Telephone and Telegraph

Company stockholders have fared well, particularly in receiving regular dividends during the depression when many other companies either drastically cut their dividends or ceased paying them altogether. On the other hand, they have not fared as well as stockholders in the more successful companies in the other expanding industries such as oil, chemicals or motors, all of which are in the competitive field, nor as well as those in the competitive chain store field.

Chapter VI

JUST AND REASONABLE WAGES

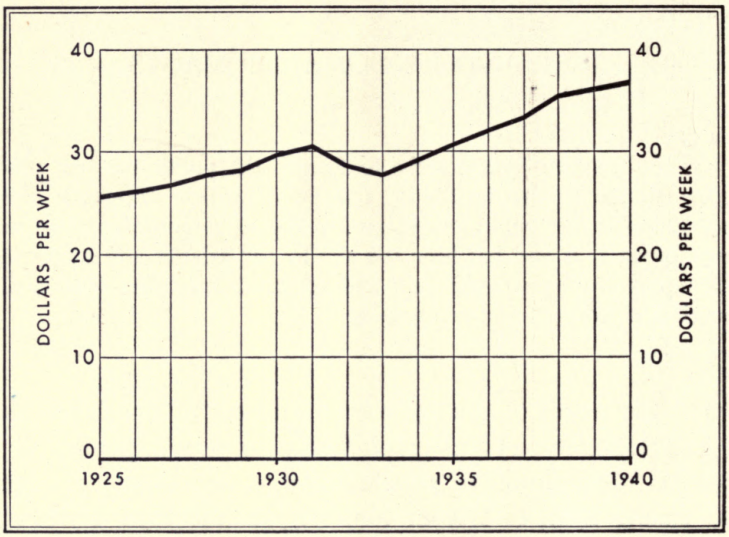
While the Bell System seeks to furnish the public the best possible service at the least cost, the policy which recognizes this obligation to the public recognizes equally its responsibilities to its employees. It is and has been the aim to pay salaries and wages in all respects adequate and just and to make sure that individual merit is discovered and recognized.

THESE words of the 1929 annual report of the American Telephone and Telegraph Company state a general objective. Most employed people strive to earn money enough to enable them to live in comfort, educate their children, provide for emergencies such as sickness and accidents, and care for old age. While doing this they wish to enjoy their work, to feel that it is useful, to do it well and to take pride in it, to have their efforts appreciated and their ability recognized, and to have pleasant relations with their fellow workers and their employers. The telephone companies have long endeavored to make it possible for those who work for them to achieve these objectives, and the personnel practices are directed to that end.

One of the most important matters to employees and one of concern to the public welfare as well, is the scale of wages—the weekly rate and the average yearly income.

In 1925 the average weekly earnings of Bell System employees were $26 a week. In 1940 the average was $37 a week, more than a 40 per cent increase. In 1925 65 per cent

of the employees in the Bell System were women and 35 per cent men. By the end of 1940 the division between the sexes had changed somewhat—60 per cent women and 40 per cent men. The $37 a week average income for all employees in



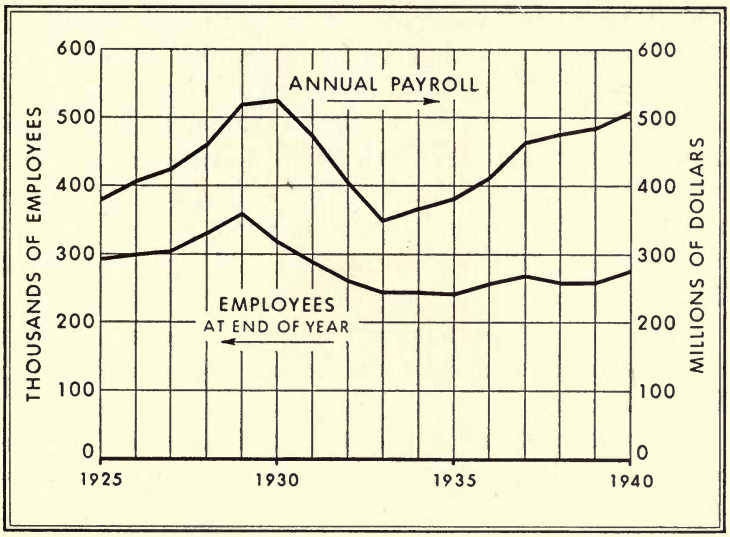
INCREASING WEEKLY EARNINGS OF BELL SYSTEM EMPLOYEES

The average earnings of all full time Bell System employees rose from about $26 a week in 1925 to about $37 in 1940. The main reason for the rise is found in the better apparatus and tools and better methods employed together with the greater experience and skill of the forces, which have a much longer average period of service than formerly. In addition to this rise in average weekly earnings, there has been a reduction in the normal working hours per week.

1940 was made up of an average women's wage of about $24.50 and an average men's wage of about $54.50.

Much of this difference in average weekly earnings between 1925 and 1940 is, of course, due to the fact that the average years of service of the force has lengthened considerably since 1925. The companies had to hire many more new employees in the 1920's than in the next decade.

The rise in weekly earnings is, however, also the result of increases in basic wage rates, and it has been accentuated by an increasing proportion of male employees, and of more highly skilled jobs. Technology in the telephone business has



BELL SYSTEM EMPLOYEES AND ANNUAL PAYROLL

By 1940 the annual payroll had again risen to a point close to the peak in 1930. The number of employees, however, was still less than the number at the peak in 1929, due in large part to the diminished need for "learners" and the smaller volume of new construction work.

the effect of "upgrading" the workers, with, of course, a correspondingly favorable influence on the trend of wage rates.

In 1925 the annual pay-roll was $381,522,000. In 1940, it was $508,344,000.

These figures give a general indication that the average income of Bell System workers has been on the rise. If improving wages are a criterion of "adequate and just," the record bears out the definition. Moreover, there are constant

studies made in the different areas of the Bell System which show how the telephone worker fares in comparison with men and women with similar skill and training in other industries. A good telephone worker, with good tools, working under favorable conditions and good management can accomplish a lot. It is reasonable from the point of view of the public, which ultimately pays his wages, that they be good wages—especially as telephone service in the commercial sense is worth more than it costs and the public is buying it in increasing quantities. Nevertheless, a management which charged the public "all the traffic would bear" for wages and raised telephone wages distinctly out of line with the pay of comparable jobs elsewhere would soon find it had done its employees a lasting disservice, for the rate paying public has no reason to prefer telephone workers' welfare to its own and in the long run the rate paying public is the final authority.

On the other hand, it is in the public interest that competent employees should be paid well enough to make savings possible. The Bell System does not intend to be a paternalistic institution. It does not know what its employees do with their money except that for their convenience and on a purely voluntary basis the companies agree to make pay-roll deductions for those who wish to participate in various savings and insurance plans. During 1940 voluntary pay-roll deductions were 6.9 per cent of the pay-roll. While all of these deductions are not strictly for savings, neither are they all the savings that telephone employees make. What amounts are saved in other ways is not known.

The purposes now generally classified as Social Security have long been objectives of the Bell System companies. As far back as 1913 a plan for employees' pensions, disability and death benefits was put in operation. The plan is discussed more fully in the chapter on management and printed in full as Appendix II. Generally speaking, it provides payments to qualified employees when ill or injured and pen-

sions equal to 1 per cent of the average wages of their last or best ten years for each year of service. The pension begins upon the employee's retirement which may be before, but must be at age 65.

The prospect of advancement is perhaps more important to the employees than rates of pay or the pensions or any other condition of work. What each man's chances are, of course, depends largely on himself in relation to the rest of the force and upon the discernment of management in "perceiving and rewarding merit," and upon general business conditions beyond the control of the management. However, the figures show that there is a very considerable opportunity to rise. There are some 110,000 men in the operating companies. Of these roughly 18,000 have under five years' service. Not many of these have supervisory jobs. Their rates of pay, however, generally speaking increase with length of service. But beginning with the men of five years' service an increasing proportion have supervisory jobs. There are about 9,000 foremen in the Bell System and above the foremen district, division, state and company supervision, as well as engineering and other staffs. Either because of length of service or because of their position, some 75 per cent of all the men made $40 a week or more and about half made $50 or more in 1940.

And anybody starting in the Bell System may hope to make the top salary, for all ranks of supervision, including the top, are recruited from the bottom. The records of the present company presidents of the Bell System give the most convincing evidence of this. None of these men had either money or connections in the telephone business. They all began at the bottom. Telephony was their profession and they came up step by step. The management and the employees of the Bell System are the same people at different stages of their careers and it is very difficult to tell where management begins or leaves off. But if the theory is correct

that good wages in the telephone business depend primarily on the training, tools, plant and the supervision which enable good men to do a first-class job, nothing is so important to the employee body as good management. And the employees themselves provide the management, whether good or bad.

Company	*Name*	*Place of Start*	*Date*	*First Pay*	*First Job*
Amer. Tel. & Tel. Co.	Walter S. Gifford	Chicago	1904	$10 week	Clerk, Payroll Dept.
New England Tel. & Tel. Co.	John J. Robinson	New York City	1899	$9 week	Cable Splicer's Helper
Southern New England Tel. Co.	Harry C. Knight	New Haven	1902	$19 week	Genl. Canvass Agent
New York Tel. Co.	James L. Kilpatrick	Philadelphia	1896	$10.50 week	Wireman
New Jersey Bell Tel. Co.	Chester I. Barnard	Boston	1909	$50 month	Clerk
Bell Tel. Co. of Pa.	Philip C. Staples	Baltimore	1904	$12 week	Salesman
Chesapeake & Potomac Tel. Co.	Lloyd B. Wilson	Plattsmouth, Neb.	1899	$12 month	Night Operator
Southern Bell Tel. & Tel. Co.	James E. Warren	Nashville, Tenn.	1900	$30 month	Stenographer
Ohio Bell Tel. Co.	Randolph Eide	New York City	1911	$15 week	Special Inspector
Cincinnati & Suburban Bell Tel. Co.	Archibald J. Allen	Pittsburgh	1907	$50 month	Service Inspector
Michigan Bell Tel. Co.	George M. Welch	Minneapolis	1904	$15 week	Stenographer
Indiana Bell Tel. Co.	James F. Carroll	Syracuse, N. Y.	1906	$12 week	Traffic Student
Wisconsin Tel. Co.	William R. McGovern	Milwaukee	1900	$25 month	Draftsman
Illinois Bell Tel. Co.	Aubrey H. Mellinger	New York City	1905	$15 week	Engineer
Northwestern Bell Tel. Co.	Arthur A. Lowman	Clarinda, Iowa	1894	$1 a day and board	Repairman
Southwestern Bell Tel. Co.	Albert C. Stannard	Springfield, Mass.	1899	$25 month	Night Operator
Mountain States Tel. & Tel. Co.	Frederick H. Reid	Denver	1902	$50 month	Collector
Pacific Tel. & Tel. Co.	Ned R. Powley	Boston	1908	$50 month	Statistical Clerk

RECRUITING MANAGEMENT FROM THE BOTTOM

List of company presidents in the Bell System with their first jobs and first pay. Management is recruited on a merit basis and practically entirely from inside the business. Advancement to any position is possible for any man starting in the business.

The present management began at the bottom some years ago. The people at the bottom now will provide the management some years hence.

The people in the Bell System, like most other working

groups in the somewhat fluid society of this country, have a very considerable turnover. Many people come into it and many go out. In prosperous times the turnover is larger and in bad times smaller, but always it is considerable. This turnover is chiefly among the younger people who are just trying the business, and it is much greater among the women than the men.

Prior to the depression the word "security" was heard less often in discussing work, but stability of employment has always been an attribute of a good job.

Before 1930 the chief problem in connection with stability was the number of people who left the Bell System each year. There was no difficulty in assuring a good man or woman worker of a job. But there was difficulty in keeping them on and adapting them to the job. In 1925, about 40 per cent of the people in the Bell System changed in a year. As it takes time to train people, that meant that there were thousands of people on the pay-roll all the time more than would have been needed had the force remained stable. Out of this 40 per cent turnover, about 30 per cent resigned. The other 10 per cent was made up of dismissals, layoffs, retirements and deaths.

By 1931, hirings were curtailed and there was a resultant sharp decline in force turnover which had dropped from 40 per cent to 12 per cent; from 1933 through 1940 turnover was not above 8 per cent, and during that 7 years the dismissals, layoffs, retirements and deaths together were not as high as 4 per cent a year. The depression produced in the later 1930's the greatest stability of force possible—in fact, it turned out that stability, like a good many other things which people cry for, when achieved, was far from being a perfect answer. The first result of the increasing stability was that if few were going to leave the service, few were needed to take their places. And as stability increased so did experience. In 1925 the average length of service of all

employees was 5 years. At the end of 1940 it was about 13 years. Later in this book there will be a discussion of the effects of the depression. Here it is enough to say that there is reason to believe that the kind of stability of employment which a young man or woman starting in the Bell System wants is a good job, but not the kind of stability in which they must keep and like the job because they can't get another anywhere else. And I am sure that somewhat more turnover—or instability—than we have had lately is healthy and normal. The Bell System will fulfil all its functions best if it is composed of people who work at telephony because they prefer that to anything else. That condition comes when the business is growing, when promotions are frequent, and when there is a certain healthy turnover in the force.

Just and reasonable wages in the Bell System have always meant, except for the interruption of the depression, a consistent increase in weekly and yearly income for employees, and, in general, easier physical work, but more skill and responsibility. It has meant that because of better training, better supervision, better tools and plant, a good worker could accomplish more and better work. It has meant that in spite of this increased production, except for the period of the depression when the business shrank, the growth of the business has increased the number of workers. And it has meant that the workers got a considerable share of the savings of their increased productivity. The employee's rate of pay has constantly gone up. The service to the public has constantly improved. The rate of payment to the public in taxes has constantly increased. The rate of payment for the money for the plant and tools has remained about the same.

The present indications are that what has happened in the past will happen again. Unless, as some people believe, the depression brought in a new era and a new order and new economy must come with it, it would seem that the em-

ployees of the Bell System can look forward reasonably to improving their fortunes along with the rest of the country and perhaps somewhere toward the head of the procession. In any case that would be the objective. If the depression has wiped out the value of all experience prior to it and the effect of the depression and war in the world is to change the picture in a revolutionary rather than an evolutionary way, the people who make up the Bell System will have to go on the catch-as-catch-can method along with everyone else. But so far as anyone that I have seen in the Bell System knows, there is no better way of insuring the success of the people who work in telephony than the old one of endeavoring to give more and better service to the public for what it pays and doing it so skilfully and economically that the average worker can have a higher return in the real values of life for his efforts. If this is done, there ought also to be satisfaction and pride in the job as well as pay, for a job that only yields money must be unsatisfactory in the long run. A worker spends nearly half his waking life working and most of his or her human companionship with fellow-employees. If the job and the people bring no satisfaction, there can hardly be money enough in it to make satisfactory the other parts of life.

The chief new element that might affect the workers in the Bell System is the Wagner Act.

Collective bargaining is as much a natural right under the common law as individual bargaining. Both were voluntary. Neither was mandatory. The Wagner Act made it mandatory for the employer to bargain collectively if employees desire.

This statutory right given labor was based upon the theory that without it, under modern conditions, employees were at a disadvantage in bargaining with employers, especially large corporations. There has been much criticism of certain aspects of the Wagner Act and its administration, but none or prac-

tically none of the theory that workers should have the right to bargain collectively if they want to do so. If this right eliminates the individual's sense of fear of coercion or intimidation from management where it existed, it will have achieved a good end unless it puts the individual under more intimidation and coercion from the bargaining unit. If in the long run the right to bargain results in a greater knowledge of what makes better wages possible in his particular business—that too will be an advantage to the worker. If the right to bargain leads to greater understanding of the business, it may well develop men for promotion. On the other hand, if the right to bargain results in hostility to the source of the worker's livelihood, the results will not be so good. In the long run there is more money in promoting the job than in fighting it. It is not clear yet just what set of results will come from the bargaining.

The Wagner Act's passage and the publicity attending its passage and administration almost indicated to workers that the government felt it was their duty to bargain collectively often and hard. There were many speeches that indicated that by this process labor would get more money and a greater share of the returns of industry. These are, of course, two different things. Everyone is agreed about the desirability of labor getting more money. Americans are proud that the average income is higher here than elsewhere in the world. It has for many years been rising. Wages have been going up and everyone wants and expects that trend to continue. The increases can come in the future as in the past from increased effectiveness of labor, tools and management in production.

A greater share of the returns of industry—if that phrase is meant literally—raises another question. From what source is the greater share to come? The groups who divide the returns of industry now are those who work in the industry, those who buy its products and those who provide the money

that builds the buildings that house industry and the tools that it uses—and the tax-gatherer.

The tax-gatherer is mentioned last, but in fact he comes first. He is going to take an increasing amount—and without debate. After this, are the consumers to get a smaller advantage from the improvements in industry and give their proportion to the workers? If collective bargaining is to get a greater proportion for the worker and give less to the customer, it means that the smaller group is going to advance its interests at the expense of the larger. There is a question whether a statement by labor to the consumers of "higher wages for us, higher prices for you" would meet with much favorable response.

However, in bargaining it will always be more popular to whittle the return on the capital invested in the business rather than to get the extra money desired from the consumer. The difficulty with this is that it is the capital which makes the economies possible out of which wage increases come. It often happens in industry that capital loses its return. Wages are paid when capital gets nothing or little. But in such industries capital usually does not provide improved methods and tools and the chance for increasing wages is small. Industry, however, ought to increase in efficiency in the future as it has in the past and labor should at least get its proportion of the increase. Collective bargaining may play its part in this.

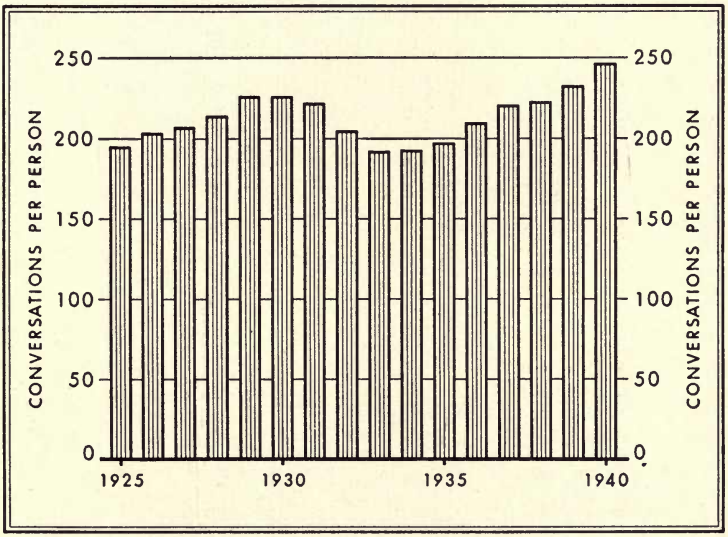
Chapter VII

THE DEPRESSION

AS EARLY as 1927 many people in the telephone business, as well as those elsewhere, were concerned about the condition of the economic life of the country. It will be recalled that toward the end of that year Mr. Gifford restated the System policy to furnish the best service at the lowest cost consistent with financial safety, including the declaration that it would be contrary to sound policy for the management to earn speculative or large profits for distribution as "melons" or extra dividends.

The telephone business was growing at a prodigious rate. This presented an increasingly difficult problem. If the public asks for 800,000 added telephones in a year, a good deal of the plant—that is, switchboards, cables, pole lines, etc.—must be ordered six months to a year, or even two years, ahead. Good plants can't be rapidly improvised. If in the middle of 1929 all signs had pointed to continued growth at the rate it was then going on, the plant problem would have been simple to plan. The personnel problem would have been much harder. Jobs were easy to get. People took them and left them without much concern, although as far as the Bell System was concerned, the turnover was not as large as it had been a few years earlier. In 1929 the Bell System hired more than 100,000 people in order to add 29,000 regular employees to the pay-roll. And it would not have needed the 29,000 or anything like that if the turnover in the force had not kept the experience factor down. There was no assurance that the boom would continue.

Many other signs besides the labor situation spelled abnormality. The American Telephone and Telegraph Company was asked—but refused—to put out its cash on the call money market at interest ranging up to 15 per cent. The stock market, fed by loans, was actually paying 15 per cent for money and buying American Telephone and Telegraph Company stock at a 3 per cent yield, and that in the face of a declaration of policy against melons, split-up or high dividends. That was a small matter but quite significant of the abnormality of the period.



TELEPHONE CONVERSATIONS IN THE UNITED STATES

Showing the average number of conversations per person per year. The telephone usage per person in 1929 was not reached again until 1939.

However, no one knew when the break would come, nor to what degree it would affect the telephone business. Previous depressions had slowed the growth of the telephone business but had not actually stopped it. Even those who

were most pessimistic over the situation did not picture an actual reduction in the telephones in service. The question of when the demand would slow up was most important.

In 1919 and 1920 the Bell System had undergone a very hard experience. The Army in the World War had taken over 25,000 Bell System employees, including a considerable number of the specially skilled personnel who went into the Signal Corps. It had also taken material from the Western Electric Company for use in France. When the war was over the Bell System was short of men and materials and had to face a boom in demand. There were not enough telephones, not enough lines, nor switchboards, nor trained men and women. Traffic was congested. People waited for installations. Service was bad. The Bell System vowed never to be caught again.

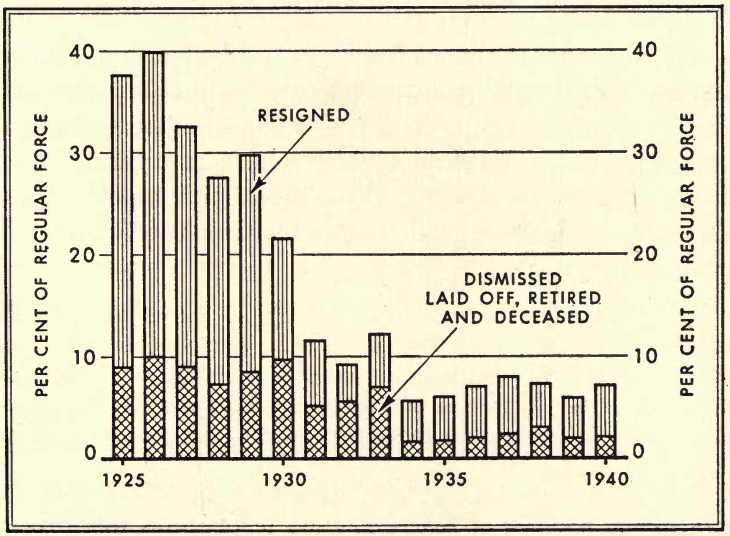
With that memory in mind, the System continued to keep ahead of growth in 1927, 1928 and 1929, determining to slow down when the growth itself slowed down. That meant a construction program of about $600,000,000 in 1929, and the net addition of 29,000 employees. It meant also that the Western Electric Company rented outside space, added to its facilities and working forces, and planned additions at Hawthorne, Kearny and a new works at Point Breeze, Maryland.

Then the stock market crash came and the depression began. Its early manifestations were not different from expectation. In the fall of 1929 and for the year 1930 there was a gain in telephones. It was in 1931 that it became evident that the impact of the depression on the Bell System was going to stop growth and actually produce losses, which no previous depression had done. In 1931 the System lost 290,000 telephones.

In the first two years of the depression—1930 and 1931—a rapid change occurred in the employment situation. In 1929 about 21½ per cent of the total regular working forces voluntarily resigned. They were still not fearful of the fu-

ture. Another 8½ per cent went off the pay-rolls because they were dismissed, laid off, retired or had died. There was a 30 per cent turnover. In 1930 the total turnover was down to about 22 per cent and the voluntary resignations down to 12 per cent. In 1931 the voluntary resignations were about 6 per cent and the total turnover about 12 per cent.

In the three years, 1929, 1930, 1931, the percentage of the regular force that was laid off and dismissed was less than for any three-year period of record before that. But there was



YEARLY TURNOVER IN THE WORKING FORCES OF THE BELL SYSTEM

Prior to the depression, resignations of regular employees ran from 20 to 30 per cent of the total force a year. Since 1930 they have never been as high as 7 per cent. The turnover from all other causes from 1925 to 1930 had a maximum of 10 per cent. For the last five years it has never been as high as 4 per cent.

this difference. A layoff in the twenties was not very serious for the man concerned. If prosperity had been around the corner in 1930 or 1931 those layoffs would not have been

very serious either, for there would have been jobs elsewhere. However, up to the end of 1931 nothing very abnormal had happened except that resignations had not been replaced. By the end of 1931 the force was stabilized. The turnover from all causes was at a rate of about 12 per cent. The 60,000 or more learners, who in 1929 were being trained to care for added business and to take the place of those who were expected to resign, were no longer needed. They had disappeared, and with them the evidences of boom conditions from the employee aspects of the telephone business.

But a somewhat serious condition had begun to appear in the engineering and construction forces whose activities are dependent on growth. Yet, if business had begun to improve at this point the situation would not have been far different from previous depressions. The 1931 annual report of the American Telephone and Telegraph Company made this comment:

> Everything practical was done to keep, so far as possible, all regular employees on the pay-roll; in some instances, as when specific jobs were completed in territories where other work was not available, layoffs were unavoidable, but the number of employees laid off by Bell telephone companies in 1931 was not as great as in normal years.
>
> Employment was kept at a maximum by the inclusion in the construction program of betterments and replacements which could be advanced. The continuance of the program of conversion of manual operation to dial resulted in net additional employment throughout the year of more than 10,000 persons. Increased sales efforts and the new teletypewriter exchange service were helpful. Employees were transferred from departments not busy to busy departments and, where possible, from localities not having work to localities having work available.
>
> In order to spread available work so that the maximum number could be kept employed, more than half of the employees of the Bell telephone companies by the end of the year were working less than full time. Also, the employees of the Western Electric Com-

pany and the Bell Telephone Laboratories were working only five days a week or less. . . .

In 1930 President Hoover had asked industry to maintain wage scales and to build ahead in order to keep up purchasing power and employment. He suggested that short-timing all employees would reduce the number of layoffs. To a considerable degree industry followed these suggestions. The Bell System practiced short-timing and did not reduce wage rates. It also had under way a strong sales campaign.

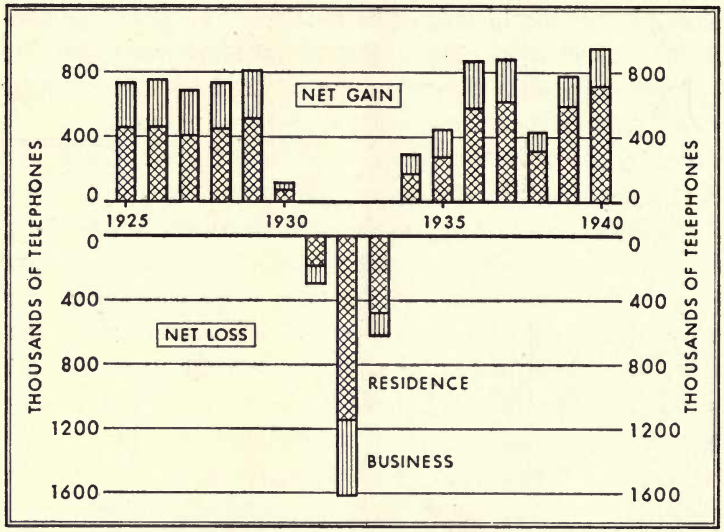
During the boom period of 1926-1929 there had been no great sales effort by the telephone companies for business was coming in as rapidly as it could well be taken care of. There had been, however, some sales training experiments. As the depression came on, the sales work was rapidly developed. People who did not have telephones were canvassed, people who had one telephone were urged to take two, and particularly every person who ordered his telephone taken out was seen in an effort to get him to reconsider. This "saving of disconnects" was effective beyond expectation. Besides the regular forces of the commercial department, every employee was drafted for sales work and given instruction. In hours and out, they worked to stem the tide.

The years 1929, 1930 and 1931 might well be considered the first phase of the depression. By the end of it, all excess employees of the boom times were gone. A seasoned force and a stable force were giving better telephone service than ever before and striving hard to sell more service. There had been some layoffs, and much effort to prevent layoffs by transfers, extra maintenance work and all sorts of devices. Most employees were on short-time to some degree and practically all were contributing to voluntary funds to help the general unemployment problem. A great many telephone employees worked in these campaigns.

During these three years the earnings per share of American Telephone and Telegraph Company stock had gone

down from $12.67 a share to $9.05. On the other hand, the number of stockholders had increased. There were 454,596 at the beginning of 1929 and 644,903 at the end of 1931.

Then came 1932. In that year the Bell System lost



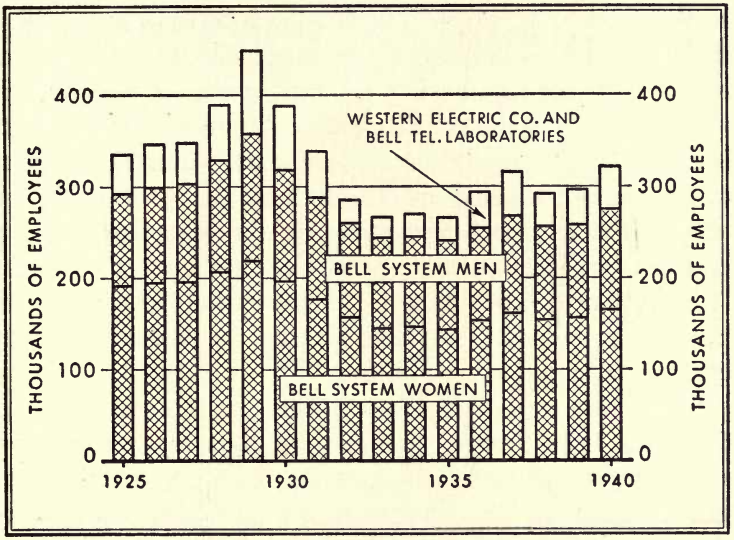
THE EFFECT OF THE GENERAL BUSINESS DEPRESSION ON TELEPHONE GROWTH

In 1931, for the first time in its history, the Bell System had a net loss in telephones, and in 1932 it had a net loss greater than any yearly net gain in its history. For the three years 1931-1933 combined, the net loss was about 15 per cent of the number of telephones in service at the end of 1930.

The chart also shows the proportion of business and residence telephones in the gains and losses.

1,614,000 telephones—more than 10 per cent of its total. The loss of 290,000 telephones in 1931 had been the first time that a year had ever passed without an increase in telephones in the Bell System. That a loss of twice a boom year's increase could happen had been inconceivable. But that happened in 1932. In the years 1932 through 1935 there was not a single

quarter in which Bell System earnings met American Telephone and Telegraph Company dividend requirements. In no year in the history of the company had the System ever failed to earn these dividend requirements before. In 1932 and 1933 when telephones decreased 14 per cent and construction was with difficulty kept up to less than one-third that of 1929, employment dropped about 15 per cent. But in one sense that sounds much better than it was. If the



BELL SYSTEM EMPLOYEES

Showing the number of employees in the Bell System, with the relative proportion of men and women, and the number of employees in the Western Electric Co. and the Bell Telephone Laboratories.

experienced force then in the Bell System had worked full-time in a normal manner, many more people would have been dropped from the rolls. They were continued chiefly by part-timing which, as time went on, got to be very severe.

This second period differed in another respect from the first. In the first period the Government had done what had

not heretofore been done in depressions in advising industry to maintain wages, adopt spending programs and spread work.

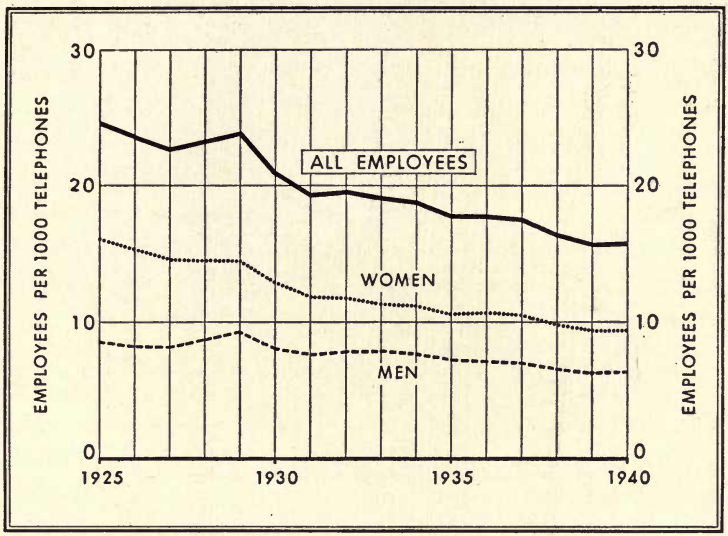
In August, 1933, the Bell System signed the President's Reemployment Agreement under a National Recovery Administration Code and appeared under the Blue Eagle. The work-week became formally 40 hours instead of 44 or 48. Wage rates were not reduced; they were, in fact, to some degree increased. But there was not an immediate increase in the average pay envelope, for the practice of spreading and providing productive "made" work which began in 1930 resulted by 1933 in having 60,000 people on the pay-roll who would have been unnecessary had everyone been working full-time. During the next four years, while the losses in telephones were being recovered, these 60,000 were being absorbed so that part-timing had largely disappeared by the end of 1937, except that the 5-day week had been established.

Even taking into account the absorption of the 60,000 people, there would have been a larger increase in the force except for several unusual things.

There was an extraordinary increase in the experience in the force. In five years, 1928 to 1933, the average length of service increased from five and one-half years to ten. That greatly increased the average capacity and performance. Secondly, there was a surplus of lines, switchboard capacity, etc., which made operations unusually easy. Also, there was almost none of the operating problems which arise from infiltrating new apparatus into the system, for there was no growth and no need of it.

All this resulted in greater average accomplishment per worker though not at a more rapid rate than usual, for the increasing experience of the force was offset by a slower introduction of improved apparatus. The chart on the opposite page shows the increasing capacity of the force, both in the depression and before, in terms of employees per 1000 telephones.

The NRA did not continue but it was followed in 1938 by the Wage and Hour Act, which had about the same effect on the Bell System. Neither changed much, if any, the average scale of wages in the Bell System. Some of the technicalities produced inflexibility in operation. And in both laws there



INCREASING EFFECTIVENESS OF BELL SYSTEM EMPLOYEES

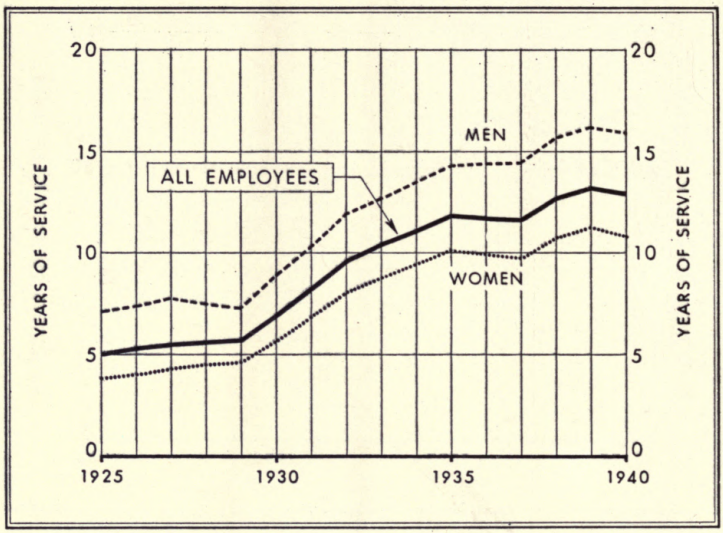
In 1925 the number of Bell System employees per 1,000 telephones was nearly 25. In 1940 it was about 16. This smaller number was, to some extent, a result of a smaller volume of new construction work; but in the main it reflects better plant and appliances, better methods of work and the greater skill and experience of the forces.

was a tendency to place wage rates in the small towns and rural districts on too high a basis in relation to the value of telephone service in those places. What has happened is not serious, but it is another instance of Federal regulation taking responsibility away from management. It also has a tendency to limit state regulation.

All in all, during the years 1933-1937 a good part of the time of management in the Bell System was consumed in

adjusting itself to laws, orders or investigations in Washington, for besides the NRA, the Wagner Act, the Wage and Hour Act, the Federal Communications Commission was created and held its investigation of the Bell System.

The other governmental activity which affected the Bell

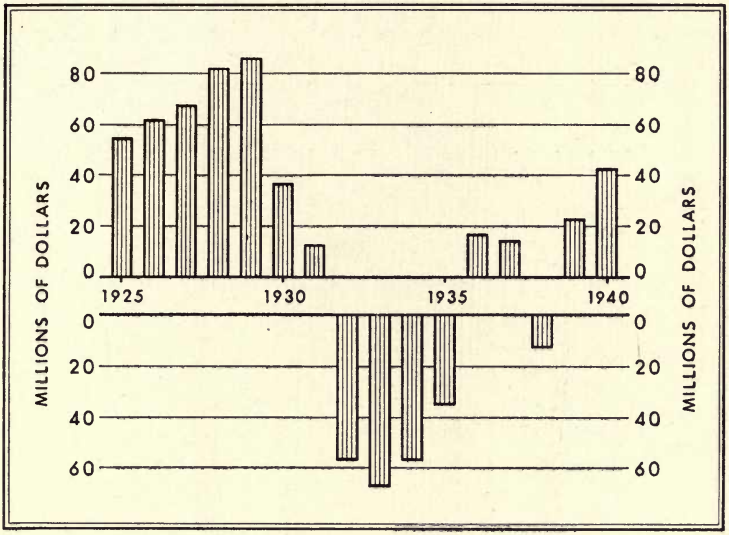


INCREASE IN EMPLOYEES' EXPERIENCE IN THE DEPRESSION

The average length of service, which was five-and-a-half years for all Bell System employees in 1928, reached ten years in 1933 and about thirteen in 1940.

System during the depression was the increase in taxes. In the boom year of 1929, the Bell System's operating taxes were $82,304,000. Eleven years later they were $184,770,000, an increase of 124 per cent. The revenues of the System, however, increased only 11.9 per cent, 1940 over 1929. This is not an argument that the Bell System's taxes should not have been increased. An increase was inevitable. It is merely to point out that the management had to find some $102,000,000 more in 1940 than it did in 1929 that could not go to the

public in lower rates or improved service, or to the employees or to the owners of the property. The improvements in operation in the business have to take care of this $102,000,000 before they can effect the policies of the System in regard to lower rates or better wages. Our whole system of business

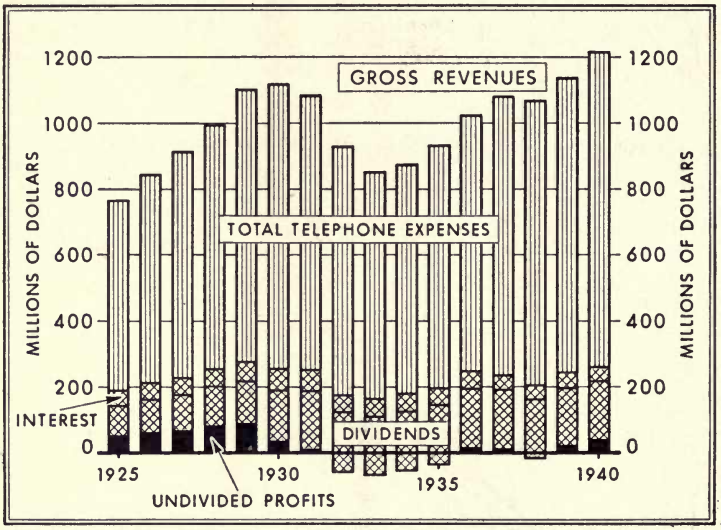


BELL SYSTEM UNDISTRIBUTED PROFITS APPLICABLE TO A. T. & T. CO. STOCK

During the period shown, after paying the regular dividend on American Telephone and Telegraph Company stock, there were undistributed profits in eleven years. In five of the past ten years, the regular dividend was paid in part out of surplus.

and government is built upon the idea that private enterprise in one way or another will support the government. On what basis that shall be has always been the most important continuing matter of business of those elected to conduct the country. At present, there seems to me no question but that the public correctly prefers national defense to lower telephone rates, and that the increase in telephone taxes along with other taxes is correct.

That period of the depression which began in 1932 not only changed the character of the personnel problems and increased the amount of government activity in various fields affecting the telephone business, but it brought a great change in the financial situation of the System.



THE DISPOSITION OF THE REVENUES OF THE BELL SYSTEM

Showing amounts of revenues applied to telephone expenses, interest charges on debt and dividend payments on stock. Undivided profits, if any, are shown by the solid black areas of the columns. Dividends paid out of surplus are represented by the areas below the zero line.

Up through 1931 the American Telephone and Telegraph Company had never failed to earn its dividend. At the end of 1931 the consolidated surplus applicable to A. T. & T. Co. stock was some $595,000,000—or about 12 per cent of the total Bell System assets. In 1931, the A. T. & T. Co. had just squeezed through with $9.05 a share to pay its $9 dividend. For the next four years the A. T. & T. Co. did

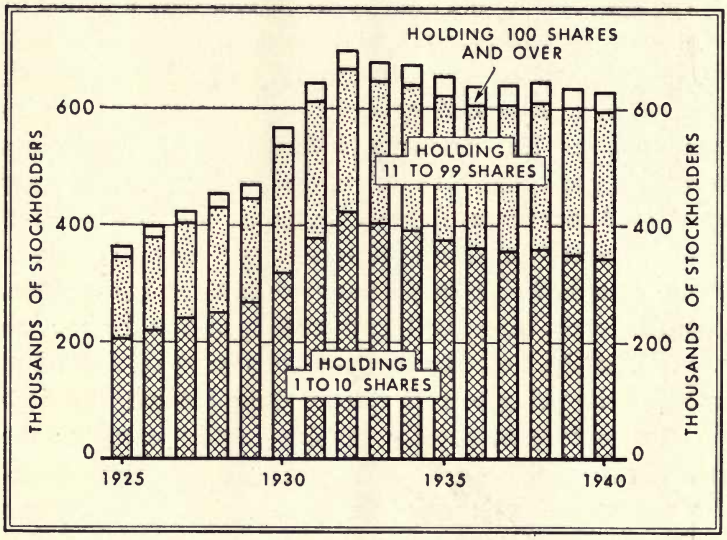
not earn its dividend in any year. At the end of that time the consolidated surplus of the Bell System applicable to A. T. & T. Co. stock had decreased to approximately $353,000,000, or some $242,000,000, and was about 7 per cent of total Bell System assets.

The Bell System had built up its surplus over a period of fifty years. In rate case after rate case, it had testified that this surplus was for emergencies—to protect the personnel, property and financial integrity of the business. The surplus was there, and the emergency. So the deficiency in earnings was made good from surplus and the dividend paid. No one questioned that it was right as long as it was safe to do it. But there was a question as to how long it would be safe to continue to do it. Hindsight has since justified the decision. Grateful letters from small stockholders, such as the 200,000 who joined the Bell System from 1929 to 1933, helped to maintain the policy as each quarter came around. The decision to continue to pay the dividend really rested on the principle that there was at least an implied promise to do so, that the stockholders needed the money, and that the System could afford safely to reduce its surplus in the belief that good times would come again and it would again be built up. But the decision was not easily made. There were many anxious hours devoted to the problem. There is no way of telling accurately now, but it was reasonably clear during that period that the larger stockholders and the financial community were more in favor of cutting the dividend and safeguarding the property, and the smaller stockholders more in favor of paying the dividend which they so much needed.

In order to carry out this policy the American Telephone and Telegraph Company not only had to have a surplus on the books but also a surplus in cash. In 1932 the American Telephone and Telegraph Company not only had to have cash ready for dividend payments beyond current earnings,

but nearly $60,000,000 of cash to give back to employees. This need for cash came about in this way.

The American Telephone and Telegraph Company had an Employees' Stock Purchase Plan through which employees



STOCKHOLDERS OF AMERICAN TELEPHONE AND TELEGRAPH COMPANY

Showing the proportion holding 1 to 10 shares, holding 11 to 99 shares and holding 100 shares or more. No stockholder owns as much as one per cent of the total stock. The 35,000 largest stockholders holding 100 shares or more, which include insurance companies and other large institutions, own fifty per cent of the total stock.

were buying its stock on the instalment plan by deductions from their pay or by assignment of dividends upon shares already owned. This plan provided that employees could cancel their subscriptions at any time prior to completion of their payments and receive their instalments back with interest. During 1932 when the market price of American Telephone and Telegraph Company stock was below the subscription

price, employees under this option withdrew something over $58,000,000. The Company paid out this $58,000,000 in cash.

The book surplus and an ample cash reserve were immensely valuable in giving freedom to management in continuing construction, maintaining wage rates, granting termination allowances, repaying the stock instalments, and continuing the dividend.

If, to loss of business and lack of demand, there had been added a lack of money, the condition would have been far more serious for all concerned.

A comparison of the Bell System for 1929 and 1940 brings out some of the results of the years of depression.

	1929	*1940*
Plant investment	$3,705,536,000	$4,747,674,000
Operating revenues	$1,049,245,000	$1,174,322,000
Surplus applicable to stock of American Tel. and Tel. Co.	$567,005,000	$360,452,000
Total operating taxes	$82,304,000	$184,770,000
Number of employees	358,575	275,317
Average weekly pay envelope	$28	$37
Total wages	$518,784,000	$508,344,000
Number of telephones	15,034,605	17,483,981

The operating revenue was about the same in 1940 as eleven years before. The investment was much larger. The number of employees was smaller and their wages higher, so that the total wage bill was nearly the same. Payments to the public treasury were greatly up. The surplus was less than two-thirds of what it was in 1929 and, at the 1940 rate of earnings, it would take a long time to restore it.

Looking back over the whole depression period for light on the future is not as productive as we could wish it. There is the encouraging indication that the American people deeply desire to alleviate the miseries attending a depression with more generosity than ever before. People did not starve in any previous depressions, but the help—both private and public—in this depression was undoubtedly greater than

ever before. But there is no indication that this help or any other measures—either public or private—do or will control the ups and downs of business in any effective way. On the contrary, as far as the Bell System is concerned, it is not only reasonable for us to expect booms and depressions, but to expect them to affect the System severely—which had not happened up to 1929.

The most obvious first preparation for such a future is to have the System in such financial shape that it can do at least as well as it did from 1929 to 1940 in maintaining and raising wage rates, paying termination allowances, building ahead on whatever can be reasonably planned, and paying the stockholders a reasonable dividend.

In the second place, we can perhaps to some degree keep from building up our forces unduly in the booms. There is no formula for this, no scheme or trick. It will just depend on better management and judgment. For the Bell System would not be serving the nation, if, for instance, it should risk having its service deteriorate when the nation is exerting itself to get all services that help in defense in perfect shape. The experiences of the last ten years will be valuable in planning construction in depression and in handling transfers of people from one kind of job to another, and also in the selling of telephone service under such conditions. Neither private industry nor the government found a way in the last depression any more than in previous ones to adjust the work to the workers with accuracy all over the nation. On the contrary, at the end of that depression—if it is counted as ended—we had unemployment and made work as never before. But it is reasonable to hope that out of our experience in the Bell System, which is being carefully studied, we should be able to handle the problems better when and if they come again and to the degree to which management will be allowed to function. This improvement might be a five, ten, twenty per cent improvement. Improvements in this

general order are possible in all phases of management and are constantly occurring. There is no reason why they should not occur in the treatment of employees in depression circumstances. And toward this end the Bell System is devoting its studies, for we see no likelihood of a formula that will rid the country of business cycles and no prospect that will justify our neglecting to prepare for them, as best we can.

Chapter VIII

MANAGEMENT AND OPERATIONS

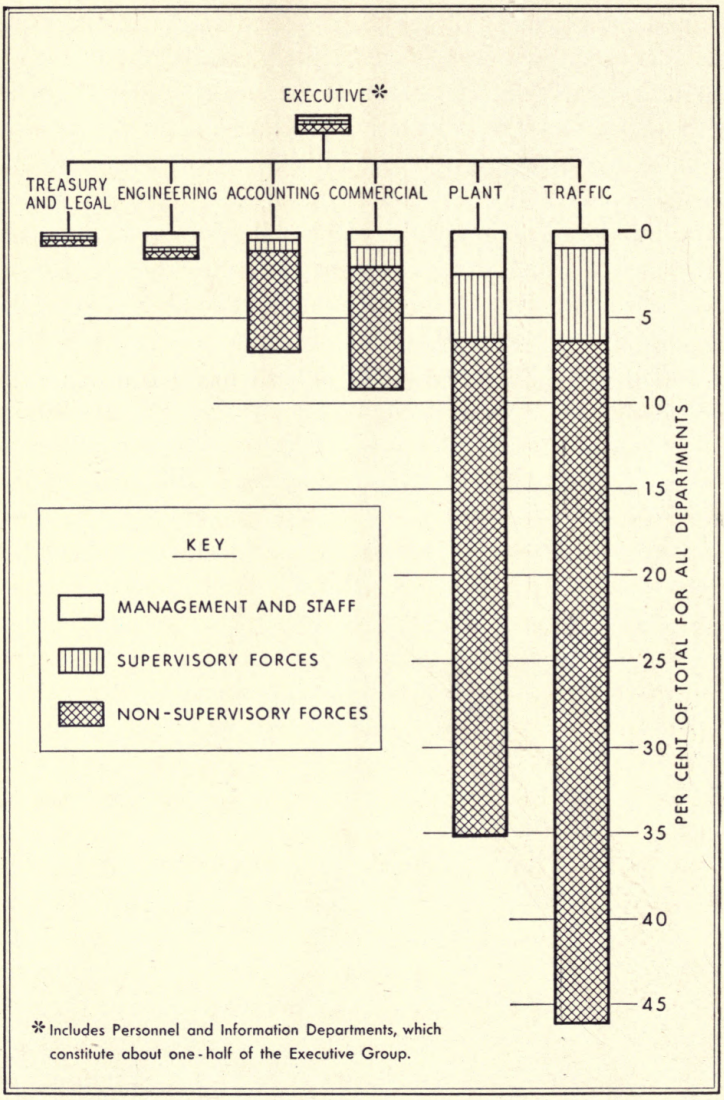
THE art of managing large numbers of people so that they work together effectively toward a common end has improved immensely in the last hundred years, along with the technical processes that are used in modern industry. And the art of organization is as essential to modern large-scale industry as any technical process.

Throughout history the military profession has probably been under more pressure to create effective organization of large numbers than any other. Frederick of Prussia was distinguished for precise training and was the model of his time. Steuben made good soldiers in far less time than it took Frederick and left them more initiative. Napoleon with his marshal's baton in every knapsack emphasized initiative. He also had in Berthier the beginnings of a modern staff. The Germans have developed the staff function in recent years to high degree. The staff is perhaps the greatest contribution to the art of management in the last half-century.

In an ordinary infantry division roughly three-fourths of the men are privates, one-fifth non-commissioned officers, and one-twentieth officers. That division also has service and supervision from corps and army staffs and the general headquarters staff. These organizations make the plans for the division by which it gets to the right place at the right time, with proper equipment, ammunition, food and everything else it needs, so that its maximum power may be used without waste or confusion.

The management of the Bell System works in the same manner. Instead of infantry, artillery, tanks or air forces, the telephone army has plant, traffic and commercial forces —business office representatives to take orders for service, accounting forces who prepare bills, operators who work the switchboards and construction crews, installers, repairmen who build and maintain the plant. All of these have supervisors of varying grades just as the army has corporals, sergeants, lieutenants, captains, majors, colonels and generals.

The Bell System percentage of non-supervisory forces, supervisory forces, management and staff is much the same as the Army's men, non-commissioned officers, and officers. But as the problems of the two organizations are different, their organization to meet the problem is different. Let us take the traffic forces, for example. There are some 110,000 operators at the switchboards. To enable them to function most effectively there are one-fifth that many other women in the traffic forces who do not regularly handle calls. Behind each group of about a dozen operators is a supervisor who takes care of special cases and trains and counsels the group. This is far more effective than having an extra girl at the switchboard. These supervisors report to a chief operator. The chief operator has the work of assigning the force so that enough will be there for the peak loads and not too many at slack times; she trains new employees and has the general supervision of the office. She has assistants and clerks to help her. On the average, there is about one non-operator for every five operators in the traffic department. And the operating force itself is quite varied, for there is great variety in the work. There are ordinary operators, intercept operators, information operators, and a number of different kinds of operators on the toll boards, depending on the kind of equipment in the office, including quite a number of operators in dial offices. It is an interesting fact that although the Bell System has been changing from what is called manual to what is called machine operation for more



COMPOSITION OF BELL SYSTEM FORCES

Showing the per cent of the total employees in the various departments of the Bell System telephone operating companies and the proportion of supervisory and staff personnel in each department.

than twenty years, the percentage of women employees has been reduced only from 70 per cent to 60 per cent of the total employees.

A number of offices with their chief operators report to a district traffic manager. He is responsible for the quality of service, the costs and in fact everything about the conduct of these offices—that the offices are properly equipped, properly maintained, that the forces are adequate and properly trained, etc. He in turn, along with several other district managers, reports to the division traffic manager.

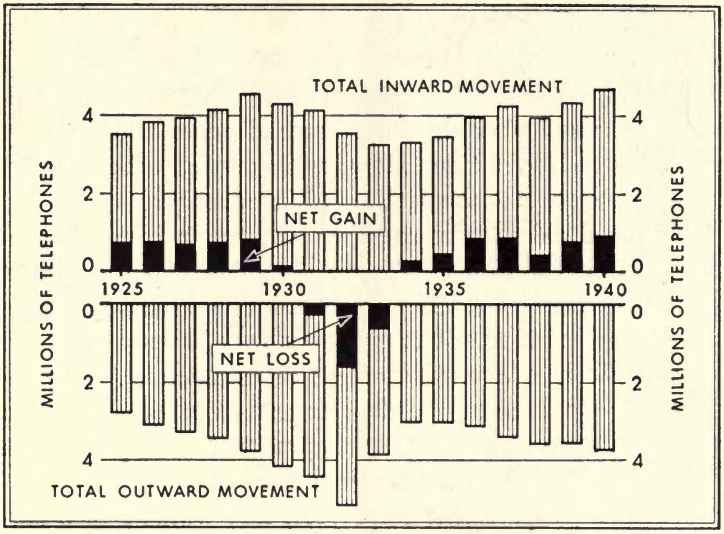
But the district traffic manager also has a constant contact with his coordinates, the district plant and the district commercial managers. They are like three partners in charge of a business. Many of the problems they have to meet are not exclusively either traffic, plant or commercial. They involve two or three of the departments. The three have to work as a team at the district level as well as reporting on their special functions to the division level.

The traffic department employees, like workers in a factory, work indoors, where group supervision is easiest.

The commercial department is much the same as far as most of its employees are concerned. Taking orders, receiving payments, the large part of the commercial work is done in company offices. But on the other hand, the commercial sales force goes to the public. And the district commercial manager has more relations with the public than anyone else. Almost everything that the public wants or does not want from the telephone company comes to his attention. Of the three coordinate-managers at the district level he is by the nature of his work most in touch with the public attitude toward the company and its service.

The district plant man has a different kind of job. His forces are scattered all over outdoors as well as in the company offices. They are divided roughly into two groups, one maintaining the property in working condition, the other

installing, removing and changing telephones on order. This is an active business. In the year 1940, when the Bell System gained 950,000 telephones, the plant forces connected



BELL SYSTEM TELEPHONE MOVEMENT AND NET GAIN

This chart shows the gross number of telephones connected yearly (Total Inward Movement) and the gross number of telephones disconnected (Total Outward Movement), these figures including connections and disconnections due to subscribers moving from one address to another. The chart also shows the yearly net gain or loss in telephones, which is the difference between the Total Inward Movement and the Total Outward Movement. In most years the inward movement has been five or six times the net gain.

3,325,000 new telephones, disconnected service at 2,375,000 telephones and changed another 1,400,000 from one address to another. The schedules for this work are at the convenience of the public. To plan this without waste of time is a test of management.

At the same time the district plant man has a crew going over the "outside" plant all the time, doing both trouble

shooting and preventive maintenance, and another crew at work inside the central offices. Wherever they are, the test deskman knows their whereabouts so he can get hold of them and their fully equipped cars for any emergency.

The ordinary district does not have enough continuous construction work to keep engineering staffs or construction crews busy. They are organized on the division level.

But, in general, supervision in the Bell System is based primarily on the district. There are about 330 of them. But they are not alike as are regiments in an army. They may vary from 5,000 telephones to 175,000 telephones, and men, women and material in proportion. The average is about 50,000 telephones. In districts in big cities the demarcation of functions embraces everyone pretty thoroughly. In districts made up of small towns an individual may have overlapping duties. A small town manager may be responsible for plant, traffic and commercial activities. In the smallest places the operator may do commercial work or the plant man function as company representative. The organization is not stereotyped. It is adapted to whatever the circumstances require for good service on the most economical basis.

The next rank above the district is the division which includes from two to seven districts, also has functional managers, plant, traffic, and commercial, and as the districts vary so do the divisions.

Above the division comes the company headquarters, with a general manager for each of the three functions. To these men about 90 per cent of all employees report. This is the operating organization. But at the company headquarters there is a considerable staff—the legal department, the treasury, the engineering department, the accounting department, the information department, the personnel department.

Several big single-state companies like the New York and

Illinois Bell Companies have area organizations between the division and company headquarters and these area headquarters have some staff functions. Other multi-state companies, such as the Southern and Southwestern Bell Telephone Companies, with divisions co-extensive with a state, have state managers who have certain staff members. Hardly any two companies function exactly alike, yet they are all alike in the essentials which enable the recording of service results in very considerable detail and likewise financial results.

The idea is to have an organization technically competent at every level, with a blending of experience, practice and initiative and a clear channel of communication from the contact employees who deal with the public to headquarters and from headquarters back again through the line of organization. Any problem too much for the first person who gets it should quickly go up until it finds a man who knows the answer. And new experience, or new techniques, or new ideas, or new emphasis from headquarters should flow down easily, quickly and intelligibly. Keeping a living organism in a state to do this well is like keeping a human being healthy. It isn't a problem that is ever solved, but according to the way of living you can get better or worse. Anybody can keep his brains, knowledge and human understanding busy all the time on this job and most everybody in the Bell System does.

There is still another staff besides those at operating company headquarters. There is a general staff for the Bell System in the American Telephone and Telegraph Company offices in New York. This staff codifies all experience in the Bell System, keeps in touch with what goes on throughout the System and acts as a coordinating influence on all operations. This general staff under the direction of the President of the American Telephone and Telegraph Company is responsible for overall system policies, for the dissemination to

all operating units of improved practices discovered by staff study or arising in practice anywhere in the System. It does for the System what the company staffs do for the divisions and districts. However, it has some additional functions.

The President of the Bell Telephone Laboratories and the President of the Western Electric Company are members of this staff and they have no counterparts in the company headquarters' staffs. These two are responsible for the discovery, development, and manufacture of constantly improving tools and plant for the conduct of the business. The needs of new material for the operating forces are reported from those forces to the Operating Department of the American Telephone and Telegraph Company. That department also devises the methods for using new material. The Laboratories, Western and the Operating Department heads of the American Telephone and Telegraph Company are very closely knit together in their functions and this material side of the business is closely knit with the financial, legal, personnel, and with the relations with the public and the public's agents, the commissions. All the vice-presidents of the American Telephone and Telegraph Company, the staff heads of the System, are intimately in touch with each other.

Pretty much everything is settled by conference. Practically everything of any importance affects two, three, four or five departments and several companies or maybe all of them. When any matter comes up it is the staff job to think of who will be affected and how and act accordingly. Immediate matters are attended to by telephone, letter or visit. Other matters are rounded up in conferences. The presidents of the operating companies confer twice a year for three or four days with the President of the American Telephone and Telegraph Company and his staff. The operating vice-presidents have a conference with the vice-presidents of the American Telephone and Telegraph Company in

charge of operations. There are similarly personnel conferences, public relations conferences, legal, plant, traffic, commercial, engineering, accounting department conferences, etc.

By this means, by visits between operating company men to American Telephone and Telegraph Company headquarters and American Telephone and Telegraph Company staff men to the field, there is constant personal contact to supplement the regular flow of reports and documents.

There is not an entirely clear line of demarcation between line and staff operations. The chief operator and her staff are pretty much concerned with operations, pure and simple. Yet, in a sense, the planning of changes in the force for a week ahead is a staff function. The district staff will plan with a longer vision. Generally speaking, the higher the level at which the staff operates, the longer distance view it has to take and the less it has to do directly with operations. Both the operating and planning functions of the management are vital to System operations. A good force and good equipment cannot produce good results under bad direction. And there will not be a well-trained force properly equipped if there has been bad direction. The staffs which constitute management must accept responsibility for the results. They made the policies, hired and trained the forces, supplied them with equipment and directed their energies. If the result is bad or good, the responsibility is theirs.

With such an organization, what is the philosophy of the management of the Bell System? It is, of course, considerably influenced by the kind of business it is called on to manage.

The telephone business is a retail rather than a wholesale business, a tailor-made business, not a mass production business. Every call is set up individually and no two are alike. The telephone instrument itself in one house may be like the one in the next house; the wiring that makes it work in every case is an individual job. If every job is different,

somebody has to do some thinking about every job, whether it is a simple local call or installing a complicated cable. That situation brings out one of those interesting conflicts which make the art of management fascinating. Routines are the embodiment of previous experience. Red tape is the rules that grow out of previous practice. As much as people complain about them and as much acclaim as the public gives to people who slash red tape, the fact is that routines and red tape, if you want to use unpopular words, are essential to organized effort. But like most things they have to be used with judgment and discretion. Initiative is as popular a word as red tape is unpopular. And initiative is also essential to successful organized effort, but it too has to be used with discretion. The bull in the china shop was full of initiative. Initiative tends to forget experience, and the routines and red tape tend to dampen initiative.

And then in the highly technical business you have the specialist who confines himself to one function. And this tendency falls foul of the necessity for a balanced overall conduct of the business. Yet someone has to have the specialized knowledge. The operations of the Bell System have all of their conflicting elements in varying proportions in accordance with the management's judgment of the conditions to be met.

The foundation of the management's procedure is the detailed and comparative data on operations from all parts of the System for many years back. This is the experience from which the operating routines are evolved. The Bell System is a profound believer in the results of accumulated experience. But it does not believe that experience stopped yesterday so it is constantly experimenting with relaxation of the routines and encouragement of initiative and individual responsibility. In general, the better people know their routines and the reasons for them the more they can safely take added responsibility and depart from them. But those

who don't know well what they are departing from are likely to get lost in their own improvisations. In recent years the average length of service of Bell System employees has increased and the experience of the force is much higher than it used to be. As a result, blending of experience—personal and routine—with individual responsibility and initiative is much more effective than it used to be. This is true pretty much throughout the forces, including supervision.

The same process of collecting information which codifies the experience of the Bell System also provides a means of judging performance.

There are ratings for every district and division in the System on a great number of what are called service items; for example, the number of operating errors, the time and cost of installing telephones, the number of customer complaints, the number of bad accounts and a great variety of other things. There is probably more severe—perhaps more intelligent—competition arising from the comparative figures of offices, districts, divisions, areas and companies in the Bell System than there is in most competitive industries. This internal competition in the Bell System is not at all confined to the final balance sheet. It covers pretty much everything by which both the quality of the service and the financial results can be judged. And it differs from the practices of competitive business also in the fact that there is no secrecy. Whatever is accomplished anywhere in the System is known all over the System, and the methods of the accomplishment explained in detail. A man who comes up through an organization in which his work can be fairly accurately measured in comparison with that of men in similar jobs all over the country, ought to be competent. This internal competition ought to produce as much progress as the competitive system elsewhere and give management as good or better judgment on which to base promotions. It is quite largely on this competitive process on which

the Bell System relies for assurance of progress in the management of the business.

To give as clear a road as possible to competency, the Bell System has long had a pension plan. As far back as 1903 people in the Bell System were discussing the establishment of a plan, to be supported solely by the employer because "it promotes the efficiency of the service by permitting the retirement of incapacitated employees without working very great hardships on old and faithful employees." At that time a certain number of companies, mostly the railroads, had pension plans, but such plans were not common in American industry. Nor were they common practice in 1913 when the Bell System put its plan into operation.

This plan (printed in full as Appendix II) is entitled "Plan for Employees' Pensions, Disability Benefits and Death Benefits."

Under its terms employees of from two to five years' service receive as sickness benefits four weeks' full pay and nine weeks' half pay, if their disability lasts that long. These periods are extended with the lengthening of the term of service until they reach 52 weeks' full pay for all employees with 25 or more years' service.

If an employee is partially disabled by accident in the course of employment the plan provides, depending on length of service, full compensation for loss of earning capacity for periods ranging from 13 to 52 weeks and half the loss of earnings for the remainder of the disability up to six years.

For total disability there is full pay for the periods referred to above in connection with partial disability and thereafter half pay for the continuance of the disability except that after six years the maximum payment is $20 a week.

In practice these provisions mean that the ordinary sicknesses and accidents of Bell System employees do not affect

their income. Not only do they have the benefits enumerated above, but company medical facilities are available to the great majority of employees for emergency treatment and medical advice. In addition to providing advisory service and assistance in employees' sickness problems, the fundamental purpose of the medical service is to be sure that conditions of employment are healthful and safe and that employees know as much as possible about healthful living.

The sickness and accident disability payments and the health service are not intended to guarantee to Bell System employees immunity from the vicissitudes of life nor to deter them from their individual responsibilities in making in so far as possible provisions to care for emergencies themselves. The greater part of the long term employees have savings and insurance, in many instances, probably more than they would have if they had not been paid for lost time during sickness and accidents.

Nor are the pension provisions of the plan supposed to relieve employees from the necessity of making provisions for their old age in accordance with their individual circumstances.

With the help of the plan the average worker in the Bell System has a pretty good chance of making a fair provision for old age. For example, let us take the case of a plant man who worked for the Bell System from the time he was 25 until he was 65—40 years—and had an average pay of $2,500 a year in the last ten years. The pension amounts to one per cent of that average pay for every year of service. In this man's case the pension would be 40 per cent of $2,500 or $1,000 a year. Let's assume that in his earlier years with lower wages he saved little, but credit him with total savings equal to 10 per cent of his wages for the last 12 years. That would be $3,000. If he bought an annuity with that he would get about $250 a year for life. In order to get as much from his savings as he does from his pension he would

have had to save some $12,000. Of course, now under the Social Security Act he is forced to save for old age in the shape of social security tax payments. And from this source he would, if retired on January 1, 1941, receive $447 a year (not including any additional amounts under the Act for qualified dependents) of which only the half represented by the company's direct tax contribution would be deducted from his service pension. Altogether, therefore, from the Bell System pension, from the Government and from savings of $3,000 this man who was earning $2,500 would have some $1,475 per year to live on when he quit work. If he had made no savings of his own at all he would still have some $1,220 a year.

That is a pretty fair result not only in fact after the man is retired, but what is perhaps equally important to him, in prospect before he is retired. That he has a basis for serenity while he is effectively at work and that he is not required to work for the company when he can't do its work reasonably effectively are both important to the efficiency of the business. And, as the first memorandum of 1903 stated, fundamentally the plan is designed to increase the efficiency of the business by providing for the retirement of those who cannot continue their jobs or continue them effectively. If the management is right in its judgment, the pension plan is valuable to the stockholder, to the public, and to the employees. If it increases efficiency, as management thinks it does, it is essential to the conduct of the business in order to earn enough to pay fair wages and benefits and pensions, and at the same time lower rates and improve service and still provide safety and a fair return to capital. To accomplish these ends year after year there must be an organization of healthy men and women with their vigor and initiative unimpaired by superannuation or disability.

Up to 1930 regulations in most of the companies provided that employees must retire upon attaining 70 years of age.

In 1930 retirement was made compulsory at age 65. Inefficiency in some occupations is relatively easily discernible. And in some cases the employees at the retiring age desire to stop work requiring manual dexterity and some measure of endurance. But in supervisory positions, especially in top management, while the consequences of ineffectiveness are more serious to the progress of the business, it is far less easy to discern. A supervisor who fails to do the routine part of his job can be spotted easily enough, but it is not easy to prove ineffectual a supervisor who does the routine job reasonably well, but who fails in the extra initiative, interest and push that make good management. And it is likely to be difficult for men of nearly his own age to persuade a member of top management who is hale and hearty enough to go to the office and do a full day's work, that the best interests of the business require his retirement. Yet a management whose imagination, creativeness and open-mindedness were somewhat dulled by age might easily slow up progress so as to endanger the fair wages, lower rates and safety of capital, which have so far characterized Bell System history. The provision for mandatory retirement at 65 which was adopted to become effective in 1930 has not only kept the top management younger, but it has turned over and revitalized management oftener, and by so doing given many more people chances at the supervisory jobs.

Practically everyone in management believes that the compulsory retirement at 65 has improved the conduct of the business. Everyone knows that the rule and the facts in some individual cases do not synchronize accurately, that some men keep their best abilities after 65 and some lose them before that. But there is a general conviction that any attempt to make exceptions extending employment beyond age 65 would jeopardize the general working of the rule and set up invidious comparisons of much potential impairment to morale. Along with this general agreement, there is a

feeling among the majority who reach 65 that they could function well for a few years longer and practically all would like to do so. It is hard for men still active to cut themselves off from the associations of a lifetime and few, if any, in the Bell System have learned enough about the time-consuming qualities of leisure to make that an enticing full-time job.

The pension and benefit plan saves money. But the accounting on the books does not show it. On the books the pensions and benefits appear as so many dollars of expense. If the books told the whole story they would have entries something like this.

The cost of a force in which there are many people working who are not now fit to do their jobs.

Underneath in a lesser total amount would be: The cost of an efficient force plus the cost of the pensions and benefits.

The difference is the saving made possible by the pension plan. But as these intangible facts, like many of the most important human considerations that come to management to decide, cannot be translated exactly into dollars and cents they cannot be set down in the books.

On the whole, it seems to me that the organization of modern business, of which the Bell System is but one example, which mixes reason with authority and routines with initiative so that more than a quarter of a million people can engage in a complicated art, each using his or her brains, and yet have the whole thing move toward a desired end without confusion, is as significant as the discovery of new facts about nature that allow what is called technological progress. When a baseball manager or football coach gets split-second functioning from nine or eleven men, people understand the problem and the difficulties. Brains, morale and team play are likewise necessary in business, but the coaching staff has to have tens of thousands of good teams that size. Inside the Bell System the records show which are the best teams. Although for the enterprise as a whole there is

limited direct competition, there is plenty of competition within. Again, we can't tell whether the telephone people are as good a team as the rayon people or the chemical people, but we do know that it has taken many years of patient work to build the team that is now the Bell System, and that only by constant and careful effort will it improve. Improvement isn't luck. It won't just happen.

The fact remains that neither the men and women in industry nor the money in industry can be effective without good management. Nothing else is as important to the workers' welfare, the investors' welfare or the public welfare. It is for this reason that the fundamental job of the Board of Directors is to see that the business they control has good management. Being near to the problem and seeing the possibilities of great success or great disaster, their point of view may be different from those who, being further away from responsibility, have a tendency to feel that big business to an extent runs itself, and that management is not so important and need not be particularly well paid. The directors' point of view is perhaps as well expressed as anywhere by a letter from Mr. Elihu Root, Jr. to a friend of his who questioned him on this subject:

Dear ——

I have your letter of March 18th. You ask me in effect whether, in view of the fact that the American Telephone and Telegraph Company has "an assured monopoly," we could not get good enough men to run it for lower salaries.

Don't think that because the telephone business is a monopoly it is easy to run or that the quality of its management does not affect the return to its stockholders. The Company leads a precarious existence between the upper millstone of the rate making power and the nether millstone of the taxgatherer. Its record is a record of constantly increasing taxation and constantly decreasing rates. There is no escape from this process through a mere increase in volume of business, for an increase in the number of connections which must be made tends to increase, rather than decrease, the unit cost.

Profits have been made good by dint of persistent, ceaseless efforts to perfect technical processes, apparatus and material, and to improve methods of organization and management. Only my belief that the management will be able to continue for some years to come its active, living process of constant self-criticism and improvement gives confidence in the immediate future. I have not the slightest doubt in my mind that—monopoly or no monopoly—a second-rate man at the head of the Telephone Company could make it plenty of trouble.

Now let us look at the cost of the present salary scale to the stockholders. If we impose throughout the entire Bell System a top limit on salaries of $50,000 a year, the salary saving per share would be 1½¢, or half the price of a postage stamp. As a stockholder, considering the complexity of the business and the uncertainties of our times, I would not add that 1½¢ to my $9.00 at the expense of any risk of a decrease in the effectiveness of management.

If you were here in person I think you would now say to me something like this:—"Admitted that the business is difficult and that as stockholders we need and can afford the best managerial talent there is—isn't there really, when you get right down to brass tacks, a very large number of extremely able and intelligent fellows in this country who would run this business just as well and do it for less money?"

Nobody knows how many potential corporate presidents there may be on the farms and the ranches, in the shops and the counting rooms, but the supply of proven talent is not large and proven talent is what we need. There may be a thousand keen eyed, steady handed, intelligent young surgeons potentially as able as the Mayos or Dr. Crile, but if there is a critical operation to be performed on a member of your family, if you can afford not to, you don't experiment and take chances.

The supply of proven talent is small. The effect of talent at the top on corporate profits is large. And, therefore, under the operation of simple economic law the price tends to be high.

Everywhere in industry I see going on the process of bidding for talent—particularly as regards the men just below the top—the No. 2 man in one company going over at an increase to be the No. 1 man in another company. If their salaries were deeply cut the present men at the head of the American Telephone Company might stick out of sentiment—for there is sentiment in the Company. But in the long run I am sure that if salaries in the telephone business

were cut below the competitive point the flow of good young men into the business would be impeded as it has been in some other great businesses where conditions have reduced the prizes of success and, that in so far as we did develop talent, we would only serve as a proving ground for the benefit of others.

I have spoken of the bidding for talent which goes on in industry. I think that this process is sound and in the public interest. There *should* be a free passage of talent from company to company. When a man has proven himself in a smaller unit he *should* pass to a larger one, persuaded by more ample compensation to undergo the discomfort of uprooting and change and the burden of increased responsibility—to the ultimate end that the greatest proven talent may gravitate to the point where it will have the widest effect.

Let me turn aside here to say that I am not for a moment suggesting that any great company should pay high salaries for indifferent management. If a company finds itself with such management its remedy does not lie in the retention of the management and the reduction of the compensation.

I know that there are many thoughtful people who have been led to question the salary scale in the great corporations by making a comparison with the salaries paid to our great public officers. If states and nations bid against each other for their chief executives on the basis of a demonstrated capacity for sound administration, I think we would get some very high salaries in public life, but you will note that the process by which our political executives are selected is not such a one. The men come seeking the jobs and the successful candidates are paid not in money but in kudos, prestige and sometimes even by seats in the halls of history. You will note also that we have not as a people shown any inclination to pay our business executives in that kind of currency.

The stockholders own the bricks and concrete, the engines and the tools—the inanimate material of industry;—they do not own the talent, the ingenuity, the patience, the devotion, which alone can animate the plant and earn them profits. They have to buy these qualities and I think they are not wise if they trade for them in too niggardly a spirit for they are a full third of the great triad of production. . . .

Chapter IX

THE CONTROL OF THE BELL SYSTEM

THE ultimate control of the Bell System is the Board of Directors of the American Telephone and Telegraph Company.

The Federal Communications Commission in its summary of the management and control of the Bell System stated:

> Observation of the Bell System in operation shows that management control is concentrated in the parent company, the American Co. A description of most of its subsidiaries as autonomous corporations is only justified in the strict legal sense, for they function simply as parts of an integrated corporate system completely and directly controlled by the holding company officers. Many of the corporations constituting the Bell System are the result of the statutory requirements of the various States.
>
> It follows that responsibility for Bell System policies and their results rests, initially at least, with the executive officers of the American Co.

This is correct in theory, but the statement that the subsidiaries function simply as parts of an integrated corporate system completely and directly controlled by the holding company officers gives a wrong impression of actual conditions. It is true that such a condition as the Commission describes could happen legally, for the American Company in most cases owns a majority of the stock of Bell System companies and it could elect Boards of Directors who would select officers on the basis outlined. However, that is not the practice.

The Boards of Directors of the operating companies are

men of capacity and importance. The Federal Communications Commission investigators made long and impressive lists of their business connections. They are well known in their communities.

It is also true that it would be entirely possible to have officers of the operating groups who were directed and controlled by the American Telephone and Telegraph Company. However, if they were so controlled it is doubtful if they would be the kind of men capable of administering their jobs well. In other words, the degree of actual direction is not determined by the legal possibilities, but by the practical consideration of getting the job done well. Because it develops bigger men and better operation the actual responsibility for operation of the Bell System is highly decentralized. Yet these operations are also highly coordinated. The staff of each operating company receives the operating data of that company not only by reports, but by continuous contact with their operating people individually, and collectively in conference. The resulting decisions are pretty much in the nature of a pooled judgment with the President of the company having to accept the responsibility for putting them into practice or overriding them. In a similar way, the composite experience of all the operating companies comes into the System staff at American Telephone and Telegraph Company headquarters. That staff is constantly in touch with the operating companies, individually by letter, telephone, personal visit, and by conference. The technical letters, methods, procedures and practices that go from the American Telephone and Telegraph Company staff to the operating companies are pretty much the codification of a more or less general agreement arising out of all these contacts. It is doubtful if any operating companies have for many years received a letter or bulletin of this nature to which it had not in some way contributed and certainly none that came as a surprise.

The line of responsibility and authority in the Bell System is perfectly clear in law and in fact. The American Telephone and Telegraph Company could operate the Michigan Company, for example, from New York. But experience has proved that such centralized operation in the telephone business is not good, so that the actual responsibility for operation of the regional organizations has been decentralized, and the results in service and economy have justified this policy. The character of the men who run the operating companies and the character of their Boards of Directors are proof that these companies are not just order-takers, proof that the stockholder, in this case the American Telephone and Telegraph Company, has learned that if it wants good results it must hire good men and give them authority. In electing able local men as Directors of the operating companies, the American Telephone and Telegraph Company also gives evidence that it intends to operate the business in the interests of that community. To be concrete, the American Telephone and Telegraph Company owns all the stock of the Michigan Bell Telephone Company. This New York stockholder, partly owned in Michigan (for Michigan citizens own American Telephone and Telegraph Company stock), elects a Board of Directors of Michigan citizens of such distinction, first, that the people of Michigan know them and their reputation; and second, that as long as they are on the Board, the Michigan Bell Telephone Company must conduct itself on the standards that these men would conduct it if they owned it, with the advantage that, through its membership in the Bell System, the Michigan Company has an assured source of money, access to telephone experience all over this country, to new improvements and to a sure source of material of high quality.

Under the law the American Telephone and Telegraph Company, either as the only or as the largest stockholder, is responsible for the selection and election of the operating

company directors. In practice, the process is that the President of the operating company consults with members of his Board as to who should fill any place that becomes vacant. This selection is referred to the President of the American Telephone and Telegraph Company who has the power to vote the stock and the responsibility for so doing. He could veto the selection, but in the last ten years no such case has occurred.

In discussing the selection of Directors of the American Telephone and Telegraph Company itself, the Federal Communications Commission Report says:

> Under these conditions the power to select directors apparently has been exercised directly by the president. It is significant to bear in mind that, legally, the directors have the power to appoint the president, rather than the reverse.

The facts are that while the initiative in making a list of possible directors is usually with the President (although in the last ten years that has not always been the case), the selection is made by discussion in the Executive Committee and the Board which elects them.

But unless the Board had lost confidence in management it would be unnatural for it to insist on electing Directors against the advice of the President—or, indeed, against the advice of any member of the Board, for few non-harmonious boards can be really successful.

There has been a good deal of discussion in recent years in the press concerning the choice and functions of directors for companies with large numbers of stockholders. The small stockholder, generally speaking, cannot very well judge the individual performance of those to whom he entrusts his savings except on the overall results. He does not know whether one director actually functions better than another. The general character of the board can give confidence to the stockholder. But he generally votes for the

board of directors and approves the management if the business seems to be going well and sells his stock if he fears it is going badly. In his own mind he expects to get a return on his money, but to do no work and take no responsibility as part owner. If he puts his money in the trusteeship of people with reputation for character he has probably done pretty much all he can do. A great many people do not even go this far. They invest their earnings with no inquiry as to the character of the board.

As Mr. Gifford said at Dallas:

> The fact that the ownership is so widespread and diffused imposes an unusual obligation on the management to see to it that the savings of these hundreds of thousands of people are secure and remain so.

Under the law, the people responsible for that trusteeship in the American Telephone and Telegraph Company are nineteen directors. They are listed below with a partial list of each man's activities following his name.

Charles Francis Adams—Boston
Chairman of the Board, State Street Trust Company, Boston; President, Greater Boston Community Fund; President, Board of Overseers of Harvard College; Mayor of Quincy, 1896-97; Treasurer of Harvard College, 1898-1929; Secretary of the Navy, 1929-1933.

Winthrop W. Aldrich—New York
Chairman of the Board, Chase National Bank; Director of Metropolitan Life Insurance Company, Westinghouse Electric and Manufacturing Company; Trustee, Barnard College, Tuskegee Normal and Industrial Institute, Rockefeller Foundation, General Education Board, Welfare Council of New York City, New York Orthopaedic Hospital.

James F. Bell—Minneapolis
Chairman of the Board of General Mills, Inc.; Director of Northwestern National Bank and Trust Company, Northwest Bancorporation, and Pullman Company. Elected Trustee of the

Corporation of the University of Minnesota by the legislature of Minnesota in 1939.

Lewis H. Brown—New York
President, Johns-Manville Corporation; was member of President's Emergency Committee for Employment, and Chairman, Noise Abatement Commission of New York City; Director, Johns-Manville Corporation and affiliated companies, Bankers Trust Company, New York; Trustee, Mutual Life Insurance Company of New York; Chairman and Trustee, Tax Foundation, Inc., New York.

David A. Crawford—Chicago
President of Pullman, Inc.; Director, Pullman, Inc. and The Pullman Co., Armour and Co., Continental Illinois National Bank and Trust Co., Chicago, Montgomery Ward and Co.; Trustee, Wisconsin Alumni Research Corporation and Pullman Manual Training School.

John W. Davis—New York
Member of law firm, Davis, Polk, Wardwell, Gardiner and Reed; former member of Congress; former Solicitor General of U. S.; former Ambassador to Great Britain; Director, Guaranty Trust Co. of New York; Trustee, Mutual Life Insurance Company, Washington and Lee University.

W. Cameron Forbes—Boston
Former Governor-General of the Philippine Islands, former Ambassador to Japan; Chairman, Board of Trustees of Carnegie Institution of Washington; Trustee, Hampton Institute; Director, Old Colony Trust Company.

G. Peabody Gardner—Boston
Director of Amoskeag Company, Boston Fund, Inc., Eastern Steamship Lines, Inc., First National Bank of Boston, General Electric Co., Old Colony Trust Co.; Member of Board of Overseers of Harvard College.

Barklie Henry—New York
President of the Community Service Society of New York; Director, Texas Company and United States Trust Company.

Thomas I. Parkinson—New York
President, Equitable Life Assurance Society; Trustee, Rockefeller

Foundation, General Education Board, Columbia University, University of Pennsylvania. Began practice of law in 1902; Professor of Legislation, Columbia Law School, 1917-1935.

Elihu Root, Jr.—New York
Member of law firm, Root, Clark, Buckner and Ballantine; Director, Fiduciary Trust Co. of New York; Trustee, Mutual Life Insurance Co. of New York, Carnegie Corporation, Carnegie Institution of Washington, Metropolitan Museum of Art, Cooper Union, New York Public Library, Hamilton College, Teachers Insurance and Annuity Association of America.

Tom K. Smith—St. Louis
President of the Boatmen's National Bank; Curator, University of Missouri; Director, Wabash Railway Co.; Special Advisor on Banks and Banking of U. S. Treasury in 1933-34; Trustee, Community Fund, St. Louis, 1923-27; Chairman, St. Louis Citizen's Committee on Relief and Unemployment, 1931-32; President, American Bankers Association, 1936-37.

Myron C. Taylor—New York
President Roosevelt's Personal Representative to Pope Pius XII; Vice-President of Intergovernmental Committee on Political Refugees, organized at Evian, France, 1938; Director and formerly Chairman of the Board of United States Steel Corporation; Director, Atchison, Topeka & Santa Fe Railway Co., First National Bank of New York, New York Central Railroad; Trustee, Mutual Life Insurance Co. of New York, Metropolitan Museum of Art, New York Public Library, Cornell University, American Academy in Rome, Robert College (Turkey), member, Board of Managers of St. Luke's Hospital.

Samuel A. Welldon—New York
Vice-President of the First National Bank of New York; Director, Bigelow-Sanford Carpet Co., Northern Pacific Railway Co. and Lehigh and Wilkes-Barre Corporation.

Daniel Willard—Baltimore
Chairman of the Board of Baltimore and Ohio Railroad; President, Board of Trustees, Johns Hopkins University; Director and member of Executive Committee, Association of American Railroads; Chairman of Advisory Commission, Council of National Defense,

March, 1917. Chairman, War Industries Board, November, 1917-18.

S. Clay Williams—Winston-Salem, N. C.
Chairman of Board, R. J. Reynolds Tobacco Co.; Director, R. J. Reynolds Tobacco Company and Security Life and Trust Co.

The other three directors, Walter S. Gifford, President of the American Telephone and Telegraph Company, Charles P. Cooper and Arthur W. Page, Vice-Presidents, are members of the management of the company.

None of these nineteen represents anything except a trusteeship for all the stockholders.

Of the sixteen members of the Board who are not telephone officers, five—Messrs. Bell, Crawford, Brown, Taylor and Williams—could be classed as industrialists. There are four bankers—Messrs. Adams, Aldrich, Welldon and Smith. Messrs. Forbes, Gardner and Henry with rather diversified interests might be classed either as business men or as personal trustees, an activity more common in Massachusetts than elsewhere. There are two practicing lawyers, although a number of the others began their careers as lawyers. There is one insurance president and one railroad executive.

In this list are a number of men of distinguished public service with the Government, a number who are trustees of colleges and universities, some of scientific or other institutions of learning, and almost all of them have served the charities, hospitals or similar institutions of their communities. The group has experience in public affairs, education, charity, science, business in many forms, banking, insurance and the law—in fact, there is some one in the group conversant with almost any side of American life.

Of the eleven members who now live in New York or nearby where they are easily accessible, two were born in New York State, three originally came from New England, one from New Jersey, one from Pennsylvania, one from Ohio, one from Iowa, one from West Virginia and one from

North Carolina. Of the other eight, three now live in the vicinity of Boston, one in Baltimore, one in Minneapolis, one in Chicago, one in Winston-Salem and one in St. Louis.

The Board of the American Telephone and Telegraph Company is a cross-section of successful American business life, of people of varied interests, different occupations, different geographical antecedents. The Board as such does not pretend to operate the technical part of the telephone business. It hires a management to do that. It watches the results of management, not only the financial results, but the policies and standing of the company. It knows of all important matters. Individually and collectively it is consulted by the management. Its fundamental functions are to be sure that the management is managing well; and to change managements when it becomes necessary, either from retirement, resignation or death of a president, or because the management is failing in its task.

During the depression human affairs operated in corporate form failed in many cases just as human affairs operated individually did. But as making over humanity individually has lost the charm of novelty, the major effort was put upon reforming human effort in corporate form. Real reform even of this is not very easy. Laws to prevent this, that and the other thing, in general, are almost as likely to slow down good things as to prevent bad ones. Effective publicity can help. But there is a real hope that the experience of the depression will itself improve the functioning of our corporate structures. The degree to which small investors own industry is relatively new. The extra sense of trusteeship, which is implied in acting for people who both from lack of knowledge and lack of funds cannot act effectively for themselves, is comparatively new. The directors and managements of big business must accept this responsibility in its fullest sense. And I would think that the fewer rules which limited their

action, and, therefore, limited their responsibility, the more assurance the public would have in the long run.

This freedom will be abused in some cases. But the alternative to it automatically creates abuses also. For example, many years ago, some of the states specified what were legal investments for trustees. These specifications included most railroad bonds. As a result, as the field for investment was limited, great streams of money were legally turned into railroad bonds. That enabled the railroads to sell more bonds than they otherwise could have done, and, by the same token, made the bonds less safe. The result was a much larger loss in these securities than would have occurred in a free market. The law about "legal investments" tended to soften for trustees the hard duty of taking responsibility and clothed them with a kind of defense if they lost the money entrusted to them.

Perhaps the law saved money in some periods as it lost it in others, but there is no question that character and ability without restrictions should do better than character and ability with its hands more or less tied by the enactments of a previous time.

Authority and responsibility have to rest somewhere. The problem is to get them fixed clearly and unequivocally upon people of character and ability. If they are so diffused and divided that no one can be held accountable, the results can never be really good. If enough authority and responsibility are centered somewhere to allow effective results, the main reliance that these results will be good and not bad is the reliance on character. Happily, it is generally true that while good character can function a long time, bad character in high places is usually short-lived. Actually, bad character is comparatively rare in business. Bad judgment, however, is more common, but it is not cured by restrictions, and it is certainly just as likely to occur in government bureaus that make restrictions as in private industry.

There is one other requirement for successful large enterprise. That is faith in human nature. Mr. Danielian in his book, *A T & T*, refers to Mr. Gifford's statement concerning the obligation to small stockholders in these words:

> The "trusteeship" of which Mr. Gifford speaks, if it exists, has at best the tenuous strength of a self-imposed obligation.

Which is as much as to say, if a good act is voluntary, it can't be real.

He explains his point of view somewhat further in this way:

> The Security and Exchange Commission reported that in 1935 the officers and directors of American Telephone and Telegraph Company owned, directly and indirectly, a total of less than 14,000 shares of common stock. This in itself does not explain the financial policy of American Telephone and Telegraph Company, which has been peculiarly tender toward the welfare of stockholders. The management is evidently conscious of the interests of trust estates controlled mainly by bankers who are directors of the Company.

To such a mind, a trust given the directors to look after the welfare of the stockholders would, "if it exists at all," be but tenuous because the directors do not own enough stock to have personal self-interest actuate them. But because some of the directors are supposed to control trusts containing American Telephone and Telegraph Company stock in banks of which these men are directors, then immediately all is changed and those whose interest in the 600,000 stockholders was but tenuous before serve with great tenderness to protect the infinitesimal percentage of stock in the trust funds in the banks. Why these men would be more solicitous as bank directors than as telephone directors is not clear, but if the general public had no more faith than Mr. Danielian in humanity we should be back in the barter stage, for such acute and involved suspicion would make commerce impossible.

As Lord Bacon said, "Suspicions amongst thoughts are like bats among birds. They ever fly by twilight. Certainly they are to be repressed, or at least well guarded, for they cloud the mind, they lose friends and they check with business, whereby business cannot go on currently and constantly."

And yet Mr. Danielian was "financial and utility expert" of the Federal Communications Commission and has since testified as an expert before the Temporary National Economic Committee.

Neither boards of directors nor the conduct of business has been perfect in the past, nor are they likely to be in the future. But the large publicly owned enterprises, controlled by boards of directors and managed largely by men who came up in the business they managed, performed rather better than most business during the depression. Financially, they survived better than small business or farmers or most other activities. They did as well or better than any other group in providing jobs, raising money and paying taxes. They maintained wages better than other groups. The breakdowns in character in big business from the nature of the case are more spectacular than those in little business, but the actual proportion is probably smaller. And it ought to be, for the public has a right to expect greater responsibility, and greater wisdom in the moralities in big enterprise than in small ones.

As we come out of the disturbed and vindictive atmosphere engendered by the sufferings of the depression, we are in much better state of mind than we have been to study calmly what happened and to profit by our experience and to create a more constructive atmosphere in which more general confidence and a higher sense of responsibility can greatly help in meeting the problems ahead.

Chapter X

RESEARCH AND TECHNOLOGY

TELEPHONY "was born and raised" in the laboratory. Every job in the telephone business is created by technology. And the increasing number of jobs has been the result of technology. If the apparatus of telephony had not constantly improved, the business would never have grown as it has. It could not have grown. For example, if we still had to depend on open wire lines on poles, there could not be 930,000 telephones on Manhattan Island for there isn't room on the Island to set the pole lines to reach that many telephones. If telephone technology had not advanced, there would be no long distance or radiotelephony for, to begin with, no one could make a circuit that would talk a hundred miles by wire or talk at all by radio. The advertisement on page 114—the first issued by the Bell System—gives some idea of the original possibilities of telephony. In the history of the business there are innumerable places at which the growth of the business and its serviceability to mankind must have come to a stop except for technical improvements. Likewise, the employment of increasing numbers of people in the telephone business must have stopped also as it does in most businesses that have ceased to grow. I don't think any one seriously questioned all this until the depression. Then the phrase "technological unemployment" appeared frequently and people began to picture a conflict in which men and machines struggled against each other for jobs. The Bell System began to be questioned as to

THE TELEPHONE

The proprietors of the Telephone, the invention of Alexander Graham Bell, for which patents have been issued by the United States and Great Britain, are now prepared to furnish Telephones for the transmission of articulate speech through instruments not more than twenty miles apart. Conversation can be easily carried on after slight practice and with the occasional repetition of a word or sentence. On first listening to the Telephone, though the sound is perfectly audible, the articulation seems to be indistinct; but after a few trials the ear becomes accustomed to the peculiar sound and finds little difficulty in understanding the words.

The Telephone should be set in a quiet place, where there is no noise which would interrupt ordinary conversation.

The advantages of the Telephone over the Telegraph for local business are

1st. That no skilled operator is required, but direct communication may be had by speech without the intervention of a third person.

2d. That the communication is much more rapid, the average number of words transmitted a minute by Morse Sounder being from fifteen to twenty, by Telephone from one to two hundred.

3d. That no expense is required either for its operation, maintenance, or repair. It needs no battery, and has no complicated machinery. It is unsurpassed for economy and simplicity.

The Terms for leasing two Telephones for social purposes connecting a dwelling-house with any other building will be $20 a year, for business purposes $40 a year, payable semiannually in advance, with the cost of expressage from Boston, New York, Cincinnati, Chicago, St. Louis, or San Francisco. The instruments will be kept in good working order by the lessors, free of expense, except from injuries resulting from great carelessness.

Several Telephones can be placed on the same line at an additional rental of $10 for each instrument; but the use of more than two on the same line where privacy is required is not advised. Any person within ordinary hearing distance can hear the voice calling through the Telephone. If a louder call is required one can be furnished for $5.

Telegraph lines will be constructed by the proprietors if desired. The price will vary from $100 to $150 a mile; any good mechanic can construct a line; No. 9 wire costs 8½ cents a pound, 320 pounds to the mile; 34 insulators at 25 cents each; the price of poles and setting varies in every locality; stringing wire $5 per mile; sundries $10 per mile.

Parties leasing the Telephones incur no expense beyond the annual rental and the repair of the line wire. On the following pages are extracts from the Press and other sources relating to the Telephone.

Cambridge, Mass., May, 1877. GARDINER G. HUBBARD.

For further information and orders address THOS. A. WATSON, 109 Court St., Boston.

THE FIRST TELEPHONE ADVERTISEMENT—MAY 1877

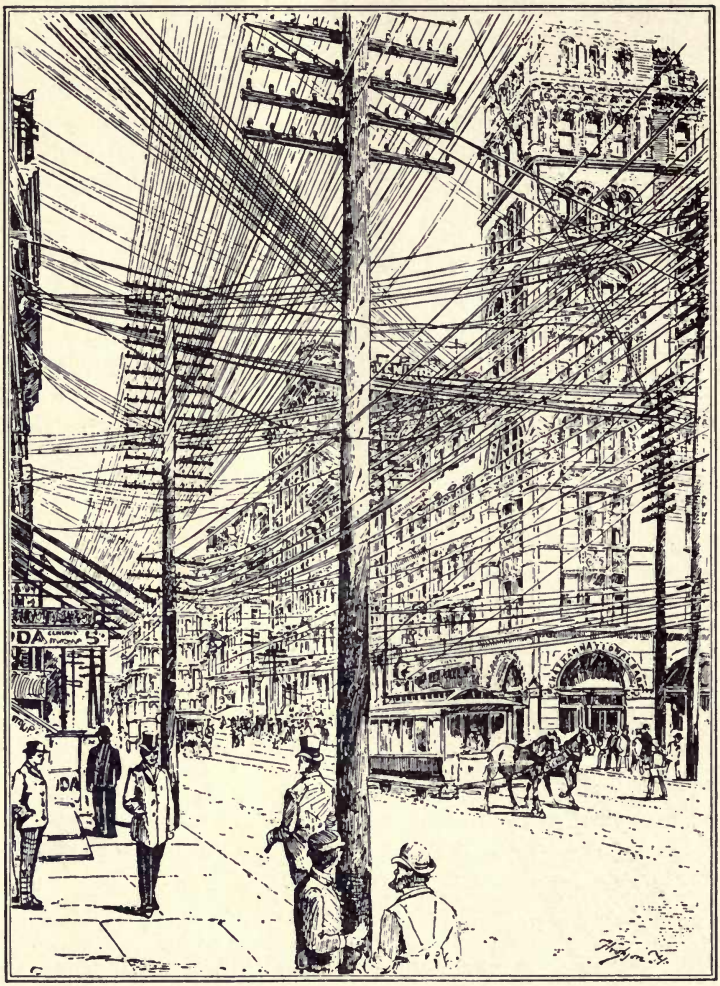
Showing the cost of service between two telephones before the introduction of switchboards.

whether it should continue to use science and technology, which had created every job in telephony, on the ground that from that time on the same science and technology would destroy the jobs.

Of course, technology in telephony has always eliminated some jobs and created others, the net being an increase. In the period from 1930 to 1937 the net increase was not equal to the number of jobs in telephony which the depression eliminated. But it was not technology that created the net decrease—it was the depression.

Telephony originally displaced messenger boys. It has perhaps kept the number of letter carriers from growing as much as their numbers would otherwise have grown. It may have affected railroad travel and employees on railroads, by having people call instead of travel; but by keeping people at distances in touch with each other it may have stimulated travel. Telephony itself has directly employed great numbers, made modern cities and skyscrapers possible, for you wouldn't want a forty-story office building without telephones, and it has aided in the development of the suburbs. Rapid communication has reduced the risks of distribution and cut its costs and played an essential part in modern civilization. No one in his right mind thinks that there would be as many jobs in this country in industry as there are now if we had only the technology of the 1870's.

If the population is going to continue to increase, it does not seem reasonable to expect to take care of the increase on a high standard of living by forcing five men to do in the future what four do now, or even by insuring that at least four men shall do what four do now. You can't produce more goods, services and comforts for mankind that way. From the Bell System point of view, its duty to the country is to continue the work of its technology in its laboratories so that the development of the telephone as a public service can continue. There seems every reason to



TELEPHONE WIRES IN NEW YORK IN 1890

Pole lines in New York at a time when there were about 8,000 telephones on Manhattan Island. There are now 930,000 telephones on the Island. Without the research that produced telephone cables which can be buried underground, the growth of the telephone business would have stopped. There is not room enough in Manhattan to make feasible the connection of 930,000 telephones over open wires on pole lines.

expect that in so doing it will have growth enough to increase the number of telephone workers. But much more important, by its services it will enable an infinite number of other enterprises to be more efficient and more economical and thereby grow to employ more and more people.

In the last ten years, also, I have read a number of editorials in the newspapers along the lines of the following paragraph from the *New York Post* of August 5, 1936:

> There are those who believe that the increased potential volume under lowered profit margins may prove beneficial to the earnings of the company. Throughout the growth of the telephone business from its humble beginning to its present stature history has shown that the lowering of rates has increased earnings over a representative period.

If merely lowering rates would increase earnings as the papers suggest, it would seem strange that the newspapers did not apply the simple formula to their advertising rates and the price of their papers to their everlasting advantage. But there is something more to the problem as one editor had the sense of humor to see. The following editorial is from the *Columbia State* (S. C.) of August 10, 1936:

> Mr. Andrew Jenkins Cauvious notes the reduction in long distance telephone rates, which is estimated to save users more than $7,000,000 a year, but is not interested. He suggests a cut of 40 to 50 per cent. in house, office and farm phones. "Many folks," he says, "who know a great deal about this business believe the company would make more money by the jump-up in new subscribers than they are making now."
>
> Mr. Cauvious would like our views on the suggested 40 to 50 per cent. Our view is that we would like it fine. It would save The State and its workers hundreds of dollars a year.
>
> But unlike our correspondent's advisers, we do not know a good deal or anything, in fact, worth printing about the telephone business. There are federal and state agencies in charge of such matters, and we believe they have from time to time made exhaustive investigations, and that rates have from time to time been reduced in spots.

We do know that these agencies and the courts have a dual part to perform—to secure the patrons service at rates in reason, and to secure the millions who have furnished the money to the telephone company return in reason on their investment. That is their job; we know nothing about it.

But we do know something about the newspaper business and have had numbers of persons assure us that the way to make a "killing" was to reduce the cost of the paper to, say, five dollars a year. That, they felt sure, would double our circulation.

Perhaps, but doubled or not doubled, the result in this section would be certain bankruptcy.

Mr. Walker of the Federal Communications Commission expressed a feeling that a rate reduction might itself achieve the end sought if the reduction was only large enough, in these words:

I have always had the theory that if the telephone companies were to reduce rates, materially reduce rates, that they would materially increase business. The companies' reply to that is that the reductions they have made have shown approximately between 30 and 40 per cent increase in revenue. So that it does not always follow that if they reduce the telephone rate 50 cents that they get a 50-cent greater revenue, but that if they reduce the telephone rate 50 cents they would probably get 20 or 22 cents more revenue.

But I have always been of the theory that there was a point somewhat beyond where reductions have gone which, if it were reached, if you were willing to go to that point, it would materially increase revenues. The telephone companies' reply is that if you go too far they cannot handle the business; that they would have to have more plant, that they would get a different capitalization as a rate base and consequently that they would not be able to reduce rates.

There are instances, and many of them, in industry where a sufficiently low price has created a wide enough market to enable a producer to invent and use effectively the technique of quantity production, which in turn would cheapen production enough to give a greater overall profit. But the vital thing is the improved technique. Rate reductions must

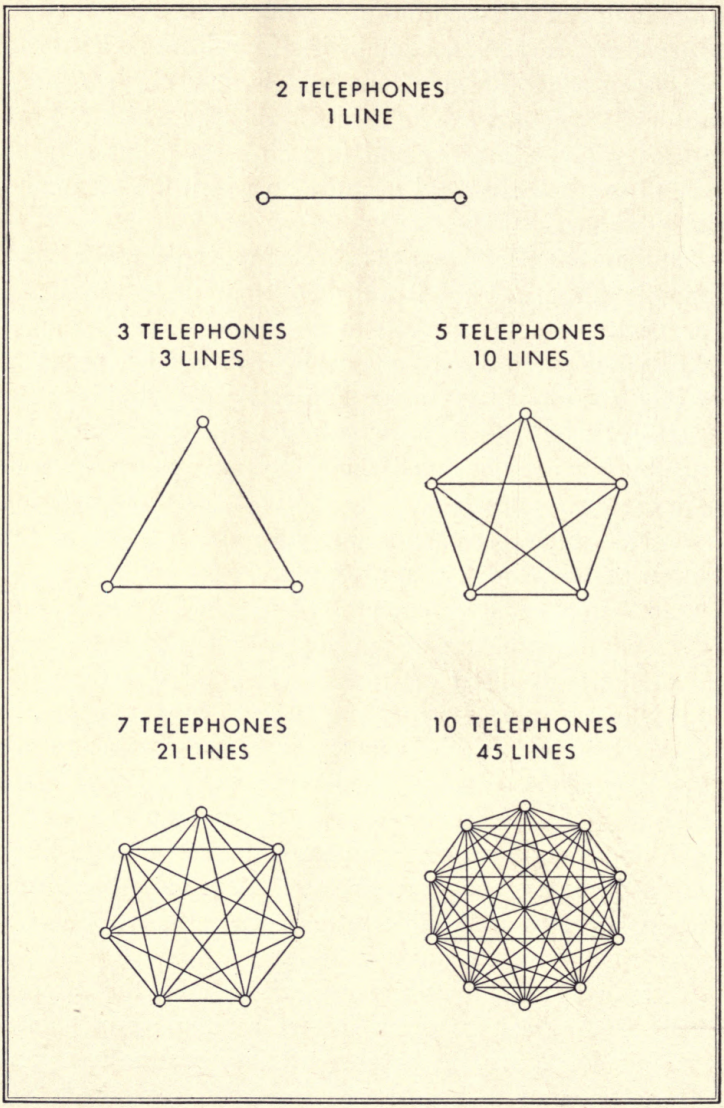
in the long run be based on improvements in technology or management. A rate reduction by itself produces no improvement or economy. In some businesses, in some circumstances, improved techniques can be used for quantity which can not be used without quantity and in such cases prices may be reduced to get the desired quantity on which the economies can be had.

But there are a good many elements in this picture. It is not a simple formula. And it only works in those times and places where it can be made to fit. There is nothing automatic about it. In the telephone business, which produces services to individuals rather than standardized things for public purchase, the elements essential for mass production economy in operation are lacking in large degree. In fact, there are elements which make the unit costs of rendering service higher rather than lower with the increase in the number of telephones in an exchange.

One example will be enough to indicate the trend.

The earliest problem of interconnecting telephones grew out of the multiplicity of lines required for direct connections between subscribers. If you have to connect only two subscribers one line is enough; for direct connection for three subscribers, it takes three lines; for five subscribers, 10 lines; for 10 subscribers, 45 lines; for 100 subscribers, 4,950 lines; 1,000 subscribers, nearly one-half million lines, and so on to astronomical numbers. Obviously direct connection becomes impossible with large numbers. So telephony went to switched connections.

Technology had to produce a switchboard for the purpose. Then, as the business grew further a simple switchboard wouldn't do. When the number of lines became too great for one operator to handle, the subscribers' terminals had to be multipled so that each of the operators could reach all terminals for completing calls. This increased the switchboard equipment for each subscriber and greatly increased



LINES REQUIRED TO INTERCONNECT TELEPHONES

Showing the number of lines which would be necessary to provide connections between various numbers of telephones if a switchboard were not used.

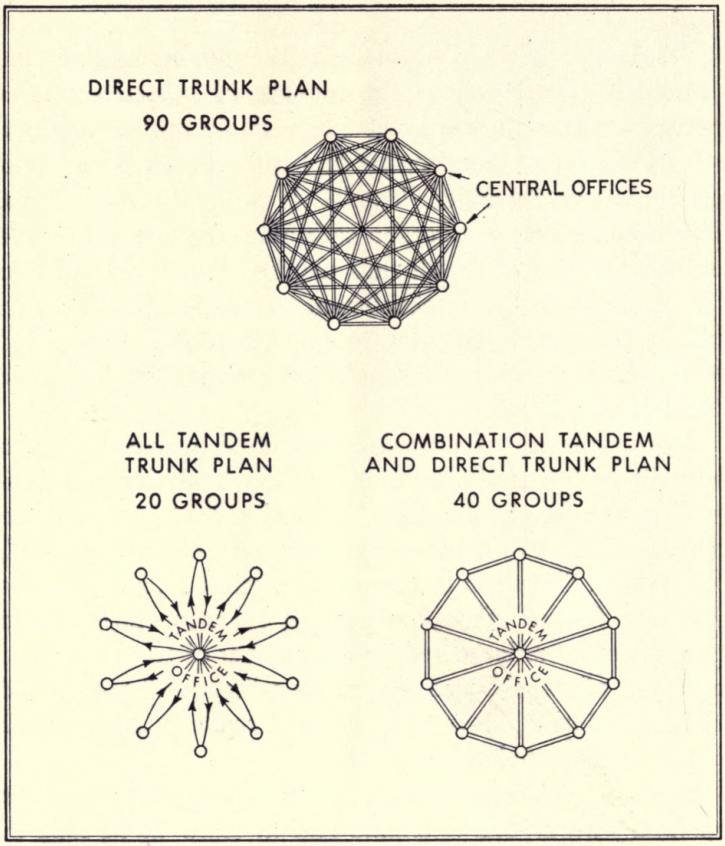
the cost and complexity of the equipment and operating work.

The length of a girl's arm limits the number of lines she can reach. Therefore, as the number of subscribers in a community became too great for a single central office, a second office just like the first had to be installed and connected by circuits called "trunks" between the two offices. This meant extra operators in each office for completing the trunk calls. Each such call thus required the services of two operators. With the establishment of the second office, an additional switchboard of a type not needed before called a "B" board, on which the trunks were terminated, had to be installed in each office.

As the number of central offices grew, connecting them brought problems similar to the original problems of connecting individual subscribers. For example, to connect two central offices, two trunks or groups of trunks are required, one in each direction; to connect four offices, 12 groups are required; for 10 offices, 90 groups; for 100 offices, 9,900 groups, etc. In order to reduce the number of trunks another new type of switchboard, known as a "tandem" board, had to be developed. How such a board made possible fewer trunks is illustrated on page 122.

The more the business grew the more complex became the operating work. The operators had to know or be able to ascertain quickly the route to a large and increasing number of called offices. With the introduction of the third operator (tandem operator) on some calls, the chances for delays and errors materially increased.

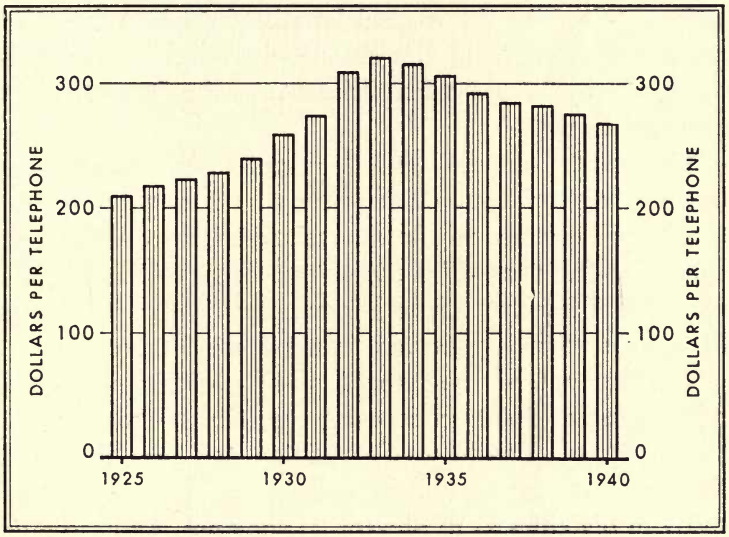
It is a long step from the early switchboards to the modern ones. As time went on, wholly manual service became increasingly inadequate and more and more mechanical aids were necessary in order to give speedy, accurate and effective service. For example, at the start it was necessary for the subscriber to signal the operator by turning a crank on a



TRUNK LINES BETWEEN CENTRAL OFFICES

This diagram shows how a type of switchboard known as a "tandem" board makes it possible to reduce the number of trunk lines between central offices. This and the preceding diagram illustrate the tendency for telephone plant to become more complex and costly as the number of telephone subscribers increases and how the switchboard and tandem trunking have been used to offset the tendency towards increasing costs.

magneto generator at his telephone. Later, a lamp was substituted which lighted when the subscriber lifted his receiver to make a call and was extinguished when he hung up his receiver. Technology kept improving the apparatus although very few of these changes were visible to the public.



THE BELL SYSTEM'S PLANT INVESTMENT PER TELEPHONE

The total investment of the Bell System in plant—i.e., buildings, equipment, apparatus and all the physical things by which the telephone business is conducted—divided by the total number of Bell System telephones in use. The rapid rise in the depression years came largely from the fact that the loss in telephones left the System with spare plant and, by the same token, the subsequent decline reflects largely the recovery of these telephones. With the increasing growth, complexity and mechanization of the business, there has been a long-term tendency for plant investment per telephone to rise.

But it became evident that the future demand for service would be such that switching systems and operating methods would continue to be more and more complex and that manual operation, even with such automatic features as

could be introduced, would be less and less suitable for handling the volumes of traffic, to say nothing of permitting improvements in quality of service.

After exhaustive experiments, an automatic switchboard which met the exacting service conditions was developed and introduced for general use in the Bell System in the early 1920's. Like the manual boards, there have been improvements made in it ever since its introduction, the latest being a new dial switchboard known as the "cross-bar" introduced in 1938.

The words "manual" and "automatic" in this story are likely to mislead somewhat anyone who does not know the telephone business. In the manual switchboards there are automatic features. With the automatic switchboards there are manual features. There are operators in the dial offices, but not as many as there are in the manual offices.

This analysis of the technology of switching elucidates two important points concerning research. It shows clearly that had the technology of switching not been improved, telephone service would have been so cumbersome and costly in big cities as to prevent its wide use. And secondly, it is a good example of the fact that economy in the telephone business comes primarily from technology and management and not from mass production. Just cutting rates to increase volume would have produced nothing but chaos in service and bankruptcy for telephone companies. Generally speaking, where rates come down in the telephone business, the economies that make this possible have been previously achieved either by better apparatus, better methods or both. The rate reductions are a result not a cause of low costs.

Even with the utmost emphasis on technical improvements, it has not been possible to give a man in Chicago, for example, the right to call any one of the million telephones in his community as cheaply as the right can be given to a

man in Medicine Bow to call all of the 290 telephones in his community.

This is well known in the business. For instance, Mr. Blakeslee of the New York Commission (Case No. 377 and 7720) said:

> Another distinguishing difference between the telephone and other utilities is: Telephone service, within certain limits, increases in both cost and value per unit of service with growth of the business; in other utilities, cost per consumer generally decreases as the number of consumers increases, and the number served gives little or no added value to the service.

But this is not so well known to the public.

On long distance business where the proportion of switching is less, what might be called the penalty of size of exchange is not so manifest. But here again the facts are that the rate reductions must arise mostly from technological advance made prior to the rate reduction.

Without continuous technological improvement the Bell System would not have been able to give an adequate or nation-wide service, even if it would have been able to give any service at all. And without continuous technological advance the Bell System would not have employed much of anybody, nor would it have served the economy and speed of other businesses so that they would employ more people. And without continuous technological advance there would not have been either increased values or reduced rates to the public, and certainly no added income to devote to increased wages for the employees.

With the day-by-day necessity for constantly improving apparatus plain to telephone people from the beginning of the industry to the present, there has been every reason to organize to produce an improving technique. That organization is the Bell Telephone Laboratories, Incorporated.

Chapter XI

THE LABORATORIES

THE research and development work for the Bell System, beginning in Mr. Williams' shop in Boston in 1875, was carried on for a number of years in various ways, some by the American Company and some by the Western Electric Company. In 1907 research and development activities were consolidated in one group which later, in 1925, became the Bell Telephone Laboratories, Incorporated. There was still, however, a development and research group at the American Company headquarters. That remained until 1934, when it too moved to the Laboratories.

At present the Laboratories have a technical staff of about 2,000 people—scientists and engineers. There are about 2,600 other people who in one way or another aid the effectiveness of the technical organization—assistants, clerical employees, model shop workers, building employees, etc.

That 4,600 is a powerful force directed against the limitations of telephony. Its job is to push those limitations back, a little here, a little there, or if possible by great advances.

Particular problems which the operating forces meet are either reported by them to the parent organization, the American Telephone and Telegraph Company, which analyzes them and relays the results of these analyses to the Laboratories, or an operating company staff may refer problems directly to the Laboratories. The number of distinct problems which in these ways have reached the Laboratories over the years is very large.

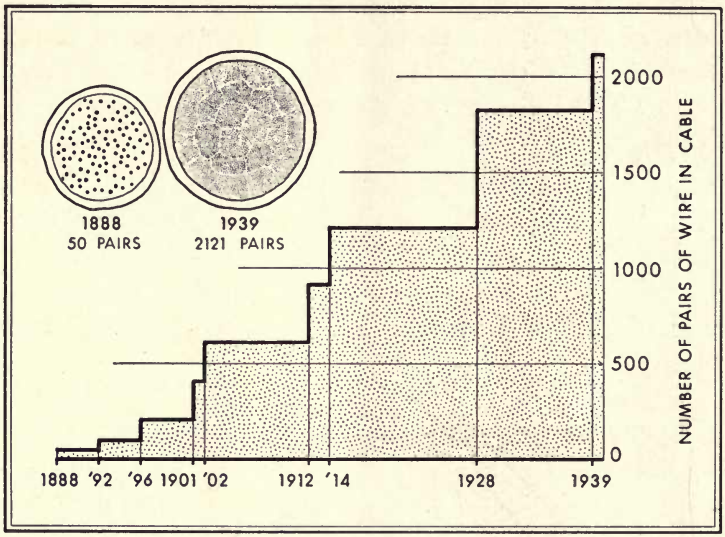
A typical group of important problems has concerned the circuits to be used for interoffice and intercity lines. The original telephone lines consisted each of a single wire with ground return. For short distances such lines were satisfactory, but as the attempt was made to reach out to greater distances, it was found that the longer lines were noisy. The substitution of a second wire for the ground return cured this trouble for the moment, but as business increased and several circuits had to be mounted upon a single row of poles, a new trouble arose. The various circuits crosstalked to one another. This difficulty, in turn, was cleared by the introduction of various systems of transpositions, by means of which the relative positions of the various circuits on the pole line are varied in a systematic fashion along their lengths so that inductive effects, both electric and magnetic, leading to the interchange of energy between circuits largely cancel each other.

But still another line problem arose shortly. The necessary size of the poles soon became a limiting factor. If the business was to grow, means had to be found of running the telephone lines underground. While the modern lead-covered cable may seem a simple enough structure as we view it today, it took years of painstaking study and trial to perfect it. The first cables standardized in 1888 contained no more than fifty pairs of wires. Progress in cable design and in the machines for laying up and covering cable has been steady, however, and the maximum number of wires which can be successfully placed in a lead sheath of a given size is shown in the diagram on the next page. Today a single cable can carry 2,121 separate physical circuits.

The packing of wires tightly together within a cable sheath has not dodged the problem of induction which gives rise to crosstalk and which makes transpositions on open wire lines necessary. Transpositions are effected during the

construction of the cable by twisting the wires together into pairs, each pair of course later comprising a distinct circuit.

Some years ago the need appeared for still a different approach to the telephone line problem. It called for a single pair of wires so insulated that it could be buried underground, and yet cheap enough to supplant a single pair



THE INCREASING CAPACITY OF TELEPHONE CABLES

In 1888, the maximum number of pairs of wire in the largest standard exchange cable was 50; at present, for the smallest wire, it is 2121. This increase is due to transmission research on telephone instruments and apparatus, which has permitted the use of smaller and smaller wires, and to improvements in materials and in the art of cable manufacture which have permitted placing more and more wires of the same gauge in a given size sheath.

pole line. The original suggestion was for use from the road to farmers' houses, in the hope that the buried wire would be cheaper to install and maintain than a pole line. Subsequent discussion has developed that it may find even more use in keeping poles out of backyards in suburban areas. The

Laboratories set to work to find a cheap insulation which would withstand moisture as well as electrolytic tendencies to decompose and, as subsequent trials proved, which would withstand attack by certain insects and rodents as well. It was finally accomplished and the wire was laid in the field by a plow which dug a trench, unreeled the wire and covered it over in one trip along the ground.

For nearly half a century the conquest of distance provided a ready and appealing measure of telephone progress. A brief chronological table would appear somewhat as follows:

Date	*Termini*	*Miles*
1876	Boston to Cambridgeport.....	2
1881	Boston to Providence.....	45
1884	Boston to New York.....	235
1892	New York to Chicago.....	900
1911	New York to Denver.....	2,100
1915	New York to San Francisco.....	3,400
1935	New York to New York, passing completely around the world..	23,000

There are many significant facts which a simple table of this sort cannot bring out. For instance, the bridging of the American continent telephonically brought the thermionic vacuum tube into play for the first time on telephone circuits. It proved to be a remarkably successful amplifier or restorer of the voice currents which otherwise grow weaker with increasing distance. But more than this, it was found to be the open sesame to radiotelephony. Within a year of the bridging of the continent by a telephone line, Bell engineers had succeeded in transmitting speech across the Atlantic Ocean and also across the American continent by radiotelephony.

Progress in the field of radiotelephony has reacted favorably, in turn, upon long distance telephony by wire. Progress in the radio art was dependent upon the ability to produce and control high-frequency electric oscillations, something that had not been used theretofore in wire telephony. But as

the radio art developed, it became apparent that these high-frequencies could be applied to wires as readily as they could be turned loose in the ether, where they travel somewhat promiscuously.

One form of metallic circuit which is particularly suitable to the transmission of high-frequencies is known as the coaxial cable. Its fundamental component is a copper tube about one-quarter inch in diameter, along the axis of which runs a single copper wire. Physically, the cable looks to be the simplest thing in the world, but electrically it can be made the equivalent of 500 or 600 distinct telephone circuits or it can be adapted to television. The terminal apparatus that does the combining and the dividing of the several hundred simultaneous telephone conversations is costly and complicated. Likewise, it took long study to perfect repeater stations along the cable that would enhance all the transmission channels in it without interference or distortion.

In fact, the accomplishment of transcontinental telephony or overseas radiotelephony or the coaxial cable could only have come about through the cooperative effort of hundreds of experts such as an organization like the Bell Telephone Laboratories provides. It is extremely doubtful if any group of independent inventors—certainly, no individual worker nor member of a science faculty—could have found the time and the resources to achieve these ends.

The dramatization of great inventions has somewhat obscured the process by which mankind has pushed forward the frontiers of knowledge. Most advances are made almost simultaneously by several people. There were possibly a half-dozen inventors of the steamboat. Certainly two men, Bell and Gray, were working at about the same time on the invention of the telephone, and it took several years to settle the question of Arnold's priority over Langmuir in the invention of the high vacuum tube as an amplifier. The reason for this is that many people get the information necessary

to make a step forward at the same time and several arrive at some more or less similar conclusion at much the same time.

For example, after the steam engine itself was invented, it was logical enough for many people interested in water transport to try to adapt it to boats. Both Bell and Gray possessed in common the knowledge of that part of electrical science upon which the early telephone was based. Moreover, this sector of science itself illustrates simultaneity of discovery. Michael Faraday in England and Joseph Henry in the United States, working as independently of each other as their common knowledge would permit, each discovered the principles of electromagnetic induction.

To cite another instance from telephone history, the Arnold-Langmuir case arose because both men were familiar with deForest's three-electrode tube and each was striving to find a way to make it work more reliably. In other words, even when the people involved in the different steps of an "invention" have been said to be "individual workers," they have in fact been part of the organization of science, depending on each others' published findings. "Invention" is a process somewhat akin to a relay race—one man takes up where another leaves off.

To direct progress in the specific direction of telephony, a special group of 2,000 is concentrated in the Bell Telephone Laboratories. But they are still part of the general organization of science. Their publications are useful in other fields. Others' publications are useful in their field. It is as much their function to study what turns up in other science and industry that can be used in telephony and use it, or adapt it, as it is to try to create new things by their own research. Almost everything is a combination of the two.

The teamwork which has been necessary to perfect the larger telephone developments shows why it is reasonable, and also necessary, to maintain an extensive research labora-

tory. In industrial research money is not spent in the hope that, out of millions of individuals, there will be discovered the one man of vast genius who can himself produce the results desired. It is spent on the more dependable and the more controllable process of getting results with well-trained people who are available in sufficient numbers.

Bell Telephone Laboratories, which is a division of the marching world of science, is itself divided into three major departments, each of which has a particular function and yet which dovetail with one another. One department is devoted to research of a more or less fundamental character, not only in electricity, but also in mathematics and various fields of physics and chemistry. The function of the Research Department is to act as an advance scouting party and, when something new and promising is located, to ascertain its general field of application to telephony. The second department, devoted to Apparatus Development, has the function of building upon old and new facts, and in particular of scrutinizing the new facts turned up by the Research Department, to discover possible applications. It is also responsible for the proper functioning of the individual units of mechanism which constitute the telephone plant. The third department, devoted to Systems Development, takes these discrete units and merges them into comprehensive and frequently very complex assemblages or systems. Obviously, cooperation between the three departments must be extremely intimate.

Chapter XII

THE WESTERN ELECTRIC COMPANY

WESTERN ELECTRIC was originally brought into the Bell System in 1882 because it was the best manufacturer in the telephone field. Its ownership gave the System a dependable source of reliable equipment. At that time there were not many concerns that could make good telephone apparatus and each produced equipment of different design and quality. Also, the Bell System faced the possibility of serious delays and high prices in buying for its growing business. It was buying from six manufacturers. The equipment it got was of differing design and quality. By getting control of the Western Electric Company it got assurance of standardized equipment of high quality, reasonable prices and a dependable source of supply. These advantages have continued, but with increasing effects, for the Western has become more and more a specialized manufacturer of telephone equipment and more and more devoted exclusively to the interests of the Bell System. It has come to its present position gradually.

From the early nineties until roughly the beginning of the World War in 1914, the Bell System was in competition with other telephone companies which got their equipment from other manufacturers. Although during this period the Western did not confine itself exclusively to telephone manufacturing, it concentrated enough so that its price, standardization and the quality of its products were of great advantage to the Bell System. During this period, in 1909,

the Western went out of the power apparatus business. It still manufactured other electrical products and had, moreover, a large electrical supply business. Besides, it had built up successful plants in England, Germany, Belgium, France and Japan.

It was an efficient and profitable organization as tested by competition in the fields in which it competed directly, and likewise in telephone equipment by which it helped the Bell System to compete.

When the United States went into the war in 1917 the engineering staff and laboratories of Western Electric were devoted almost entirely to war activities, and large quantities of material were supplied the United States Signal Corps. Some fourteen battalions of the Signal Corps personnel came from the Bell System en bloc and they felt at home with their material and equipment, for most of it came from the Western. Western's knowledge and capacity are now, as they were then, an important military asset. But now it is relatively better prepared to serve military and naval needs than it was in 1917 for the Army and Navy have maintained a continuing relationship with the Western, which, knowing their wants, can work for them without delay or confusion.

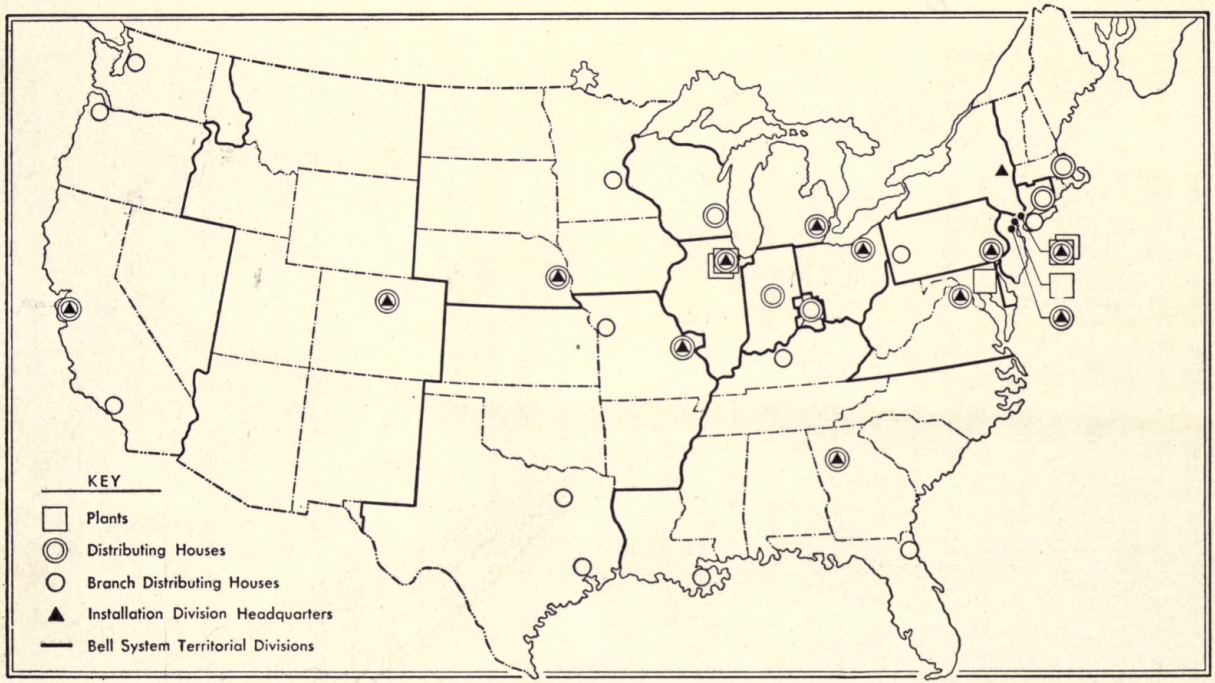
In the last sixteen years, since the beginning of 1925, the Western has continued the process of concentrating upon telephone equipment and so far as feasible getting out of other kinds of manufacturing. In 1925 the company sold all its plants abroad to the International Telephone and Telegraph Company. This fact, and the similarity of names between the International Telephone and Telegraph Company and the American Telephone and Telegraph Company, lead many people to assume that they are part of the same System. This, however, is not the fact. They are quite separate. The International Telephone and Telegraph Company has no operating telephone properties in the United States and the

American Telephone and Telegraph Company has none outside the United States, except a minority interest in the Bell Telephone Company of Canada.

When the Western sold its foreign business to the International Telephone and Telegraph Company it entered into an agreement with the latter's manufacturing subsidiary, International Standard Electric Company, providing among other things for an interchange of patents and for the Standard Company to act as selling agent for the distribution of any Western Electric telephone equipment that might be sold abroad. This naturally has never been a large amount since the International plants abroad manufacture almost everything in the telephone line for which there is a market there.

Shortly after the sale of the foreign business, Western formed the Graybar Electric Company and turned over to this company its general electrical supply business. In 1928, an arrangement was made whereby the employees of Graybar could immediately acquire ownership of the voting stock of the company and later the entire capital interest of the business by redemption of the preferred stock, out of the earnings of the business. This process was nearly completed by the end of 1940.

But while it was getting out of one phase of the non-telephone business, the Western was getting into another. In the course of its telephone research the Bell Laboratories saw a way to make a practical apparatus for synchronizing sound with motion pictures. The Western began the manufacture of this apparatus and in 1926 arranged for its exploitation by license to the Vitaphone Company, a Warner Brothers' subsidiary. This effort by Western to divorce itself of all aspects of the talking motion picture business except the manufacture of equipment was not successful. The Western then organized Electrical Research Products, Inc., to which was turned over not only the handling of the talk-



THE WESTERN ELECTRIC COMPANY

Map showing the location of its manufacturing plants at Hawthorne, near Chicago, Kearny, near Newark, and Point Breeze in Baltimore; its distributing houses at the headquarters of the different Bell System telephone companies; its branch houses and installation division headquarters.

ing motion picture business, but also certain other non-telephone products which had grown out of telephone research. Electrical Research Products, Inc., or ERPI as it is known to the trade, is owned completely by the Western. ERPI was set up as a separate organization to segregate as far as possible the management of certain non-Bell System business. ERPI has a sales problem requiring a different kind of organization from the service relationship between the Western and the other parts of the Bell System.

Western Electric products for the Bell System are sold direct. Most other Western products not handled by ERPI are distributed through the Graybar Electric Company in the United States, the Northern Electric Company in Canada and the International Standard Electric Company abroad. The Northern Electric Company, of which the Western owns 43.6 per cent, is a subsidiary of the Bell Telephone Company of Canada in which, as previously stated, the American Telephone and Telegraph Company owns a minority interest.

Western's business with customers outside the Bell System, while not essential to Bell System telephone service, provides equipment to certain non-Bell telephone companies and is of importance to the Government and other industry.

Normally the sales of Western's products through its distributors to others than the Bell System is about 5 per cent of its output.

Western thus is able to concentrate on being the manufacturing and supply organization of the Bell System. The amount of business it does in this field of concentration makes it one of the large electrical manufacturing companies in this country.

Western's head office is at 195 Broadway, New York City, in the American Telephone and Telegraph Company building.

Its principal plants are the Hawthorne Works on the outskirts of Chicago, the Kearny Works between New York

and Newark, New Jersey, and the Point Breeze Works in Baltimore. These do the main manufacturing job. Hawthorne specializes in telephone instruments, dial central office equipment, loop cable for the telephone companies best served from Chicago and certain other miscellaneous items used in the telephone business. The Kearny Works make manual central office equipment, carrier current and repeater equipment, radio and precision instruments and loop cable for eastern territory. Point Breeze makes cords, rubber covered wire, terminal boxes, protection equipment and toll cable.

Besides these main works, the Western has a Tube Shop in New York City which manufactures various types of thermionic vacuum tubes; a woodworking plant in Queensboro, Long Island, New York, mostly busy with telephone booths, and a small plant called the Clearing Shop near Chicago which manufactures pole line hardware and steel wire.

These six plants are parts of the Western Electric Company itself. It also owns the Nassau Smelting and Refining Company of Staten Island, New York. This company was bought to enable the Western to reclaim advantageously various kinds of scrap metal recovered from Bell System plant and elsewhere. The Western also bought the Teletype Corporation with its Chicago factory which makes the printing telegraph equipment used in teletypewriter and private wire services of the Bell System.

The Western Electric Company has a half interest in the Bell Telephone Laboratories, Incorporated, a research organization, the other half interest being held by the American Telephone and Telegraph Company, and its creation as a separate entity was purely for administrative purposes. The Laboratories do the research on the fundamentals of telephony for the Bell System. This is done for and charged to the A. T. & T. Co. as part of its services under the A. T. T. Co.'s service contract with the operating companies

The Laboratories also develop the application of their research to the apparatus of telephony. This the Western Electric Company pays for and it is thus a part of the cost of its products. The board of directors of the Laboratories is made up of officers of the American Telephone and Telegraph Company, the Western Electric Company and the Laboratories itself.

The sort of close cooperation that exists between the Laboratories and Western would be difficult if the companies did not have the same fundamental interests. The knowledge and experience gained in such collaboration result in valuable ideas and methods, some patentable and some not. Companies with divergent financial interests could not easily be as completely frank as are the Laboratories and Western in dealing with each other. Nor could the same intimacy of dealing be achieved between the Laboratories' men and the manufacturing men of three or four competing concerns. The Laboratories' and Western men are essentially a single team and men cannot get as used to several sets of teammates as they can to one. Moreover, although the two groups are in different organizations they have a common aim.

This arrangement works well. For example, let us take the studies carried on to determine the proper relation of twisted pairs of wires to each other in a cable to prevent the words on one pair from being heard on another. This is the kind of work in the Laboratories for which the American Telephone and Telegraph Company pays. The design by which this knowledge is applied to the cable is Laboratories work for which the Western pays. The design of the machinery for making such a cable would be a Western Electric engineering job. And a very close collaboration between the Laboratories in designing the cable and Western in designing the machine to make the cable saves much time and money and likewise greatly improves the results.

By being effectively informed of the Bell System's needs as

they arise, the Western is in the best position to meet those needs. And the needs of the Bell System are peculiar and create for the Western a peculiar problem. The Bell System sells service—not products. The Western produces or supplies much of what the Bell System calls "plant" to render the service. Plant is anything from switchboards, cables, wires, instruments down to nuts and bolts necessary to render service. This plant has to function all the time so improvements in any or all of its parts must not interfere with its daily operation. The human body is supposed to change every seven years. But while at the end of that time it is practically a new body, there was no particular day on which it became a new model. Telephone plant is renewed by a similar evolutionary process. In the average household where a telephone has been for ten years it provides a better service from what it did to begin with, but at no time was the whole connection between the telephone and the central office taken out and a new one put in. At one time cable may have been substituted for open wire for part of the distance. At another time the instrument may have been changed. At another time the transmission characteristics of the line changed. At another the switchboard changed to dial. When all this has been done perhaps nothing but the wires into the house itself remain the same. Yet at no time was the service interrupted. This process means that improved apparatus must be so designed as to work with all existing apparatus and be introduced into the plant piecemeal so that improvement is an evolutionary process.

That is one reason why the Western produces some 25,000 different designs in a year. About one-third of this number are produced in quantities of ten or less per year, 64 per cent being produced in quantities of less than 100 per year, while very few, probably less than one per cent, require production of 100,000 or more per year. In other words, only a few of the designs are made on a quantity basis. Besides the 25,000

designs which are manufactured in a year there are almost as many designs which the Western must be prepared to make, but for which in a given year it will not get any orders. These are usually replacements or repairs for apparatus still in use, but which has been superseded for new installations. To be ready to make any one of over 40,000 designs that may be currently required, the Western has to be ready to make about 150,000 parts. One design may take, for example, ten parts, but by adding or changing a couple of these parts, two other designs can be made. The organization of the Western to do this kind of job is very different from the type required for mass production of a limited number of products.

Manufacturing for a service business in which new and old plant must be interchangeable and in which improvement is made by infiltration of new plant is a complicated job. And the fact that the whole telephone system is interconnected presents another problem. It takes a great variety of plant to complete any one telephone call. When you pick up your telephone in a city equipped with the dial system, such as New York or Chicago, and call your home, there will be some 2,000 switching connections made in the apparatus in a few seconds before your house telephone bell rings. If poor manufacture or maintenance resulted in a failure of any one of the 2,000 you would not get your call. The telephone uses very small amounts of electricity. And to have good results its plant has to be manufactured with accuracy, precision and endurance. The more complex the Bell System plant becomes, and that is a constant process, the more important it is that the manufacturer for the System be an integral part of the process of getting new ideas and getting the apparatus into the plant to carry the new ideas into effect. The position of the Western is the result of many men for many years devoting their energies and experience to the problem of getting the best service from

the Western for the Bell System. It is inconceivable that any one in close contact with the daily functioning of the production of apparatus for the System should doubt the advantages of the close working arrangements between the Laboratories, the Western and the operating companies.

However, that is a question of getting things done well. From the regulatory angle there is another question. How can it be proved that the Western not only can, but does, provide the operating companies with the best equipment at reasonable prices? There are several angles to this. One of the advantages of the arrangement with the Western, the intimate working relations of the laboratory and the telephone staffs with but one manufacturer, precludes the form of proof of Western's efficiency and economy that comes from the use of competitive apparatus in the System. There are a number of other companies which make telephone apparatus in the United States, but all put together they probably do not produce one-fifth as much telephone apparatus as the Western. There are many kinds of apparatus which they do not make at all. And as they are working for other telephone companies with other standards they make practically nothing which is exactly the same as Western Electric products. Competition in the circumstances is a guide of somewhat limited value. But to the degree to which comparisons are possible they show that the arrangement with the Western which should enable it to produce the best value for the Bell System in quality and price appears to have that result.

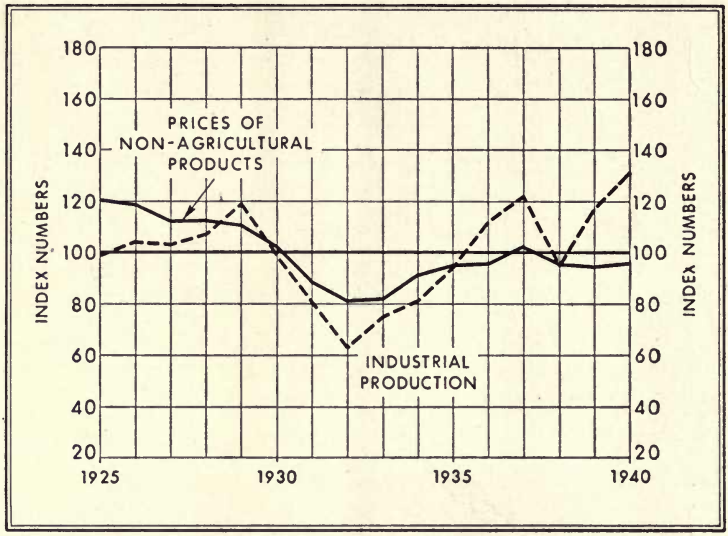
There are some things such as the transmission characteristics of a handset which can be electrically measured. In all such tests the Western apparatus maintains its high place. Another indication of quality is that when the company operated abroad it competed successfully with British, German and Swedish manufacturers. Conviction of quality comes to people inside the System from experience with Western equipment in use. The relation of the Western

to the operating companies and their operating practices produces a constant pressure for quality. The manufacturer who sells to thousands of customers has difficulty getting information about the experience of those customers with his product and yet this is one of the main stimuli to quality. The Western has this stimulus in a somewhat different way, and in a high degree. Plant failures or troubles in the Bell System are observed, recorded, and analyzed, and the reasons for them are determined by trained people. Complaints from the operating companies go to a particular section of the Laboratories. There is, therefore, a pretty accurate check on quality going on all the time and a pressure not only to maintain a high standard, but constantly to improve it. The better the Western's equipment, the better will be the record of the plant and operating forces of the Bell System and naturally they will see to it that if any equipment lacks quality the full story of the lack will reach the Western.

The reasonableness of Western's prices is important as well as quality of product. The American Telephone and Telegraph Company has for many years kept a comparative record of the prices of Western Electric equipment sold to the Bell System and of telephone equipment of other manufacturers sold to the telephone companies outside the Bell System. As the designs are not the same, nor the quality, nor the length of life, nor the conditions of sale, these records cannot provide exact comparisons, but they are a very satisfactory general check. They indicate that the Western's prices are less than those of other American manufacturers for comparable equipment. Some of the non-Bell telephone companies use Western equipment and pay more for it through the Graybar than the Bell System does, which is another straw in the wind by which to judge.

But again, as in the matter of quality, the assurance of saving is not in comparisons. They check the savings. The assurance comes from the inherent advantages of the Western's intimate working relationship with its customers.

Added to that, the Western has no selling expense and no expense for a credit or collection department and no losses for bad debts on its Bell System business, which comprises 95 per cent of its total sales.

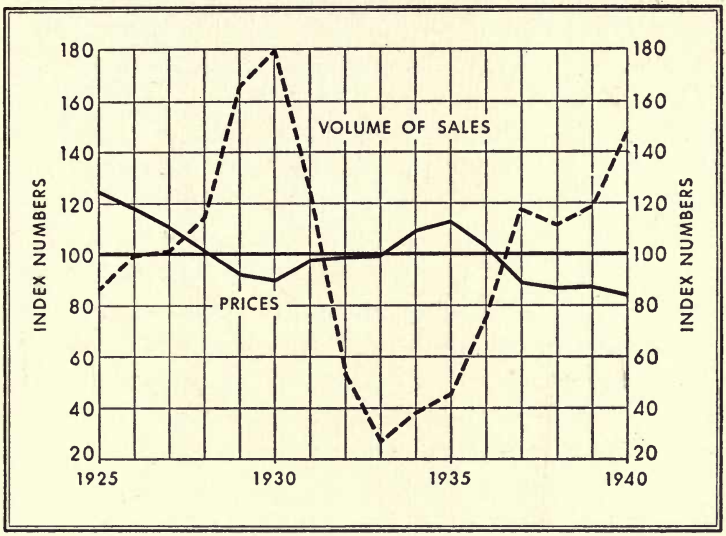


THE RELATION OF INDUSTRIAL PRICES AND INDUSTRIAL PRODUCTION IN THE UNITED STATES

This chart shows that, broadly speaking, when industrial production is relatively high, prices of non-agricultural commodities are also relatively high. Since most industries build new plants when production is high, most plants are built at relatively high prices. (The annual index numbers plotted on the chart are based upon data on industrial production published by the Federal Reserve Board and data on wholesale commodity prices published by the U. S. Bureau of Labor Statistics; the average for the years 1925 to 1940, inclusive, is taken as 100.)

The relationship of the Western to the Bell System tends to increase the economies of a long range viewpoint in management. The Western is in a better position than an independent manufacturer could possibly be to foresee the justification for and undertake expenditures for developing

methods of cheaper and better manufacture, for it is in close touch with the Bell System requirements and probable future demand for particular products.



THE RELATION OF PRICES AND PRODUCTION OF WESTERN ELECTRIC APPARATUS AND EQUIPMENT

When the volume of production of the Western Electric Company has gone up, its prices for products in which the value added by manufacture is a substantial element, generally have gone down. As a result, the greater part of the investment in Bell System plant and equipment, having been made in years of relatively high Western Electric production, has been made at prices which have been relatively low. The above chart, relating to the Western Electric Company, shows the relative annual movements of prices and volume of sales of apparatus and equipment. (In each case the annual average for the years 1925 to 1940, inclusive, is taken as 100.)

There is another interesting effect which the position of the Western Electric Company in the Bell System has on prices. It has a tendency to make Western Electric price changes run counter to the general trend. Prices in general are relatively high in good times and low in bad. Since the

amount of construction and the quantity of machinery bought are much greater in good times than in bad, most plant, regardless of the type of industry, is built at the high prices of good times. Moreover, the prices of some materials, equipment and machinery that go into plant are often very high in the seller's market that usually accompanies the peak of prosperity. On the other hand, in a limited profit business like that of Western Electric the margin between costs and prices is reduced rather than increased in prosperity. When the economies resulting from full time operations in prosperous times more than offset the increased costs of raw materials and labor, the Western can and has many times reduced its prices when the general price trend was going up. The bulk of the Bell System plant is put in at these lower prices. Comparatively, it makes less difference what the Western prices are in bad times for then there is less plant being built. This contrast between the trend of Western's prices and industrial prices in general is illustrated by the charts on pp. 144 and 145.

It is perhaps somewhat artificial to discuss quality and price separately for they are inextricably bound together. A better article at the same price is as much a bargain as the same article at a lower price. The processes of improving manufacture are likely to affect both price and quality. For example, in 1930 the Western put into operation a new insulation vulcanizing process which it had developed for the manufacture of rubber covered wire. This process is not only cheaper, but it makes a better product than the processes used previously either by the Western or other manufacturers of insulated wire. Many of these are now using the Western's process under license.

The Western has made a similar improvement in the processes of drawing wire and this has also been made available to other wire manufacturers. When the Western began its study of wire-drawing, the available commercial machines

were limited to production speeds of approximately 1000 feet per minute. The Western's engineers developed a machine that would produce at twice the speed and subsequent developments have increased it to ten times. There are many other instances in which the Western has developed new machines and new processes which have been adopted by other manufacturers. This evidence of progress and leadership is another and important check on the efficiency and economy of Western Electric operation.

Of course, the Western might save money and keep it as profits. But as a matter of fact, it does not. It has long been perfectly apparent to the management of the American Telephone and Telegraph Company that its obligation under its policy to charge just and reasonable rates included only reasonable profits for the Western Electric Company. The Western has deliberately limited its profits. That is one of the important instances of self-regulation practiced by the Bell System.

From 1882 to 1913, which included the competitive period in the telephone business, the profits of the Western were 8.3 per cent on the gross book cost of the investment. From the beginning of 1925 through 1940 the profits on the same basis have been 5.0 per cent. In the utility business it is common to speak of profits in relation to the value of the investment producing them. However, in the manufacturing and distribution business it is also common to speak of profits in relation to gross sales. On this last basis the Western Electric Company's profits on sales of manufactured and purchased supplies for the same sixteen year period have been 5.3 per cent, which is a little more than three-fifths that of comparable manufacturing businesses in the competitive field. In other words, the Western has kept its profits very much below what they would have been had it not been owned by the American Telephone and Telegraph Company. They turned out to be unreasonably low because there was not

enough allowance for periods of actual loss in depression. If the Western has been mistaken in relation to its prices, it has been on the low rather than the high side.

An average profit for the last sixteen years of 5.0 per cent on investment and 5.3 per cent on sales is certainly on the low side of "reasonable" for a manufacturing business. The Western, of course, with its one big customer escapes the risks of a competitor taking its business, but assumes the risk of loss of business when that one customer has but few needs as happened in the depression, and also assumes the obligation to provide facilities to supply that customer's requirements no matter how they peak up.

The Western Electric Company's capacity to manufacture and to improve the processes of manufacture for the Bell System is a vital part of the ever improving telephone service in this country. In the last war and in the present program of preparedness it is essential to the program of the Army and Navy. From time to time in rate cases its prices have been questioned, as practically everything is, but the Western has had no regulatory interference with the freedom of its management to accomplish results. The progress it has made, it has made itself. The record of the reasonableness of its profits speaks for itself.

A SERVICE OF SUPPLY

In September, 1938, the great hurricane struck New England and parts of New York. It put 600,000 telephones out of service. The policy of the Bell System which provides uniform equipment and training enabled crews from as far west as Arkansas and Iowa to roll into the devastated areas and start work without delay, helping the local forces restore service. There was ten million dollars' worth of damage to telephone plant in a great area. The amount of material necessary was tremendous, far beyond any normal expectation. Yet the entire job was done without delay for lack of

material. That was the greatest emergency test of the Western Electric's Service of Supply since the World War in 1917-18 when the Western was supplying the Signal Corps.

In spite of railroad washouts and roads blocked by fallen

Items of Telephone Equipment	Storm Orders Shipped; to Oct. 14, 1938	Bell System Monthly Demand (1938 Average)
Lead Covered Cable, conductor feet	607,000,000	1,206,000,000
Lead Covered Cable, linear feet	3,797,000	3,804,000
Drop Wire, linear feet	53,613,000	27,195,000
Strand, linear feet	6,910,000	3,426,000
Line Wires & Ties		
Copper and Steel, pounds	2,380,000	2,020,000
Pole Line Hardware, pounds	2,039,000	1,178,000
Lead Sleeving, pounds	494,000	273,000
Solder, pounds	132,000	115,000
Paraffin Wax, pounds	110,000	45,000
Cable Rings, number of	3,211,000	1,322,000
Drop Wire Clamps, number of	535,000	460,000
Bridging Connections, number of	491,000	113,000
Pine Poles, number of	21,800	28,500
Cable Terminals, number of	21,700	10,000
Prepared Cotton Sleeves, number of	16,632,000	10,036,000
Copper and Steel Sleeves, number of	2,956,000	963,000

EQUIPMENT ORDERS DUE TO THE 1938 HURRICANE

Telephone equipment sent to New York and New England areas from September 21, the day of the hurricane, to October 14, compared with the monthly average of the orders for the entire Bell System during the first nine months of 1938 (excluding the storm orders). In spite of the large amounts of storm orders required, not a man or truck was delayed awaiting material.

trees, the Western Electric Service of Supply delivered the material shown in the table above, between September 21 and October 14. The Western has done the same kind of thing many times before and since in emergencies caused by floods, ice storms or earthquakes.

The Western's service, which makes possible a constant

flow of material to the plant departments of the operating companies when and as they need it, is second only in importance to its manufacturing function. Back in the days when the Western manufactured all kinds of electrical equipment and ran a supply business as well, it sold to the telephone companies of the Bell System not only telephone apparatus of its own manufacture, but also a large part of their needs for equipment and supplies which it did not make, such as telephone line wire, poles, crossarms and insulators. It was then the practice of the Bell System telephone companies to maintain their own purchasing departments and warehouses, each buying its supplies in the open market and thus, in effect, competing with each other for its individual requirements.

By 1900, however, the advantages of having all the buying and warehousing of supplies for the Bell System concentrated under one management were becoming clearly apparent. It was logical that the Western Electric Company should assume such a task because it already had an organization trained in quantity purchasing, and experienced in large-scale distribution. In 1901, The Bell Telephone Company of Pennsylvania made an arrangement with the Western Electric Company to act as its purchasing and supply agent for such other materials as the telephone company might require in addition to apparatus of Western Electric manufacture.

The assumption of this purchasing function produced such satisfactory results that other Bell telephone companies made like arrangements, and within a few years the Western was buying substantially all the telephone equipment for the Bell System at a great overall saving, for it could buy on quality specifications in large quantities and consequently at low costs.

Furthermore, through cooperation between its Purchasing and Engineering Departments, it developed new sources of

supply and thus drew upon the most favorable markets in the world. The resulting economies were then passed along to the telephone companies in the form of lower prices.

In fact, Western Electric is one of the largest buyers in the United States. Its purchases in a recent year exceeded $60,000,000. They were made from more than 10,500 different sources located in 1,500 towns and cities of the nation's 48 states. They ranged from paper clips to automobiles, from pencils to telephone poles. Filling its contracts has kept thousands of workers busy in mine and factory, in forest and office and on the farm.

Its Purchasing Department cooperates closely with suppliers. Contracts govern almost every relationship with suppliers. These contracts are awarded on the basis of bids submitted by competing concerns. Each bid is examined, not only for price, but also to check the bidder's ability to render regular service on high quality materials in the quantities required. The buying is done with a long view rather than on a hand-to-mouth basis.

It is obvious that in the long run a contract disadvantageous to either party cannot endure. The long run policy is to buy at prices which are fair to the Bell System and hence to the telephone user; to buy at prices which are fair to the seller so that he can continue as a dependable source of supply. Such a policy produces economies for the Bell System and a desirable customer for American business.

The suppliers must be ready to pour materials into the breach made by any emergency with the same dispatch expected of Western Electric itself. That this buyer-supplier relationship works is evidenced by the fact that recent years that have witnessed devastating floods, hurricanes and sleet storms wreak havoc on the telephone plant, found reservoirs of equipment and supplies immediately available.

When Western Electric assumed the supply and distribut-

ing function for the Bell System, it established warehouses and repair shops in the principal cities throughout the country to serve the associated telephone companies with supplies and apparatus. This arrangement proved to be economical and of great benefit to the telephone companies, and to telephone users. It made possible the maintenance of service with minimum interruptions not only under normal operating conditions, but also in times of fire, flood or other emergencies when prompt restoration of service is of vital importance.

From the point of view of the Western Electric Company's management, its greatest problem is adjustment to the rising and falling demands of its one big customer. To the Western as to most other industry in this country that problem did not assume large proportions in the twenties when the demands were all on the rising side. But even that produced considerable difficulty. In the late twenties the volume of business began to force the company to overtime, to the renting of extra space outside its own buildings, to the hiring of personnel more rapidly than they could be well trained or absorbed. All these things tended to reduce the rate of return on the volume of business. At times the company made less on more business than it did at other times on less business. However, even with the best cooperation with the operating companies it could not keep the volume even, for the Bell System could not tell the American people that they could not have as much telephone service as they wanted.

Then came the depression. The Western Electric Company's business depends partially on replacements, but largely on growth in the businesses it serves. When the growth stopped in the telephone business in 1930 the Western Electric business began to fall off and in the subsequent years it fell off very rapidly. This produced a most serious personnel problem. While in the operating companies in the

Bell System the voluntary resignations, deaths and retirements materially helped to take care of the shrinkage in the force, in the Western the shrinkage in work far exceeded the ordinary turnover in the force. In 1933, for example, the Western was running at 13.7 per cent of capacity.

On August 1, 1931, working time was changed generally from a 5½-day week to a 5-day week of 40 hours. From July 1, 1932, to December 31, 1935, the Western generally was on a 4½-day week of 36 hours. During these periods there were some employees working longer or shorter hours, but the majority were on the general schedule. Employees laid off after over 2 years of service were given a termination wage varying from one week's pay to 55 weeks' pay, according to the length of their service with the company. During the four years 1932-1935, $4,700,000 was paid out in this manner. The Company's personnel division endeavored to keep track of those laid off and found that an encouraging percentage secured other jobs even in the worst depression years.

Savings, termination allowances and unemployment insurance can all help soften the blow of being out of work, but steady employment is the only satisfactory solution from the point of view of both worker and management. While the Western cannot fully escape the effects of a defense era, as it could not escape the effects of the boom in the twenties or the depression in the thirties, it is hoped that its experience will enable it in the future to stabilize its personnel relatively better than in the ups and downs of past booms and depressions.

Chapter XIII

TELLING THE PUBLIC

BACK some twenty years ago, when I was editor of a current events magazine, one of the complaints against the big corporations was their secrecy. It was felt that they ought to give the public more information about their affairs. There was a good deal of discussion about enterprises "affected with the public interest," or "quasi-public" enterprises, and I think it fair to say that both the press and the public felt that the public should know about the affairs of large business. The argument that private business had the right to keep its affairs private was heard then, but it got so little support that it is much less heard now.

It seemed to me then, as it does now, that all business in a democratic country begins with public permission and exists by public approval. If that be true, it follows that business should be cheerfully willing to tell the public what its policies are, what it is doing, and what it hopes to do. This seems practically a duty. It is not an easy duty to perform, for people who make up the public are generally busy about their own affairs and are not particularly prone to take time off to hear about the telephone business or any other. On the other hand, I think it clear enough that the public would very much resent it if a business now took the attitude which many used to take, "We'll tell you nothing. It is none of your affair."

The Bell System endeavors to tell the public about its affairs in a number of different ways.

The most important method is the issuance of statements from time to time by the officers of the different companies.

Anyone who has read the last fifteen annual reports and the fifteen or twenty other public statements of the President of the American Telephone and Telegraph Company would have a very clear picture of the policies, objectives and accomplishments of the Bell System as a whole. The presidents of each operating company have made similar statements for their particular areas.

The statements outside the annual reports cover such matters as the fundamental policy stated at Dallas, the Bell System's attitude toward the investigation of its affairs by the Federal Communications Commission, announcements about rates, comments at annual meetings on research, finance and other subjects.

Next to these statements perhaps the most important method of "telling the public" is advertising. In proportion to the size of its operations the Bell System has never been a large advertiser, but it has been at it a long time. Operating companies in the Bell System began newspaper advertising about the same time that they began to give service. The American Telephone and Telegraph Company began advertising for the Bell System in magazines of national circulation in 1908.

The general theme has been to ask for public approval and patronage on the basis that the business is run economically, efficiently and in the public interest. An individual advertisement may seek business by saying in effect to the public, "you can telephone across the continent for $4.00 during the day, and for as little as $3.00 at night and all day Sunday," or "your telephone service is cheap because the Bell Laboratories discover new and better ways of giving it," or "because the business has been properly financed." In other words, the theory is that the more the public knows

about the conduct of the business the more the public will understand it and use its service.

A similar national advertising program on the radio was begun April 29, 1940.

The investigators of the Federal Communications Commission, in commenting upon the advertising policies of the Bell System, quoted from a letter from an advertising agency to the American Telephone and Telegraph Company advising against radio advertising. The Federal Communications Commission's report to Congress recorded this in this way:

> The Bell System does comparatively little advertising by radio, despite the fact that it is one of the beneficiaries of radio broadcasting through the leasing of circuits for program transmission service. The reasons, as stated by one of its advertising agents, for the Bell System's failure to advertise more extensively over radio are twofold: first, such advertising would direct the public's attention to the amount of money being spent for advertising purposes, and second, the probable adverse effects upon the established goodwill of newspaper editors.

This is not of much importance except as a commentary on the methods of the investigation. The facts were that this letter was written in connection with a study of a possible radio program for the Bell System. The interest in radio continued after the receipt of the letter just as it had before and finally resulted in a program recommended by the same agency that wrote the letter. If the investigator who ferreted out this isolated letter, which seemed to fit a thesis he had in his mind, had asked any one of several people, he could have found out in a few minutes that the letter did not represent the Company's view. We did not then have a general radio program for the simple reason that we hadn't found a program to suit us. The Bell System was trying to find such a program then and it kept on trying until it succeeded.

Selected documents used as a means of interpreting a business, without direct testimony by those engaged in the

business and without cross-examination, are very likely to produce just such variations from the facts as they did in this case.

The Bell System uses several other supplemental methods of telling the public about the business.

Here is a list of pamphlets giving historical, financial and other facts:

The Birth and Babyhood of the Telephone
The Telephone in America
The Magic of Communication
The Telephone's Message
The Changing Years as Seen from the Switchboard
The Miracle of Talking by Telephone
The Early Corporate Development of the Telephone
Facts About the Bell System
The Story of Western Electric
Broadcasting Network Service
Overseas Telephone Service
The Long Distance Building
Bell Telephone Laboratories

These are given to anyone who asks for them. Altogether the distribution is more than a million copies a year. Then there is the *Telephone Almanac.* This is a booklet of some thirty-two pages with to me an extraordinary history. Back in 1922 some one had the idea of getting out an almanac after the manner of the old farmers' almanacs, but giving in it information about telephony instead of farming. I don't know what kind of circulation the originator of the idea expected, but last year it had a circulation of more than 2,500,000.

Interest in telephone pamphlets is not the only evidence that the public has a considerable interest in the business.

During the year 1940 various Bell System people, from local managers to company presidents (and the list includes a few people who do nothing but lecture), gave some 7,000 lectures or demonstrations before clubs, associations and

various other groups including schools—all by request. There are more requests than the companies can take care of. Some of these talks are accompanied by movies of Bell System subjects and there are many movie shows without talks. In recent years the Bell System has made three or four movies a year of telephone subjects. These movies have been shown to about 10,000,000 people a year.

There is a more direct method of showing what the business is like—by permitting inspection of a central office. A million and a third people have visited Bell System exchanges in a year on "open house" days. The Bell System also sends its subscribers small pamphlets or folders with their bills, telling specifically about rates and service and also about the company that renders service.

All these methods of telling the public about the conduct of business and asking for public approval and patronage cost something less than one cent for every dollar of income in conducting the business. It seems to me that the duty of informing the public and the value to the company and the public of such information would justify a far larger expenditure if that happened to be necessary to do the job. The adjustment of big business to the public is of as much importance to the public as it is to business and it cannot be done without frankness and understanding.

Although the process of "telling the public" is a very inexpensive part of the business, it is an important one. Perhaps it would be wiser to spend more and perhaps less. Here again there is no mathematical formula that will give the answer. Like most matters of management, experience and observation have to be mixed with whatever help can be had from figures, and decisions then made based on judgment. It is fortunate, however, for the telephone industry that it seems to be possible to do a fairly comprehensive job for a very much smaller proportion of the total

expenses of the business than can be done in most other enterprises.

One section of the Federal Communications Commission's report was devoted to the advertising of the Bell System:

> Testimony introduced at the hearings in the special investigation illustrates the manner in which a judicious placing of advertising with certain newspapers has changed the attitude of the Editor from one of opposition to one of cooperation.

Mr. Danielian, one of the investigators, in his book, *A T & T,* said:

> In addition to the creation of good will among the public by constant reiteration . . . advertising enables the telephone company to dispense patronage in an effort to purchase the good will of the press. Perhaps this is stating it a bit too bluntly, but the evidence leaves the purpose exposed.

Mr. Danielian then referred to a few instances occurring in one company over a fifteen- or twenty-year period in country papers. The papers represent less than 2 per cent of the circulation in which the company involved advertised. This is the evidence which seems to him to leave the purpose exposed. What these instances really are, are the exceptions that prove exactly the opposite of his conclusion. The newspaper advertising of the Bell System is placed in practically all newspapers in the places where there are Bell System exchanges. The list of papers in which advertising appears remains probably 90 per cent the same from year to year. This policy has been going on for twenty years or more, regardless of what the papers say editorially, and they have said everything from high praise to high blame. This is the last procedure any one would adopt whose purpose was to control the press by giving or withholding advertising.

Mr. Danielian, being one of the investigators, had reason to know what the Bell System really did about advertising. The Commission in making its report had nothing but the

investigators' material to go on. It had no way to know what the Bell System's policy on advertising was. It had only the investigators' slant on a few instances scattered over several years affecting a few small papers. Nor did the investigators give these newspapers a chance to tell their understanding of these instances.

From my observation both inside and outside the advertising business for forty years, I think the facts are about as plain as the moralities.

The great part of the press, particularly the important part with large circulation, has a high but not perfect performance of honesty in this particular.

My impression is that the general public is more cynical on this subject than the facts justify—that is, that people believe that advertising influences the press in favor of the advertiser when it does not.

I suspect that inside most big businesses there is also more cynicism about the integrity of the press than the facts justify, but in this case it is based on the belief that the press distorts facts to make news to the detriment of big business, on the assumption that any attack on big enterprise will increase circulation—which is the basis of advertising.

As far as the Bell System is concerned, the policy is to buy advertising for advertising purposes only. This is perfectly well known to advertisers and advertising agents and the newspaper world in general.

The other publication advertising done by the Bell System, that in the magazines, is a continuous effort like the newspaper advertising. The magazines which account for 80 per cent of the money and circulation have been on the schedules at least ten years, some of them for twenty years or more. The list bears no relation to the editorial attitude of the magazines toward the telephone business.

All these fundamental facts were available to the investigators of the Federal Communications Commission, of

whom Mr. Danielian was one. The effort to prove a thesis evidently warped their studies sufficiently to make them valueless as scholarly presentations or as helpful material in analysis of business problems.

It is perfectly clear that no business, big or little, has a right to live in a democracy if it bases that right on the practice of corrupting the press.

But if, as Mr. Danielian implies, the press is corrupt, the American public had better tackle that problem directly, for in this democracy I should think the most important big business was the press itself. If it is not a good servant of the public welfare, its failure will be more important than that of any other large enterprise. And the press would include newspapers, magazines, books and government documents that fail to tell the truth or which violate the Ninth Commandment.

There is another interesting point of contact between big business and another agency serving the public—the schools. For a hundred years or more college faculties have written and lectured on matters which affected business, such as the tariff, ship subsidy, etc. But it is only recently that the secondary and high schools have taken so large a hand in "adjusting the student to modern life."

Forty years ago the local school would not have asked the livery stable man to come around and show the students how to hitch up a mule. But now the schools ask people from industry to explain about vitamins in cold storage food, how ice-boxes are made, etc. They also want to know about the electrical science back of the telephone and how the telephone works.

Whether or not these things are the best things for schools to spend time and money on is for the public school authorities to decide.

It is unquestionably good for the telephone industry to

have the oncoming generation know how to use the telephone and understand the physical forces back of it.

On the other hand, the Bell System does not want to ask the public schools to spend the public's money for preliminary sales work for it.

As a result, the program adopted is to furnish printed matter or speakers or demonstrations or movies within reason when the school authorities ask for them.

In this as in every method of talking to the public we take great pains to be sure that the audience knows the source of the material or whom the speaker represents.

All matter originating with the Bell System that goes to the press is plainly marked or stated as coming from the Bell System. It does not always appear in the press with that statement. For example, if a newspaper or magazine writer gets statistics of telephony or facts of history from the Bell System, he is not apt to put a credit line in the story to that effect. If a newspaper prints a story about running a telephone cable under San Francisco Bay, which it got from the Bell System, it is not likely to state the source of the material. Where the source is pretty obvious from the content it is common practice to omit it, except when the matter is controversial. The practices governing this have grown up in the newspaper business and are based on the assumption that the judgment of the reporter and city editor as to the reliability of the source of the information is the public's assurance of truth, rather than having the public rely on its own estimate of the sources. This is almost a necessity, for otherwise the news columns would be half filled with footnotes and parentheses on the sources of the news.

But whether the newspaper habits are right or wrong, the point as far as the Bell System is concerned is that whenever matter reaches a newspaper from the System, the newspaper knows the source. The newspaper as the public's agent then

decides whether to print it at all, or to print it with a credit to the source or without such credit.

The philosophy of the Bell System is that as a large enterprise set up by the public to do an important task for it, we should constantly inform the public what we are doing, on what basis we are doing it, and what our policies are—and further, that we should do our own talking directly to the public and not hire other people to talk indirectly for us.

The statements of policy made publicly and reiterated are hostages for performance. They are also assurance to all employees of the purposes of the management. Thus, they are important in helping to create and maintain a unity of purpose and understanding within the organization. The effort to state a matter sometimes even helps clarify the thinking on the subject.

For consumption both inside and outside the business, the statement and discussion of the policies and practices of the System help it to keep clear its obligations to the public and enhance the effort to render service from the customer's point of view.

Chapter XIV

POLITICS

PROBABLY the greatest continuous problem of American democracy has been the maintenance of honesty in public office. Public officials are always in a position to benefit other people at the public expense. That possibility has led to favoritism and corruption. Eternal vigilance is as necessary to political honesty as to the maintenance of liberty, and perhaps they are largely interwoven.

There never has been a time when there has not been some measure of political corruption. Whether it was more or less in the early days than now would be hard to guess. Whether corruption is more extensive between politicians and little business or between politicians and big business there is no means of knowing. But it is a reasonable guess that the public fears the influence of the money of big business on politics far more than it does the influence of the money of little business, for the obvious reason that a big business usually has more money than a little one.

The natural consequence of this is that big business must have standards and practices completely above the least suspicion.

Anyone with a memory of the events of the last thirty years can recall some major and a number of minor incidents of improper relations between big business and politics. And it would be hard to think of any other cause so potent in arousing public antagonism to big business as this—certainly none as well justified. Even the simplest honesty of not pay-

ing money that is either blackmail or bribery may need considerable courage if powerful and corrupt political forces make such demands. Big business is also an obvious target for the smaller political graft. For example, in 1928 the assessment of the Southwestern Bell Telephone Company in St. Clair County, Illinois, was suddenly raised from $591,000 to $864,945. In 1933 one of the officials of the County Board of Tax Review confessed that this was a part of a tax-grafting scheme. As the confession stated, "The Bell Telephone Company was on the list to have its valuation increased. . . . The percentage was fixed as a matter of judgment and it was known to us that they hadn't come through so we just put it on." This "pressure" tax increase was finally taken off by court action. But whether it is major pressure or minor blackmail, the fundamental fact remains that big business can never get and hold public confidence unless it maintains the most scrupulous standards in its relations with politics, even in places and at times when the public tolerates corruption among its public servants. Big business must accept this responsibility. It more nearly has the power to enforce morality in this field than anyone else and if it has the power it will have to accept the responsibility. There is nothing that businessmen or business associations can do more fundamental to the long range success in the relation of big business to our democracy than to maintain scrupulous honesty between business and politics.

It would seem that what is honesty in these relations should be very simple to define, but it is not quite as simple as it appears at first sight.

The ordinary corporation does not have a vote. It is not a political person. Its functions are not political. The stockholders' money is to be used only for the purposes defined in its charter. The charter of the American Telephone and Telegraph Company, for example, is pretty broad, but it says nothing about voting, influencing elections or saving the na-

tion by political means. It is fundamental in the Bell System to pay no money for political purposes directly or indirectly, either by campaign contributions or by advertising or in any other way. It is likewise fundamental in the policy of the System not to attempt to influence the votes of employees. The job of the Bell System is to provide a nationwide telephone service to the American people under whatever government the people have. It is not the function of the Bell companies to try to affect what kind of government that will be.

But, of course, practically all of the people who work in the Bell System are citizens and have the responsibility of voting. There is no theoretical reason why these people should not take as active a part in politics as anyone else. But, as a matter of fact, in cases where such participation might involve the company in a political issue, it is customary to resign the company job, because the public in a campaign may be led to confuse individual with corporate action. For example, when in 1937 Mr. Maurice J. Tobin who was at one time a supervisor in the Traffic Department of the New England Telephone and Telegraph Company ran for Mayor of Boston, his opponent printed an advertisement in the *Boston Post* which began as follows:

FOLEY WARNS CITY'S VOTERS

Attacks Telephone Interests

Charges Plot to Sell Out to Racketeers

The New England Telephone and Telegraph Company, and its parent holding corporation—the American Tel. and Tel.—will make a desperate effort today to seize control of the government of the City of Boston. Allied with this powerful corporation are James M. Curley and Malcolm E. Nichols, whose public services have disgraced our city. Working hand in hand with them on orders of this powerful corporation, is Maurice J. Tobin, a clerk employed by the New England Telephone and Telegraph Company.

It was immediately answered by the President of the New England Company in these words:

NEW ENGLAND TELEPHONE AND TELEGRAPH COMPANY

A Statement to the Public

In a most astonishing advertisement in this morning's *Boston Post* the New England Telephone and Telegraph Company has been charged with an attempt to seize control of the government of Boston by supporting the candidacy for Mayor of one of its former employees.

This statement is false and ridiculous. The Company has no right to take part in political campaigns and has not and is not doing so. No successful or unsuccessful candidate for any public office can truthfully say that he has had the support or opposition of the management of the Company.

If any employee becomes a candidate for the office of Mayor of a city the Company requires his resignation. That policy has been adhered to in this case and the resignation was received and accepted as of April 1, 1937.

Such instances show that even where the company scrupulously refrains from political action, it may not be able altogether to escape being made an issue in politics. But in the long run, if business leaves partisan politics strictly alone, that fact will become generally accepted. That may never happen completely, but the public acceptance of it can certainly be achieved to an increasing extent. As a matter of fact, that is happening. In the last ten or twelve years there have been a number of cases where politicians have attacked the telephone companies. I think they did this on the old political formula that attacking any big business was a good way to produce votes. As far as I have been able to observe, the old formula did not work. I do not think the attacks produced any votes for there was not a real issue. Once during that period also a chain of newspapers tried a series of articles devoted to "exposing" the Bell System, but that petered out too and I don't think it increased any circulations. I know

that there are many people in business who believe that political and newspaper attack on business is inevitable and that regardless of how business is conducted it will be the football of politics. As business is the means by which we all make a living it is of natural and proper concern to government, but I am optimistic enough to believe that if big business uses as much brains and care in maintaining proper relations to politics as it has devoted to production and salesmanship, the old formula that you can make votes by attacking anything big just because it is big will fade away. The majority of the people who work—if such polls as I have seen are correct—would prefer to work for big corporations rather than for little ones. Some recent government publications indicate that big business tends to pay higher wages than little business. The consumers create big corporations by their purchasing habits, for big business tends to sell cheaper than little business. If it does better for the workers and the consumers, that ought to balance the instinctive fear of size. With its assets big business ought to have a cordial public acceptance, especially if its large size and its operations are so completely exposed to view that the public can see that no dangers exist. Large size calls for behavior that is wiser and more scrupulous and responsible than is permitted in the obscurity of littleness.

I included the word "wiser" in the last sentence because wisdom is a good part of the moralities in the relation between big business and government. For example, the N.R.A., when it was functioning, told the Bell System to make a code for the telephone industry. In assets the Bell System is a large part of the telephone industry in the United States, but there are some six thousand telephone companies outside the System. Most of them operate in small towns. However, the N.R.A. went out of the picture before the code was completed. If it had not and the Bell System had done what the N.R.A. asked, any code which the N.R.A. would have ac-

cepted for the Bell System would have meant bankruptcy for a lot of these other companies. And when they were bankrupt, there would have been no one but the Bell System to buy them in. Had this sequence of events occurred, I can hardly believe that there would not have been a government investigation to expose the "wickedness" of a big business that had ruined its little neighbors. We should almost certainly have been accused of immorality. The fact that a government agency instigated the act would have merely increased the indictment by adding that we hoodwinked the government.

Or let's take another kind of situation. A telephone company operating in many places has occasion to use the legal services of local counsel. There can be no reason against it. But suppose the best local counsel has a partner in the legislature and there are bills before the legislature which affect the company, does that change the picture? If the legislator is the kind of man he ought to be, the answer would be "no." But such arrangements might be improper, they can arouse suspicion and the ramifications of this kind of situation are infinite. The reputation and the character of the people involved and the circumstances of the case all play their part in determining whether in such cases a scrupulous and wise standard will allow the employment of the counsel with a partner in the legislature. Certainly it would be absurd to go so far as to say that big business would not deal with any man who was himself, or had a partner or a relative, in politics. It is not in the public interest that business, big or little, should treat men who go into public service as if they were contaminated.

Or let's take another example. The Federal Communications Commission in its investigation complained that in a certain state the telephone company gave free service to the public utility commissioners. The implication of the criticism was that this was done to influence their decisions. In many

places, of course, the law provides that service to certain public officials be free. Unless the company thought of the free service as creating an obligation, or the commissioners did, it certainly had in it no immorality. But there was an amusing side to this criticism. The Commission's investigators themselves who made the reports in which the criticism appeared used free local telephone service and free room space in 195 Broadway during the investigation. And in this case also there were no implications involved on either side. It was merely customary. Yet the incident shows that it is not enough to be innocent of bad intentions, it is necessary to foresee situations so that no innocent act may be misinterpreted by anybody.

A 100 per cent performance in this field is as impossible as it is in any human activity. The telephone companies deal with city governments, and with practically all their departments, counties, state government departments, commissions, and with a large number of federal agencies of one kind or another. The rule in all of this is to have the proper official of the company deal directly with the proper governmental officials. In doing this the telephone officials endeavor to have all the governmental bodies with which the companies have to deal, understand the policies of the telephone company and the facts of the business that bear on any question.

The Bell System has no political influence and wants none. To the great number of honest men in all walks of political life with whom it has to do, the Bell System is happy to present its case on its merits. Where there are other kinds of people in politics we have to depend on the reputation of the business with the public and the long run judgment of the public. This may take time to function, and strength in a business is a great help in passing this time. But in the long run a business that believes in serving a democracy must have faith in this method.

Chapter XV

THE INVESTIGATION

In 1935 a joint resolution of Congress authorized the Federal Communications Commission to investigate the Bell System.

This was at the time when the boom in investigations in Washington about equaled the previous boom in finance and industry and rivaled it in unhealthy qualities. The wording of the resolution indicated that the investigation of the telephone industry might be a search for scandal rather than a scholarly inquiry. The minority report on the resolution in the House stated that the form of the resolution indicated a prosecution rather than an investigation. The telephone industry understood it as such. When the newspapers asked Mr. Gifford to comment on the proposed investigation, he said:

> In a business as extensive as ours which so vitally concerns so many people, the public has a right to the fullest information as to how its affairs are conducted. We therefore have no objection to investigations by properly constituted authorities at any time. We have no skeletons in the closet to be exposed.
>
> It is regrettable although perhaps inevitable that public investigations should be disturbing to confidence, at least until all who have criticisms to make have made them and the company has had an opportunity to reply. We are primarily concerned with furnishing the people of this country with the best possible telephone service at the lowest possible cost, consistent with fair treatment of employees and of those who have invested their savings in the business. We believe there is no conflict between our aim and the aim of the Federal Communications Commission and we welcome the opportunity

to place before that body all the facts as to the manner in which our business is conducted.

The chief counsel of the investigation started his hearings in a search for scandal, for he opened the investigation of a great national service with testimony on the use of telephone service by horse race bookies. At the end of this he suggested to Mr. Gifford that this was a skeleton in the closet.

But the facts did not measure up to that stature.

The newspaper reporters looked on the investigation as a search for scandal and, when scandal did not appear, rather neglected the hearings.

The investigators produced thousands of pages of reports in which it is hard to find any comment indicating their belief that the Bell System ever did anything well or from a good motive. The Chairman of the Telephone Division of the Commission in asking Congress for more money to complete the investigation "admitted" that the telephone company gave the finest service in the world—as if that were against his interest.

The "hearings" during the investigation were conducted without allowing the company to present its case on the matters brought up or to cross-examine the Commission's witnesses. The "comments" on the investigators' reports and the "Brief" on Commissioner Walker's Proposed Report which the company was later allowed to file with the Commission could not take the place of cross-examination and the presentation of company testimony at the hearings. The investigators could make any statements or deductions without challenge and their reports, although not officially adopted by the Commission, were printed at Government expense and sent by the Commission to state commissions all over the country. The investigating group, while of a caliber to discover financial juggling if it had been there, certainly had neither the engineering competence, management skill nor experience in telephone operations to give to a lay board

like the Federal Communications Commission a balanced or judicious background for its policies. It is inconceivable that anyone would rely on the reports of the investigating group as an authority if he were going to risk his own money in large quantities.

In its annual reports for 1936, 1937 and 1938 the American Telephone and Telegraph Company publicly registered its objections to the unfair methods of conducting the investigation, as it had also done to the Commission itself.

This was a most unusual proceeding for a business that had long advocated and lived with regulation. But there were two compelling motives to register every possible objection to the methods of the investigation.

Character is an asset of a business. Reputation affects the customers, the stockholders, and the employees. The method of the investigation, far from tending to improve service or economy, was calculated to create discord, destroy morale and frighten investors. The Bell System would have been derelict in its responsibilities had it not protested.

In the second place, the people who make up the Bell System are citizens of the United States with standing in their various communities. They have children and friends like other people and their reputations mean something to them. They have, therefore, every reason for deep seated personal resentment when an agency of the Government, which they help to support, sets out to attack their characters.

On the other hand, no one in the Bell System questions the right or propriety of the Government's conducting an investigation. The Bell System conducts an essential national service. The nation has every right to know how it is done. A study of the Bell System on a high plane by men able and experienced in engineering and management could well have been very valuable. Even the investigation that was made had value to the public as well as loss. A business is stupid if it goes through such an experience without careful study

of what the investigators report. Those and the concurrent studies made by the business itself are bound to have some results. And whether the net of this particular kind of investigation is plus or minus, there is every reason to make full use of the plus values.

When the investigation was done Commissioner Walker issued a Proposed Report. This was not accepted by the Commission itself, which later issued its own report. This latter is, in reality, the only responsible official document from the proceedings, although all the investigation documents and the Proposed Report were sent to practically every state in the Union.

The members of the Commission who issued the final report, with the exception of the Chairman of the former Telephone Division of the Commission, had taken little part in the investigation. Some had been appointed after the investigation was really finished and had taken no part.

Although the final report had to be built from the material of the investigators and could, therefore, hardly rise above its source and analyze the telephone problem from much of any point of view but the statistical, it did nevertheless have a very different tone from the conduct of the investigation. Some of the attitude of the investigators remained, as for instance putting in the word "alleged" before the mention of services by the American Telephone and Telegraph Company, but on the whole the report isn't another chapter in the school for scandal.

On those elements, the quality of service, the cost of service, the financial integrity of the business, the treatment of personnel, which seem most important to the public from the Bell System point of view, the emphasis in the report is very uneven.

There is comparatively little about the quality of service, which is after all the main purpose of the business. There is little about wages, working conditions, or the development

of personnel, which are important bases of good service, except certain discussions on pensions.

Aside from the historical sections, the report deals mainly with the same questions that have continually arisen in commission and court cases and which must probably continue to arise from time to time in the future.

But the investigation did tend to emphasize some questions concerning the success of regulation of the telephone industry and the scope and direction of regulatory activity in the future.

Chapter XVI

STATE REGULATION

REGULATION by state commission is a device of the American political system to give the public an equivalent assurance of reasonable rates in fields served by monopolies to that which competition gives in competitive fields. It also is designed to prevent discrimination and to rid the legislatures of technical problems of business relationships which they are not well equipped to handle.

The recent Brookings Institution volume on the Government and Economic Life has this to say concerning regulation, chiefly referring to regulation of electric companies:

> The record of public utility regulation generally since 1907 is neither impressive, nor yet too disheartening. The excessive costs and delays of regulation, its rigidities, and its apparent lack of purpose beyond the settlement of individual controversies, cannot fairly be overlooked. On the other hand, the utilities industries have experienced an enormous physical growth, the increasingly complex problems of regulation have been met by the improvisation of elaborate regulatory machinery, and the period for adjustment has, after all, been short.

In other words, regulation itself is somewhat on trial. It has possibilities of serving the public by protecting it against discrimination, by insisting on the publication of the facts concerning the businesses it regulates, by preventing undue charges to the public, and perhaps by encouraging money, brains, enterprise and ingenuity to enter the businesses it regulates and increase their service to the public.

It has possibilities of disservice to the public in discouraging money, brains and enterprise in these businesses, in creating such uniformity as to discourage initiative, in invading the sphere of management sufficiently to disintegrate responsibility and finally to limit progress to the personal concepts of the regulators who themselves are not daily in touch with the problems and possibilities of the business.

It can hardly be said that regulation is a success if under its jurisdiction the public pays unreasonably for goods and services.

It can hardly be said that regulation is a success if under its jurisdiction business tends toward bankruptcy, for a country isn't strong that bankrupts its essential services.

Regulation that is so loose as to accomplish nothing is obviously a failure, and regulation so tight that the regulated industry can accomplish nothing is equally obviously a failure.

The Bell System is regulated by forty-five state commissions which have jurisdiction over the rates and service inside their respective states, and a commission for the District of Columbia. This regulation covers the intrastate business which is about 98 per cent of the calls and about 85 per cent of the telephone income of the System. The Federal Communications Commission has jurisdiction over interstate rates and service. When the Bell System was struggling to establish "one policy, one system, universal service," it visualized regulation as a necessary part of that picture. It so stated in the 1910 annual report of the American Telephone and Telegraph Company. It still holds to that belief. The Bell System is committed by the "Dallas" policy to "the best possible service at the least cost consistent with financial safety," and as Mr. Gifford said, that is the objective of the commissions also. Logically, it might be asked if the Bell System is working for exactly the same ends as the commissions, why have commissions? The answer to that to my mind lies in human nature. I don't believe there is any commission

in the United States which has worked any harder or more sincerely toward that common objective than has the management of the Bell System which I have closely observed in the last ten years. Yet in the long run, I am certain that the presence of the commissions is essential for three purposes: first, to obviate the necessity of the legislatures dealing directly with the utilities on rates and services; second, to give the public assurance that some agency besides that rendering the service is looking after its interests; and third, to provide a continuing tribunal to receive, hear and decide complaints. But with the operating groups and the regulatory groups both agreed that the main objective is the best service at the least cost, the points of difference ought to be within a relatively small range. That there will be points of difference is certain, both because people differ and because an estimate of what can be done in a given circumstance made by the people who are going to do the work is likely to vary from an estimate by those who are going to watch it being done.

State commissions as a political mechanism for regulating the intrastate telephone business can claim a very satisfactory record. The industry it has regulated has constantly increased and improved its service, the rates have been reasonable, the industry on the whole is prosperous enough to be in condition to continue to improve its service and to meet any local or national emergencies.

The record of state regulation indicates that it has been a very active force. In the sixteen years, 1925 to 1940, there have been rate changes affecting local charges for telephone service in practically every exchange of the Bell System.

A rough calculation of orders affecting Bell System companies, made by the different state commissions—including the District of Columbia—from the beginning of their jurisdiction to March, 1936, gives a total of more than 5,600. This shows a very considerable activity and indicates a fairly constant scrutiny of rates and adaptation to changing condi-

tions in the needs for service and operations in providing it. Of these 5,600 orders, about 2 per cent were litigated by the companies. A little more than 2 per cent reached court with some other plaintiff. The rest of the orders went into effect without an appeal to the courts. This whole record indicates a general and successful practice of cooperation between the companies and the commissions. Another check on the effectiveness of state regulation is the time taken by commission cases. There were between August, 1919 and June 30, 1936, about 950 orders affecting Bell System Companies. Of these, some 600 were completed within six months, about 150 more within a year, about 120 more within two years and some 70 took more than two years. The greater number of orders are issued without ever becoming formal commission cases. That fact does not imply that the companies have not had an opportunity to discuss the facts and issues with the commission. In practically all instances they do. But in most instances the orders are based upon informal discussion between the commission and the company and agreed to without formal hearings. Even when the companies originate a rate reduction, they usually go to the commission and talk it over with the commission and quite often it appears as a commission order. On the whole there is a constant and effective examination of rates going on almost all the time. It takes a lot of hard work and serious discussion on both sides, and proceeds with relatively little friction.

This kind of regulation gets results with a minimum of expense either to the commission or to the company and a minimum diversion of the company's efforts from operation to rate case arguments, and this is important because a company whose management is primarily tied up with a rate case is temporarily, at least, not functioning at its best on its main job.

However, while most state regulation goes on more or less in this manner there are exceptions.

In 1925, the beginning of the period under discussion, there were four rate cases on the docket of a kind which a student of regulation might well say were evidences of its ineffectiveness. One was a case which the New York Telephone Company had started in 1920 to increase rates to care for the increase in costs arising from the high price era following the war of 1917-18. The facts were in favor of the company, but in one way and another the case was delayed so that it never got the decision granting increases until 1930. As the company was endeavoring to raise rates neither reason, nor the actual facts, would indicate that the company was the cause of the delay.

Another was a case started by the commission in Ohio in 1924. Hearings were begun in 1925. As far as the company was concerned, the case was submitted to the commission on evidence and briefs in April, 1927. Against its protest the case was reopened by the Attorney General. It went through various vicissitudes after that and was finally settled by compromise more than ten years later.

A third was a more or less similar case in Michigan begun in 1919 and ended in 1936.

Both the Michigan and Ohio cases were delayed somewhat by the court decisions in the Illinois rate case. This, the fourth of the protracted cases, was begun in 1921. The longest delay in that suit was from the fall of 1925 until the fall of 1928, a delay entirely at the instance of the City of Chicago, and so stated by the court.

There have been criticisms of the Bell System for using the law's delays. In the kind of cases described above there have been law's delays aplenty and an almost total absence of that necessary aspect of full justice, which is swift justice. But as to who caused the delays I think the record is clear enough that the Bell System is far more sinned against than sinning. And this is natural, for there is nothing that interferes with the flexibility or effectiveness of management more than one

of these semi-perpetual rate cases. Many things which the management feels should have prompt decisions can't be decided while the rate case is going on, for they are affected by it; or the company can't tell what to do because it can't tell which way the case will come out. And all the while, telephone rates become more and more a political football, debated by candidates for office—the very thing which regulation was supposed to eliminate and which in most cases it has eliminated.

The Bell System does not like to go to court with rate cases. It does not like them while they are in court. It does not want to keep them there. If in the legal processes of trying cases the Bell System counsel put in too lengthy evidence, as some people claim, or in any other way contributed to the tedious length of these proceedings, I am certain that they would welcome any court's ruling for trial on a simpler basis. But once the companies come to the place where they feel they are forced to go to court, and also in the almost equal number of cases in which another party takes the case to court, it is the duty of the lawyers to present the case as fully as may be necessary to obtain final decision on the merits under the existing rules and practices of the courts in which they appear.

Generally speaking, the state laws provide that rates shall be just and reasonable, neither unreasonably low nor unreasonably high. There is quite a margin between these two extremes. The federal Constitution provides that no person's property shall be taken without due process of law, that is, it shall not be confiscated. The federal courts hold that fixing rates so low as to deprive the owner of the opportunity of earning a fair return on the fair value of the property would be confiscation. In Massachusetts the principle is followed that rates which would justify a prudent investor in putting his money in the business are proper rates. The Bell System policy says "earnings must be sufficient to assure the best

possible service at all times and to assure the continued financial integrity of the business."

If one looks over all these criteria for rates and earnings, it would seem that a rate base that just missed confiscation was too low, that the Massachusetts prudent investment and the Bell System's "financial integrity" bases would probably be about the same if judged by the same people, and that a reasonable rate of return for a utility ought not to be lower than the return for equal efficiency in the competitive field.

The knowledge, experience and point of view of the commission or court which is determining the matter have much more to do with the result than the theory which they accept. If the rates are cut until the company begins to show signs of financial distress, the assurance of good service will be threatened and a recession in business catching a company in that condition may cripple it for a long time. If the rates are set so low as to require the company to go in debt to get money, again it is on the downward path. The return which will satisfy stockholders in the long run, the cost of equity money, is the essential criterion.

Before a Senate Committee in 1930, Mr. Gifford testified:

> So far as we are concerned in the Telephone business, so far as I am concerned in charge of trying to operate the business and give telephone service, these figures of rates of return and all of these legal terms are not of particular importance except when we do not earn what we need to earn to carry on the business. The thing that interests me is whether we have enough money and enough income to carry on this business which requires hundreds of millions of dollars of new money each year if we are going to go forward.

So far, under state regulation, the Bell System has met this test. State regulation of telephony has as good, if not a better, record than any other regulation in the United States. By the same token the Bell System has had as good or a better record of successful cooperation with regulation than any other industry. Either group can claim credit in varying de-

grees to suit itself. The element in the commissions which has made the system work has not been so much the theories on which it is based, or the technical processes of regulation, but the ordinary horse sense and business judgment of the commissions and their staffs on the simple question—is the company making too much or too little money to enable it and encourage it to give good service at the present and plan for better service in the future? The answer to that comes down to a matter of judgment.

Chapter XVII

FEDERAL REGULATION

THAT part of the Bell System business which comes under the federal government because it is interstate business, is about 2 per cent in number of calls and about 15 per cent in gross revenue.

The Interstate Commerce Commission was first given authority over interstate telephone rates in 1910. The authority was enlarged in some ways and remained in the Interstate Commerce Commission until 1934 when it was transferred to the Federal Communications Commission. While it held authority, the Interstate Commerce Commission set up a uniform system of accounts for telephone companies doing interstate business and rules for depreciation accounting. It handled the cases of consolidation under the Graham Act subsequent to 1921. It investigated and dealt with such complaints as were made to it by the public. It instituted no rate cases. So far as I know, the Interstate Commerce Commission has never officially stated whether this was because it believed the rates to be reasonable or for some other reason. The Federal Communications Commission in its investigation report made this comment on its predecessor.

> Early in the investigation, it was noted that, whereas the Federal Government had as early as 1910 . . . vested certain interstate telephone toll-rate authority in the Interstate Commerce Commission, such regulation had in practice proved largely nugatory partly by reason of the lack of an effective statutory mandate, but also because of a lack of "appropriations sufficient to carry on an investigation."

In judging the whole problem of regulation from the point of view of results to the public (rather than by activity of the regulators), it is interesting to see what happened in this so-called "nugatory" period. During 1933, the depression year, there were 35,477,000 interstate toll messages passing over circuits of the Long Lines Department of the American Telephone and Telegraph Company. In 1930, a pre-depression peak of 50,528,000 messages was reached. A comparable figure for 1910, the beginning of the period, was 5,994,000. Even taking the depression year of 1933 as the end of the period, these figures show a rate of growth more than twice as fast as that in the number of Bell System telephones.

As an indication of what happened to rates in the "nugatory" period, the following table gives the interstate rates for various distances in 1915 when transcontinental service began, and in 1933, and also the reductions since the "nugatory" period from 1933 to 1940.

	1915 *Day Rate*	1933 *Day Rate*	1940 *Day Rate*
San Francisco-New York.....	$20.70	$9.00	$4.00
Chicago-New York.....	5.00	3.00	1.90
Boston-New York.....	1.25	1.00	.80

During the eighteen years—1915 to 1933—the telephone became transcontinental, transoceanic, even world-wide. And the service changed in speed and quality completely.

The dates of the telephone rate reductions made by the American Telephone and Telegraph Company, Long Lines Department, during this "nugatory" period are as follows: 1926, 1927, 1929 and 1930.

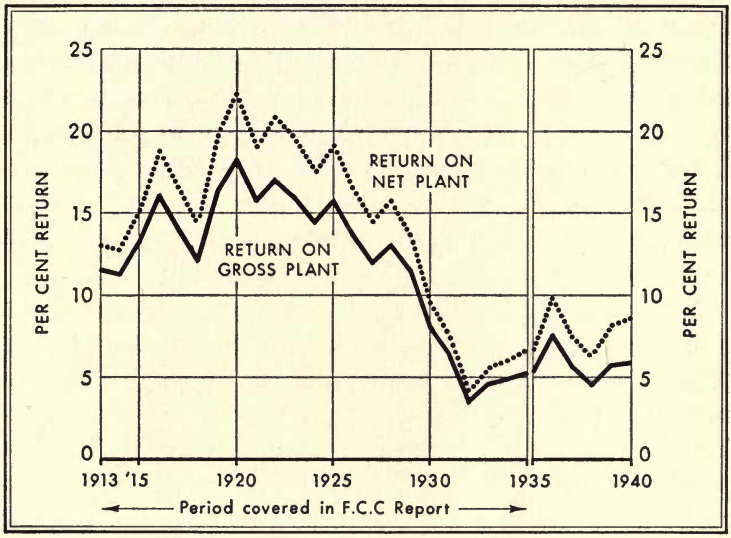
The "nugatory" period began at about the same time that development in the art really permitted the Bell System to create the kind of plant that would render nationwide service. It was still a new enterprise with considerable risk and expense on the technical side and uncertainty on the commer-

cial side. The creation of a nationwide toll service had many of the elements of the early days of the automobile, the railroads or any other new enterprise that grows rapidly and calls for large amounts of capital. The capital was forthcoming. Constant improvement in the art made the service better and the facilities cheaper. Rates were constantly reduced. A system of long distance telephony was created such as existed nowhere else and has since served as a pattern for the rest of the world. Freedom to create, plan and construct, and money to do it with, brought the quality of service that there is now and the facilities that make present rates possible.

The chart on page 187 was originally prepared by the Federal Communications Commission to show its calculations of the per cent return of Long Lines Department earnings to average plant in service from 1913 to 1935. It covers what it calls the "nugatory" period 1910-1934, except the first three years 1910-1913. It is quite interesting in that it shows that from 1913 to 1920 when the interstate business was still relatively small in amount and the business still in the higher risk state, the profits were high. As it became more established, the combination of improving service and reducing rates brought a steady decline in the rate of earnings. From 1920 to 1929 the trend was steadily down. The rate of earnings, since 1935, has been computed on the same basis as that used by the Commission, and has been plotted up to and including 1940. A study of the chart would indicate that the "nugatory" period was not nugatory in results, although it was without interstate rate cases.

It is an interesting picture of self-regulation on the part of an industry working under the broad supervision of a regulatory body. It may be that the Interstate Commerce Commission consciously let the Bell System go its way because it had found without formal rate cases that that way was properly serving the public interest—or it may have had some other reason. The fact remains that rates of the

American Telephone and Telegraph Company's long distance service under the Interstate Commerce Commission were reduced about as rapidly as they have been since that time, for the rate of technical improvement made it possible.



THE EARNINGS OF THE LONG LINES DEPARTMENT

This chart shows the annual per cent net return on Long Lines plant. The solid curve shows the return in relation to the plant investment (i.e., the plant as carried on the books at cost); the dotted curve shows the return on the plant investment after deduction of the reserve for depreciation of plant. On the left of the break in the grid, the chart is a copy of a Federal Communications Commissions chart. The curves on the right of the break show similar information for the subsequent period as reflected by the Long Lines Department records. From 1913 to 1934 the Interstate Commerce Commission had jurisdiction over the Long Lines Department. The Federal Communications Commission's report calls that the "nugatory" period of regulation. The 1935-1940 period has been under the jurisdiction of the Federal Communications Commission.

It may well be that what is called strict regulation of the interstate business from 1910 to 1934 would have been a very distinct disservice to the public. It is quite possible that

"strict" regulation might have produced the system prevalent in Europe where long distance connections habitually have many minutes—and sometimes even hours—delay, for that kind of service could have been made cheaper to begin with. The no-delay service is the result of long range planning and the availability of funds to finance it. It is quite possible that regulation which provides encouragement may produce better and cheaper service in the long run than a process of seeing how close a business can be kept to confiscation. If regulation is to be a success and the regulated industries are to be strong and serviceable both normally and in emergency, regulatory bodies must consider what it is that encourages men and organizations to function.

From the time the Federal Communications Commission took over the regulation of the interstate telephone business through 1940, there have been five reductions in long distance telephone rates. Three of these were made by the American Telephone and Telegraph Company, as it had done previously when under the jurisdiction of the Interstate Commerce Commission, and two after discussions initiated by the Federal Communications Commission, in the manner frequently followed by state commissions in their dealings with the operating companies. There have also been several reductions in the interstate rates of associated companies.

The Federal Communications Commission also made some changes in the standard accounting practices which had been developed by the Interstate Commerce Commission.

The Federal Communications Commission under the new statute departed from the "nugatory" attitude of its predecessor in two other matters. The language of the 1934 act covering telephone regulation followed the act covering railroad regulation. In the latter act there was a provision that no company could build a new interstate line without the Commission's agreeing that it was in the public convenience or necessity. The purpose of this was to limit un-

necessary competitive construction by rival railroads. This competitive condition does not exist in the telephone field, but the rule is applied and new construction after having passed the Bell System engineering staff and management staff must be submitted for approval to the Commission.

In the railroad law there is a provision requiring Commission approval for any man to hold directorships in two railroads. There is a similar provision in the telephone law. The Interstate Commerce Commission generally approves officials of the parent road serving on the boards of subsidiaries which its owns. It disapproves men serving as directors of rival systems. The Federal Communications Commission approved the officers of operating units in the Bell System serving on the boards of smaller companies which they owned, but refused to allow any officers of the American Telephone and Telegraph Company to serve on the boards of the companies it owned. Considering the fact that the Bell System is an integrated national service, a decision that prevents a natural and logical method of coordination seems incomprehensible. The result is that the owner, the American Company, can elect anyone to these boards except especially qualified people from its own organization who know the business and the owner's policies. That is an extraordinary ruling. It seems almost as if the words "interlocking director" had frightened the Commission out of all logic.

Regulation by the Federal Communications Commission is only a few years old. It has come coincident with a rapid increase in the amount of government control in many fields of business and a marked concentration of control in Washington. It is important, therefore, to consider federal regulation not only as it has been in the past, but as its tendencies indicate it may be in the future.

Regulation renders the public a service, but it is not a case of something for nothing. It costs something in money, but what it costs in money is not the crucial point. What it costs

in other ways is more important. And both the costs of regulation and its service to the public are dependent on how it is run.

There is a division of opinion on how it should be run.

On one side is the belief that the function of regulation is to see that rates are just and reasonable, that service is good and given without discrimination, and on the financial side that the accounts are accurate. These, in essence, are quite simple requirements. They can be accomplished with comparatively little expense, with small technical staffs under commissions of laymen. In functioning in this manner the commissions leave the methods of achieving good service at reasonable rates in the hands of the management of the business. The state commissions have largely practiced this method. They do not generally require management to consult with them from week to week on how to operate the business. They look at results and judge whether they are satisfactory or not.

The extreme other view has been expressed by Mr. Walker of the Federal Communications Commission in his Proposed Report on the Commission's investigation of the telephone industry released in April 1938 in which he said:

> The Federal Communications Commission should be given jurisdiction and authority by Congress to review, approve, or disapprove all Bell System policies and practices promulgated by the central management group of the American Company.

The Commission's final report did not include this recommendation which would mean transferring the responsibility for managing the business to the Commission. The Commission under such a system could force any policy it pleased by the simple plan of negativing all others. Under such a condition, if a calamity happened to the business certainly the management could not be held accountable for decisions made by government authority. And this kind of manage-

ment would almost certainly produce the calamity. For the Federal Communications Commission to be competent to make all the major decisions in the Bell System, it would have to have as much experience, as much contact with operations and as much staff as the Bell System. If it had less it would presumably be less competent to judge. If it had as much there would be two parallel organizations doing the same job. It seems impossible to plan a better way to promote operating and service paralysis.

Such complete taking over of management under the name of regulation is an extreme view. But between that and the simpler form of regulation which leaves management free as to ways and means of obtaining best results, there is great diversity of opinion and considerable diversity of practice. If it is correct that full management control by regulatory bodies would spell paralysis, how much creeping paralysis will inch-by-inch encroachments on management's field produce? In general, to the degree by which regulation deprives management of authority, management responsibility and initiative will decline. The regulatory commissions have not the set-up to create advances in the art of telephony or in the practice of operation. They cannot create much. They can stop other people from creating a lot. They can slow down the efforts of management to best serve the public. That is part of the price the public pays for the regulatory assurance that rates are just and reasonable and for the other functions of regulation. The question before the public is whether an extension of regulatory power further into the field of management will produce benefits commensurate with its costs in reduced efficiency of management. There is a tendency among many public men to state that they believe absolutely in private management, but with strict regulation. A strict definition of the limits of regulation might well be coupled with strict regulation. For the words "strict regulation" do not mean much unless the fields of management

and the fields of regulation are quite clearly defined. There is no question that management, if entirely free to act, has greater possibilities of achievement if it has no regulation at all. There is equally no question that this liberty might in time be abused if it were not watched. If the watching can be so devised that management has the maximum freedom to function, but still is kept to proper results, the public can expect the best. If the watching is so contrived as to disintegrate responsibility and interfere with the people doing the job, the public can expect less good results. Human nature in the managements cries for freedom to act, and little interference with their power to act. Human nature in the commissions cries for more power and authority, bigger and more important spheres of action.

The public, acting through its legislators, has a right to expect and demand good service at reasonable prices from business. It has the power to take any action it pleases to insure this. It can use taxation, regulation, general statutes or any other means it sees fit to get the results it wants. The question is, which means are effective? If regulation is used, the further question is, what kind of regulation will produce the best results to the public in the long run; whether the public can get people to work for it successfully by giving them a good deal of responsibility and freedom, or whether it must reduce freedom and divide responsibility? This main question has been considerably overlooked in a process of endeavoring to extend the detailed powers of regulation over one aspect of a business after another. This process is entirely natural since one aspect of the business undoubtedly affects another, and so on through the whole enterprise. The logical end of this process would be management by commission.

The regulatory bodies as well as legislators have a responsibility not only to see that business does serve the public well, but that the regulatory conditions are such that it can

serve the public well and that the commissions do not force a disintegration of responsibility that renders healthy industries and the best service to the nation impossible.

Aside from the general question of what are the proper limits of regulation, there is the further question of whether regulation should be centralized or decentralized.

When the Congress was debating taking interstate telephone regulation away from the Interstate Commerce Commission and putting it under the jurisdiction of a separate commission in 1930, Mr. Gifford was asked his opinion of the change. His comment in part was as follows:

MR. GIFFORD: . . . I would say that I have no objection whatever in principle to the proposed Communications Bill. I think, however, in fact, that what will happen . . . if we have this Communications Commission it will be the end of State regulation of telephone companies.

. . . on the face of it there is no reason why that should change the situation over what it is today.

But my own judgment is that what has happened in the case of the railroads is bound to happen in the case of communications companies, if a single Federal commission is created and charged solely with the duty of regulating these companies.

SENATOR DILL: Do you not think that the legislation might be so written as to assist state regulation?

MR. GIFFORD: I think that as a practical matter that is impossible. I will point out what I mean.

Let us take the present situation. The Interstate Commerce Commission is supposed to regulate only interstate business. As a matter of fact, 98½ per cent or something like that, of telephone messages are intrastate, wholly within a state, and only about 1½ per cent are interstate. Nevertheless, the present regulation is such that all the accounts of all of our companies are kept in accordance with Federal regulations laid down by the Interstate Commerce Commission. Our records are destroyed according to the regulations laid down by the Interstate Commerce Commission. The Interstate Commerce Commission is engaged in fixing our rates of depreciation. In other words, wherever a Federal commission touches these utilities, going back to railroad experience,

the result is that the Federal part of it controls and the State part of it fades away.

MR. GIFFORD: . . . I think it would be unwise to take the business that is so largely intrastate away from the State commissions. I think that the telephone business generally in this country has made a record that the country can be proud of as compared with anywhere else in the world, and it has been done under this method of regulation.

The process of taking regulation from the state commissions has already begun.

The Federal Communications Commission report of its investigation says:

So long as the Bell System continues to be organized upon its present basis the individual States must continue to look to the Federal regulatory agency to afford them with many elements of the essential factual background of telephone regulation. Not only, therefore, is an adequately staffed and properly organized Federal regulatory agency important in itself, but there is need for such a body to act in some measure as a cooperating agency with the States. Only through such a program may the public authorities of both the Nation and the States be enabled to cope with this complex situation, and only thus may assurance be had that the public moneys which have been expended on the telephone investigation may find full fruition.

Numerous specific issues which must be faced have been discussed at length in the foregoing report. Certain of these are common to all public utility regulation, others are peculiar to the telephone business, while still others stem from the particular organization and operating practices of the Bell Telephone System. Among the more important of the issues thus to be faced in connection with active and positive telephone regulation may be mentioned the problem of developing an effective method of determining the reasonableness of the costs and prices of telephone apparatus, equipment, and supplies whenever the manufacturer or supplier and the operating company are under common control or ownership; the question of the proper separation or allocation of property, expense, and revenue as between different types and classes of telephone service and of the simplification of existing allocation procedures; the problem of determining

just and equitable divisions as between the various entities which render the component parts of certain phases of this service; the problem of effectively meeting the issue of Bell System license-contract charges as well as other intercompany transactions and agree ments; and the problem of developing processes and machinery of an accounting nature which will enable the public authorities to keep at all times fully abreast of progress in this business, and to determine continuously and with accuracy the reasonableness of particular rates and charges.

The most compelling reasons in the minds of the Commissioners for the building up of a large technical force in Washington and the entry of federal regulation into the state field in the form of cooperation is to get some value from the money spent on the investigation by giving the states information on the Western Electric Company and the license contract.

The most compelling reason in the minds of operating people for not having the Federal Communications Commission build up a force of engineers, accountants, etc., more than are needed for normal regulation is that they are certain to infiltrate into the fields of management to the confusion and disintegration of responsibility and the consequent deterioration of the courage and initiative in the business.

But aside from that, it is interesting to analyze the question of Western Electric prices and the license contract fees in the Bell System set-up.

If the American Telephone and Telegraph Company should buy the property of the Western Electric Company and all the properties of all the operating telephone companies in the United States in which it owns stock, and dissolve these companies, the Bell System could operate as one company with one board of directors.

If these purchases were made, there would be no intercorporate relations between Bell System operating companies. Such an operating company would not buy material

from the Western, nor rent space from the Long Lines of the American Telephone and Telegraph Company. The Long Lines would not pay commissions or prorates to the operating companies. The operating companies would not pay the so-called license contract fee to the American Telephone and Telegraph Company. While this process would eliminate intercorporate relations, it would solve no real problem whatever.

What the companies and commissions acting for the public want to know concerning the prices paid by telephone companies for equipment is whether or not the prices are fair. If the Western were a department of the American Telephone and Telegraph Company, the question would arise exactly as it does now with the Western a separate company. It can probably be more easily handled with the Western separate in law as well as in accounting. The same is true of the other intercorporate relations. If all telephone property belonged to the American Telephone and Telegraph Company, nevertheless the cost of specific work would have to be recorded and properly allocated. As at present the cost would ultimately be paid for by the customer. The companies and the commissions would still have to struggle with the allocations of the total amounts.

The problem which has usually been discussed under the head of intercorporate relations is in reality not produced by having a number of corporations. It is produced by having interdependent operations of which the costs have to be ultimately allocated to the bills of various kinds of customers all over the country.

Nor would the dissolution of the Bell System obviate the problem. If all of its component parts were separtely owned and each in a separate state, they would still have to deal with each other to give service and pay each other for intercompany services. The bases of these payments would affect

rates. We shall, therefore, probably have to continue the difficult task of allocating costs in a complicated business and finding bases of agreement with the commissions on the allocations, but there is nothing about the problem that makes it better done in Washington than anywhere else.

But aside from the question of who gets these facts, how important are they likely to be? What effect on rates do these things have which are to call forth a great organization of federal power to help the states?

Western Electric earnings are given in the chapter "Profits of the Bell System" in the Federal Communications Commission report. This chapter shows that Western Electric earnings for the 51 years from 1886 to 1936 averaged less than 7 per cent on net investment. The percentage of profit to sales is lower than that. Entering into the cost of Bell System telephone plant and equipment are many items which are not affected by Western Electric activities. For instance, Western Electric charges do not enter into the cost of land and buildings. Many items of plant and equipment, such as poles, trucks, office furniture, etc., are not manufactured by the Western. The cost of such articles, which are in many cases purchased for the telephone companies by the Western, would include a Western Electric charge for purchasing and handling, but would not include any Western Electric manufacturing costs. Also, about one-fifth of the cost of plant to the Bell Telephone System is made up of labor charges of telephone company employees engaged in the installation of such plant. The consequence is that, even if the Western Electric were to make no profit at all, the reduction in costs of telephone plant and equipment would be only about 3 per cent.

The other important question is to see if rates are greatly affected by the license contract. The prospect there is much the same. The so-called license contract is a contract by which, at present, the operating companies pay the American

Telephone and Telegraph Company 1½ per cent of their gross telephone revenue (with certain small exceptions) for the rights it conveys and services it performs. Like most things in the Bell System, the license contract was created by necessity and has changed from time to time to meet new conditions.

The original purpose of the contract was to lease and license telephone apparatus which embodied the Bell patents to operating companies. To improve the art there had to be research. To develop the business there had to be financial assistance. As one need after another developed, the parent company met the need and got paid for its services by means of the license contract. The document itself is pretty broad in terms so that what is done under it changes with the needs of the times, while the language of the contract itself has only been revised at infrequent intervals.

In 1925 the license contract, which then provided that the payment for the services be 4½ per cent of the gross income of the operating companies, brought into the American Telephone and Telegraph Company $30,197,214. The costs of the services rendered in that year were $26,556,167. There was a profit of $3,641,047. Up to that time, whenever the charges under the license contract had come before the courts, the ruling had been that they were proper because the services were worth more than they cost. But the situation under which the contract operated had changed very much from the early days. At that time no one would have questioned the propriety of a profit in the license contract, for it was about all the parent company had to sell.

By 1925, however, the American Telephone and Telegraph Company had come to the conclusion that the profits on the license contract, if they existed at all, should be limited. Effective January 1, 1926, the rate was reduced from 4½ per cent to 4 per cent. At the end of 1927, a further reduction to 2 per cent was made accompanied by the sale of the tele-

phone instruments which had theretofore belonged to the American Telephone and Telegraph Company, their lease and maintenance being part of the contract. In its annual report for 1926 the company said:

> The purpose of these contracts is not to make money for the American Telephone and Telegraph Company, but to further the development of the telephone art and to enable the growth and expansion of the telephone service on a nation-wide basis.

Since January 1, 1929, the payments have been at the rate of 1½ per cent.

These reductions were made with the intention of bringing the income from the contract to about the cost of the services rendered under it so that even where commissions questioned the allocation of the cost of services on the basis of income or had any other technical question, the actual amount of money in question would be inconsiderable. The reduction to 1½ per cent was made in the hope of creating voluntarily a situation sufficiently more favorable than the law required, to bring all controversy about the license contract to the vanishing point. The effort in some ways was more successful in getting rid of all profit than anticipated; in getting rid of controversy it was less so.

As the depression came on soon after the last reduction in the license contract rate, the gross value of operating companies' revenues fell quite sharply and the income from the contract along with it. Instead of a profit, the contract has netted a very considerable loss ever since.

Another particular reason stated in the Commission report for the organization of a large regulatory staff in Washington is to help the state commissions find out what percentage of 1½ per cent can be saved from payment for services rendered by the American Telephone and Telegraph Company —services which cost considerably more to give than it gets from them. Whether the American Telephone and Tele-

graph Company or someone else does the work called for under the license contract, it will have to be done and paid for. The paper work on this subject can be mountainous, but effect on rates infinitely minute.

A continuous study of Western prices and of the cost of the American Telephone and Telegraph Company staff work by the Federal Communications Commission is not important for rate making purposes. Certainly these studies would call for no major organization, unless the day-by-day, week-by-week, and month-by-month scrutiny of the figures is to be used as a day-by-day, week-by-week and month-by-month means of injecting the commission currently into the sphere of management. If that is the intention—and there is some indication that it is—the question is the very highly important one of whether management's responsibility for managing is to be shared with the federal regulatory body and if so on what basis and also with what results. That is a question which affects the Bell System, but one which affects the public much more. And it likewise affects the state commissions for their jurisdiction over a business partly administered by federal management can hardly help fading.

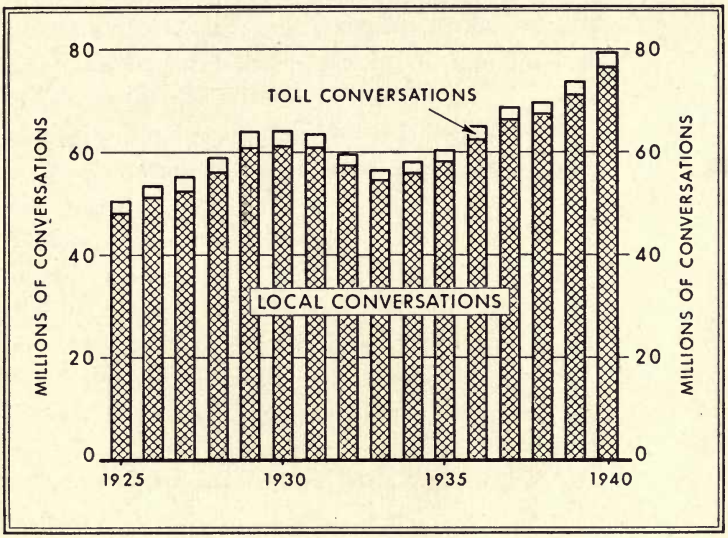
As in the case of railroad regulation, it is quite possible that an expanding definition of the field of federal authority will gradually give federal regulation practically the whole field. Is this good or bad for the public? One kind of regulation will be very different from the other, but whether better or worse is a matter of point of view. The differences are already fairly apparent.

On May 14, 1940, the Federal Communications Commission issued a statement which said in part:

> Inconsistencies of interstate telephone rates in the Southeastern States and in New York and New Jersey were today, by direction of the Federal Communications Commission, called to the attention of the Southern Bell Telephone and Telegraph Co., the New York Telephone Co., and the New Jersey Telephone Co. with request

that consideration be given to revising their respective schedules.

It was pointed out that the rates of the Southern Bell Telephone and Telegraph Co., which serves Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and part of Kentucky, are generally higher than the rates of its parent

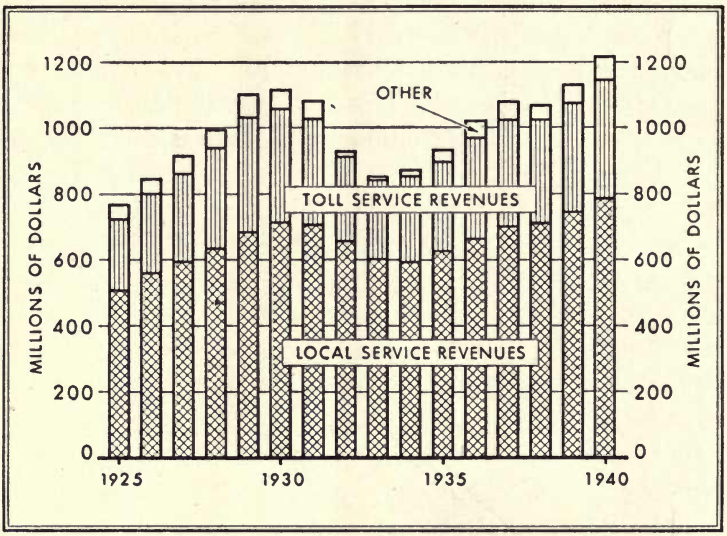


AVERAGE DAILY TELEPHONE CONVERSATIONS IN THE BELL SYSTEM
Showing the growth in telephone usage and the small proportion of toll and long distance conversations.

company, the American Telephone and Telegraph Co. The difference ranges from five cents for station-to-station day rates at a distance of 50 miles, to 60 cents at a distance of 750 miles.

The facts given were correct. The interstate rates of the Southern Bell Company were, however, generally in keeping with its intrastate toll rates. These were under the jurisdiction of the state commissions. It had long been the habit of most state commissions to keep residence exchange rates as low as possible since they affected the larger number of people of less income and to leave toll rates relatively higher because they affected business and a smaller and more well-

to-do residence class. This philosophy of rate making is natural to a state regulatory body and probably in accordance with general public desires. The problem of marketing and pricing the several services that can be offered by a telephone company differs greatly in different places and



THE GROSS REVENUES OF THE BELL SYSTEM

Showing a preponderance of revenues from local service. However, the revenues from toll and long distance service represent a much more substantial proportion of gross revenues than do toll and long distance conversations of total conversations. This is because the revenue per toll call is materially greater than the revenue per local call. ("Other" revenues include such items as revenues from advertising in directories and dividend and interest revenues; uncollectible revenues have been included as a deduction from "other" revenues.)

under different conditions. A rate schedule which gives the best service at the least cost to one area does not necessarily do the same for another. But an interstate regulatory body having no immediate concern with the exchange subscribers wants the interstate rates as low as they can be and that will

in turn put pressure on the state commission to reduce the intrastate toll rates, which will ultimately lead to relatively higher exchange rates.

The Federal Communications Commission statement uses the word "inconsistencies" as evidence of being wrong. The implication is that all rates should be consistent. That is what one would expect from centralized regulation. Decentralized regulation tends in the opposite direction. Rate schedules in one place fits the wants of people there and rate schedules in another fit those local conditions and there is no consistency at all, except that they are consistent with local desires and local conditions of operation.

Now, of course, if the centralization continues and the consistency theory prevails, there would be in time a standard rate schedule for all towns of the same size or perhaps for all towns regardless of size. The local preferences would have been gradually washed out. It all tends toward consistency, but it is not very individual. The effort to make rates fit a particular place would be gone, and with it perhaps some part of telephone usage. In fact, all experimentation to find better rate schedules would be eliminated unless the experimenter could find one of universal application.

This tendency is the opposite of the efforts of the Bell System in the last sixteen years. The Bell managements have decentralized operations, endeavored to give a flexible service adapted to different conditions and different people, a personalized service even for each customer. The two tendencies are as far apart as the poles. One operates the business to make the easiest job for accountants and record keepers. It is all consistent with regular forms. It is all based on the assumption that human affairs can be correctly translated into figures and that if the figures are consistent everybody ought to be happy, and in any case it is a good record.

The other operates to try to create an organization in which everyone uses his head on every job to give the public

what it wants. In this conception consistency is not the primary virtue. The primary purpose is the service to the public and the records have to be kept as best they can. They follow what happens instead of control it. It is not, of course, impossible for a single regulatory body to have consideration for a decentralized point of view, but the natural tendency is the other way. If the consistent, standardized, centralized conception dominates regulation it is going to be that much harder to maintain local initiative in management, consideration for local feelings, adaptation to local conditions, and personalized service.

From the point of view of pride in the profession and satisfaction in working toward a high goal in public service, this kind of centralized regulation would seem to me a calamity both for those in the Bell System and for the public. On the other hand, management in one respect would be much simpler if the Bell System were merely ordered to offer everyone the same rate and if he didn't like it to tell him to go to Washington. A similar consistency in other things besides rates might in time make the whole enterprise quite simple, wholly inflexible and relatively dead. There is no immediate prospect of the application of this tending to the point of absurdity. But a creeping paralysis on initiative and flexibility could very easily and without public notice in the next fifteen years cost the public a tremendous toll. And it could, of course, while pretending to leave management free, really circumscribe its efforts so that telephone service as we now know it would no longer exist.

If the tendency toward rigidity against which all business managements, big and little, have to struggle is increased by commission rules and regulations, the effect will be bad. The most serious problem before regulation is self-restraint. It can't create initiative for it is not in a position to do so unless it takes over the business. It can and does decrease initia-

tive. Taking all fields in which there is federal regulation, it is not clear that it can function without deadening the business it regulates. It does not seem necessary that this should be so, but the evidence is not clear that it is not so. There is a reasonable suspicion that federal regulation tends to destroy the initiative on which business must depend for health in a changing world. There is at least a prima facie case for a serious consideration by the public of the methods of federal regulation to see if it cannot be made more helpful in keeping the country supplied with essential services in good condition.

However the public finally decides to apportion the field between regulation and management, it will have to accept the responsibility for results strictly on the lines that it fixes the freedom and power to get results in the long run. The question for the public and its elected representatives is what is most likely to produce energetic able organizations that have vision, take risks, and are likely to be competent and prepared at all times—organizations that have an incentive for improvement and economy and a wider service, and with the incentive, the capacity to maintain a process working to those ends.

The welfare of America is measured by progress. The test of the wisdom of extending regulation into the fields of management is whether that is likely to encourage those things in men and organizations that make for progress.

Progress in the art, improvement in management and methods, preparedness for the future and liberty to act quickly and effectively and with undivided responsibility are the positive factors from which the public may expect real benefits.

To the degree to which the representatives of the public agree to encourage or discourage these positive factors, the public is likely to benefit or suffer.

Chapter XVIII

CONCLUSION

THE Bell System conceives its obligation to the public, in the words of the policy stated at Dallas, "to see to it that the service shall at all times be adequate, dependable and satisfactory to the user. Obviously, the only sound policy that will meet these obligations is to continue to furnish the best possible telephone service at the lowest cost consistent with financial safety. This policy is bound to succeed in the long run and there is no justification for acting otherwise than for the long run."

With the long run viewpoint, the processes of improvement and economy in the Bell System are based on investing well for the future and paying well for men, materials, research and money.

Investing well for the future means getting the best personnel, the best materials, the best credit. The best is usually higher priced but less costly than poor credit, poor personnel and poor materials. The theory is to pay fairly for quality and get it, because quality well managed means ultimate economy. That is the long view. A hit-and-run management with a short view can make immediate savings by chiseling on the cost of credit, by chiseling on wages and salaries and chiseling on materials and margins of safety in plant and operation, and cutting down on the staff work and research—the men whose job it is to work for improvement. But such immediate savings will cost heavily in the long run.

It is essential to the fulfillment of the Bell System policies

to pay good wages and salaries, to provide good working conditions, vacations, pensions, sick benefits and the like—essential that everyone be given the maximum possible outlet for his brains and energies that the business affords. All this is a part of making an organization that will be effective in producing long range improvement and economy.

The payment of good returns to the owners is likewise the long range method of insuring ample credit and cash for new tools, equipment and plant whenever needed. In the long run it is the cheapest way to raise money, for credit like health, is not expensive to keep, but once lost is hard and expensive to recover.

The purchase of the best tools, apparatus and equipment is again a part of long range economy and with that goes the maintenance of adequate plant margins so that emergencies in the country create as little emergency construction in the Bell System as possible, for that is likely to be expensive in the long run.

The payment for large sums for research and staff work in each year are an immediate expense and in succeeding years a saving. In the long run it is essential to the processes of progress and economy out of which come better service, better wages, and safer dividends. Along with the research should be mentioned the depreciation account, for this accumulated reserve is a measure of the courage, capacity and intention of improvement in the business.

The relation of the Bell System to the public is clearly defined within the business, the policies that govern this relationship are understood more thoroughly throughout the business than ever before, and the organization and policies for providing the best service at the least cost are in as good shape or better than they have ever been. That statement I think is true, but I am sure it gives something of a wrong impression—an impression of a static standard. That is wrong. There can be nothing static about the organization

or operations which meet the needs of a constantly changing world in which people change their wants, their habits and their places of living from one day to another.

Constant vigilance, flexibility and freedom of action are essential to meet such conditions.

If the traditional American way of life continues, the present level of living—both material and intellectual—should continue to improve within the limitations set by human frailties. In this American experiment the Bell System intends to provide a living and a good life for the people who are in it, and a constantly improving service to the rest of the public in their pursuit of happiness. The way in which we make a living is the day-by-day practice of democracy. It is the essence of the American experiment. To be an effective part of this greatest of all human enterprises is the part which the Bell System hopes to continue to play.

BELL SYSTEM STATISTICS

By Principal Telephone Operating Companies
Year 1940

The A. T. & T. Co. and Its Principal
Telephone Subsidiaries–Consolidated
1925–1940

Name of Company Subsidiaries are indented under the controlling company	Plant Investment	Operating Revenues
New England Tel. and Tel. Co.	$333,984,303	$ 80,166,185
The Southern New England Tel. Co.	94,368,748	20,446,917
New York Tel. Co.	808,950,391	218,734,706
New Jersey Bell Tel. Co.	219,590,212	53,218,392
The Bell Tel. Co. of Pennsylvania	341,690,181	76,201,734
The Diamond State Tel. Co.	11,554,754	2,685,170
The Chesapeake and Potomac Tel. Co.	55,332,614	13,316,654
The Chesapeake and Potomac Tel. Co. of Baltimore City	65,553,204	17,492,699
The Chesapeake and Potomac Tel. Co. of Virginia	47,012,877	11,821,927
The Chesapeake and Potomac Tel. Co. of West Virginia	28,241,336	7,214,399
Southern Bell Tel. and Tel. Co.	300,952,265	75,986,497
Christian-Todd Tel. Co.	902,553	219,820
The Cincinnati & Suburban Bell Tel. Co.	45,856,783	11,108,545
The Ohio Bell Tel. Co.	198,210,951	48,040,710
Michigan Bell Tel. Co.	203,988,671	47,825,057
Indiana Bell Tel. Co.	53,743,825	14,836,049
Wisconsin Tel. Co.	84,120,330	19,436,278
Illinois Bell Tel. Co.	335,774,324	97,415,697
Northwestern Bell Tel. Co.	146,424,129	36,217,310
The Tri-State Tel. and Tel. Co.	29,182,395	6,683,543
Dakota Central Tel. Co.	7,173,640	1,322,557
Southwestern Bell Tel. Co.	389,273,177	97,697,007
The Mountain States Tel. and Tel. Co.	115,707,015	26,946,932
The Pacific Tel. and Tel. Co.	304,353,567	75,510,995
Bell Tel. Co. of Nevada	7,059,330	1,344,473
Southern California Tel. Co.	203,096,570	51,773,123

[a] Preferred stock, called for redemption.

[b] This figure represents the percentage of capital stock owned by the directly controlling company.

Capital Stock		Per Cent Distribution of Plant Investment	Number of Employees	Number of Telephones
Amount	Ownership by A. T. & T. Co.			
$133,345,800	65.31%	7.54%	20,428	1,294,557
40,000,000	33.34	2.13	4,799	383,338
421,300,000	100.00	18.25	39,230	2,710,161
140,000,000	100.00	4.95	11,819	773,097
110,000,000	100.00	7.71	17,624	1,357,055
20,000,000 [a]	———			
5,000,000	100.00	.26	577	51,593
20,000,000	100.00	1.25	4,138	275,326
40,000,000	100.00	1.48	4,499	303,976
24,000,000	100.00	1.06	3,286	235,064
19,000,000 [c]	100.00	.64	2,109	149,310
155,000,000	100.00	6.79	22,643	1,350,927
957,400 [e]	99.57 [b]	.02	144	5,343
27,488,400	29.72	1.04	2,108	198,862
150,000,000	99.99	4.47	9,894	827,157
140,000,000	99.99	4.60	11,009	820,088
37,000,000	99.99	1.21	3,627	259,008
43,400,000	100.00	1.90	6,504	393,753
150,000,000	99.31	7.58	26,491	1,549,539
100,000,000	100.00	3.30	10,018	717,604
7,000,000	99.99 [b]	.66	1,557	145,521
1,867,192	99.95 [b]	.16	462	32,336
173,000,000	99.99	8.78	24,971	1,628,208
48,049,700	73.23	2.61	7,909	544,916
180,500,000	85.80	6.87	19,762	1,254,064
82,000,000 [d]	78.17 [d]			
4,850,000	100.00 [b]	.16	201	15,118
125,000,000	100.00 [b]	4.58	11,663	790,235

[c] Includes $2,800,000 capital stock subscribed.

[d] Preferred stock.

[e] Includes $750,000 preferred stock with voting rights.

BELL SYSTEM STATISTICS 1925–1940

THE A. T. & T. CO. AND ITS PRINCIPAL TELEPHONE SUBSIDIARIES

	1925	1930	1935	1940
Number of Telephones	11,909,578	15,187,296	13,573,025	17,483,981
Number of Central Offices	6,147	6,639	6,896	7,052
Miles of Pole Lines	394,529	428,212	407,454	399,838
Miles of Wire:				
In Underground Cable	27,769,000	45,116,000	47,639,000	54,339,000
In Aerial Cable	12,835,000	23,777,000	26,425,000	30,307,000
Open Wire	4,339,000	5,231,000	4,562,000	4,660,000
Total	44,943,000	74,124,000	78,626,000	89,306,000
Average Daily Telephone Conversations	50,141,000	64,034,000	60,290,000	79,303,000
Plant Investment	$2,566,809,000	$4,028,836,000	$4,187,790,000	$4,747,674,000
Operating Revenues	$ 737,560,000	$1,075,228,000	$ 919,116,000	$1,174,322,000
Taxes (Excludes taxes charged to construction)	$ 58,113,000	$ 84,732,000	$ 94,507,000	$ 184,770,000
Number of Employees	292,902	318,119	241,169	275,317
Number of Am. Tel. & Tel. Co. Stockholders	362,179	567,694	657,465	630,902

APPENDICES

Appendix I

CERTIFICATE OF INCORPORATION AMERICAN TELEPHONE AND TELEGRAPH COMPANY

EXECUTED FEBRUARY 28, 1885

FILED IN OFFICE OF THE CLERK OF THE CITY AND COUNTY OF NEW YORK, N. Y., MARCH 2, 1885—AND THE OFFICE OF THE SECRETARY OF THE STATE OF NEW YORK, MARCH 3, 1885

CERTIFICATE OF INCORPORATION, AMERICAN TELEPHONE AND TELEGRAPH COMPANY

We, Edward J. Hall, Junior, of the City of Elizabeth, State of New Jersey, Thomas B. Doolittle, of the City of Bridgeport, State of Connecticut, Joseph P. Davis and Amzi S. Dodd, of the City of New York, State of New York, do hereby associate ourselves together for the purpose of constructing, buying, owning, leasing, or otherwise obtaining, lines of electric telegraph partly within and partly beyond the limits of the State of New York, and of equipping, using, operating, or otherwise maintaining, the same; and of becoming a body politic and corporate under and by virtue of the provisions of an act of the Legislature of the State of New York entitled "An Act to provide for the incorporation and regulation of telegraph companies," passed April 12, 1848, and the various acts amendatory thereof or supplemental thereto; and of having and exercising all and every of the powers, privileges, franchises and immunities in and by said acts conferred. And in pursuance of the requirements of the various acts aforesaid, and for the purposes above set forth, we do hereby declare and certify as follows,

First. The name assumed to distinguish such association and to be used in its dealings, and by which it may sue and be sued, is the

AMERICAN TELEPHONE AND TELEGRAPH COMPANY.

Second. The general route of the lines of telegraph of said association will be from a point or points in the City of New York along all rail roads, bridges, highways and other practicable, suitable and convenient ways or courses, leading thence to the Cities of Albany, Boston, and the intermediate cities, towns and places, also from a point or points in and through the City of New York, and thence through and across the Hudson and East Rivers and the bay and harbor of New York, to Jersey City, Long Island City and Brooklyn, and along all rail roads, bridges, highways and other practicable, suitable and convenient ways and courses to the Cities of Philadelphia, Baltimore, Washington, Richmond, Charleston, Mobile and New Orleans, and to all intermediate cities, towns and places; and in like manner to the Cities of Buffalo, Pittsburg, Cleveland, Cincinnati, Louisville, Memphis, Indianapolis, Chicago, St. Louis, Kansas City, Keokuk, Des Moines, Detroit, Milwaukee, St. Paul, Minneapolis, Omaha, Cheyenne, Denver, Salt Lake City, San Francisco and Portland, and to all intermediate cities, towns and places, and also along all rail roads, bridges, highways and other practicable, suitable and convenient ways and courses as may be necessary or proper for the purpose of connecting with each other one or more points in said City of New York, and in each of the cities, towns and places hereinabove specifically or generally designated.

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

Third. The capital stock of such association shall be the sum of one hundred thousand dollars, which will be divided into one thousand shares of the par value of one hundred dollars each

Fourth. The names and places of residence of the shareholders of said association, and the number of shares held by each of them, are, respectively, as follows,

Names.	Residences.	Number of Shares.
Edward J. Hall Jr	Elizabeth, N. J.	Two hundred and fifty
Thomas B. Doolittle	Bridgeport, Conn	Two hundred and fifty
Joseph P. Davis	New York City	Two hundred and fifty
Amzi S. Dodd,	New York City	Two hundred and fifty

Fifth. The period at which such association shall commence is the day when it shall become a body corporate under the provisions of the acts aforesaid, and the period when it shall terminate shall be at the expiration of the term of fifty years from said day.

IN WITNESS WHEREOF, we, the persons above named, have hereunto set our hands and seals this twenty-eighth day of February in the year of our Lord, one thousand eight hundred and eighty-five.

EDW'D J. HALL, Jr. (Seal)
T. B. DOOLITTLE (Seal)
JOS. P. DAVIS (Seal)
A. S. DODD (Seal)

Appendix II

PLAN FOR EMPLOYEES' PENSIONS, DISABILITY BENEFITS AND DEATH BENEFITS

(Effective January 1, 1913, with Amendments to and Including April 1, 1941)

This pamphlet describes the "Plan for Employees' Pensions, Disability Benefits and Death Benefits" of the

American Telephone and Telegraph Company

and the word "Company" in the text of the Plan on pages* 5 to 22 means said Company.

A similar Plan has been adopted by the Associated Operating Companies of the American Company, by the Western Electric Company, Incorporated, and by certain Companies subsidiary to or affiliated with the aforementioned companies, and agreements for interchange of benefit obligations have been made as provided in Section 9 of the Plan.

Summary of Benefits

A brief summary of benefits to which employees may become entitled is given below. The complete plan is contained in sections headed "Plan for Employees' Pensions, Disability Benefits and Death Benefits," pages* 5 to 22.

1. *Pensions.*

1) Retirement on pension is provided for employees coming under the classes listed below. Employees in Classs A may be retired on a service pension either at their own request or at the discretion of the Committee. Employees in Classes B and C may be retired on a service pension only at the discretion of the Committee and with the approval of the President or Vice President.

a) Service Pensions

* Pages 221 to 243 of this appendix.

Class A—Employees whose age is 60 years or more (females 55 or more) and whose term of employment has been 20 years or more.

Class B—Employees whose age is 55 to 59 years (females 50 to 54) and whose term of employment has been 25 years or more.

Class C—Employees whose age is less than 55 years (females less than 50) and whose term of employment has been 30 years or more.

b) Disability Pensions

Class D—Any employee whose term of employment has been 15 years or more and who becomes totally disabled by reason of sickness may, at the discretion of the Committee and with the approval of the President or Vice President, be granted a disability pension, which shall continue for such period only as the Committee may decide.

2) The amount of the annual pension in any of the above cases is 1% of the average annual pay for 10 years, multiplied by the number of years in the employee's term of employment. The minimum pension will be $30 a month, but this is not to apply to disability pensions granted to employees of less than 20 years' service or to pensions granted to "part time" employees.

Example: An employee whose term of employment at time of retirement has been thirty years and whose average pay for ten years has been $1,500 a year, will receive an annual pension equal to 30% of $1,500, or $450, payable in monthly amounts of $37.50.

3) Service pensions are subject to the provisions with respect to deductions as set forth in Section 8, Paragraphs 27 and 28.

2. *Accident Disability Benefits.*

Total Disability—Full pay 13 weeks, half pay for remainder of disability. Maximum benefits to be $20 a week after six years of benefit payments.

Partial Disability—For first 13 weeks, 100% of loss in earning capacity; for remainder of disability, 50% of loss in earning capacity. Period of payments not to exceed six years in all.

Beginning January 1, 1940, the thirteen-week periods specified above shall, for accident disability cases originating on and after that date, be increased to conform to the schedule for full-pay periods set forth in the Sickness Disability Benefit schedule below, if the term of employment is 15 years or more.

3. *Sickness Disability Benefits.*

These benefits commence on the eighth calendar day of absence on account of sickness and, beginning January 1, 1940, the sickness disability benefits in sickness disability cases originating on and after that date shall be as follows:

a) If term of employment has been 2 to 5 years—full pay 4 weeks; half pay 9 weeks.
b) If term of employment has been 5 to 10 years—full pay 13 weeks; half pay 13 weeks.
c) If term of employment has been 10 to 15 years—full pay 13 weeks; half pay 39 weeks.
d) If term of employment has been 15 to 20 years—full pay 26 weeks; half pay 26 weeks.
e) If term of employment has been 20 to 25 years—full pay 39 weeks; half pay 13 weeks.
f) If term of employment has been 25 years or more—full pay 52 weeks.

Note: Benefits are not provided in the Plan for sickness of employees of less than two years' service. In such cases such practice as the Company may establish from time to time will be followed.

4. *Death Benefits.*

If the employee leaves a wife who was living with him at the time of his death, a husband who was physically or mentally incapable of self-support and who was actually supported by the employee at the time of her death, or a child under the age of 18 years (or over that age if physically or mentally incapable of self-support) who was actually supported by the employee at the time of death, the amount to be awarded is the maximum specified in the schedules.

In all other cases the amounts to be awarded (within the limits indicated by the schedules) and the persons to whom the payments shall be made are subject to the discretion of the Benefit Committee.

Beneficiaries are limited to a wife (or husband), dependent children and other dependent relatives of the deceased.

The Death Benefit schedules are:

a) Accident Death Benefits.

Regardless of the employee's term of employment an Accident Death Benefit not to exceed the amount specified below may be paid in case of death by accident arising out of and in the course of employment:

Three years' pay, not to exceed $5,000; provided, however, that if a greater amount could have been paid under the Sickness Death Benefit schedule below had the employee died from sickness rather than from accident, the maximum of $5,000 is increased to the amount of the Sickness Death Benefit.

In addition to the Accident Death Benefit the necessary expenses of burial, not to exceed $250, will be paid.

b) Sickness Death Benefits.

If the deceased employee had a term of employment of two years or more, a Sickness Death Benefit not to exceed the maximum shown below may be paid:

Employee's Term of Employment	Maximum Sickness Death Benefit
2 but less than 3 years	4 months' wages
3 " " " 4 "	5 " "
4 " " " 5 "	6 " "
5 " " " 6 "	7 " "
6 " " " 7 "	8 " "
7 " " " 8 "	9 " "
8 " " " 9 "	10 " "
9 " " " 10 "	11 " "
10 years or more	12 " "

The minimum Sickness Death Benefit shall be $250.

Payments in Case of Death of Pensioners.

In the discretion of the Committee payments may be made to the wife (or husband), dependent children or other dependent relatives of the deceased. The maximum amount of such payments shall not exceed the amount which could have been paid under the Sickness Death Benefit schedule if the pensioner had died on his last day of active service.

Manner of Payment.

The payments described above will be made in monthly amounts, unless otherwise specified by the Committee, and will cease upon the death of the beneficiary.

Applications for Benefits

Applications for benefits shall follow the approved instructions of the Company. In default of such instructions applicants should promptly communicate with the Secretary of the Employees' Benefit Committee, to whom should also be addressed other communications with reference to the Plan.

Retirement Age

By action of the Directors of the Company a rule has been adopted which requires that every officer or other employee becoming 65 years of age shall retire at the end of the month in which that age is reached. Provision is made, however, that by specific action of the Directors the operation of this rule may be delayed from year to year with respect to any employee who is performing such services for the Company that continuation in active employment is deemed for the best interests of the service. Pensions will be voted to those persons retired by the operation of this rule who are eligible to pensions under the Plan at the date of retirement.

Employees' Record of Service

Each employee on entering the service of the Company will be given a copy of this pamphlet and, at that time or at such later time as is the practice of the Company, will be required to furnish for the files of the Committee, on a form supplied for that purpose, information regarding his previous service.

Leave of Absence, Lay-off and Transfers

Attention is called to the provisions in regard to absences from the service contained in Paragraphs 4, 5 and 6 of Section 8 of the Plan. In order that all employees may be treated fairly, the Company has established routines which must be observed if the continuity of the employee's service is to be preserved in case of transfer from one Company to another and in case of any absence from the service without pay. *Failure on the part of the employee to inform himself of these routines and to observe them may result in loss of credit for previous service.* Employees may obtain information regarding the routines from their immediate supervisors or from the Secretary of the Employees' Benefit Committee.

PLAN FOR EMPLOYEES' PENSIONS, DISABILITY BENEFITS AND DEATH BENEFITS

(Effective January 1, 1913, with Amendments to and Including April 1, 1941)

Section 1. Undertaking.

The American Telephone and Telegraph Company undertakes in accordance with these Regulations, to provide for the payment of

definite amounts to its employees when they are disabled by accident or sickness or when they are retired from service, or, in the event of death, to their dependent relatives.

Section 2. Definitions.

1) In these Regulations the word "Plan" shall mean the Plan for Employees' Pensions, Disability Benefits and Death Benefits, as set forth in these Regulations.

2) The word "Company" shall mean the American Telephone and Telegraph Company, a New York corporation, or its successors.

3) The words "President" and "Board of Directors" or "Board" shall mean the President and Board of Directors, respectively, of the Company.

4) The word "Committee" shall mean the persons appointed by the Board to administer the Plan.

5) The word "Employees" shall mean those persons who receive a regular and stated compensation from the Company other than a pension or retainer.

6) The expression "term of employment" shall mean period of continuous employment in the service of the Company, or of the Company and one or more Associated or Allied Companies with which agreements have been or shall be made for interchange of benefit obligations as provided in Section 9 of these Regulations, or in the service of any Bell Company predecessor of any of the above Companies. Service in companies subsidiary to, allied with or predecessors of an Associated or Allied Company will be considered, in determining "term of employment," as service in the Associated or Allied Company, in all cases authorized by appropriate action on the part of the Associated or Allied Company and approved by the Committee of the American Telephone and Telegraph Company.

Section 3. Committee.

1) There shall be a Committee of five (5) appointed by the Board to serve during its pleasure, which Committee shall be called the Employees' Benefit Committee. This Committee shall be charged with the administration of the Plan.

2) The Committee shall have the specific powers elsewhere herein granted to it and shall have such other powers as may be necessary in order to enable it to administer the Plan.

3) It shall determine conclusively for all parties all questions arising in the administration of the Plan.

4) It shall be empowered to authorize disbursements according to these Regulations.

5) It shall adopt such By-Laws and rules of procedure as it may find necessary, subject to the approval of the President.

6) It shall be empowered to employ a Secretary and such other assistants as may be required in the administration of the Plan.

7) The expenses of the Committee in administering the Plan shall be borne by the Company.

Section 4. Pensions.

1) On and after January 1, 1913:

a) All male employees who have reached the age of sixty years and whose term of employment has been twenty or more years and all female employees who have reached the age of fifty-five years and whose term of employment has been twenty or more years may, at their own request, or at the discretion of the Committee, be retired from active service and become eligible to pensions, which pensions are designated "service pensions."

b) Any employee whose term of employment has been thirty years or more, or any male employee who has reached the age of fifty-five and whose term of employment has been twenty-five or more years, or any female employee who has reached the age of fifty years and whose term of employment has been twenty-five or more years may, at the discretion of the Committee and with the approval of the President or of a Vice President designated by the President, be retired from active service and granted a pension, which pension is also designated a "service pension."

c) At the discretion of the Committee and with the approval of the President or of a Vice President designated by the President, any employee who has become totally disabled as a result of sickness or of injury, other than by accidental injury arising out of and in the course of employment by the Company, and whose term of employment has been fifteen years or more, may be retired from active service and granted a pension, which pension is designated a "disability pension." If a disability pension is granted it shall be for such period as the Committee may determine, and if at any time during such period the employee recovers sufficiently to resume active service, the pension may be discontinued by action of the Committee. If the employee reenters the service of the Company at the time such pension is discontinued he shall thereupon be eligible to benefits under these Regulations, and the

period of absence on pension shall be considered as a leave of absence and not as a break in the continuity of the employee's service.

2) The annual pension allowance for each employee retired with a pension on account of age, length of service or disability shall be as follows:

For each year of his term of employment, one per centum (1%) of the average annual pay during the ten years next preceding retirement, provided, however, that the Committee may, at its discretion, base such pension upon the average annual pay of the ten consecutive years of service during which the retired employee was paid the highest rate of wages. The minimum pension shall be Thirty Dollars ($30) per month, provided, however, that at the discretion of the Committee the pension allowance may be less than Thirty Dollars ($30) per month, but not less than the allowance computed as aforesaid, in the case of pensions granted under Paragraph 1 (c) of this Section to employees of less than twenty years' service, and in cases in which, in the opinion of the Committee, the days or hours constituting the employee's normal service have not been adequate to constitute full time service, during the number of years required to establish eligibility to pension in the class under which the employee is retired.

3) Pensions shall be payable monthly or at such shorter periods as the Committee may determine in each case.

4) Service pensions granted to employees shall continue from date of retirement to death of pensioner, but disability pensions shall continue for such period only as the Committee may determine in each case from time to time. Further payments, if any, which may be made to the wife or dependent relatives of a deceased pensioner are as provided and limited by Section 7 of these Regulations.

5) Regular employment under a salary with this Company or with any company with which arrangements for interchange of benefit obligations, as described in Section 9 of these Regulations, have been made directly or indirectly, shall suspend the right of a retired employee to pension payments during the period he continues in such employment.

6) If an officer of this Company is retired on a service pension and thereafter becomes regularly employed for compensation (except as provided in Paragraph 5 of this Section) the service pension of such retired officer shall be reduced during the term of such employment, or over a period equal to the term of such employment, by

the amount of compensation received therefor, unless the Committee with the approval of the Board of Directors shall otherwise determine.

7) The Committee shall furnish quarterly to the President a list of all employees qualified to receive pensions.

8) The Committee shall notify all employees of their eligibility to retire on service pensions at their own request, as they become eligible.

9) In order to meet its obligations to pay service pensions (defined in Paragraphs 1 (a) and 1 (b) of this Section) granted to take effect under the Plan, the Company, effective January 1, 1927, established a trust fund to be known as the "Pension Fund." It undertakes to maintain this Fund by periodic charges to operating expenses and payments to the Fund in such amounts that when employees are retired or become eligible to retire at their own request under the Plan there will be available in the Pension Fund an amount sufficient to provide for them pensions in the amounts stated in the Plan. It has also made adequate provision in the Pension Fund for the payment of all service pensions granted under the Plan to take effect prior to January 1, 1927. The Pension Fund shall be held by a trustee or trustees for service pension purposes only and shall be disbursed as directed by the Company from time to time. In case of termination of the Plan, or in case of revocation or other termination of any trust agreement for service pension purposes executed under the Plan, the Company undertakes to preserve the integrity of the Pension Fund as a trust fund to be applied solely to service pension purposes and to take such action as may be necessary or appropriate to insure the application of the entire fund to such purposes. All service pensions granted to take effect under the Plan shall be paid from the Pension Fund either directly or through the purchase of annuities from an insurance company as the Company may determine.

10) In the event of termination of the Plan, the balance in the Pension Fund shall be applied as follows:

First: To making adequate provision for the payment of the full amounts of the service pensions previously granted to retired employees who are on the pension roll as of the termination date, and for the payment of the full amounts of the service pensions to which employees eligible, as of the termination date, for retirement at their own request have then become entitled, such pensions to start upon the employee's retirement from active service.

Second: To making provision, to the extent permitted by the balance, if any, remaining in the Fund after the foregoing provision shall have been made, for the payment of deferred pensions starting at age sixty-five and continuing until the death of pensioner, computed as hereinafter specified, to all employees who have become eligible, as of the termination date, for retirement on service pension at the discretion of the Committee and with the approval of the President or of a Vice President designated by the President, but not at their own request. If the remaining balance in the Fund shall be insufficient, in the judgment of the Company, to provide the full amount of the computed deferred pensions to employees in this group, the amount of the pension to each employee in the group shall be reduced pro rata.

Third: To making provision, to the extent permitted by the balance, if any, remaining in the Fund after the foregoing provision shall have been made, for the payment of deferred pensions starting at age sixty-five and continuing until the death of pensioner, computed as hereinafter specified, to all employees who have not yet become eligible as of the termination date for retirement on service pension at their own request or at the discretion of the Committee and with the approval of the President or of a Vice President designated by the President, but who have completed a term of employment of ten or more years on that date and would, if continued in active service until the end of the month during which they would attain age sixty-five, complete a term of employment of twenty years on or before the end of that month. If the remaining balance in the Fund shall be insufficient, in the judgment of the Company, to provide the full amount of the computed deferred pensions to employees in this group, the amount of the pension to each employee in the group shall be reduced pro rata.

Fourth: In the event that there is any remaining balance in the Pension Fund after making provision deemed adequate for the full amount of the pensions hereinbefore specified as payable in case of termination of the Plan, such balance shall be applied solely for service pension purposes in an equitable manner consistent with the purposes of the Plan.

The deferred pensions, specified in this Paragraph 10 as payable to employees who have not yet become eligible as of the termination date for retirement on service pension at their own request, shall be

computed, without allowance for any payment upon the death of the employee, in accordance with the provisions of Paragraph 2 of Section 4, subject to the provisions of Paragraphs 27 and 28 of Section 8, except that the term of employment used in the computation shall end as of the date of termination of the Plan, the average annual pay used in the computation shall in every case be the average annual pay for the ten-year period ending on the date of termination of the Plan, and the provisions relating to minimum pensions shall not apply. The payment of such deferred pension shall not be contingent upon the employee's continuing in the service of the Company after the termination of the Plan. In all cases such deferred pensions shall be computed on the basis of the employee's age and term of employment as shown by the Company's records as of the termination date. The Company reserves the right to make provision out of the Pension Fund for any or all pensions specified in this paragraph through the purchase of annuities from an insurance company or in such other manner as the Company may determine. In the case of all pensions for which provision is made through the purchase of annuities from an insurance company, the delivery of an annuity contract to each employee to whom such pensions are payable shall serve to absolve the Company and the Pension Fund from any further obligation for the payment of such pensions. In the case of all pensions for which provision is not made through the purchase of annuities from an insurance company, the Company's judgment as to the adequacy of the alternative provision made shall be final. If such alternative provision made, as of the termination date, for deferred pensions to employees not then retired or eligible for retirement at their own request should thereafter at any time appear, in the judgment of the Company, to be inadequate or more than sufficient to continue the payment of the amounts previously estimated to be payable, the remaining payments on all such pensions shall be adjusted pro rata in accordance with the remaining provision available. In lieu of the deferred pensions starting at age sixty-five as provided for in this paragraph, the Company reserves the right to offer to all or specified groups of employees the option of a reduced pension starting at an earlier age, or such other form of payment as may be consistent with the employee equities involved. The Company's judgment as to the amounts and methods of such alternative payments and the groups to which such options are to be offered shall be final. If any pension payable under the provisions of this paragraph amounts to less than Ten Dollars ($10) per month, the

Company reserves the right to pay to the employee upon the date the pension becomes payable the commuted value of such pension in a single lump sum.

11) All Disability Pensions (defined in Paragraph 1 (c) of this Section) and all payments to dependent relatives of deceased pensioners (defined in Paragraph 4 of this Section) shall be a charge to the operating expense accounts of the Company when and as paid.

Section 5. Accident Disability Benefits.

1) All employees of the Company on January 1, 1913, and thereafter shall be qualified to receive payments under these Regulations on account of physical disability to work by reason of accidental injury (not including the accidental injuries specified in Paragraph 13 of Section 8 of these Regulations) arising out of and in the course of employment by the Company. Such payments are hereinafter referred to as Accident Disability Benefits.

2) Accident Disability Benefits shall be as follows:

a) Total Disability—Full pay for any period of total disability during the first thirteen weeks of disability, and half pay for any period of total disability after the first thirteen weeks of disability, provided, however, that after the expiration of six years of disability payments, the benefits shall not exceed Twenty Dollars ($20) per week.

b) Partial Disability—For any period of partial disability during the first thirteen weeks of disability, 100% of the difference between full pay at time of injury and wages which, in the judgment of the Committee, the employee is capable of earning; for any period of partial disability after the first thirteen weeks of disability, 50% of difference between full pay at time of injury and wages which, in the judgment of the Committee, employee is capable of earning, provided, however, that no payments for partial disability shall be made after the expiration of six years of disability payments.

c) Beginning January 1, 1940, the thirteen-week periods specified above in sub-paragraphs (a) and (b) shall, for accident disability cases originating on and after said date, be increased to conform to the schedule for full-pay periods set forth in Paragraph 2 of Section 6, if the term of employment is 15 years or more.

"Full pay" and "half pay" for the purposes of this paragraph shall be based on the number of hours per week commonly regarded

as constituting full time service, not including overtime, and shall be computed at the employee's rate of pay at the time the disability began.

3) If after a period of total disability the disability becomes partial or after a period of partial disability the disability becomes total, the amount of the benefits shall be changed accordingly.

4) In ascertaining the period during which Accident Disability Benefits shall be paid, the period of disability shall be taken as commencing upon the first day on which, because of disability, a full day's wages is not paid. Successive periods of disability from accident shall be counted together if from the same accident and separately if from different accidents.

5) Accidental injuries shall be considered as arising out of and in the course of employment only where the injury has resulted solely from accident during and in direct connection with the performance of duties to which the employee is assigned in the service of the Company, or which he is directed to perform by proper authority, or in voluntarily protecting the Company's property or interests, and there must be a clear and well-established history of the cause and circumstances of injury accidentally inflicted, and they must be sufficient to produce the alleged injury, and there must be satisfactory evidence that such injury renders the employee unable to perform his duty in the service of the Company.

6) In case of accidental injury to any employee arising out of and in the course of employment by the Company, resulting in permanent loss of a bodily member or loss of its use, special benefits, in lieu of all other benefits on account of such injury, may be awarded by the Committee, provided, however, that such special benefits shall not exceed the payment hereinafter authorized to be paid in case of death from accidental injury, except by specific authority from the Board.

7) In case of accidental injury to any employee arising out of and in the course of employment by the Company, the necessary expenses for "first aid" shall, on approval of the Committee, be paid by the Company. In addition the Company will pay for necessary surgical treatment, but no employee shall have authority to contract any bills against the Company or the Committee and nothing herein shall be held to mean or imply that the Company will be responsible for such bills as an employee may contract or his surgeon may charge. Bills for surgical treatment must be itemized before they will be considered by the Committee. The decision as to whether in any case

surgical treatment was necessary and as to what constitutes surgical treatment shall rest with the Committee. At its discretion the Committee may authorize payment of other expenses necessary for the proper care and treatment of the employee, during such period as the Committee may determine.

8) All Accident Disability Benefits and related expenses shall be a charge to the operating expense accounts of the Company when and as paid.

Section 6. Sickness Disability Benefits.

1) All employees of the Company on January 1, 1913, or thereafter shall, after a term of employment of two years, be qualified to receive payments under these Regulations on account of physical disability to work by reason of sickness. Such payments are hereinafter referred to as Sickness Disability Benefits. Such payments shall terminate when disability ceases and shall in no case extend beyond the periods hereinafter mentioned. For the purposes of these Regulations, sickness shall include injury other than accidental injury arising out of and in the course of employment by the Company.

2) Beginning January 1, 1940, the sickness disability benefits in sickness disability cases originating on and after said date shall be as follows:

a) If term of employment has been 2 to 5 years—full pay 4 weeks; half pay 9 weeks.
b) If term of employment has been 5 to 10 years—full pay 13 weeks; half pay 13 weeks.
c) If term of employment has been 10 to 15 years—full pay 13 weeks; half pay 39 weeks.
d) If term of employment has been 15 to 20 years—full pay 26 weeks; half pay 26 weeks.
e) If term of employment has been 20 to 25 years—full pay 39 weeks; half pay 13 weeks.
f) If term of employment has been 25 years or more—full pay 52 weeks.

"Full pay" and "half pay" for the purposes of this paragraph shall be based on the number of hours per week constituting the employee's normal service under his contract of hiring, not including overtime, and shall be computed at the employee's rate of pay at the time the disability began, provided, however, that the benefits shall at no time exceed the pay which the employee would receive, based on his rate

of pay and the general schedule of hours per week constituting a full week's service at the time the disability began.

3) Sickness disability benefits shall begin on the eighth calendar day of absence on account of disability, provided, however, that if an employee has received sickness disability benefits for any period and is again absent on account of sickness within two weeks after the termination of such period, any benefits on account of such further sickness shall begin on the first day of absence instead of on the eighth day.

4) Successive periods of sickness disability shall be counted together as one period in computing the period during which the employee shall be entitled to benefits, except that any sickness occurring after an employee has been continuously engaged in the performance of duty for thirteen weeks shall be considered as a new sickness and not as part of any disability which preceded such period of thirteen weeks.

5) Employees shall not be entitled to receive sickness disability benefits for time for which any wages are paid them by the Company.

6) All Sickness Disability Benefits shall be a charge to the operating expense accounts of the Company when and as paid.

Section 7. Death Benefits.

1) In the event of the death of any employee, occurring on or after January 1, 1930 and resulting from accidental injury, on or after January 1, 1913, arising out of and in the course of employment by the Company, hereinafter referred to as death by accident, there may be paid (and, in the circumstances described in sub-paragraph 4 (a) of this Section, there shall be paid) an Accident Death Benefit, the maximum amount of which shall be three years' wages, as defined in Paragraph 8 of this Section, but which shall not exceed Five Thousand Dollars ($5,000); provided, however, that if the maximum Sickness Death Benefit which could have been paid under the provisions of the next succeeding paragraphs had said employee died from sickness rather than from accidental injury, is in excess of said limit of Five Thousand Dollars ($5,000), said limit shall be increased to the amount of said maximum Sickness Death Benefit. Payment of the Accident Death Benefit, subject to the conditions imposed in Paragraph 5 of this Section and Paragraphs 27 and 28 of Section 8 and elsewhere in these Regulations, shall be made to the employee's beneficiaries as provided in Paragraph 4 of this Section. In addition to the Death Benefit the necessary expenses of the

burial of the deceased employee, not exceeding Two Hundred and Fifty Dollars ($250), shall be paid.

2) In the event of the death of any employee, occurring on or after January 1, 1930 and resulting from sickness as defined in Paragraph 1 of Section 6 of these Regulations, hereinafter referred to as death by sickness, if the employee's term of employment has been two years or more there may be paid (and, in the circumstances described in sub-paragraph 4 (a) of this Section, there shall be paid) a Sickness Death Benefit which shall not be in excess of the amount specified in the following schedule:

Employee's Term of Employment	Maximum Sickness Death Benefit
2 but less than 3 years	4 months' wages
3 " " " 4 "	5 " "
4 " " " 5 "	6 " "
5 " " " 6 "	7 " "
6 " " " 7 "	8 " "
7 " " " 8 "	9 " "
8 " " " 9 "	10 " "
9 " " " 10 "	11 " "
10 years or more	12 " "

The minimum Sickness Death Benefit shall be $250.

Payment of the Sickness Death Benefit, subject to the conditions imposed in Paragraph 5 of this Section and elsewhere in these Regulations, shall be made to the employee's beneficiaries, as provided in Paragraph 4 of this Section.

3) In the event of the death on or after January 1, 1930 of any person who at the time of death is receiving a pension under these Regulations, the Committee in its discretion may authorize further payments to the wife (or husband) or dependent relatives of the pensioner the total amount of which shall not exceed the maximum amount which could have been paid as a Sickness Death Benefit under the terms of Paragraph 2 of this Section if the pensioner had died on his last day of active service.

4) The persons who may be beneficiaries of the Accident or Sickness Death Benefit or of payments on the death of a pensioner hereunder are limited to the wife (or husband) and the dependent children and other dependent relatives of the deceased. The amount to be paid in each case and the beneficiary or beneficiaries who shall receive the same, and the share which each shall receive, shall be determined by the Committee, subject to the following provisions and to the provisions of Paragraph 5 of this Section.

a) In the event of death by accident the maximum Accident Death Benefit specified in Paragraph 1 of this Section, or in the event of death by sickness, the maximum Sickness Death Benefit specified in Paragraph 2 of this Section, shall be paid, subject to the provisions of sub-paragraph (c) of this Paragraph 4, to the wife of the deceased employee if living with him at the time of his death; to the husband of the deceased employee, if physically or mentally incapable of self-support and actually supported in whole or in part by the deceased employee at the time of her death; or to the child or children of the deceased employee under the age of eighteen years (or over that age if physically or mentally incapable of self-support) who were actually supported in whole or in part by the deceased employee at the time of death. If the employee leaves both wife (or husband) and a child or children, as here described, the Committee, in its discretion, may pay the Death Benefit to or for any one or more of such possible beneficiaries in such portions as it may determine.

b) If there be no beneficiary of the deceased employee as described above in sub-paragraph (a), then, in the event of death by accident, an Accident Death Benefit in an amount not to exceed the amount specified in Paragraph 1 of this Section, or in the event of death by sickness, a Sickness Death Benefit in an amount not to exceed the amount specified in Paragraph 2 of this Section, may be paid to any other person or persons who may be beneficiaries, as defined in the first sentence of this Paragraph 4, and be receiving or entitled to receive support from the deceased employee at the time of his death.

Subject to the limitations expressed in this sub-paragraph (b) the Committee shall have full authority to determine to whom payments shall be made and the amount of the payments, taking into consideration the degree of dependency and such other facts as it may deem pertinent.

c) If the employee shall have made written request and shown good cause therefor the Committee may pay all or a portion of the Death Benefit to a person or persons included in sub-paragraph (b) above, and reduce, by the amount thus paid, the amount which is payable to the persons included in sub-paragraph (a), provided in the opinion of the Committee good cause for such action still exists at the time of the employee's death.

d) Upon the death of an employee or pensioner, if there be no beneficiary qualified to receive an award under the provisions of this

Section, or if the amount of such award authorized by the Committee be less than the maximum specified in Paragraphs 1, 2 or 3 of this Section, as the case may be, the Committee may authorize such payments as may be required to defray the necessary expenses incident to the death of the employee or pensioner and the disability immediately preceding, together with, in the case of death by sickness, the necessary expenses, not exceeding Two Hundred and Fifty Dollars ($250), of his burial, provided, however, that the aggregate amount so paid shall not exceed the maximum benefits specified in said paragraphs.

5) Unless otherwise specified by the Committee the Death Benefit at the death of an employee or the amount awarded at the death of a pensioner shall be paid in monthly sums equal to the monthly wages or monthly pension paid at the time of his death. In the discretion of the Committee, however, such sums and times of payments may be varied.

In the event of the death of a beneficiary who is receiving or is entitled to receive installment payments under this Section, such payments shall cease. In the discretion of the Committee, however, and within the amounts which the deceased beneficiary would have received if he had survived, the Committee may authorize payments in connection with the disability, death and burial of the deceased beneficiary under conditions similar to those described in subparagraph (d) of Paragraph 4 of this Section, or may authorize payments to some other person eligible as a beneficiary of the deceased employee or pensioner under the provisions of Paragraph 4.

Upon the death of an employee or pensioner, the Committee, without awaiting determination of the beneficiary or beneficiaries, if any, to whom the award will be made, may pay an amount equivalent to the wages, disability benefits or pension which the deceased was receiving, to the end of the payroll period in which the death occurs, and such payment may be made to the wife of the deceased, or to some other suitable person selected by the Committee. Such payment, if made, shall constitute a part of the award. In addition the Committee, in its discretion, may authorize payment, before the final settlement, of a part of the award not exceeding Two Hundred and Fifty Dollars ($250), to meet urgent expenses incident to the death and the immediately preceding disability of the deceased. If any of the persons to whom an award may be payable cannot be found or cannot be conveniently communicated with or are incompetent to authorize use of any part thereof for the burial of the deceased and

the payment of necessary expenses incident to his death and preceding disability, the Committee in its discretion may make such payments, as a part of the award, as in its judgment may be reasonable for the proper burial of the deceased and the payment of necessary expenses incident to his death and disability immediately preceding.

6) A Death Benefit shall not be payable in the case of any person who dies after he has ceased to be an employee of the Company, unless such person became disabled by reason of accident or sickness while an employee and continued disabled, until death, to such a degree as to be unable to engage in any gainful occupation. In such cases a Death Benefit may be paid, in the discretion of the Committee, provided it has been furnished from time to time with such proof of continued disability as it may have required and provided it has been permitted to make, or have made by a physician, such examinations of the disabled person as it has deemed necessary in order to ascertain his condition. The amount of the Death Benefit, if any, shall not exceed the amount which could have been paid if the disabled person had died on the day he ceased to be an employee of the Company.

7) All claims for Death Benefits, to be valid, must be made in writing within one year of the death on which the claim is based. In case notice in writing of the existence of a wife (or husband), child or other dependent relative of a deceased employee shall not be served on the Committee within one year after such employee's death, it shall be conclusive, in so far as these Regulations are concerned, that there are no such persons in existence.

8) "Wages" for the purposes of this Section shall mean wages for full time service (not including overtime), computed at the employee's rate of pay at the date of death, provided, however, that if the employee normally serves the Company on less than a full time basis, benefits in case of death by sickness shall be computed on the basis of the time constituting the employee's normal service under his contract of hiring.

9) All amounts payable under this Section shall be a charge to the operating expense accounts of the Company when and as paid.

Section 8. *General Provisions.*

1) Neither the action of the Board of Directors in establishing this plan for employees' pensions, disability benefits and death benefits, nor any action hereafter taken by the Board or the Committee shall be construed as giving to any officer, agent or employee a right

to be retained in the service of the Company or any right or claim to any pension or other benefit or allowance after discharge from the service of the Company, unless the right to such pension or benefit has accrued prior to such discharge. Except in the event of termination of the Plan, no employee shall have any right to a service pension by reason of service less than that specified in Paragraphs 1 (a) and 1 (b) of Section 4 of these Regulations, nor any right in the Pension Fund unless a service pension authorized by the Committee under the Plan has not been paid, nor any right against the Company to any benefit under the Plan other than the amount to which the employee has theretofore become entitled and which the Committee has directed be paid to that employee under the Plan. In the event of termination of the Plan, no employee shall have any right in the Pension Fund or against the Company except as herein provided.

2) Assignment of pensions or other benefits under these Regulations will not be permitted or recognized.

3) In all questions relating to the term of employment and rates of pay of employees, the decision of the Committee, based upon these Regulations and upon the records of the Company, shall be final, provided, however, that as to service prior to June 1, 1914, the Committee shall have discretion to base its decisions upon the general intent of these Regulations and upon such information as may be obtainable from any source. As to service on or after June 1, 1914, this discretion shall not exist and the Committee shall base its decisions strictly upon the facts in the case as shown by the records of the Company.

4) Any absence from the service without pay, other than absence during a period of disability benefits, or leave of absence or temporary lay-off as defined in Paragraphs 5 and 6 of this Section, shall be considered as a break in the continuity of service unless the Board of Directors specifically authorizes the Committee to consider such absence as a leave of absence, and if any person is reemployed after such a break in the continuity of his service, his term of employment shall be reckoned from the date of such reemployment.

5) Leave of absence shall not constitute a break in the continuity of service, but in the case of any such absence prior to June 1, 1914, which was of more than six months' duration, the period of absence shall be deducted in computing term of employment. On and after June 1, 1914, leave of absence, for the purposes of these Regulations, shall mean leave formally granted in conformity with the rules of the Company, as adopted from time to time, and, except in the

case of leave granted by the Board of Directors as provided in Paragraph 4 of this Section and leave on account of continued disability following the expiration of a period of disability benefits, such leave must be obtained at or before the time the absence begins. Leave of absence for any period in excess of one month shall not be effective unless approved in writing by the Committee, and in any case in which such approval is given, the Committee shall indicate whether or not the period of absence is to be deducted in computing term of employment and whether during the absence the employee shall be eligible to benefits under these Regulations. Absence following the expiration of a period of disability benefits shall be considered as a break in the continuity of service unless the employee is granted a leave of absence, provided, however, that in its discretion, the Committee may consider any such absence as a leave of absence, if satisfactory evidence is furnished that the disability was continuous during the entire period of absence.

6) Temporary lay-off on account of reduction of force shall not be considered as a break in the continuity of service, but when the period of absence from such cause exceeds six months in any twelve consecutive months, the entire period of the absence shall be deducted in computing term of employment, and all subsequent periods of lay-off shall be so deducted until the employee shall have been continuously engaged in the performance of duty for a period of twelve consecutive months. On and after June 1, 1914, a period of lay-off shall not be considered as temporary unless the employee is reemployed within such period as the rules of the Company, as adopted from time to time, may require, not in any case exceeding two years. If the employee is not thus reemployed, the continuity of his service shall be deemed to have been broken. No benefits under these Regulations shall be payable during a period of lay-off.

7) Every employee who shall be absent from duty on account of sickness or injury must at once notify his immediate superior, and the employee shall not be entitled to benefits for time previous to such notice, unless delay shall be shown to have been unavoidable and satisfactory evidence of disability is furnished.

8) All claims for disability benefits, to be valid, must be made within sixty days from the date of accident or from the first day of absence on account of sickness.

9) Disabled employees wishing to leave home shall obtain from the Committee written approval of absence for a specified time and

furnish it satisfactory proof of disability while absent, otherwise no benefits shall be paid for such period of absence.

10) It shall be the duty of disabled employees, when their condition and location do not prevent, to call on the Committee or the Committee's representative at such times as the Committee may require.

11) A disabled employee shall not be entitled to benefits if he declines to permit the Committee to make or have made by a physician, from time to time, such examination as the Committee may deem necessary in order to ascertain the employee's condition, or if he fails to give proper information respecting his condition, or if he prevents the necessary examination by absenting himself from home without arranging with the Committee, or giving satisfactory reasons for not doing so and furnishing the necessary evidence, or if he fails to comply with notice to meet the Committee, at its offices or elsewhere, when his condition and location permit of his doing so.

12) Disabled employees must take proper care of themselves and have proper treatment. Benefits will be discontinued to employees who refuse or neglect to follow the recommendations of the Committee.

13) Death or disability resulting from infection of a cut, abrasion, scratch, puncture, or other wound not immediately disabling and not reported at the time of the occurrence causing the injury, or from sunstroke or frostbite, shall not be classed as due to accident, except at the discretion of the Committee.

14) Payments under the Plan shall be made in conformity with the financial methods of the Company and on orders of or bills prepared by the Committee or such other persons as may be designated by the Committee.

15) Disability benefits will ordinarily be paid at the same intervals of time as would govern the payment of wages to the employee if he were in the performance of duty, but at the discretion of the Committee benefits on account of continued disability may be paid monthly and on account of disability for short periods when the amounts are ascertained.

16) In case of any grave injury or chronic sickness, if the employee requests that a lump sum be paid in full settlement of all claims under the Plan and against the Company on account of such injury or sickness, the Committee may, in its discretion, make full and final settlement with the employee by commuting the benefit payments into a single lump sum payment, which payment shall be

the present value computed on a fair basis, of the benefits to which the employee would become entitled during such period as his disability may reasonably be expected to continue.

17) Disability benefits or pensions accrued but unpaid at the death of an employee or pensioner may, in the discretion of the Committee, be paid to the wife of the deceased person or to some other suitable person selected by the Committee, for use in payment of expenses incident to the death of the deceased person or the disability immediately preceding, or for the benefit of any one or more persons who were dependent upon him at the time of his death.

18) Benefits payable to an employee unable to execute a proper receipt may be paid to a relative or other proper person, selected by the Committee, to use for the benefit of the employee and the receipt of such person shall be a sufficient discharge.

19) After an employee has received the maximum Sickness Disability Benefits herein provided for an employee of his term of employment, he shall not be eligible to further benefits on account of sickness until he shall have performed his duties as an employee of the Company for a continuous period of thirteen weeks. If an employee who has received Sickness Disability Benefits shall subsequently become disabled by reason of accidental injury arising out of and in the course of employment by the Company, or if an employee who has received Accident Disability Benefits shall subsequently become disabled by reason of sickness, the period during which benefits are payable on account of such subsequent disability shall not be affected by the preceding period of disability.

20) Benefits shall not be payable for both accident and sickness at the same time to the same person.

21) Granting a pension to an employee or retiring him from employment without a pension during a period of disability benefits shall not terminate or decrease his disability benefits. Granting a pension during a period of disability benefits, however, shall not entitle the employee to any payments on account of the pension, while the disability benefits continue, unless the amount of the pension is greater than the amount of the disability benefits, in which case only such amount shall be paid on account of the pension as may be necessary to make the total amount paid to such employee on account of the disability benefits and the pension equal to the amount he would have received if the pension alone had been paid.

22) "Rate of Pay" as used in these Regulations shall mean the time rate at which the employee is entitled to receive payment for

services under the contract of hiring, provided, however, that if the employee's compensation is ordinarily computed on other than a time basis, the employee's average compensation (not including compensation for overtime) for so much of the preceding three months as he has been in the service of the Company, may be taken as determining the rate of pay, provided the rate thus computed is not less than the employee's time rate.

23) If an employee of this Company is an employee also of one or more other companies which have adopted plans for employees' pensions, disability benefits and deaths benefits, similar to that herein described and which have entered into arrangements with this Company, directly or indirectly, for an interchange of the benefit obligations to which the companies may be subject under such plans, any pension, disability benefits or death benefit to which such employee or his beneficiaries may become entitled under the plans shall be computed on the basis of the total combined pay which the employee is receiving from all such companies and, except in the case of injury or death due to accident arising out of and in the course of employment by any of such companies, shall be pro-rated among the companies on the basis of the pay the employee was receiving from each company, and this Company shall only pay its share thus determined. Any maximum or minimum amounts fixed by these Regulations for pensions, disability benefits or death benefits shall apply to the total amount payable by all companies and not to the portion payable by this Company.

24) In case of accident resulting in injury to or death of an employee which entitles such employee or his beneficiaries to benefits under these Regulations, he or they may elect to accept such benefits or to prosecute such claims at law as he or they may have against the Company. If election is made to accept the benefits, such election shall be in writing and shall release the Company from all claims and demands which the employee or his beneficiaries may have against it, otherwise than under these Regulations, on account of such accident. If any persons other than the beneficiaries under these Regulations might legally assert claims against the Company on account of the death of the employee, no part of the death benefit under these Regulations shall be due or payable until there have also been delivered to the Committee good and sufficient releases of all claims, arising from or growing out of the death of the employee, which such other persons might legally assert against the Company. The Committee, in its discretion, may require that the elections and re-

leases above described shall release any other company, connected with the accident, with which arrangements have been made, directly or indirectly, for interchange of benefit obligations, as described in Section 9 of these Regulations. The right of the employee to accident disability benefits under these Regulations shall lapse if election to accept such benefits, as above provided, is not made within sixty days after injury, or within such greater time as the Committee shall, by resolution duly entered on its records, fix for the making of such election.

25) Should claim other than under these Regulations be presented or suit brought against the Company or against any other company with which arrangements have been made, directly or indirectly, for interchange of benefit obligations, as described in Section 9 of these Regulations, for damages on account of injury or death of an employee, nothing shall be payable under these Regulations on account of such injury or death, except as provided in Paragraph 26 of this Section; provided, however, that the Committee may, in its discretion and upon such terms as it may prescribe, waive this provision if such claims be withdrawn or if such suit be discontinued.

26) In case any judgment is recovered against the Company or any settlement is made of any claim or suit on account of the injury or death of an employee, and the amount which would otherwise have been payable under these Regulations is greater than the amount paid on account of such judgment or settlement, the difference between the two amounts may, in the discretion of the Committee, be distributed to the beneficiaries who would have received benefits under these Regulations, except that no party to any such suit against the Company shall be entitled to any portion thereof.

27) In case any benefit or pension shall be payable under the laws now in force or hereafter enacted of any State or Country to any employee of the Company or his beneficiaries under such laws, the excess only, if any, of the amount prescribed in these Regulations above the amount of such benefit or pension prescribed by law shall be the benefit or pension payable under these Regulations, except as provided in Paragraph 28 of this Section. In those cases where because of differences in the beneficiaries, or differences in the time or methods of payment, or otherwise, whether there is such excess or not is not ascertainable by mere comparison but adjustments are necessary, the Committee in its discretion is authorized to determine whether or not in fact any such excess exists, and in case of such

excess, to make the adjustments necessary to carry out in a fair and equitable manner the spirit of the provision for the payment of such excess.

28) From the time when a person retired on a service pension under this Plan is entitled to a "primary insurance benefit" under the "Social Security Act Amendments of 1939" the amount of his monthly service pension otherwise payable under this Plan shall be reduced by one-half of said "primary insurance benefit" subject to the following conditions:

a) Such adjustment shall begin as soon as such person would become entitled to receive, upon application, said "primary insurance benefit" solely on the basis of employment included in his "term of employment" as defined in this Plan.

b) For the purpose of this adjustment the wages to be taken into consideration by the Committee in the calculation of said "primary insurance benefit" shall be those wages, as defined in Title II of said "Social Security Act Amendments of 1939," shown by the Company's records at the time of such person's retirement.

Except as provided in this Paragraph 28, no non-discretionary benefit or service pension payable under this Plan shall be reduced by reason of benefits payable under Title II of said "Social Security Act Amendments of 1939." Such payments under said Act, however, may be taken into consideration by the Committee in determining discretionary payments under the Plan. This Paragraph 28 shall be effective only while the Act entitled "Social Security Act Amendments of 1939" shall remain in effect unchanged.

29) The Committee shall publish annually to the employees a report of the operations under the Plan.

Section 9. Interchange of Benefit Obligations.

Agreement may be made by this Company with any Associated or Allied Company for an interchange with that Company of the benefit obligations to which such Company may be subject under a plan for employees' pensions, disability benefits and death benefits similar to that herein adopted. The general provisions of such agreement will be:

a) That as long as such agreement remains in force the Plan of such Associated or Allied Company shall be maintained so as to conform to the Plan of this Company.

b) That advance provision for the payment of service pensions shall be made by such Associated or Allied Company in such amounts as may be necesary to provide for and fulfill all requirements of the Plan as in effect from time to time.

c) That an employee's term of employment, as hereinbefore defined, shall include employment not only in this Company, but also in any other Company with which reciprocal agreements under this Plan shall have been made by this Company.

d) That in case of consolidation or merger with another Company having a similar employees' benefit plan, the Pension Funds of the Companies consolidated or merged shall be combined.

Section 10. *Changes in Plan.*

The Committee, with the consent of the President and subject to the approval of the Board of Directors, may from time to time make changes in the Plan set forth in these Regulations, and the Company may terminate said Plan, but such changes or termination shall not affect the rights of any employee, without his consent, to any benefit or pension to which he may have previously become entitled hereunder.

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