Century One ... A Prologue

PAUL A. GORMAN

"Were American Newcomen to do naught else, our work is well done if we succeed in sharing with America a strengthened inspiration to continue the struggle towards a nobler Civilization— through wider knowledge and understanding of the hopes, ambitions, and deeds of leaders in the past who have upheld Civilization's material progress. As we look backward, let us look forward."

—CHARLES PENROSE
(*1886-1958*)
Senior Vice-President for North America
The Newcomen Society
for the study of the history of
Engineering and Technology
(*1923-1957*)
Chairman for North America
(*1958*)

This statement, crystallizing a broad purpose of the Society, was first read at the Newcomen Meeting at New York World's Fair on August 5, 1939, when American Newcomen were guests of The British Government

"Actorum Memores simul affectamus Agenda"

This Newcomen Address, dealing with the history of Western Electric Company, was delivered at a National Dinner Meeting of The Newcomen Society in North America held at New York City when Mr. Paul A. Gorman was the guest of honor and speaker on April 17, 1969.

"We will build as we have built—relying on the resources of Bell Laboratories imagination and our own manufacturing expertise in turning the Laboratories dreams into practical realities. For this innovative . . . this collaborative partnership among designer and manufacturer and telephone operating organizations is the underpinning of the Bell System's past accomplishments and future promise."

—Paul A. Gorman

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PAUL A. GORMAN

MEMBER OF THE NEWCOMEN SOCIETY

PRESIDENT

WESTERN ELECTRIC COMPANY, INC.

NEW YORK

THE NEWCOMEN SOCIETY IN NORTH AMERICA

NEW YORK DOWNINGTOWN PRINCETON PORTLAND

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INTRODUCTION OF MR. GORMAN AT NEW YORK, ON APRIL 17, 1969, BY MR. HAROLD H. HELM, CHAIRMAN OF THE EXECUTIVE COMMITTEE, CHEMICAL BANK, MEMBER OF THE NEW YORK COMMITTEE IN THE NEWCOMEN SOCIETY IN NORTH AMERICA

My fellow members of Newcomen:

THIS is not the first occasion that I have introduced our speaker of the evening.

My motive for doing it has always been the personal pleasure of presenting men whom I have enjoyed and respected as business leaders and as men.

In the lives of all leaders there is *one* special moment that shapes their fortunes and their future. It's an uncanny thing how such men can weigh all the alternatives and sort out the one—the right direction to pursue.

I can think of no better example of this than tonight's speaker. When a Western Electric recruiting team visited the University of Missouri, they offered him a job. But there was still a month of recruiting to be done at the U. of M.; so in his wisdom our speaker suggested that he expected other interviews and other offers. The Western recruiter was equally incisive. He suggested 30 dollars-a-week and 30 days to think it over. The other companies came. The other companies went and our speaker weighed the alternatives. He went with Western Electric . . . since no one else offered him a job.

In the jargon of a present day song, "You've come a long way, baby!"

If any of you good friends and admirers of our speaker would like to get the full details of his many connections, honors, etc., I refer you to "Who's Who" where mention is made of his directorships, including Prudential Insurance Company of America, Bankers Trust Company, Campbell Soup Co., and others. I should also mention that he was made a Doctor of Laws by his own Alma Mater, the University of Missouri in 1965.

My comments are brief because, my fellow members, I know you came to this dinner to pay tribute and hear the chief executive of one of the nation's most unique corporations. His influence and his character has helped to shape his company into an organization that is a model of what is best in American business. Our speaker, the President of Western Electric, PAUL A. GORMAN.

My fellow members of Newcomen:

I WOULD feel privileged to address this gathering on any occasion. But, since this occasion coincides with Western Electric's centennial year, tonight has special meaning for me. For my company—like this organization—prizes the past as a means of serving the future.

In a thousand ways it is easy for me to talk about Western Electric. For, with the exception of a few business years, I have had a career partnership with it. It has been my commitment, my cause, a source of deep personal pleasure . . . and some troubled days and wakeful nights.

But this involvement of mine—on such an occasion as this—sometimes makes it difficult to talk about the company objectively.

However, I hope that this will be a shared experience . . . that I can convey something of my enthusiasm, my sense of excitement as we explore the Western Electric adventure.

There are three thoughts that I should like to thread together this evening . . . thoughts that reflect the character of my company:

—a passing discussion of the technological innovations and manufacturing developments that have made modern communications possible,
—our shared Bell System goal of serving the needs and wishes of America's telephone users,
—and our commitment to help solve some of the pressing social problems of the day.

If you were to ask me, what is this company called Western Electric? My answer would be a simple definition. We are the manufacturing and supply unit of the Bell System. But if you were to ask me, what does this definition entail? The answer would not come so easily. Just consider a few of the things facing us between today and 1980.

—It is estimated that 70 million phones will be added to the existing network. We'll be producing a substantial part of the Bell System's portion of that equipment. In addition we expect to introduce Picturephones® and at least 300,000 will be produced in that period.

—It will be our job to build for the Bell System a substantial part of the switching and transmission systems to carry a threefold increase in long distance calls . . . from 5 billion to 15 billion a year. If present trends hold, we believe that by 1980 the total number of telephone calls will rise from 300 million to 500 million on a typical business day. Add to this the fact that, we think, the data information exchanged in 1980 will equal that of all transmissions of voice communications and it's evident that we face a challenge of major magnitude.

—Or consider it another way. Today's communications network in the U.S. includes switching centers in 8,000 places joined by 700 million miles of communications circuits. Today, when you lift your telephone, there are more than 6 million billion possible interconnections at your finger tips. Yet, the present interstate network represents only a small fraction of the plant-in-service that may be needed in just 11 years from tonight. Another one of our jobs will be to engineer and install more switching centers so the Bell Telephone Operating Companies can service this anticipated growth.

—We will be spending hundreds of millions of dollars in research and development to devise new products and new systems to handle this growth. This involves risks. For whether these estimates mature, or not, we must be prepared to meet the communications needs and wishes of the American people . . . whatever they are, whenever they come.

—As in the past, we shall be serving as the purchasing agent for the Bell System of tomorrow. This means we will be buying goods and services from tens of thousands of suppliers, located in every state in the Union, to meet the needs of the Bell Telephone Companies.

—And one more thing. It will be our assignment to help make certain that everything that is new in 1980's telephone network is compatible with everything that has gone before. This includes compatibility between the most advanced forms of electronic switching and earlier electro-mechanical systems, compatibility between telephone instruments employing the Touch-Tone® principles of sound pulsation and those

employing decades-old rotary dial signalling, compatibility between today's microwave and cable transmission systems and tomorrow's possible use of the laser to send sound, data and video signals across distance.

And we're to do all this by providing products of the highest quality, with phenomenal life expectancies, at the lowest possible cost.

In all candor . . . this is no small assignment. But we will do it. We will build as we have built—relying on the resources of Bell Laboratories imagination and our own manufacturing expertise in turning the Laboratories dreams into practical realities. For this innovative . . . this collaborative partnership among designer and manufacturer and telephone operating organizations is the underpinning of the Bell System's past accomplishments and future promise.

There are countless examples of how this creative partnership has built this amazing communications network that Americans enjoy today, just as there are numerous examples of how the by-products of Bell Laboratories and Western Electric research and development have created whole new industries which employ millions of Americans today.

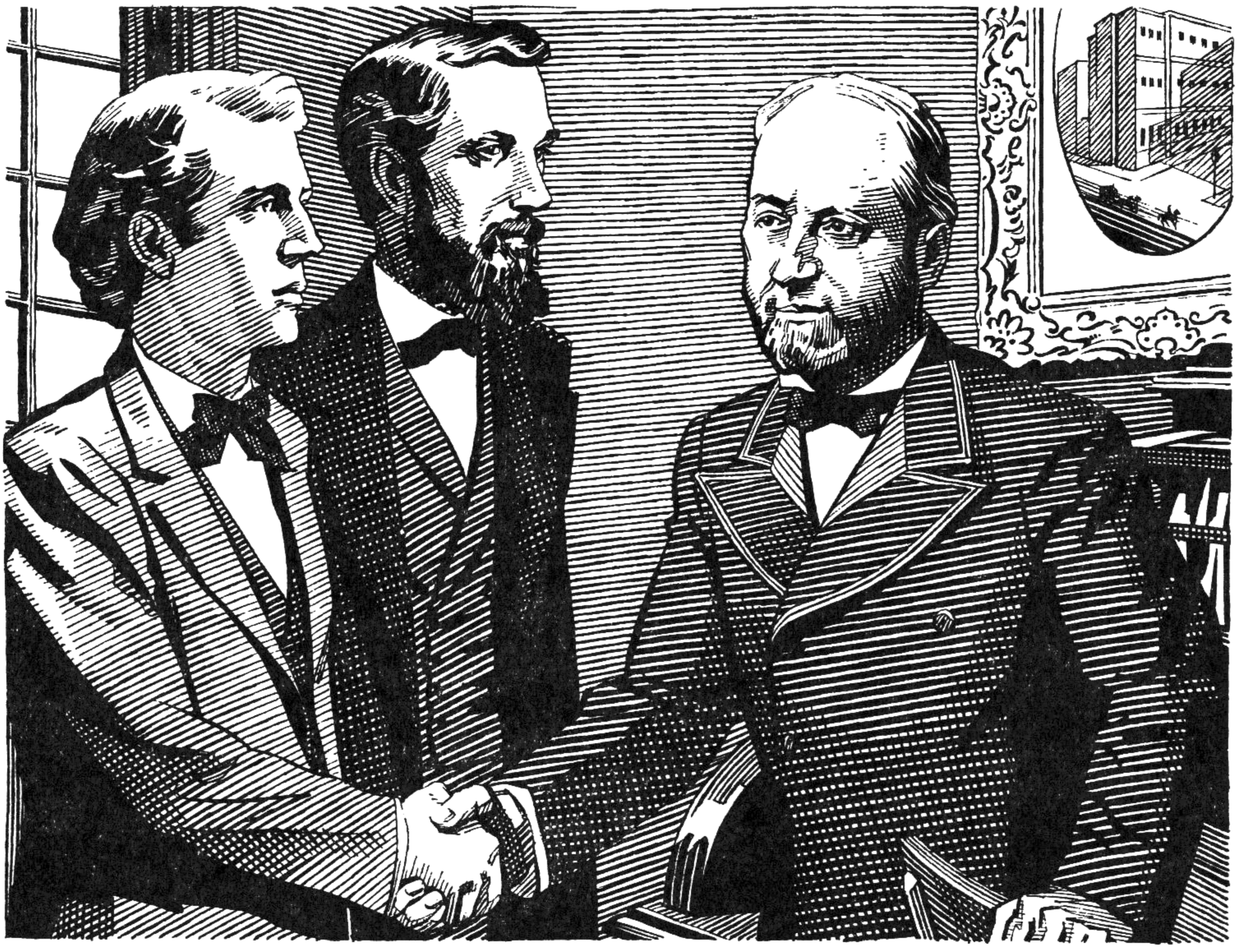
I was musing about this centennial of ours recently. One thought struck me. If no one else had invented the things that have come from Bell Labs and Western Electric, what would this modern world be like? Beside the telephone itself . . . sound movies, the first electronically operated computer, the first television system, the first industrial use of the laser, the transistor, radio astronomy . . . Telstar.

Perhaps a few telephone-oriented examples will illustrate how we have worked, how we have built and why we are confident that we will meet the challenge of tomorrow's communications needs.

In the beginning—in the same year that America completed its first transcontinental railroad, and one day after the Suez canal opened for business, three men created a small electrical firm in Cleveland, Ohio.

On the 18th of November 1869, a partnership was formed among Enos Barton (a former telegraph operator), Elisha Gray (an inventor and one-time physics professor) and Anson Stager (a Western Union executive who had been chief of U.S. Military Telegraphs during the Civil War). They called the firm Gray and Barton. In 1872 Gray and Barton was reorganized and it became Western Electric Manufacturing Company.

I suspect Western Electric's adventure with the telephone began with Philadelphia's Centennial Exposition in 1876. Western was proudly exhibiting its wares . . . a railroad signalling device, police call boxes, the Edison electric pen (forerunner of the mimeograph) and the world's first commercial typewriter (being marketed for its manufacturer, E. Remington and Sons). In the



LEFT, YOUNG ENOS BARTON SHAKES HANDS WITH GENERAL ANSON STAGER WITH ELISHA GRAY BETWEEN. THE SCENE WAS CLEVELAND, OHIO, ON NOVEMBER 18, 1869, WHEN THE TRIO CREATED A SMALL ELECTRICAL FIRM THAT NOW IS WESTERN ELECTRIC COMPANY.

same building, Alexander Graham Bell was demonstrating his invention . . . the telephone.

By 1877 Western began the development and manufacture of the Gray Battery Telephone. In 1878, the company introduced its first standard telephone switchboard. And in November of 1881, American Bell Telephone Company purchased a major interest in Western Electric. Thus began the Bell System vital-partner relationship that continues today.

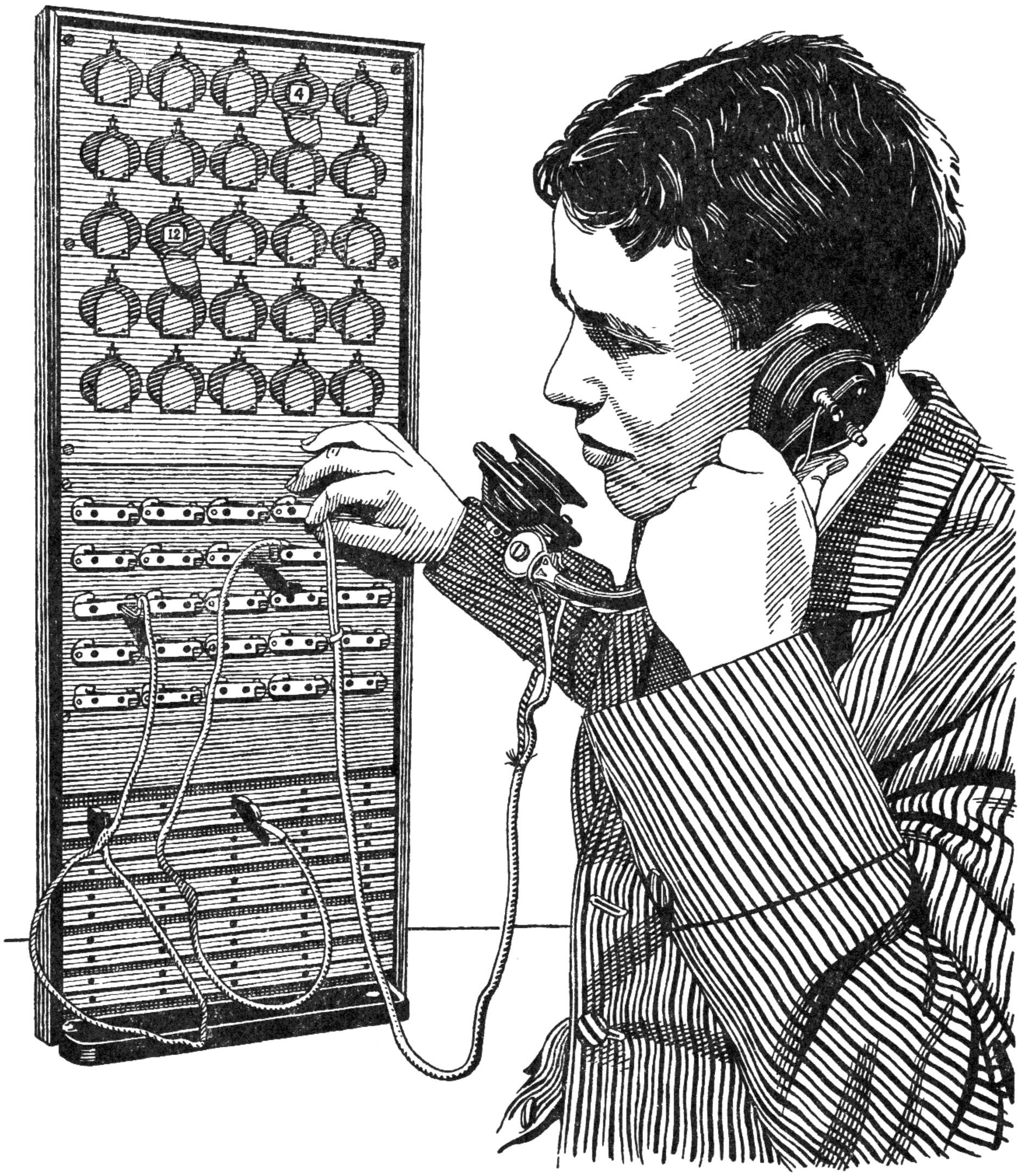
In the earliest days—just as today—the growth, the success of telephony depended mainly on three things: amplifying the telephone signal over distance, switching the signal from one place or person to another and providing the electronic means to haul more and more messages.

In the telephone's infancy, the range of a call was about twenty miles. And the quality of the telephone signal depended upon the lung-power of the user. Telephone pioneers first employed the legacy of the telegraph to extend telephone communications. Morse solved the problem of boosting current along his telegraph lines by introducing relay stations—each with a local power source of a type developed by Volta in 1800 . . . the battery. Telegraph men also triumphed over their system's early inability to send more than one message at a time over a line.

By using Duplex repeaters, based on the Wheatstone bridge, the simultaneous transmission of signals in both directions of the line was possible.

Sources which would boost power along a line, mechanical repeaters, and a system which would permit several messages to travel on the same line—these were part of the legacy the telegraph passed to the telephone. But these achievements, important as they were, were only steppingstones to solutions which were needed to make quality long distance telephony possible. That breakthrough came in 1913.

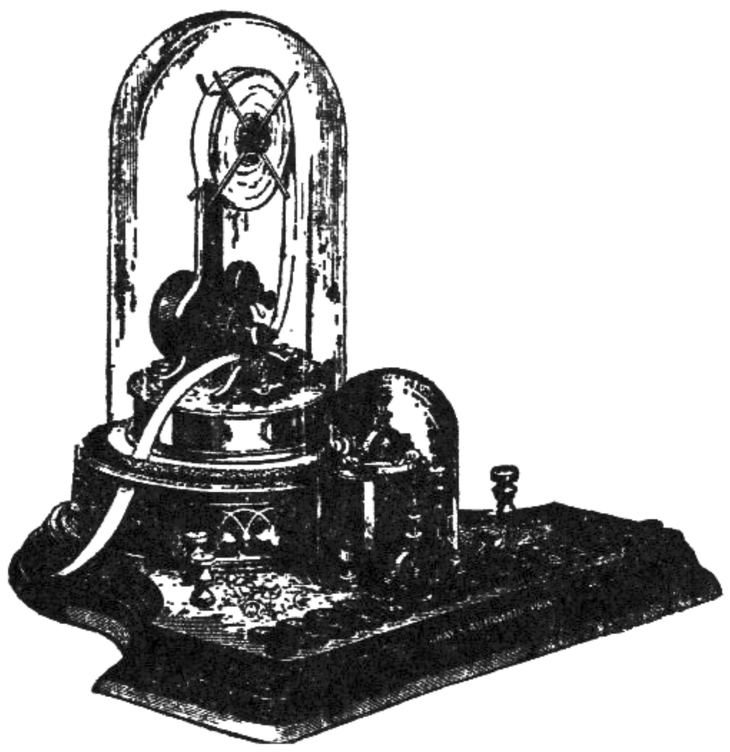
Dr. Harold D. Arnold of the Western Electric Engineering Department—while working on the problems of long distance telephony—witnessed Lee De Forest's demonstration of his Audion as a means of amplifying sound. Arnold realized then that commercially successful telephone amplifiers could be based on



WESTERN ELECTRIC'S CATALOGUE FOR 1880 FEATURED THE "UNIVERSAL SWITCH," PATENTED ONLY ONE YEAR BEFORE. IN 1968 EMPLOYEE BILL TRACY POSES WITH OLD BOARD, PHONE AND JACKET OF THE PERIOD, DUPLICATING A SKETCH IN THE CATALOGUE. THIS WAS THE WORLD'S FIRST SWITCHBOARD SPECIFICALLY DESIGNED AND MANUFACTURED FOR TELEPHONE USE. WESTERN ELECTRIC IS MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM.

the Audion . . . or vacuum tube. Arnold made the first high vacuum electronic tube for amplifying sound in telephone cables. This not only lead to the first transcontinental call two years later, but also to the development of entirely new industries: today's phonograph, sound motion pictures, radio and television.

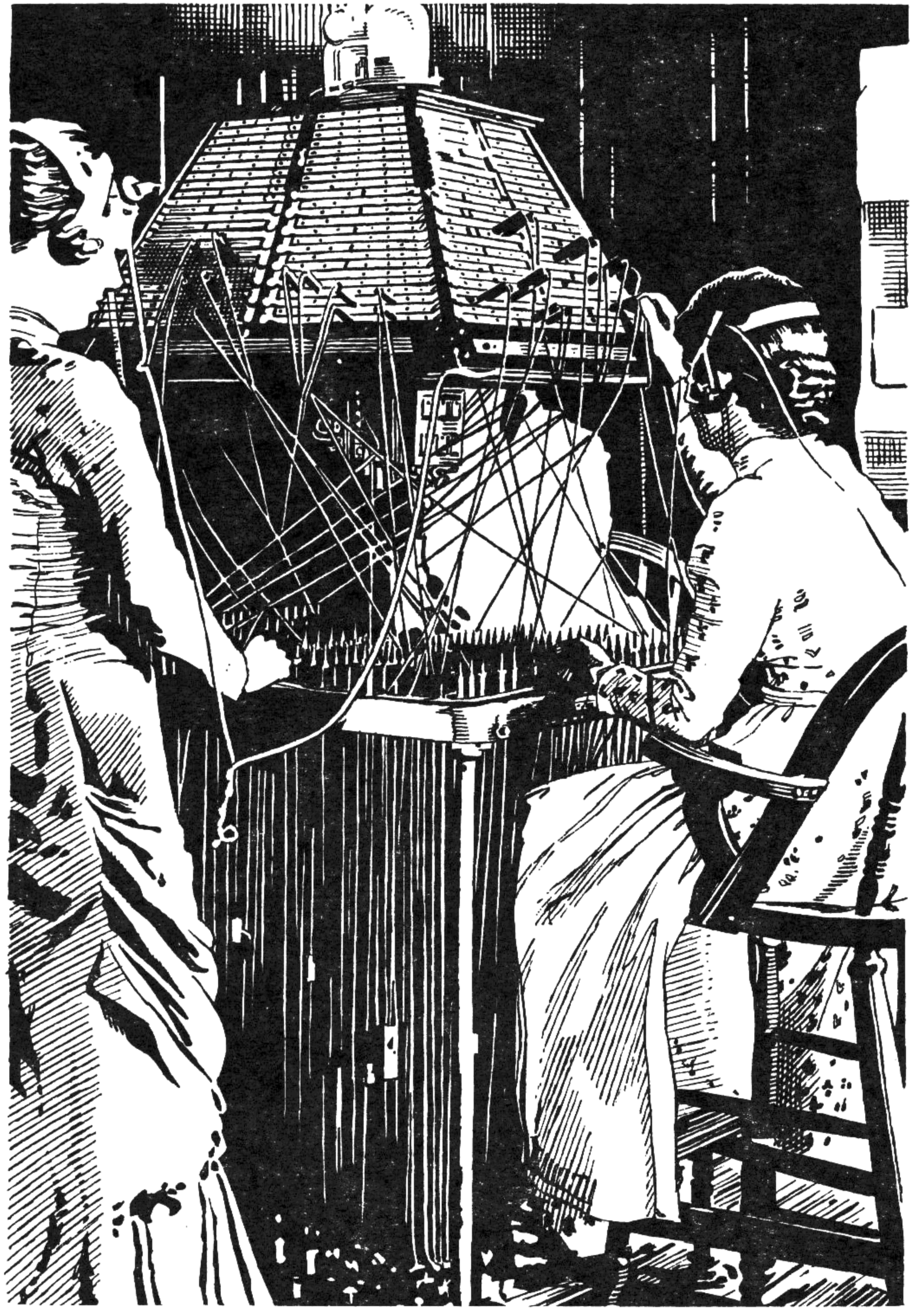
By 1915 the human voice could leap from coast to coast. In the same year, man's voice was to span the seas. On equipment developed by Western Electric, a now-famed Western engineer stationed in the Eiffel Tower in Paris heard a colleague of his



THE AUTOMATIC PRINTER OF THE 1870's INVENTED BY ELISHA GRAY, WAS ONE OF THE FIRST PRODUCTS MADE BY THE FIRM THAT BECAME WESTERN ELECTRIC COMPANY. IT RECEIVED MESSAGES AT A SPEED OF 25 WORDS A MINUTE. A CONTRAST IS THE INKTRONIC® PAGE PRINTER TODAY, MADE BY TELETYPE CORP., A SUBSIDIARY OF WESTERN ELECTRIC. ITS PRINTING SPEED IS 1,200 WORDS A MINUTE.

in Arlington, Virginia say . . . "and now Shreeve, good night." That night radio telephone communications between continents came into being. After years of further technical developments and international negotiation, commercial radio telephone service between the United States and England began in 1927.

In large measure, I suspect the strides in vacuum tube technology occurred because of the introduction of commercial sound broadcasting back in 1922. In that year Western Electric's first standard transmitter, the 5,000 watt model 1A was installed at AT&T's station WEAF in New York. By the end of 1922, the 1A was in use at more than 30 radio stations across the country.



ON THE LEFT, AN 1881 PYRAMID SWITCHBOARD CONNECTED BELL SYSTEM CUSTOMERS. ON THE RIGHT, WESTERN ELECTRIC'S TRAFFIC SERVICE POSITION SYSTEM CONSOLE WITHOUT CORDS. TSPS CAN HANDLE ALMOST ALL TELEPHONE CALLS NEEDING OPERATOR ASSISTANCE, BOTH LOCAL AND LONG DISTANCE, EXCEPT FOR DIRECTORY ASSISTANCE.

The development of these special tubes for the generation and detection of radio frequencies above 30 megacycles led to many other of today's electronic wonders: microwave and Over-the-Horizon radio and radar.

The next advance in amplification devices made world headlines in 1948 . . . the transistor. Developed at Bell Laboratories and first manufactured by Western Electric—transistors have not only helped to gather information and relay it from America's satellites and missiles—they contributed directly to the creation of the computer and data-processing industries. The impact of the transistor has not only added a new dimension to science—solid state physics—but its ability to serve as a tiny repeater has opened the door to whole new vistas in communications.

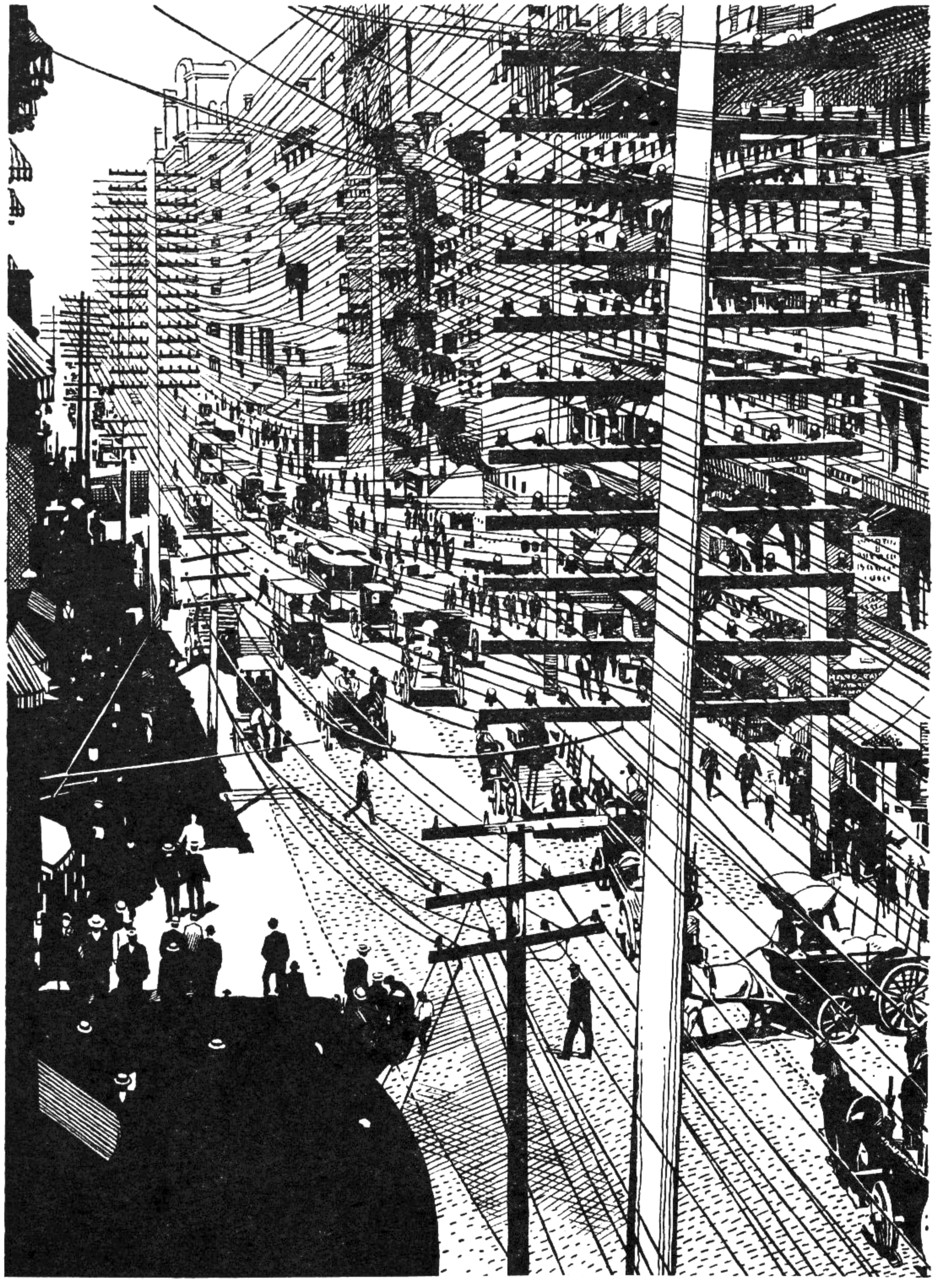
The second technical challenge to telephony is switching. It's a staggering problem today—at least numerically; especially when you consider that there are some 300 million calls placed on an average business day.

The first commercial switchboard went into operation in New Haven, Connecticut back in 1878. It was on the customer's premises. It had a capacity of eight telephone lines.

It wasn't too long before the switching facilities were gathered into a central office. It wasn't too long before Tinpan Alley came up with the smash hit, "Hello Central." I doubt if anyone in this audience remembers "Hello Central." Those were the days before the dial phone. Those were the days when a smiling voice would hold a patient customer while nimble fingers made the connection.

But as a recent AT&T advertisement said, "We didn't stop there." Scientists from Bell Labs and engineers from Western were exploring ways to do this job mechanically. Others were also working on the problem and were offering equipment for sale. Studies of available alternatives however indicated that an entirely new and different approach was needed and equipment must be versatile enough to serve both small and large cities.

After many experiments, Panel Dial—our first automatic switching system manufactured by Western Electric—was introduced into service in 1921. Panel switching has two divisions of



TRANSMISSION OF TELEPHONE CALLS GOES UNDERGROUND. THE FOREST OF WIRES ON NEW YORK CITY'S LOWER BROADWAY IN THE 1880'S COULD CARRY ABOUT 200 SIMULTANEOUS CONVERSATIONS. ON THE RIGHT, MODERN CABLE MADE BY WESTERN ELECTRIC COMPANY FOR THE BELL SYSTEM IS BEING LAID OUT OF SIGHT. IT CARRIES 32,400 SIMULTANEOUS CONVERSATIONS.

equipment with different functions. Dialing tells the control equipment the number you want, and the control equipment finds the proper path through the switching network and closes the necessary switches to complete the call. Once the connection is made, the panel switch "drops off" to establish other connections. *But we didn't stop there.*

Continued development led to a Bell Labs' designed and Western Electric manufactured system called *Step by Step*. The first *Bell System Step by Step* office was cut over in 1927. It was a great system and is still in manufacture. *But, we didn't stop there.*

Next came a new and faster system called Crossbar. Crossbar made it possible for calls to bypass overloaded trunk lines, to find alternate routes through the communications network and to do all this in seconds. Because of this development, direct long distance dialing became a reality. *But, we didn't stop there.*

In 1968, the National Society of Professional Engineers selected the Bell System's Electronic Switching System (ESS) as one of the 10 engineering achievements of the year. ESS is the switching system of the future—designed to handle not only anticipated growth but to provide the telephone user with an array of new services.

ESS is a solid state electronic switching system. It has the ability to store information much as a computer does.

This new switching system is the result of many developments in the world of microminiature components such as the integrated circuit. It is the result of a Bell Laboratories development announced in 1960 . . . the twistor memory. This unit—built by Western Electric—can permanently store more than five million "bits" of information. ESS is a reality because of work done at Western Electric's Engineering Research Center near Princeton, New Jersey. There, our engineers—who work on developing new manufacturing processes—devised a machine to provide and maintain a high degree of vacuum in operating areas through which a continuously moving production line is running. This enabled us to mass produce vital components that were necessary for the economical development of ESS.

And I believe ESS is a reality because of something else—the innovative climate which pervades Bell Laboratories and Western Electric and the unique relationship among designer, manufacturer and telephone operating organizations.

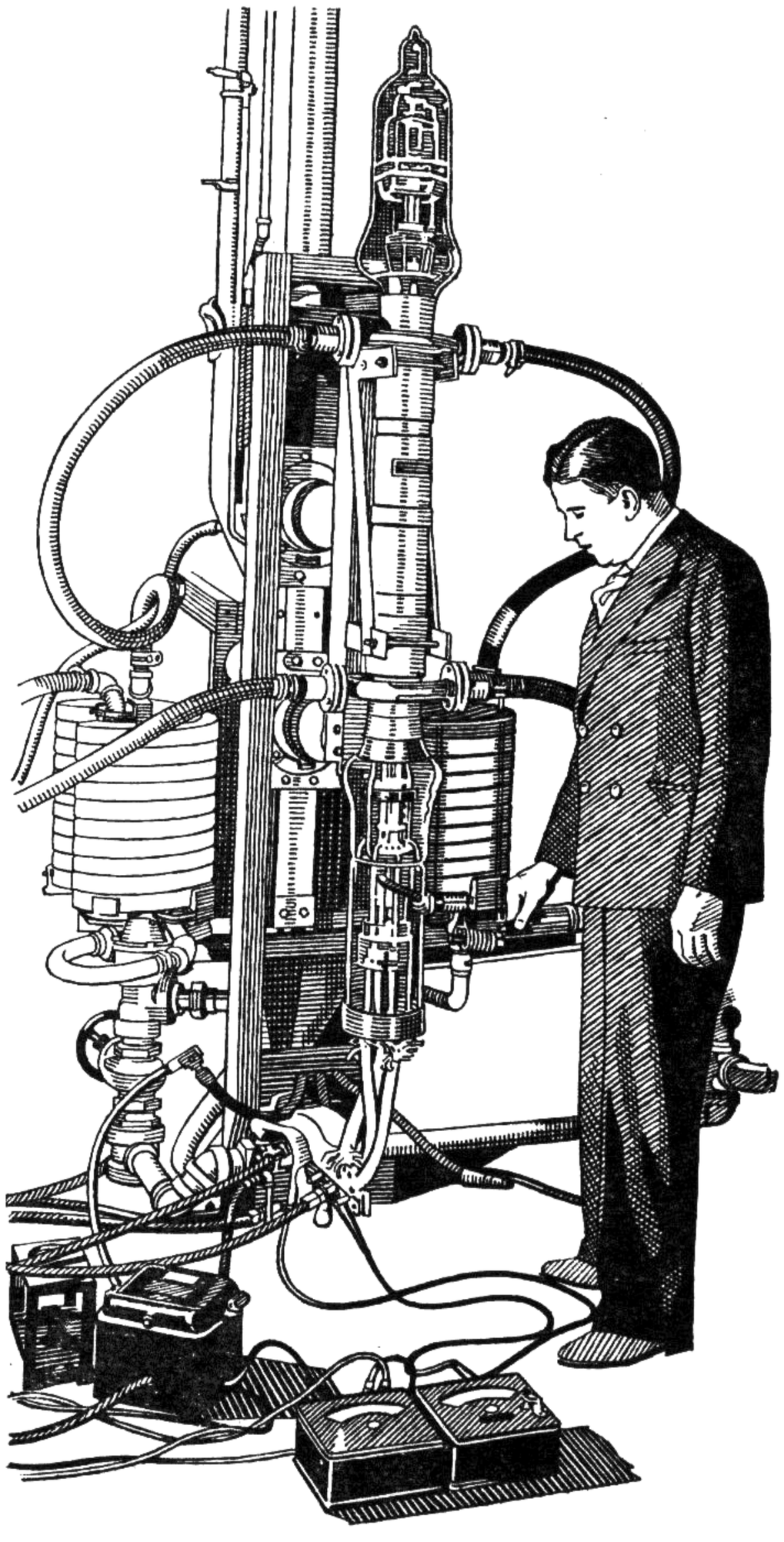
This willingness to experiment and risk—this willingness to commit large sums to research and development that led to so many breakthroughs in amplifying and switching systems—was the same spirit that pervaded our developments in systems to carry sounds, and pictures and signals.

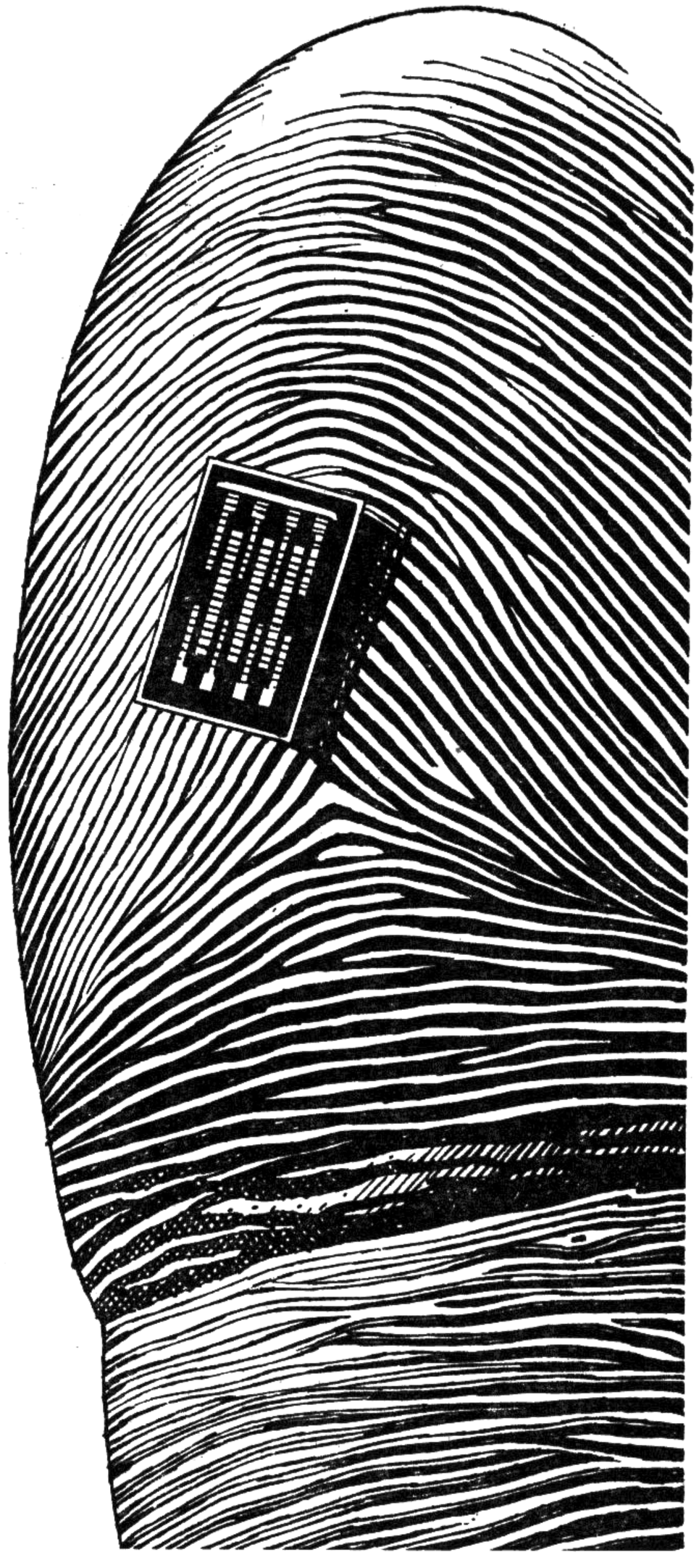
In the light of the Bell System's historic growth, our problem was obvious. How do you carry many messages across long distances? How do you get a few physical conductors to handle many voice channels?

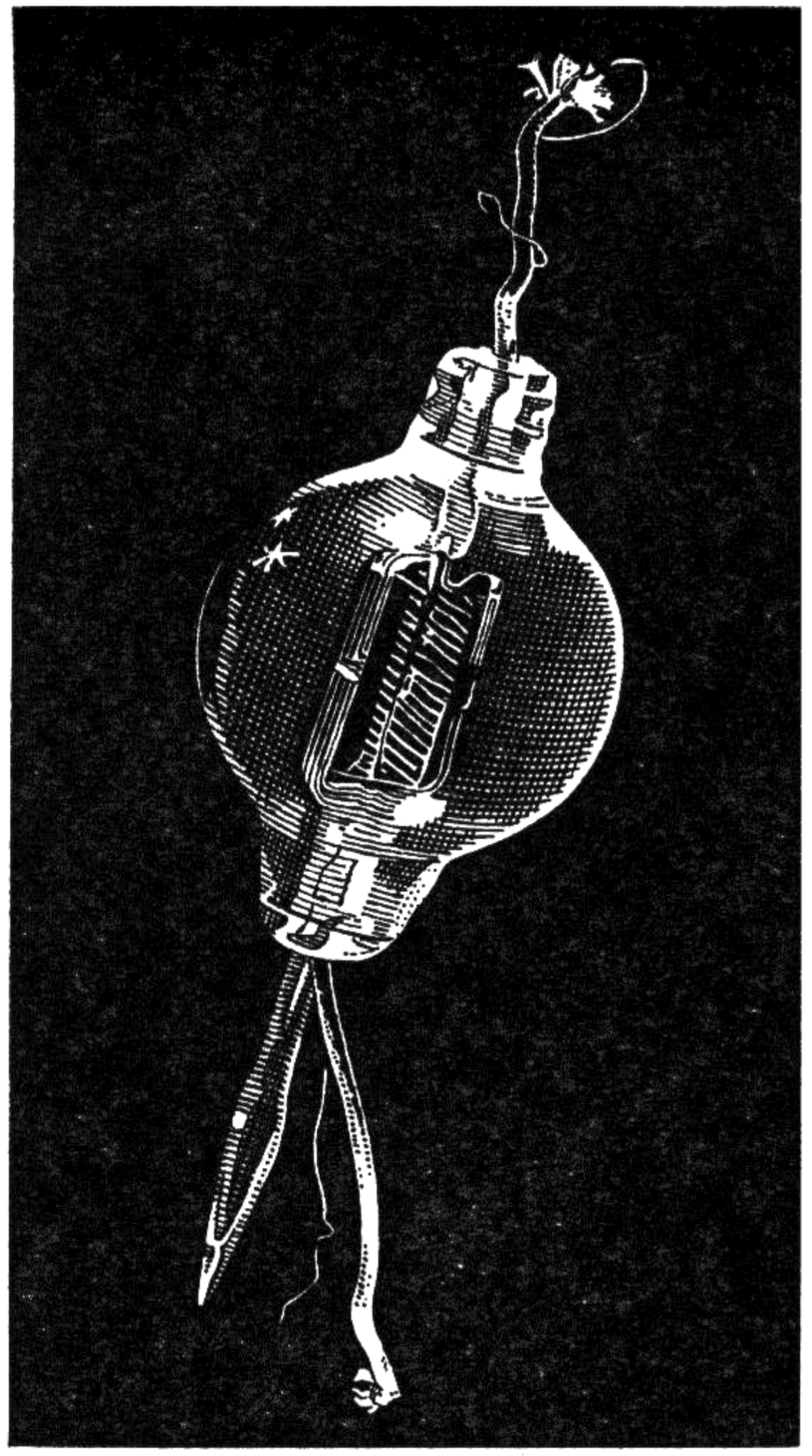
In 1918 A. M. Nicholson, another Western Electric engineer, filed a patent on a piezo-electric oscillator. These oscillators were first used in radio transmitters, and then applied to carrier equipment. They were used to separate various voice channels travelling over the same telephone circuit.

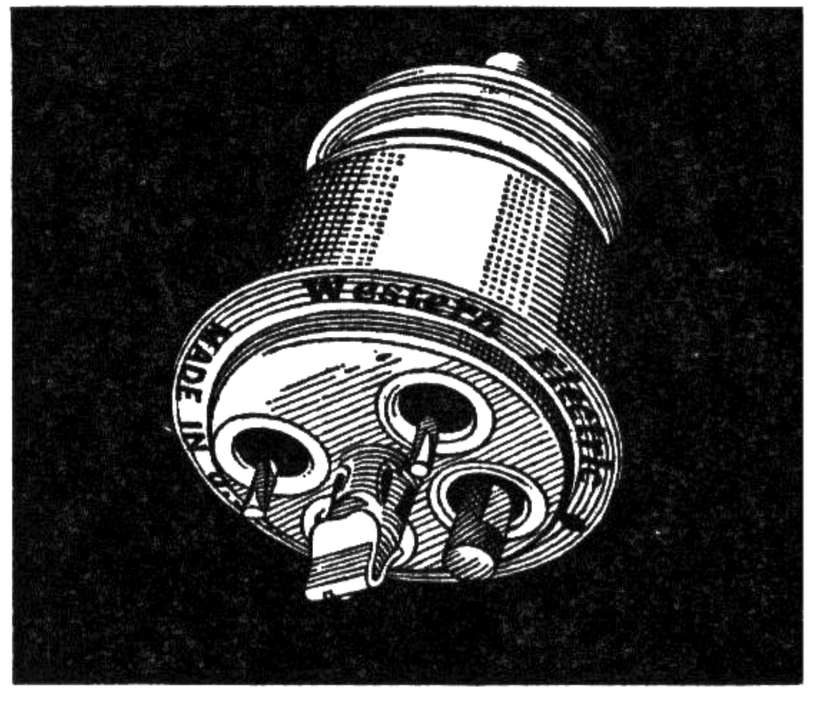
From this quest of packing more and more circuits into a single system came coaxial cable and microwave transmission. Today's coaxial cable—not much larger than my wrist—can carry 32,000 simultaneous conversations. And one of our microwave systems can handle 11,000 conversations at the same time. Both of these systems of course are also the workhorses of network radio and television.

The second thing I want to touch on this evening is our part of the Bell System's goal of serving the needs and wishes of America's telephone users. We view this as more than producing between seven and eight million telephones a year (in 1,200 varieties including color options). We view it as more than making about 100,000 miles of all kinds of cable in a year, or producing enough switching equipment in a typical year to meet the needs of Boston, Chicago, Minneapolis, Omaha and San Francisco combined. We view it as more than furnishing engineering and installation services to the Bell Telephone Companies or in the supply and repair functions of our service centers. We view our contribution to the Bell System's service goal as one of producing









ON LEFT, ONE OF THE LARGEST ELECTRON TUBES EVER MADE, A 250-THOUSAND-WATT RADIO TUBE. IN CENTER, A SEMICONDUCTOR WAFER USED IN MAKING TRANSISTORS. UPPER RIGHT, COMPANY'S FIRST HIGH-VACUUM AMPLIFIER, INTRODUCED IN 1913. LOWER RIGHT, 416C TUBE WHICH AMPLIFIES 1,200 TELEPHONE CALLS SIMULTANEOUSLY IN RADIO RELAYS—NEWEST TUBE WESTERN ELECTRIC MAKES FOR THE BELL SYSTEM.

products of high quality and great reliability at the lowest possible cost over the service life of the product.

For example, when we build underseas amplifiers to carry messages across the oceans, they're built to perform faultlessly for a minimum of 20 years. Every component is made of specially selected materials and assembled under surgically clean conditions.

Or consider the simple relay, which we make by the millions for use in telephone switching offices. They are designed and built to last for 40 years. They have to. An ordinary telephone call involves the operation of about 1,200 such relays. If just one fails, the call doesn't get through.

The prices of Western Electric's products and services directly affect the rates telephone users pay; so our commitment to serve the telephone-using public also includes a constant war with costs. Our efforts to hold the line on prices depends on our cost *avoidance* and cost *reduction* programs.

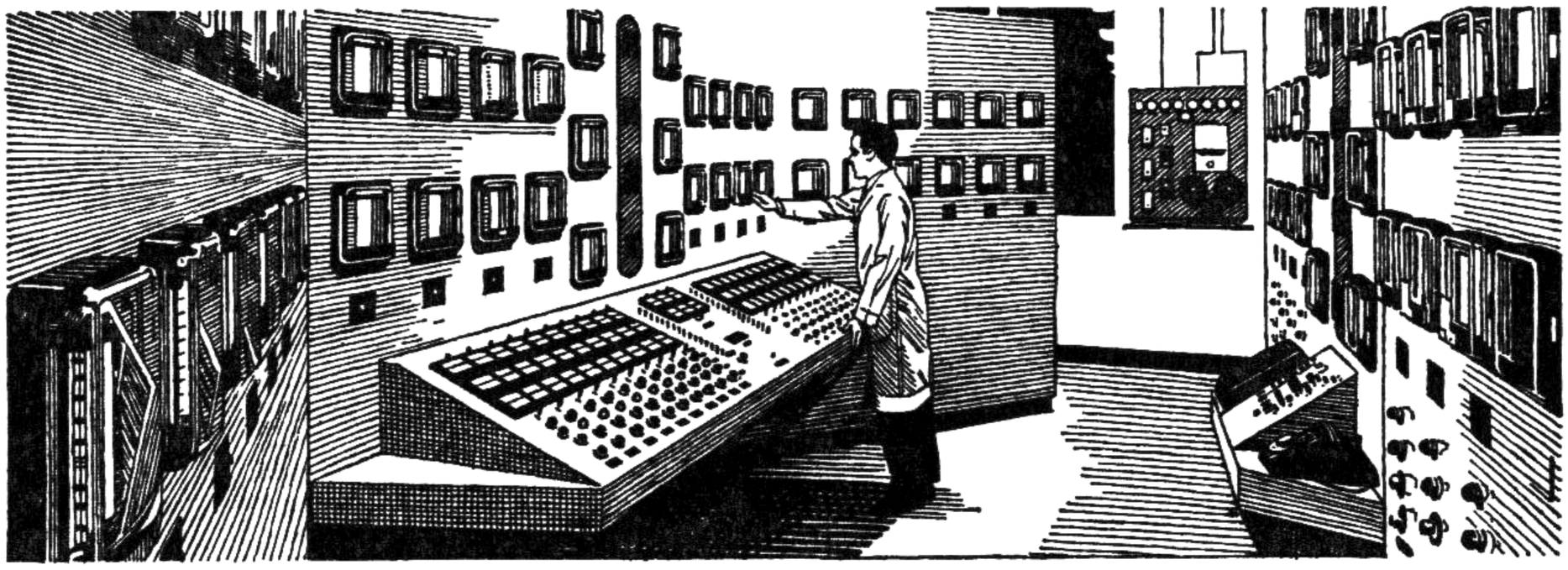
Cost *avoidance* applies to new products being introduced to manufacture for the first time. The goal is to see to it that the design of a new product and the facilities for manufacturing it, will offer the utmost economy.

One example of our efforts in this area has been the establishment of Product Engineering Control Centers. Each center has overall responsibility for a given product, product line or system, and for the services attached to it. This responsibility extends all the way from the original point of collaboration with Bell Labs on design to the ultimate repair or modification of the system in the field.

This arrangement is helping to save both time and money by speeding laboratory ideas and designs from drawing boards through manufacture, and thence to customer service.

Cost *reduction* begins with the product's actual introduction to manufacture, and continues indefinitely as long as the product is in use. This year-in, year-out effort—involving thousands of changes annually in our production methods—has enabled us to absorb higher and higher wages and materials costs and still make our products better bargains for our customers.

For example, at Western Electric's Indianapolis factory, where telephones are made, engineers continue to work on cost reduction cases affecting the telephone itself. The results of that work are that we have been able to offset increased labor rates and material costs and still lower the price of our standard telephone instrument.



SCENE AT ONE OF COMPANY'S 16 MAJOR MANUFACTURING PLANTS. EMPLOYEE CHECKS AUTOMATED CONTROLS FOR PRODUCTION OF ARTIFICIAL QUARTZ.

Another example . . . high-purity quartz. This substance is used in a variety of telephone products. It is expensive and difficult to obtain in its natural state. By developing facilities to "grow" cultured quartz in the factory we have achieved an annual saving of over $2 million. In terms of size and uniformity, the grown quartz is so much superior to that found in nature that one pound of the former replaces six pounds of the latter.

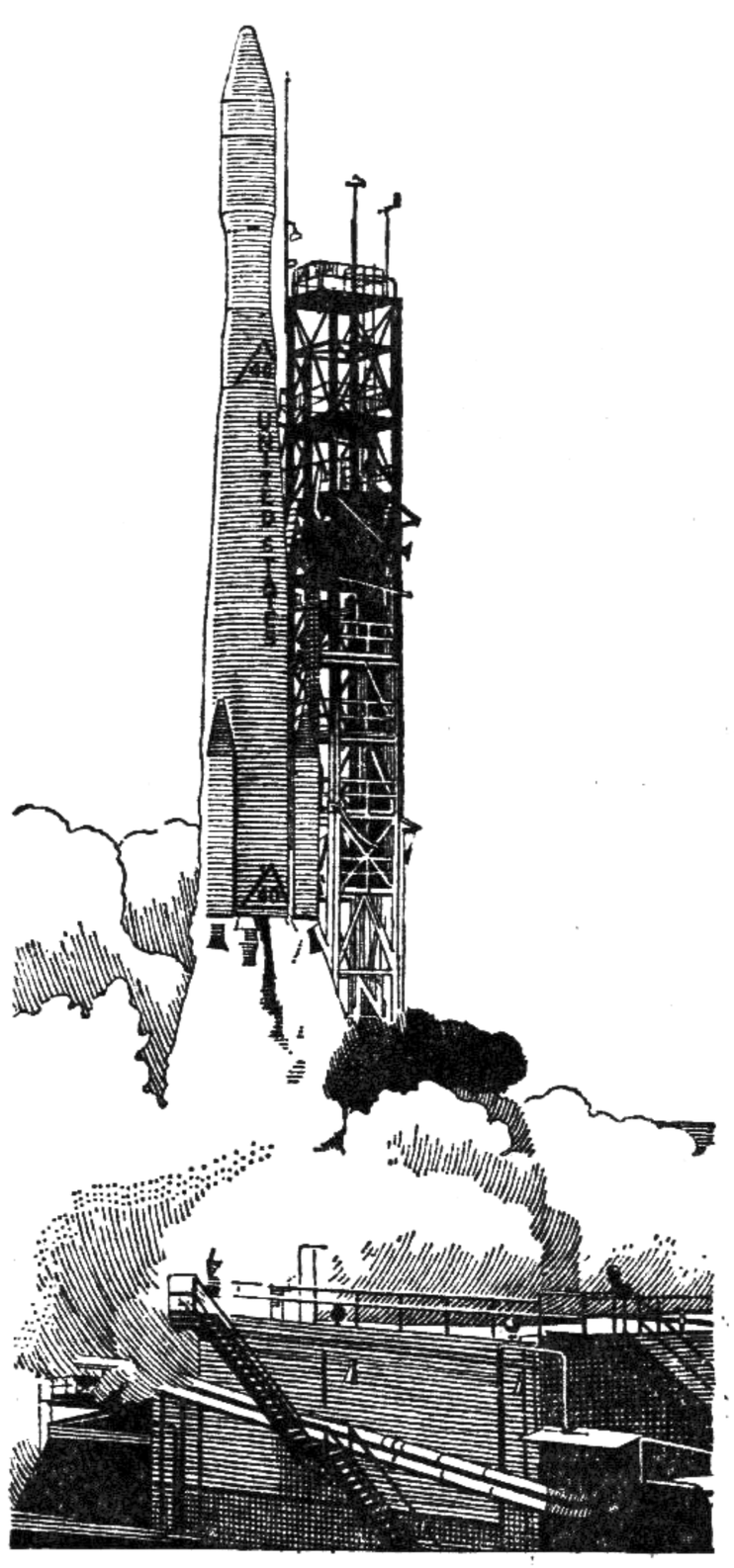
Our massive cost reduction programs and improved productivity, have enabled us to reduce the level of our prices for the products we make for the Bell System. In fact, the level of our prices today is lower than it was at the beginning of 1950—despite the substantial increases in wage rates and raw material costs that all of us have experienced.

This picture of Western Electric would not be complete without at least some mention of another role we play in serving the needs of the nation. In the past and the present we have undertaken a number of assignments for the United States Government. In almost every instance, these assignments have come to us at the request of the Government, when the Government considered

that the combination of Western Electric and Bell Laboratories skills uniquely qualified us for the job to be done.

We first served the military in 1917, when we demonstrated radio-telephone for aircraft. Within a year we were producing thousands of sets. To do it required another first. We made the world's first mass-produced vacuum tube.

WORLD'S FIRST AIR-TO-GROUND RADIO WAS DEMONSTRATED IN 1917 ON THE GROUNDS OF THE WHITE HOUSE WHEN PRESIDENT WOODROW WILSON, USING EQUIPMENT DEVELOPED AND MANUFACTURED BY WESTERN ELECTRIC COMPANY, TALKED WITH THE PILOT OF A U.S. ARMY AIRPLANE FLYING OVERHEAD. FORTY-NINE YEARS LATER, IN 1966, THE UNITED STATES LAUNCHED PIONEER VII IN A JOURNEY AROUND THE SUN. STEERING THE PAYLOAD WAS A WESTERN ELECTRIC COMMAND GUIDANCE SYSTEM, WHICH HAS NOW ACHIEVED OVER 300 SUCCESSFUL SATELLITE LAUNCHES. THE COMPANY, WHICH WILL BE 100 THIS YEAR, HAS BEEN A MAJOR CONTRIBUTOR TO THE NATION'S DEFENSE.



During World War II, Bell Laboratories and M.I.T.'s Radiation Laboratory were leaders in the development of radar. Western's job was to manufacture it. The company was the nation's largest source of radar during the war. We supplied more than 57,000 units of 70 different types for airborne, ground and naval use.

Among our other large defense undertakings was the construction of the Distant Early Warning (DEW) Line across the Arctic and the White Alice communications system in Alaska. We were prime contractor on the rearward communications system serving BMEWS—Ballistic Missile Early Warning System—and

NASA's world-wide tracking and ground communications network. We have also been prime contractor for the Nike "family of missile systems" and the subsequent ABM system . . . SAFEGUARD.

The final point I should like to touch upon is Western Electric's concept of its obligation to serve the needs of a rapidly changing society. We have long recognized—paraphrasing John Donne—that no company is an island unto itself.

Internally, we have been long aware of and have tried to be responsive to the changing order between labor and management. I believe this point is well illustrated by the Hawthorne Studies. As far back as 1924, in our Hawthorne plant in Chicago, we set out to study the relationship between the intensity of light to a production worker's output. The results of that study—held in cooperation with the National Research Council—were inconclusive. However they led to an understanding that workers respond to something other than illumination.

Investigators from Harvard, M.I.T. and Western Electric pushed their research over the years into one phase after another of working conditions at Hawthorne. The ultimate conclusion of that study has changed the basic relationship between management and worker. It was discovered that a worker's output was directly related to his attitude and response toward his job, his feeling of belonging to a team, that is, to his industrial social environment—rather than to exclusively economic considerations or hours of labor.

The impact of this project has been felt by all industry in the fields of medicine, psychology, social science and education.

In the 60 cities where Western Electric has locations we are keenly aware of two things: the quality of local and state government affects us directly and the problems of the city confront our company—like all corporations—with a challenge to participate, to help shape the course of social change or be overwhelmed by it.

We believe that as a company we have a responsibility for good corporate citizenship in the community. We believe that good government depends entirely on good people . . . people who are concerned . . . people who care. To this end, we encourage all employees to participate fully in community life. We have

made available to all employees a program called Democracy In Action, which deals with effective participation in grass-roots politics. We have encouraged Western Electric people to become active partisans in the party of their choice. We do this because we believe that the kind of men and women who work for Western would serve the cause of either political party well.

As for the cities, and the problems of the unemployed or underprepared, name the effort, or label the program and you will undoubtedly find the company and Western Electric people participating in it. Within the company we have always been committed to hiring and promoting people solely because of their capacity, their talents and their potential. Thus, it was easy and natural for us to be an original signator to the Plans for Progress. Externally, we are involved in efforts which range from a project to help a Chicago Negro to establish his own business to setting up a pilot plant in Newark to train the underprepared and undereducated. We have lent the time and talents of our employees to help Ohio State University's program of redeveloping the industrial arts program of the nation's schools. The list of our activities is too long to state. But I could not let the moment pass without mentioning it, for the job to be done is so important that the future of our society may depend upon its outcome.

Government can't do what must be done by itself. Individuals cannot by themselves do all that must be done. But all of us, together, can make the city what it must be—the hub and joy of civilized men.

I have touched on only a few of the projects which engage this company called . . . Western Electric. If I have left you with the impression that innovation is our way of life; that serving the communications needs and wishes of the American public is our goal; that bettering the condition of our cities and environment is a cause to which we are committed, then, I am pleased.

If the fruits of our labors during the first hundred years have added pleasure and convenience to you and your families, then, I am happy.

And I can promise you now, that we will do all we can in our next hundred years to make communications even more meaningful to everyone.

Thank you.

THE NEWCOMEN SOCIETY
in North America

IN APRIL, 1923, *the late L. F. Loree (1858-1940) of New York, then dean of American railroad presidents, established a group now known as "American Newcomen" and interested in Material History, as distinguished from political history. Its objectives center in the beginnings, growth, development, contributions, and influence of Industry, Transportation, Communication, the Utilities, Mining, Agriculture, Banking, Finance, Economics, Insurance, Education, Invention, and the Law—these and correlated historical fields. In short, the background of those factors which have contributed or are contributing to the progress of Mankind.*

The Newcomen Society in North America is a non-profit membership corporation chartered in 1961 under the Charitable Law of the State of Maine, with headquarters on North Ship Road, Uwchlan Township, Chester County, Pennsylvania, some five miles east of Downingtown, Pennsylvania, and 32 miles west of the City of Philadelphia. Here also is located The Thomas Newcomen Memorial Library in Business History, a reference collection, including microfilm, open to the public for research and dealing with the subjects to which the Society devotes attention.

Meetings are held throughout the United States of America and across Canada at which Newcomen Addresses are presented by leaders in their respective fields. These manuscripts represent a broadest coverage of phases of Material History involved, both American and Canadian.

The approach in most cases has been a life-story of corporate organizations, interpreted through the ambitions, the successes and failures, and the ultimate achievements of those pioneers whose efforts laid the foundations of the particular enterprise.

The Society's name perpetuates the life and work of Thomas Newcomen (1663-1729), the British pioneer, whose valuable contributions in improvements to the newly invented Steam Engine brought him lasting fame in the field of the Mechanic Arts. The Newcomen Engines, whose period of use was from 1712 to 1775, paved a way for the Industrial Revolution. Newcomen's inventive genius preceded by more than 50 years the brilliant work in Steam by the world-famous James Watt.

The Newcomen Society in North America is affiliated with The Newcomen Society for the Study of the History of Engineering and Technology, with offices at The Science Museum, South Kensington, London, S.W. 7, England. The Society is also associated in union with the Royal Society for the Encouragement of Arts, Manufactures and Commerce, whose offices are at 6 John Adam Street, London, W.C. 2, England.

Members of American Newcomen, when in Europe, are invited by the Dartmouth Newcomen Association to visit the home of Thomas Newcomen at Dartmouth in South Devonshire, England, where the festival of "Newcomen Day" is celebrated each year on the fourth Friday in July.

"The roads you travel so briskly
lead out of dim antiquity,
and you study the past chiefly because
of its bearing on the living present
and its promise for the future."

—LIEUTENANT GENERAL JAMES G. HARBORD,
K.C.M.G., D.S.M., LL.D., U.S. ARMY (RET.)
(1866-1947)

Late American Member of Council at London
The Newcomen Society
for the study of the history of
Engineering and Technology