

T H E
Fabulous Phonograph
1877-1977

SECOND REVISED EDITION

by Roland Gelatt

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FOREWORD

A HISTORY OF THE PHONOGRAPH IS AT ONCE THE HISTORY OF an invention, an industry, and a musical instrument. It cannot be otherwise. Science and business and aesthetics are inseparably commingled in the historical progression from Edison's raucous tin-foil apparatus to the high fidelity reproducers and recordings of today. I have attempted to keep these three elements in fairly equal balance. If this balance is occasionally upset in favor of emphasizing the phonograph's musical role, that is as it should be. The inventors and the entrepreneurs played important and fascinating roles, but their work would have little interest for us had it not been allied to the artistry of Caruso and Melba, Beecham and Casals. There are, of course, all kinds of music—and much of it, indeed the bulk of it, purveyed by the phonograph has been of the less enduring variety. The marches and "coon songs" of 1900 were succeeded by the one-steps and the waltzes of World War I, and these in turn were followed by the jazz of the Twenties, the swing of the Thirties, and the mood music of the Fifties. Such forms of musical expression have by no means been neglected here, but they occupy a lesser place in this chronicle compared to the more ambitious and durable musical repertoire that has been entrusted to the phonograph. Again, I think that is as it should be. Those who value Jerome Kern over Mozart or Bix Beiderbecke over Toscanini may disagree.

As this is the first comprehensive history of the phono-

graph to be undertaken, I should say something about my sources of information. Much of my material has been gathered from periodicals, of which the following proved especially helpful: *The Phonoscope*, published in New York from 1896 to 1900; *Die Phonographische Zeitschrift*, published in Berlin from 1900 to the 1930s; the *Talking Machine News*, published in London from 1903 to the 1930s; the *Talking Machine World*, published in New York from 1905 to the 1930s; *The Sound Wave*, published in London from 1906 to the 1930s; the *Phonograph and Talking Machine Weekly*, published in New York from 1916 to the 1930s; *The Gramophone*, published in London from 1923 to the present; the *Phonograph Monthly Review*, published in Boston from 1926 to 1932; *The American Music Lover* (later *The American Record Guide*) published in New York and Pelham from 1935 to the present; *The Record Collector*, published in Ipswich (England) from 1948 to the present; and various house organs, dating back to 1891, published by the Columbia Phonograph Company, Thomas A. Edison, Inc., the Gramophone Company, the North American Phonograph Company, and the Victor Talking Machine Company. A set of clippings relating to early phonograph history, collected by Stephen Fassett and now belonging to the New York Public Library, cleared up many dubious points.

A few books were of assistance, notably: *The Music Goes Round* by F. W. Gaisberg (New York, 1942), a volume of reminiscences full of absorbing but not always accurate detail; *Edison's Open Door* by Alfred O. Tate (New York, 1938), memoirs by Edison's private secretary during the 1890s; *Emile Berliner* by Frederic William Wile (Indianapolis, 1926), an official biography but useful for all that; *The Romance of the Gramophone* by T. Lindsay Buick (Wellington, New Zealand, 1927), a retelling from secondary sources of the first quarter century of phonograph history; and an unpublished biography of Eldridge R. Johnson, writ-

ten by Dale Kramer at the behest of the Johnson family and based on documentary material in their possession.

Most valuable of all have been my talks and correspondence with the dramatis personae (or their descendants) of this history. I should like particularly to mention: Edgar M. Berliner, Victor R. Bettini, Walter W. Clark, Josef Hofmann, David Kapp, Joseph P. Maxfield, Joseph Sanders, John D. Smoot, Sir Louis Sterling, Edward Wallerstein, and Wilfrid W. Wetzel. All of them took time and immense trouble to answer my queries and put up good-humoredly with my incessant cross-questioning over small bits of information.

For their suggestions, encouragement, and assistance I am indebted, among many others, to: B. L. Aldridge, R. H. Clarke, John M. Conly, James Dennis, Hans Fantel, Stephen Fassett, Addison Foster, Thomas Heinitz, Irving Kolodin, Norman Speiden, and Ulysses S. Walsh. Bell Laboratories, Columbia Records, the Gramophone Company, and RCA Victor co-operated usefully at all times. Special thanks go to: R. D. Darrell, for entrusting me with his prized collection of phonograph periodicals and for offering much thoughtful advice; John H. Evans, for searching the British Isles until he found the extremely rare English periodicals that I needed; Philip L. Miller and his associates at the New York Public Library, for their unfailing courtesy in putting at my disposal the Library's unique collection of phonograph documents. Finally, a word of appreciation is directed to Lynn Carrick, an understanding and ever-helpful editor.

In the past, writings about the phonograph have often been blemished with serious inaccuracies. Some of these have been willful, the result of *parti pris*. Most of them have been owing simply to carelessness in verifying facts and to the kind of historiography that seizes on one piece of information and constructs a whole hypothetical edifice upon it. I have done my best to sift out the inaccuracies. Wherever possible, I have gone to first-hand sources and checked one against

the other. But I cannot hope that my book is entirely free from error. What I can hope is that readers better informed than I about certain phases of this subject will share their knowledge with me.

A NOTE ON THE THIRD EDITION

I began my research for *The Fabulous Phonograph* in 1952, exactly 75 years after Edison's invention. Little did I imagine then that one day I would be preparing a third edition to appear in the phonograph's centenary year. Looking over the acknowledgments in my original Foreword, I realize how lucky I was to have started when I did. In the early 1950s many of the pioneers were still around to provide me with invaluable information and insights. Had I begun my research a decade later, much of the material in the early chapters of this book would never have gone on record.

The original (1955) edition ended with Chapter 22. A second (1965) edition added a brief Postscript. In this third edition, the 1965 Postscript has been eliminated, and in its place are three new chapters that extend the chronicle from 1955 to the present.

It would be impossible for me to acknowledge all the people who have contributed to my knowledge and understanding of the fabulous phonograph as it has developed over the past quarter century. But I should like to seize this occasion to mention a few old friends in the record industry who have been unfailingly helpful over the long years of our association: Robert Altshuler, of Columbia Records; Peter Andry, of EMI Records; John Coveney, of Angel Records; Herb Helman, of RCA Records; and T. A. McEwen, of Decca-London Records. If this historian has been able to keep at least somewhat *au courant*, it is thanks in great measure to them.

R. G.

New York, November 1976

THE FABULOUS PHONOGRAPH

1877-1977

1 TALKING TIN FOIL

IN HIS LATER YEARS, WHEN EDISON WAS AN OBJECT OF national veneration and his creative spark had cooled, the old man delighted in escorting visitors through his laboratories in West Orange, New Jersey. He would lead them through a series of low red-brick buildings, showing off—as he went along—the scenes of former inventive triumphs. At some point in the tour a visitor was almost certain to quiz him about his *modus operandi*. How did Mr. Edison set about inventing something? Did he deliberately address himself to a specific problem and hatch an invention in abstract from his fertile brain? Or did he just stumble upon his inventions by accident? Edison would reply that his inventions were to be credited neither wholly to luck nor wholly to logic, but to a coalition of the two. “Look,” he would say, drawing an imaginary line with his finger, “it’s like this. I start here with the intention of reaching here—in an experiment, say, to increase the speed of the Atlantic cable; but when I have arrived part way in my straight line, I meet with a phenomenon and it leads me off in another direction and develops into a phonograph.”

The straight line was leading originally to a high-speed telegraph transmitter. For years Edison had labored to increase the efficiency of the telegraph. He had developed the system of quadruplex telegraphy, whereby four separate signals could be sent simultaneously over the same wire, and from the age of eighteen he had tinkered with telegraphic

repeaters, which recorded messages at one speed and retransmitted them at a much greater speed. In the summer of 1877 he was working on an instrument that transcribed telegrams by indenting a paper tape with the dots and dashes of the Morse code and later repeated the message any number of times and at any rate of speed required. To keep the tape in proper adjustment he used a steel spring, and he noticed that when the tape raced through his instrument at a high speed, the indented dots and dashes striking the end of the spring gave off a noise which Edison described as a "light musical, rhythmic sound, resembling human talk heard indistinctly."

Edison was not the man to let a phenomenon like this go unpursued. He once laid down a general rule for aspiring inventors: "When you are experimenting and you come across anything you don't thoroughly understand, don't rest until you run it down; it may be the very thing you are looking for or it may be something far more important." In this case the sound "resembling human talk heard indistinctly" was ultimately of far greater consequence than the telegraphic instrument which produced it. For the phenomenon set Edison to thinking that if he could record a telegraph message, he might be able to record a telephone message as well.

The telephone was much in his thoughts those days. That same year, 1877, he had invented a carbon transmitter for Alexander Graham Bell's year-old telephone, the proceeds from which had made Edison at thirty a financially independent man. It was natural that the strange noise emitted by the telegraphic repeater should set the young inventor thinking again about the telephone. The instrument was then a luxury available only to the affluent, and it occurred to Edison that he might bring Bell's invention into more general use by constructing a small, inexpensive machine

with which anyone could record a spoken message. That recording could then be taken to a central station where another machine would play back the message and transmit it over the telephone line. It was to be the equivalent of sending a written message by telegraph.

As he was speculating on this possibility, he recalled a makeshift to which he had resorted during his work on the carbon transmitter. Edison was by then already showing signs of deafness and could not trust his hearing to judge the loudness of a sound as it came over the telephone receiver. To by-pass this difficulty, he had attached a short needle to the diaphragm of the receiver. When he let his finger rest lightly on this needle, the pricks would show him the amplitude of the signal coming over the line. Harking back to this experience, Edison reasoned that if the needle could prick his finger it could just as well prick a paper tape and indent it with a record of the human voice. He set about putting his theories to a practical test, and on July 18, 1877, he scribbled in his notebook:

Just tried experiment with diaphragm having an embossing point and held against paraffin paper moving rapidly. The speaking vibrations are indented nicely, and there's no doubt that I shall be able to store up and reproduce automatically at any future time the human voice perfectly.

The steps of Edison's experimentation—whereby he was led from paraffin paper tape to the tin-foil cylinder phonograph—are not clear. Perhaps some unknown notebook lies immured in the Edison archives which could clarify the development of his work. Pending such information (if it indeed exists), we must rely on the somewhat incredible testimony of E. H. Johnson, an associate, publicist, and intimate friend of Edison's during those early years. In the summer of 1877 Johnson embarked on a lecture tour through upper New York State expounding on the marvels issuing

from Edison's laboratory. "In the course of one of my lectures," he later wrote, "it occurred to me that it would be a good idea to tell my audience about Edison's telephone repeater. My audience [in Buffalo] seemed to have a much clearer appreciation of the value of the invention than we had ourselves. They gave me such a cheer as I have seldom heard. . . . The next morning the Buffalo papers announced in glaring headlines: 'A Talking Machine by Professor Edison.' " If Johnson is to be credited, this newspaper account was the genesis of the phrase "talking machine"—indeed, of the very concept of a phonograph. For the story goes that Johnson cut his lecture tour short and returned to Edison's laboratory to report on what had happened. As a result, we are told, Edison progressed from his conception of a telephone repeater to that of a talking machine and forthwith set about designing the tin-foil phonograph. But one is loath to accept this report at face value. Johnson's account * smacks of an attempt to assign to himself—thirteen years after the event—a role in the invention which he did not quite deserve. It seems very unlikely that a man with Edison's quick turn of mind would remain insensible to the potentialities of his experimentations until a headline writer had pointed them out.

The instrument that Edison designed consisted basically of a metal cylinder (with a fine spiral groove impressed in its surface) and two diaphragm-and-needle units—one to be used for recording, the other for reproduction. The cylinder was mounted on a screw, so that turning a handle would make it both revolve and move from left to right. A piece of tin foil was to be wrapped around the cylinder, and thereon the recording needle, following the spiral groove, would indent a pattern of the sound vibrations directed into the mouth-piece. The stylus would move vertically, creating a so-called

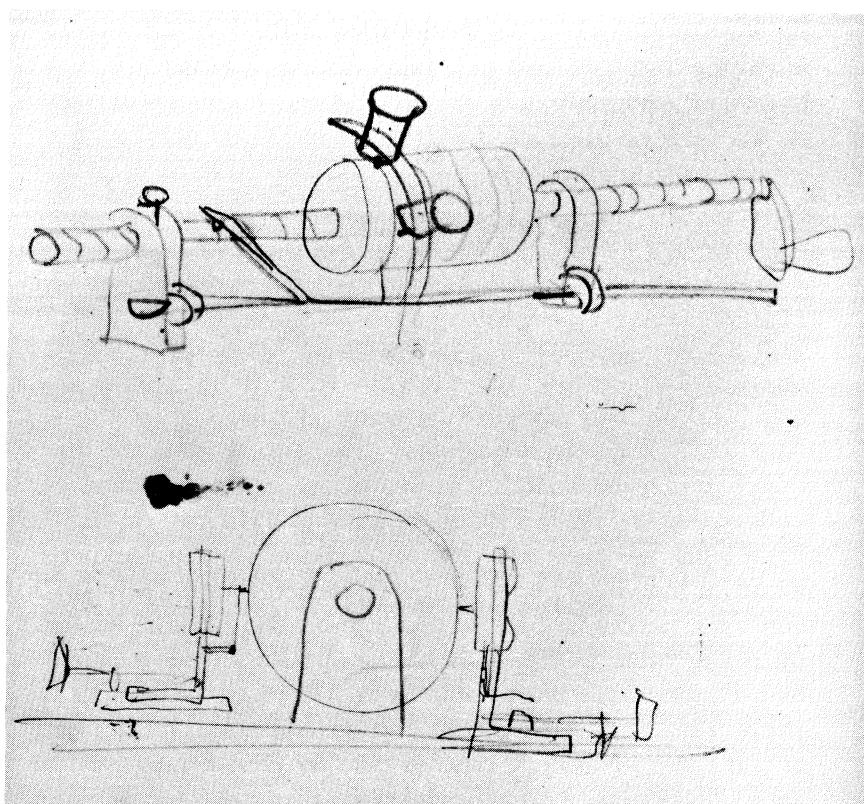
* Published in the *Electrical World*, February 22, 1890.

"hill and dale" pattern in the trough of the groove. On replaying, the reproducing needle was to convert these indentations on the tin foil back into sound. Edison made a sketch and gave it to one of his most trusted mechanics, John Kruesi, to build. Within thirty hours Kruesi is supposed to have returned with the finished product. Edison wrapped a sheet of tin foil around the cylinder, set the needle, turned the crank, and shouted into the mouthpiece the nursery rhyme that begins, "Mary had a little lamb." This was hardly the most profound quotation to utter at the birth of a great invention, but it at least gave fair warning of Edison's future lack of discrimination in the quality of phonographic repertoire. Edison then adjusted the reproducer, cranked the cylinder again, and there issued from the machine a recognizable reproduction of his voice. He admitted later: "I was never so taken aback in my life."

The "official date" for this event is given as August 12, 1877, but this was fixed upon many years later on the occasion of an anniversary celebration. The date is highly questionable, despite the evidence of a rough sketch on which Edison had scrawled the words "Kruesi—Make this—Aug. 12/77." Earlier editions of this book reproduced that sketch but questioned its authenticity. It seemed hard to believe that the tin-foil instrument could have been brought into being less than a month after Edison's initial experiments in indenting paper tape with spoken sound (July 18), and even harder to believe that Edison would have waited until December 24, 1877, to file an application for a patent had a practicable instrument been developed four months previously. Since those earlier editions appeared, researchers at the Edison National Historic Site in West Orange, New Jersey, have turned up another sketch that seems much more likely to have been the one used by John Kruesi to construct the first tin-foil phonograph (see illustration). It bears

the date November 29, 1877, and would seem to establish conclusively that the first working phonograph was made in the late autumn of 1877.

Edison was issued a patent on the phonograph February 19, 1878, less than two months after he applied. Not a single "interference" was registered nor a single "reference" cited against his application. Nothing in the Patent Office files remotely approached the instrument that Edison had devised.



EDISON'S FIRST SKETCH OF THE PHONOGRAPH

And yet Edison at this time was not the only man concerned with the invention of a phonograph—as an event at the Académie des Sciences in Paris demonstrated. For on December 5, 1877, a paper was opened in the Académie which also described a process of recording and reproducing sound. This document had been written by Charles Cros, a minor poet, amateur scientist, friend of Verlaine, Banville, and Manet. In his paper Cros described a process which "consists in obtaining traces of the movements to and fro of a vibrating membrane and in using this tracing to reproduce the same vibrations, with their intrinsic relations of duration and intensity, either by means of the same membrane or some other one equally adapted to produce the sounds which result from this series of movements."

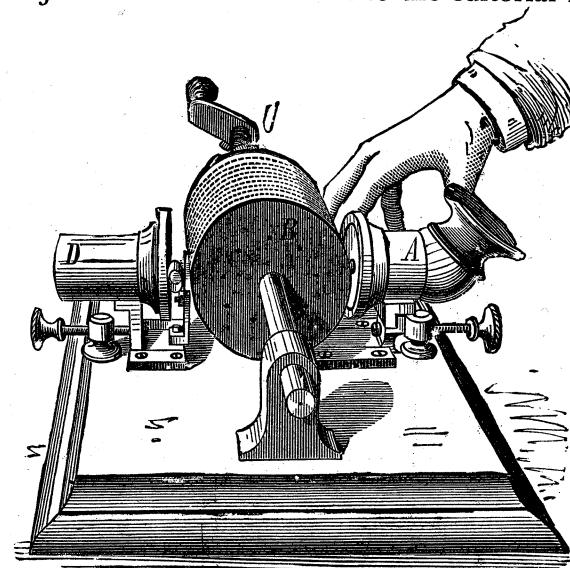
In essence Cros and Edison had hit upon the same idea. In detail there were differences. Cros specified a disc rather than a cylinder; and instead of recording on tin foil, he proposed tracing the sound waves on lampblacked glass and photoengraving the tracings into reliefs or indentations. The prime distinction between the two men, however, was that Edison had actually constructed a working phonograph while Cros dwelt in the realm of theory. But to say as much does not minimize the Frenchman's vision or imply that he would have been unable, given the proper resources, to translate his theory into a workable product. Certainly, he anticipated Edison's researches by several months.

Cros wrote his paper on April 18, 1877; he deposited it with the Académie des Sciences on April 30. During the twelve-day hiatus, it is believed, the impoverished poet tried desperately to borrow enough money to defray the costs of a patent. But as nobody felt inclined to finance him (for Cros was a scientist without portfolio and reputed to be an impractical dreamer), he tried the next best thing to securing a patent. This was to "go on record" at the Académie by

depositing a sealed paper embodying his ideas. Several months later the apparatus proposed by Cros was discussed by the Abbé Lenoir, a popularizer of scientific developments, in an article published in *La Semaine du Clergé* of October 10, 1877. Lenoir it was who christened Cros's instrument the "phonograph." Finally, early in December, Cros demanded that the sealed paper at the Académie be opened and publicly read, a move presumably stimulated by reports of Edison's successful experiments in America.

The history of invention shows that minds can and do run in the same direction, and at the same time. That Cros and Edison should both have bethought themselves of an instrument to record and reproduce human speech in the year 1877 is surprising but by no means beyond the bounds of probability. Neither is it unreasonable to assume that Edison and the Abbé Lenoir were drawn quite independently of each other to an identical name for the instrument. We know that Edison had referred to his invention as a "phonograph" by mid-December 1877. We know, too, that he could have acquired a copy of the October 10 issue of *La Semaine du Clergé* before this date and that it was thus possible for him to have borrowed Lenoir's designation. But how much more probable it is that he and Lenoir arrived at the name by an identical process of thought, for the word "phonograph" is compounded of two common Greek roots (it means "sound writer") and is, moreover, obviously inspired by the word "telegraph." No, any argument to prove Edison's dependence on parallel developments in France can be based only on the flimsiest of foundations. To whom, then, should the glory for inventing the phonograph go? This is a question on which much fruitless debate can center. Let it be resolved by giving each his due: Charles Cros for being the first to conceive the phonograph, Thomas Edison for being the first to achieve it.

That achievement was soon making its way in the world with appropriate éclat. On the morrow of its invention, Edison took John Kruesi's handiwork to the editorial rooms of



Scientific American, Dec. 22, 1877

EDISON'S ORIGINAL PHONOGRAPH

the *Scientific American* at 87 Park Row, New York City. That journal described the event in its issue of December 22, 1877:

Mr. Thomas A. Edison recently came into this office, placed a little machine on our desk, turned a crank, and the machine inquired as to our health, asked how we liked the phonograph, informed us that it was very well, and bid us a cordial good night. These remarks were not only perfectly audible to ourselves, but to a dozen or more persons gathered around.

The "dozen or more persons" were quickly augmented by other onlookers as word of Edison's curious machine sped through the building. The crowd grew so large that the

editor had to call a halt to the demonstration for fear that the floor would collapse. Reports of the invention appeared in New York newspapers, and some curiosity seekers made the trip to Edison's laboratory in New Jersey to examine the phonograph for themselves.

What they saw and heard was an instrument of crude design and dubious utility. Edison himself later admitted that the tin-foil record "lasted only a few times after it had been put through the machine" and that "no one but an expert could get anything intelligible back from it." Indeed, it was advisable for the listener to hear the words as they were spoken into the phonograph in order that he might comprehend what the instrument uttered. But at the time no one objected. To hear a recording of the human voice, no matter how faultily reproduced, was enough. The crowds came, listened with astonished incredulity to the phonograph's raucous croak, applauded it with gusto, and asked for more.

No time was lost in exploiting the phonograph's growing notoriety. On January 24, 1878, the Edison Speaking Phonograph Company was formed to control the manufacture and exhibition of the instruments. The company gave Edison \$10,000 in cash and contracted to pay him a twenty per cent royalty, in return for which Edison turned over the manufacturing and sales rights of the phonograph. Its commercial value at that time lay solely in its appeal as a curiosity. The company made no false claims for it. An advertisement stated:

The adaptation of this wonderful invention to the practical uses of commerce not having, as yet, been completed in all its mechanical details, this company is now prepared to offer to the public only that design or form of apparatus which has been found best adapted to its exhibition as a novelty.

James Redpath, the founder of a thriving lyceum bureau in Boston, was put in charge of assigning territories to a group

of showmen, who were trained in the technique and care of the phonograph, provided with an instrument apiece and a quantity of tin-foil "blanks," and sent out to cultivate their assigned terrains. The operators were to retain a stipulated percentage of the gate receipts and remit the balance to the company.

For a while business prospered magnificently. As a show property the phonograph won an immediate success. To audiences throughout the country it provided an evening's entertainment always fascinating and usually diverting. It would talk in English, Dutch, German, French, Spanish, and Hebrew. It would imitate the barking of dogs and the crowing of cocks. It could be made to catch cold and cough and sneeze "so believably that physicians in the audience would instinctively begin to write prescriptions." Skeptics would be invited on stage to test the phonograph for themselves; they came and subjected the apparatus to all the different sounds of which the human voice is capable. Then the phonograph would be called upon to demonstrate its musical proclivities. This part of the program would begin soberly enough, but it was likely to end in the kind of high jinks that took place one evening in New York when Edison himself was directing the show and the cornettist Jules Levy was on hand to provide the *materia musica*. A contemporary account described the affair thus:

Fresh tin foil being adjusted on the cylinder, the bell of the cornet was placed near the mouthpiece, and *Yankee Doodle*, first plain, and then garnished with variations of the most decorative character, assumed the form of dots on the foil. Without the loss of a note, the phonograph repeated it, and not only this, but even the peculiar expression imparted by the player, and the triumphant kind of flourish which brought the tune to a conclusion, were reproduced with wonderful accuracy. After several other popular airs had been similarly replayed, Mr. Edison showed the effect of turning the cylinder at different degrees of speed, and

then the phonograph proceeded utterly to rout Mr. Levy by playing his tunes in pitches and octaves of astonishing variety. It was interesting to observe the total indifference of the phonograph to the pitch of the note it began upon with regard to the pitch of the note with which it was to end. Gravely singing the tune correctly for half a dozen notes, it would suddenly soar into regions too painfully high for the cornet even by any chance to follow it. Then it delivered the variations on *Yankee Doodle* with a celerity no human fingering of the cornet could rival, interspersing new notes, which it seemed probable were neither on the cornet nor any other instrument—fortunately. Finally the phonograph recited “Bingen on the Rhine” after its inventor, then repeated the poem with a whistling accompaniment, then in conjunction with two songs and a speech, all this on one tin foil, though by this time the remarks began to get mixed. Just here Levy returned to the charge, and played his cornet fiercely upon the much-indentured strip. But the phonograph was equal to any attempts to take unfair advantage of it, and it repeated its songs, and whistles, and speeches, with the cornet music heard so clearly over all, that its victory was unanimously conceded, and amid hilarious crowing from the triumphant cylinder the cornet was ignominiously shut up in its box.

No wonder that, with such diversion to offer, a single exhibition phonograph could earn as much as \$1,800 per week.

During the first half of 1878, while the phonograph was thus showing its mettle, Edison kept busy designing different models—one of them a disc machine with a volute spiral, which anticipated the form of the phonograph as we know it today. He found it far easier to affix a sheet of tin foil to a flat disc than to a cylinder; but because the quality of reproduction deteriorated sadly toward the center of the disc, Edison soon abandoned it and returned to the cylinder. For a while he experimented—also unsuccessfully—with clock-work motors to take the place of the impractical hand crank. And he designed the Parlor Speaking Phonograph for home amusement, which spoke “loud enough to be heard in any

ordinary room,” used a tin-foil blank with a capacity of 150 to 200 words, and was sold for \$10.

Crude though the phonograph was during those months of its infancy, there was a general feeling that perfection lay just around the corner; and along with this conviction went roseate forecasts of the phonograph’s role in years to come. In an article for the *North American Review* of June 1878, Edison predicted ten ways in which his invention was to benefit mankind:

1. Letter writing and all kinds of dictation without the aid of a stenographer.
2. Phonographic books, which will speak to blind people without effort on their part.
3. The teaching of elocution.
4. Reproduction of music.
5. The “Family Record”—a registry of sayings, reminiscences, etc., by members of a family in their own voices, and of the last words of dying persons.
6. Music-boxes and toys.
7. Clocks that should announce in articulate speech the time for going home, going to meals, etc.
8. The preservation of languages by exact reproduction of the manner of pronouncing.
9. Educational purposes; such as preserving the explanations made by a teacher, so that the pupil can refer to them at any moment, and spelling or other lessons placed upon the phonograph for convenience in committing to memory.
10. Connection with the telephone, so as to make that instrument an auxiliary in the transmission of permanent and invaluable records, instead of being the recipient of momentary and fleeting communication.

This was a remarkably prescient forecast: every application except the articulate clocks has come to pass, though several of them had to wait for fruition until the phonograph was developed far beyond anything Edison had envisaged. To a reporter from the *New York World* the inventor elabo-

rated on his ideas for reproducing music. "Orchestral concerts by brass and string bands" were to be recorded. The phonograph would be attached to a hole in one end of a barrel, and a funnel "like those used in ventilating steamships" would project from the other end. "This," Edison explained, "will receive the music from the entire orchestra, but of course not reproduce it with so great a volume. Piano music will be phonographed by a hood being placed over the instrument, and the volume of the reproduction will be one-fourth that of the piano."

The privilege of speculation was not restricted to the phonograph's inventor. In that great era of invention, every mortal exercised his imagination in elaborating on the utility of science's latest boons. It was suggested that "public speakers repeat their speeches to the phonograph, and then twenty-four hours later have the phonograph play their words back to them that they might prevent themselves from making rash or overheated or silly remarks." An irreverent wag "didn't see but that now clergymen and choirs were out of date. The phonograph could repeat service every Sunday and run off old sermons with wonderful accuracy." Another proposal was "to erect statues of popular speakers in life size, Mr. Henry Ward Beecher for instance, reproduce his speech in tin foil, put a phonograph inside of him (the statue, not the man), and stand him on a platform to repeat the new lecture on the 'Wastes and Burdens of Society.'"

Everyone had a wonderful time—for about half a year. Then the bubble broke. For after you had listened to the apparatus and chuckled over the stunts it could perform, what was left? The phonograph, in truth, had been launched prematurely. It was all very well to talk about dictating letters into the phonograph or using it to read *Nicholas Nickleby* to the blind, but not when a tin-foil cylinder would play for scarcely more than a minute and give forth only the

barest approximation of human speech. And it was all very well to rapturize about the inspiring concerts of music that the instrument was to provide, but not when the sounds it emitted were a grating, metallic travesty of what had been recorded and when the tin-foil records would wear out after half a dozen playings. In the first flush of enthusiasm writers



SOME ATTENTIVE PHONOGRAPH LISTENERS IN 1878

had prated of the "absolutely perfect reproduction of the voice," just as they were to continue to do regularly for the next century. But a hardheaded Britisher, Sir W. H. Preece, has left us a more accurate description of the tin-foil phonograph's capabilities:

The instrument has not quite reached that perfection when the tones of a Patti can be faithfully repeated; in fact, to some extent it is a burlesque or parody of the human voice. . . . There are some consonants that are wanting altogether. The *s* at the beginning and end of a word is entirely lost, although it is heard slightly in the middle of a word. The *d* and the *t* are exactly the same; and the same in *m* and *n*. Hence, it is extremely difficult to read what is said upon the instrument; if a person is put out of the room and you speak into it, he can with difficulty translate what it says.

And so the crowds at the phonograph exhibitions thinned away as quickly as they had once appeared, and the Edison Phonograph Works after producing about five hundred exhibition instruments ground to an abrupt halt. Undoubtedly the inventor could have rescued the phonograph from its decline, could have improved it to the point of commercial feasibility. But by then his mind had struck out on another path. In July 1878, Edison had traveled to Wyoming in company with several eminent scientists to witness a total eclipse of the sun. During that trip the suggestion was repeatedly made that Edison apply himself to the perfection of a cheap and efficient electric light. On his return, Edison was further encouraged by a group of investors who offered to finance his work on the electric light—no matter what the cost. Edison did not delay long. By October 1878, he had cast aside all other work and was immersed in experimentation on the incandescent lamp. The phonograph itself entered into a total eclipse, and the ingenious tin-foil apparatus joined the printing telegraph, the motograph, the electric pen, and numerous other Edison inventions which had experienced brief reigns of glory only to be abandoned and forgotten in the wake of newer scientific marvels.

In its first report on the phonograph the *Scientific American* had averred that "the voices of such singers as Parepa and Titiens will not die with them, but will remain as long as the metal in which they may be embodied will last," the reference being to two famous singers who were recently deceased. But unfortunately voices continued to die during the decade that the phonograph lay dormant. Mankind gained the incandescent lamp, but posterity lost Jenny Lind and Franz Liszt.

2 CYLINDERS IN BUSINESS

WHEN EDISON DESERTED THE PHONOGRAPH, IT WAS INEVITABLE that others would intervene and proceed from where he left off. So auspicious an invention could scarcely be expected to remain forever in an obscure and half-realized state. The wonder is not that the phonograph was subsequently developed outside Edison's laboratory, but that it languished unattended for as long as it did.

From 1879 to 1887 the phonograph went into torpid retirement. The tin-foil apparatus had had its day; the public had lost interest; the glorious prophecies were unfulfilled. But though the phonograph had fallen on dismal days, memories of it and a divination of its promise continued to haunt a few isolated souls. One of these was Alexander Graham Bell, who had applauded its birth and followed its infancy with attentive interest. Through his father-in-law, Gardiner G. Hubbard, one of the original stockholders in the Edison Speaking Phonograph Company, Bell had kept a close watch on the early progress of the invention. It is even possible, though no documentary evidence can be offered in proof, that toward the end of 1878 Bell offered to collaborate in the future development of the phonograph. But this proposal—if indeed it was ever made—could only have met with a cool response from Edison, who was by then concentrating his energies wholly on the electric light.

We know, at any rate, that Bell subsequently proceeded on his own. With the \$10,000 Volta Prize, which he received

in 1880 from the French government for his invention of the telephone, Bell financed a laboratory in Washington, D. C., to promote research relating to sound and acoustics. In this project he associated with him his cousin Chichester A. Bell, a chemical engineer, and Charles Sumner Tainter, a scientist and instrument maker. One of the goals toward which they aspired was the improvement of Edison's forsaken phonograph.

Their work followed various courses. In searching for the best answer to their problem, they devised and patented elaborate methods for transmitting and recording sound by means of gaseous or liquid jets and by means of radiant energy. One of the air-jet models was deposited in the Smithsonian Institution on October 17, 1881. On this machine Charles Sumner Tainter recorded a quotation rather more apt than the nursery rhyme favored by Edison; he chose a line from *Hamlet*: "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy." After years of experimentation, Chichester Bell and Tainter discarded their jets of air and beams of light, and settled instead upon a method basically the same as Edison's, though refined in several important particulars. In the place of Edison's tin foil they prescribed cardboard coated with wax, in which the recording stylus engraved the pattern of its vibrations in narrow grooves. And in place of Edison's rigid reproducing needle they devised a loosely mounted stylus which could more easily be guided by the record. On June 27, 1885, Bell and Tainter applied for a patent on this apparatus, which was granted May 4, 1886. It specified a disc record; but in one of those curious vacillations between disc and cylinder which seemed to afflict all the recording pioneers, Bell and Tainter soon after decided upon the cylinder as better suited to their purposes. Early in 1887 the Bell-Tainter cylinder machine was put on public view in Washington, D. C. It was named the "graphophone."

Clearly, Edison's tin-foil phonograph had been outpaced. Judged by the standards of 1920—to say nothing of those of 1977—the Bell-Tainter graphophone was a crude and imperfect artifact; but compared to the raucous phonograph of 1878, it performed with dulcet clarity. The use of wax allowed for sharper, better defined recording, though not so loud; one could hear an early wax recording properly only through ear tubes. Wax also permitted closer grooving than had tin foil and thereby increased the number of words that could be recorded in a given surface. The "floating stylus" represented a distinct forward stride in converting the engraved impressions into recognizable sound. And the constant speed provided by the graphophone's foot-treadle mechanism, or electric motor, did away with the bizarre fluctuations of pitch that prevailed with Edison's hand crank.

Before unveiling the graphophone in public, Bell and Tainter had sent emissaries to the Edison Electric Light Company to apprise the inventor of what they had wrought. Their purpose was to enlist his co-operation in perfecting the instrument and launching it commercially. According to Alfred O. Tate, Edison's personal secretary at the time, the Bell-Tainter representatives acknowledged:

that their work was merely the projection and refinement of his [Edison's] ideas, and that they now wanted to place the whole matter in his hands and to turn their work over to him without any public announcements that would indicate the creation of conflicting interests. . . . They had named [their] instrument the graphophone to differentiate it from the phonograph, but if Mr. Edison would join them they would drop this name and revert to the original designation.

The proposed entente had no appeal for Edison. He looked upon Bell and Tainter as trespassers and usurpers, and he vowed to improve the phonograph himself and beat the upstarts at their own game.

The incandescent lamp had by then been perfected and a great electric lighting industry established; the time was propitious for fresh endeavor. In Edison's new laboratory in West Orange the phonograph was given priority over all other efforts. By October 1887 enough had been accomplished for Edison to make a public announcement. To a reporter from the New York *Evening Post* he said:

You know that I finished the first phonograph more than ten years ago. It remained more or less of a toy. When the electric business assumed commercial importance, I threw everything overboard for that. Nevertheless, the phonograph has been more or less constantly in my mind ever since. When resting from prolonged work upon the light, my brain would revert almost automatically to the old idea.

Thus sprouted the carefully nurtured legend that Edison had never deserted his "favorite invention," that he had intended always to improve it. The chronology, however, shows no constructive moves on his part until the Bell-Tainter developments had been announced. What is more, the improved Edison phonograph, as it eventually emerged from his laboratory, bore a strikingly close resemblance to the graphophone. It too employed "wax" (actually a wax-like compound) as the recording material and utilized the principle of the "floating stylus." The prime difference between the two lay in the fabrication of the records—or phonograms, as they were then called—the graphophone's being made of wax-covered cardboard while the phonograph's were of solid wax. In practice, the distinction meant that Edison cylinders could be shaved and used over and over again while graphophone cylinders had to be discarded much more quickly. Solid wax thus represented a decided gain in utility, and the graphophone soon appropriated the idea. Still, the essential modifications had been devised not by Edison, but by Chichester Bell and Charles Sumner Tainter.

While Edison continued to bombard the press with news

of his improved phonograph, the laboratory at Orange concentrated on producing a model adapted to commercial exploitation. This prototype finally emerged on June 16, 1888, after Edison and some associates had labored continuously for five days and nights. A photograph of Edison taken at the conclusion of this travail shows his hair wildly tousled, his expression forcefully determined, his posture dramatically fatigued. The picture summed up convincingly Edison's celebrated credo that genius is ninety-nine per cent perspiration, and for years to come it did duty as propaganda for the inventor and his phonograph. But Edison had not labored five days and nights merely to provide good advertising copy. This toil was rather the crowning episode in an attempt to overtake the progress of the graphophone, which had been sold by Bell and Tainter to a group of capitalists and was being marketed by the American Graphophone Company from its headquarters in Washington, D. C. This company, organized in June 1887, had as yet been unable to exploit its year's head start with much success. Its strategy had been to introduce the graphophone as a dictating machine and to let the instrument win its sovereignty in the vast government offices of Washington. But the apparatus was far from foolproof at the start, and of the few graphophones manufactured even fewer were placed in operation.

By the spring of 1888, after vexatious trial and error, the graphophone was at last beginning to make some headway. Edison had to meet the challenge without delay by producing a competing model. He had also to find financial backing. The investment house of J. & W. Seligman evinced some interest, and a demonstration was scheduled at Edison's laboratory. When the bankers arrived on the appointed day, Edison sat down before the instrument, set it in motion, and dictated a short letter into the mouthpiece. He then lowered the reproducing stylus into place and prepared to let the

phonograph sell itself to his assembled guests. But instead of parroting the words he had just spoken, the phonograph emitted nothing more than an ugly hiss. Was it showing its contempt for the leaders of finance? Edison made some small adjustments, inserted a fresh cylinder, and dictated another letter—with the same humiliating result. After some further abortive tries, the Seligman entourage took their leave, promising to return when Edison had the instrument in working order. The defect was quickly repaired, but the Seligman people never paid a second visit. Their lack of enthusiasm was understandable, though in the long run it proved costly. For when J. & W. Seligman and Company finally did buy into the phonograph business, thirty-eight years later, the price of entry was \$40,000,000.

If the phonograph would go out of order under Edison's own expert handling, it is no wonder that the instrument made slow progress in securing the esteem of others. Even so partisan an organ as the *Scientific American* had to acknowledge that the phonograph was "not yet reduced to that simplicity and perfection of operation necessary for its general sale and introduction. . . . To get really satisfactory results, we believe it needs the employment of an expert to watch, adjust, and work the instruments." But the waywardness of the phonograph, its habit of performing beautifully on one occasion and breaking down completely on the next, did not deter its early devotees. With stubborn zeal they proceeded to put the phonograph through its paces.

Like the graphophone, Edison's improved phonograph of 1888 employed an electric motor powered by heavy-duty batteries. This assurance of a constant speed for recording and playback, together with the superior qualities of wax as a recording medium, tempted Edison to make a few shies at recording serious music. In 1888 the pianist Josef Hofmann, then a boy of twelve, visited the Edison laboratories to inspect the phonograph and engrave some cylinders. These were the

Cylinders in Business

first recordings to be made by any recognized artist. Not long after, the famous German musician Hans von Bülow came to examine the new apparatus. He recorded a Chopin mazurka, then put the tubes to ears and waited for the playback. What he heard caused him to faint dead away—though whether he was laid low by his own playing or merely by the poor reproduction of it has never been divulged. The Bülow cylinder itself, like so many recorded documents of this period, has disappeared. Its musical value was probably slight, for the two-minute playing time of a wax phonogram



CORNETIST RECORDING, 1889

did not encourage musicians to record works of great consequence. But a snatch of Bülow would be better than none at all, and collectors will continue to look for a surviving copy of this Edison test record, probably the only recording that the celebrated pianist ever made. In England that same year an Edison phonograph was set up in the press gallery of the Crystal Palace during the annual Handel festival. According to the *Illustrated London News*, it "reported with perfected accuracy the sublime strains, vocal and instrumental, of 'Israel in Egypt.' "

The celebrities who made their record debuts were not

only musical ones. Henry M. Stanley visited the Edison laboratory and left a waxing of his voice; but he did *not* choose to leave for posterity the words "Dr. Livingstone, I presume." And at the Paris Exposition of 1889, William Ewart Gladstone, an early admirer of Edison's, recorded a message of appreciation to be sent to the inventor.

While the phonograph was being thus rebaptized, Edison and the American Graphophone Company readied themselves for a bitter patent fight. Edison felt himself powerless to sue. His American patent of 1878 specified a process of "embossing or indenting" the recording material. Edison employed those terms because they applied to the tin foil he then used, and by so doing he lost a "basic patent" on the phonograph. For when Bell and Tainter came to patent their graphophone, they circumvented the Edison patent by prescribing a process of "engraving" the recording material. Embossing or indenting merely changed the shape of the recording material, they pointed out, while engraving involved actual removal of material. It was, to be sure, a subtle verbal distinction, but on it Bell and Tainter had erected a patent which Edison considered impregnable. Ten years before, he might have been inclined to fight it. But mounting experience had caused him to lose faith in the efficacy of patent protection. "The burden of proof," he complained, "is now put entirely on the man who holds the patent instead of the man who wishes to infringe it."

But though Edison would not sue for patent infringement, the Graphophone interests were eager for litigation. Edison's improved phonograph they saw as a direct embodiment of the Bell-Tainter principles. Did it not engrave wax in a gouge-cut groove and employ the principle of the "floating stylus"? Lawyers on both sides began preparing briefs to present in court. The arguments they mustered are pro pounded with heat to this day—for the phonograph-graphophone controversy has refused to die. There are still those

who believe that Bell and Tainter "stole" Edison's invention, just as there are others who maintain that Bell and Tainter are the true fathers of the phonograph (Edison's tin-foil instrument being dismissed as an unsuccessful, stillborn first attempt). Neither argument is valid. The partisans of Edison might remember that any patent invites improvements and modifications, and that if the patentee does not make them others undoubtedly will. And the partisans of Bell and Tainter might bear in mind that the graphophone was originally introduced as a refinement of the tin-foil phonograph, with full credit going to Edison for the basic conception.

In 1888 reason on this subject prevailed more readily than it does today. Just as litigation was coming to a head, a third party entered the scene and temporarily harmonized the conflict.

He was Jesse H. Lippincott, a businessman from Pittsburgh who had sold a controlling interest in the Rochester Tumbler Company for \$1,000,000 and was looking for a new industry in which to invest his cash. A friend suggested the Graphophone to him as a promising venture.* Lippincott investigated, was impressed with its potential earning power, and negotiated an agreement with the American Graphophone Company whereby he invested \$200,000 and became sole licensee of the company with exclusive rights to exploit the Graphophone in the United States. By the terms of this agreement, the American Graphophone Company continued to manufacture the instruments in its Bridgeport plant, while Lippincott assumed control of sales.

Lippincott did not stop there. This was the heyday of the trusts, those giant combines which consolidated allied industries under one over-all management, and Lippincott fol-

* Although the word "graphophone" was originally coined by Bell and Tainter to denote a generic piece of equipment, it did not enter the vocabulary as such. Instead, it was understood to refer to a brand of phonographs manufactured by the American Graphophone Company—and hence deserves a capital G from this point on.

lowed the trend of the times. Once he had completed negotiations for the Graphophone, he started dickering for the rights to the Edison phonograph. His proposal was well timed. Edison wanted to begin manufacture of his improved phonograph and needed financial backing. Lippincott provided it in the amount of \$500,000, for which he secured Edison's patent rights, leaving the manufacturing rights in Edison's hands. To handle the business, Lippincott formed the North American Phonograph Company, which was organized July 14, 1888.

By the autumn of 1888, Lippincott was in control of the entire talking-machine industry in the United States. Everyone concerned had profited from his largess except the lawyers. For now that the phonograph and the Graphophone were represented by the same company, squabbles between them temporarily ceased and all litigation was canceled. The Edison and Graphophone companies turned from patent suits to the problems of manufacture, and Lippincott began the task of shaping his North American Phonograph Company into an effective sales agency. After ten indecisive years of infancy, the phonograph was ready to prove itself on the open market place.

Alas, it had the misfortune to be launched by a misguided skipper. Jesse Lippincott was blind to the phonograph's great potentialities. A businessman himself, he saw it solely as an implement of business. And he compounded this lack of vision by confusing the phonograph with the telephone. In two disastrous particulars Lippincott modeled his phonograph company on the developing telephone system. First, he divided the country into territories and sold "states' rights" for exploitation of the phonograph to territorial subsidiaries. Second, he adopted the policy of leasing, rather than selling, the instruments—the annual rental of \$40 being split between the parent company and the subsidiary in whose territory the instrument was leased. Had the phono-

graph really succeeded as an office dictating machine, these decisions might not have proved so costly. As it was, they were almost catastrophic.

Throughout its first year of business, the North American Phonograph Company was engaged principally in distributing territorial franchises. Altogether, thirty subsidiary companies were organized, and all but one started off by losing money. Both the Edison and Graphophone factories ran into production difficulties, and what instruments they did manage to manufacture quickly went out of order and had to be recalled. Only the Columbia Phonograph Company (covering Maryland, Delaware, and the District of Columbia) paid a dividend in 1889—mainly because it had inherited the already established business of servicing Graphophones in government offices. The next year began somewhat better. Mechanical kinks had been straightened out, and production in both factories was keeping pace with demand. But that demand stayed far below expectations. The phonograph did not revolutionize the ways of commerce as its proponents had hoped. A few government bureaus, a few professional people, a few scattered offices were loud in its praise; but most of the nation's business continued to be conducted as before, with the aid of flesh-and-blood stenographers. The latter, faced with the prospect of losing their jobs, did their utmost to retard the phonograph's progress. When a phonograph was on trial in a business office, the alarmed stenographers (still predominantly male) would make sure that it developed such serious defects as to make it impracticable for their employer's use. Under these circumstances, phonograph rentals ran far below what Jesse Lippincott had envisioned when he organized the North American combine. After two years of unprofitable operations, the strain on Lippincott's health and finances proved more than he could bear. In the fall of 1890 he was stricken with paralysis. A few months later, being unable to meet his obligations, he

lost control of the North American Phonograph Company, and Edison—as its principal creditor—assumed direction of the enterprise.

His first move was to abandon the misguided rental policy. Thenceforth, phonographs could be bought outright, for \$150 each in 1891. This was a well-directed step, but Edison went no further. He persisted in Lippincott's mistake of viewing the phonograph primarily as an instrument for office dictation. Edison was no longer the young man of thirty-one who had jocundly entertained large audiences with his tin-foil phonograph. He was now well into his forties, the proprietor of an overstuffed Victorian home, and an aspirant in the world of big business. He could not or would not countenance the potentialities of the phonograph as a medium of entertainment. He insisted that it was not a toy. He resented its use for amusement. And for years he deliberately discouraged the development of the phonograph as a musical instrument.

But there the phonograph was, ready and willing to reproduce the popular airs of the day; and since he would not encourage it along these lines, others did. The major subsidiaries of the North American Phonograph combine took the initiative. One by one, they began to offer the phonograph for coin-in-the-slot operation in public places and to produce professionally recorded wax cylinders of musical selections. The unsung genius who first conceived this prototype of the latter-day jukebox revivified a faltering industry. With its heavy, acrid storage batteries, the phonograph was too troublesome for the average home; it was also far too costly for the average wage-earner. But the demand for recorded entertainment existed, and the nickel-in-the-slot phonograph met it with immediate success. The strains of Sousa marches and Stephen Foster melodies quickened the tempo of phonograph business from Massachusetts to California.

Edison, in his house organ, *The Phonogram*, deplored this turn of events. In its very first issue of January 1891 that journal editorialized:

Those companies who fail to take advantage of every opportunity of pushing the legitimate side of their business, relying only on the profits derived from the "coin-in-the-slot," will find too late that they have made a fatal mistake. The "coin-in-the-slot" device is calculated to injure the phonograph in the opinion of those seeing it only in that form, as it has the appearance of being nothing more than a mere toy, and no one would comprehend its value or appreciate its utility as an aid to businessmen and others for dictation purposes when seeing it only in that form.

But as the territorial companies would have gone bankrupt pursuing "the legitimate side of their business," such pronunciamentos understandably carried little weight. It was quickly discovered that while business offices took a chill view of the phonograph as a medium of dictation, neighborhood drugstores and saloons welcomed it as a medium of entertainment. The nickels with which the local citizenry commanded renditions of Sousa and Foster mounted up at a most lucrative rate. One coin-operated phonograph installed in a well-situated New Orleans drugstore averaged \$500 a month in receipts. In 1891 this was claimed to be the most profitable phonograph in the country. They did not all reach such exhilarating heights. The average nickel-in-the-slot phonograph earned about \$50 a week—which was still an excellent return on the original investment.

At last the phonograph had caught the public's ear; and whatever Mr. Edison might say about it, the local companies were going to tout its entertainment value for all it was worth. But what kind of entertainment did it purvey? What did the customer hear when he had deposited his nickel and donned the ear tubes with grinning anticipation?

3 ENTERTAINMENT FOR A NICKEL

WHEN COMMERCIAL RECORDING GOT UNDER WAY IN THE YEAR 1890, the phonograph industry was burdened with three grave handicaps. First, the quality of reproduction was extremely poor. Only a fraction of the tonal spectrum could be caught in wax, and even that fraction issued from the ear tubes in so blurred and indistinct a manner as to make any resemblance to real music almost coincidental. Second, the wax cylinders played for a maximum of two minutes, which was too short a playing time to be productive of really satisfying musical results. Third, and most important, there was no method of duplicating cylinders; as a consequence, every recording sold was necessarily a custom-made product.

None of these handicaps was insurmountable—as events a decade or so later proved—and had Edison been disposed to encourage the entertainment side of the phonograph industry, they might all have been overcome much sooner. But because Edison was not so disposed, the industry had to adapt to the *status quo*. Was the tonal gamut limited? Very well, cylinder recordings would be limited to brass bands, cornet solos, and whatever else happened to fit into the phonograph's restricted compass. Was the playing time of scant duration? In that event, two minutes of music would have to do. Had no duplicating process been devised? Then the industry would have to hire artists willing to record the same piece again and again until the demand was satisfied. What resulted from these compromises was not especially

noteworthy. But given the dimensions within which the industry had to work, it is difficult to see how anything better could have been expected.

Consider a typical recording session in the early Nineties as it progressed in the headquarters of the New York Phonograph Company, 257 Fifth Avenue. In the center of a large room are grouped members of Cappa's Seventh Regiment Band of New York; they are surrounded by ten phonographs in a circle, each one equipped with a giant metal horn. An attendant has checked all the batteries and has inserted a fresh wax cylinder in each machine. Now the recording engineer steps before the horn of the first phonograph, starts up the motor, and announces in stentorian tone: “‘My Country ‘Tis of Thee,’ played by Cappa’s Seventh Regiment Band, record taken by Charles Marshall, New York City.” He stops the motor, steps over to the second phonograph, and repeats the same announcement—and so on, through the group of ten. (“A musical record,” Mr. Marshall believed, “is half made by a perfect announcement. Nothing is more gratifying to a listener to a phonograph than a clear and distinct announcement at the beginning of the record.”) When every cylinder has been inscribed with an announcement, all ten motors are started up simultaneously. Music pours into the big horns until each cylinder has received as many sound impressions as it can hold, whereupon Mr. Marshall holds up his finger, and the band comes to a full stop at the end of the next musical phrase. If “My Country ‘Tis of Thee” has not run its full appointed course, no one seems to worry much. The recorded cylinders are taken off the instruments and put aside in pasteboard boxes, and fresh ones are inserted. Again, the title of the selection is shouted into each horn, the band is given the signal to play, and the process is repeated. Now and then, if there is a little space left at the end of the cylinders, the band indulges in a wild burst of applause, shouting and stamping in fervent approbation of its

own performance. The session lasts for three hours; and if all goes well, the New York Phonograph Company will have three hundred cylinders ready for sale the next day, at a dollar apiece.

Similar scenes were taking place at every major subsidiary of the North American Phonograph combine. Each branch had its own specialties, but for range and extent of repertoire none could equal the Columbia Phonograph Company in Washington, D. C. From the very beginning, as an off-shoot of the American Graphophone Company, the Columbia firm had pushed ahead of its fellow subsidiaries. Under the aggressive management of Edward D. Easton, an ex-court reporter and one of the original stockholders of the Graphophone Company, Columbia was rapidly assuming leadership in the field of commercial recording. It had signed an exclusive contract with the United States Marine Band, under its brilliant conductor John Philip Sousa, and was busily producing recordings of marches that were to become the most popular cylinders in America. By 1891 Columbia had already issued a catalogue of its recordings, tiny in format and only ten pages long. There were twenty-seven marches listed, beginning with Sousa's *Semper Fidelis* and ending with the *Phonograph* March (by a composer named Campagna); thirteen polkas, including the *Anvil Polka* recorded with "real anvils"; ten waltzes, of which two were by Johann Strauss and two featured Spanish castanets; and thirty-four items listed as "miscellaneous," comprising the major national anthems, some well-known hymns ("with bell tolling"), and one operatic arrangement from Verdi's *Il Trovatore* identified as "*El Misererie*." After the Marine Band recordings came Columbia's next-ranking attraction, John Y. AtLee, the famous artistic whistler. Mr. AtLee spent his days working as a government clerk, his evenings making Columbia recordings in which he sang and whistled an assortment of popular airs. The 1891 catalogue listed thirty-six AtLee selections, among

them "The Mocking Bird," "Home, Sweet Home," and "Marching through Georgia." The piano accompaniments were by "Professor Gaisberg," a lad in his teens who would play a leading role in the history of recording for the next fifty years. The remaining recordings listed in this early catalogue were anonymous; there were thirteen selections for clarinet and piano, nine for cornet and piano, and thirty-two songs for voice and orchestra divided into categories labeled: "Sentimental," "Topical," "Comic," "Negro," and "Irish." Finally, there were twenty speaking records under the heading "The Auctioneer"; *Sale of Dime Museum* ("with parrot imitations") and *Sale of Red-Haired Girl* ("with white horse accompaniment," whatever that might have been) were typical items.

By the early Nineties the Columbia Company was disposing of between three hundred and five hundred cylinders daily. Because a singer could record at most three cylinders at a time and a band at most ten (the circle of recording horns could be enlarged in proportion to the greater volume), selections had to be repeated without end in the recording studio—no matter how weary the United States Marine Band must have grown of *Semper Fidelis* and John Y. AtLee of his popular "Mocking Bird." Only thus could the company keep stocked with the titles listed in its catalogue. Cylinders were sold mostly by mail, were warranted to be loud, clear, and free from defects, and could be returned when worn out as partial payment for new ones. They went principally to operators of coin-in-the-slot phonographs. There was, to be sure, a certain market among individuals who owned phonographs and employed them for purposes of amusement; but until 1895 home listeners were in a small minority. The phonograph of 1889–95 was priced far beyond the means of most householders. Edison's Electric Motor Phonograph of 1893, equipped with batteries, ear tubes, blanks, and sundries, sold for \$190. In 1893, with

the dollar worth many times its present value, that seemed a lot to pay for a phonograph.

To make the price seem less onerous, imaginative minds worked overtime thinking of new and wonderful functions for the phonograph to perform. A go-getter in the Columbia firm dreamed up the idea of an "advertising phonograph," for which the company made cylinders that interspersed spoken advertisements with musical selections, humorous anecdotes, et cetera. The passer-by whose attention was captured by an advertising phonograph would hear something like this: "Good morning. Are you aware that John Smith is today selling the cheapest and best spring overcoat ever offered; only \$10 each? You will now hear the celebrated United States Marine Band playing 'Marching through Georgia.'" Then the band was heard to play a few snatches, after which the cylinder continued: "You like that music, I am sure. Well, you will be just as much delighted with Mr. Smith's overcoats. For quantity and quality they cannot be excelled. Listen now to a bit of artistic whistling by John Y. AtLee, the world-renowned whistler." Then came a few strains from the *Chirp, Chirp* Polka before the cylinder continued: "Can't he whistle, though? Yes, indeed; but he is no more satisfactory in his line than is Mr. Smith in the clothing line." Phonographs to play such cylinders could be installed either inside or in front of a store and were operated simply by pressing a button. (One was not required to pay a nickel for an advertisement.) According to a Columbia brochure, "the men who have machines state that they have greatly increased their business by this novel way of advertising. The throngs who come to see the instrument leave so much money for purchases that the slight cost of the machine and supplies cuts a small figure in the calculation."

Another idea man in the Columbia organization put out an appeal to the illiterate businessman. Instead of writing

ungrammatical letters, he was urged to communicate by inscribing a phonograph cylinder and mailing the cylinder itself to the addressee. In this way, it was stressed, "poor writers and spellers are enabled to communicate by mail without disclosure of their educational defects."



"Signor Foghorni, the great Hibernian basso-tenore robusto-profondo, is so disgusted at the frivolity of contemporary musical taste (which is not ripe enough to appreciate him), that he gives up all attempts to please the present generation: he buys a phonograph, instead, and devotes his energies to singing for posterity. By applying his ear to this marvellous instrument immediately after singing into it, he not only hears his song echoed back to him out of the dim future, but he also hears the rapturous applause of unborn millions!"

"THE REAL MUSIC OF THE FUTURE" AS DEPICTED BY PUNCH IN 1888

Someone suggested using the phonograph as a musical composing machine by playing favorite airs backward on it. "A musician could get one popular melody every day by experimenting in that way."

A leading medical journal asserted that the phonograph opened up vistas delightful to contemplate. It painted a picture of the future in which the phonograph would:

reproduce the sob of hysteria, the sigh of melancholia, the singultus of collapse, the cry of the puerperal woman in the different stages of labor. It will furnish the ring of whooping cough and the hack of the consumptive. It will be an expert in insanity, distinguishing between the laugh of the maniac and the drivel of the idiot. It will give the burden of the story of the old lady who recounts all the ills of her ancestors before proceeding to the era of her own. More than this, it will accomplish this feat in the ante-room, while the physician is supposed to be busying himself with his last patient. Last, but not least, it will simultaneously furnish to the medical philosopher the grateful praises and promises of him who is convalescent from dangerous illness, together with the chilling accents in which, later, the doctor is told that he must wait for his remuneration till the butcher and baker have been paid.

These intriguing side lines notwithstanding, the phonograph was striding ever more boldly into the arena of entertainment. By 1893 the Columbia catalogue had grown to thirty-two pages. The number of marches recorded by the United States Marine Band had jumped from twenty-seven to eighty-two, representative of a like increase throughout the catalogue. George H. Diamond was augmenting an expanding list of vocal records with such gems as "You Will Never Know a Mother's Love Again" and "Have One on the Landlord with Me." Foreign-language courses recorded by Dr. Richard S. Rosenthal were offered; the price included fifty cylinders, a set of books, and the right to correspond with the good Herr Doktor. And "to meet a growing de-

mand," Columbia had added to its catalogue a whole new section of recitation records. Charles B. Hanford, a leading tragedian of the day, was represented in twenty selections, among them twelve snatches from Shakespeare.

By the mid-Nineties speaking records were in great vogue. Unquestionably the most popular pre-1900 recording artist was the monologist Russell Hunting, originator of the famous Casey series, who recorded first for the New England Phonograph Company and later for a multitude of others. To this day veteran record collectors will chuckle, in recollection, over Hunting's *Casey as a Judge*, which—like most of his recordings—consisted of rapid-fire exchanges between two Irish characters. Hunting was a young supporting player in the Boston Theater Company when he first began to make cylinders. He was an early enthusiast of the phonograph and had leased one for his private amusement before he thought of making records for sale. When the Boston Theater was empty, he would set up his phonograph on stage, attach a large horn to the reproducing stylus in place of the usual rubber ear tubes, and test its efficacy in reaching the farthest rows of the gallery. Hunting realized during these experiments how well suited his own voice was to phonographic reproduction. Not everyone could make successful speaking records in the 1890s. The record of an unpracticed speaker, a contemporary account complained, "will consist of a confused medley of harsh, grating, unintelligible sounds." One needed a voice with a timbre susceptible of intelligible recording; one needed, too, to learn how to enunciate and modulate the voice, and to know at what speed to talk and at what angle the voice should strike the horn. Part of Hunting's success lay in the audibility of his cylinders, part in the virtuosity of his performances. He covered a wide range, from the boisterous humor of his Casey recitations to the tearful pathos of *The Dying Soldier*. His recordings were extraordinary one-man shows; in *The Steamboat*, for

instance, he assumed ten different voices in addition to supplying all the sound effects, and even Edison—prejudiced as he then was against such efforts—acknowledged this to be the most remarkable record ever made on a phonograph. Russell Hunting, like Fred Gaisberg, was to enjoy a long career in the phonograph industry. He was active, first as a performer and later as an entrepreneur and recording engineer, until the 1920s.

Second only to "Michael Casey" in popularity was a mythical phonograph character called "Pat Brady," as recorded by Dan Kelly for the Ohio Phonograph Company. Kelly was an old-timer in show business who had begun his recording career with some cylinders of Shakespearean recitations and unaccompanied songs. It then occurred to him that an imitation of a courtroom scene he had witnessed as a boy might be suitable for the phonograph. He called it *Pat Brady's Plea in His Own Defense*. This cylinder far outsold the Shakespearean recitations and the songs, and soon Kelly's rich brogue was to be heard in dozens of Pat Brady scenes, such as *Pat Brady before the Election*, in which Pat dispensed some extravagant promises to the electorate, or *Pat Brady and the World's Fair at Chicago*, in which he exposed his views on what countries should send representatives and who should stay away. In 1893 an encomiast wrote that "wherever mankind appreciates the peculiar wit and humor of Irish character, that comical Irishman, Pat Brady, is always in demand, and it is not at all uncommon to see ladies and gentlemen standing in line before an automatic phonograph in many of our larger cities to hear him sing and talk."

There were many singers, too, building up reputations by way of the phonograph: Will F. Denny, "a tenor of pure tone and much pathos," who recorded popular songs of the day; Len Spencer, a son of the handwriting expert, who specialized in Negro songs interspersed with shouts, humorous asides, and touching sayings according to the temper of the

verse; George J. Gaskin, a tenor whose forte was pathetic ballads; Dan Quinn, a specialist in musical comedy hits; George W. Johnson, a Negro with an infectious laugh, who became famous for his record of "The Whistling Coon." Such were the major musical personalities of the phonograph during the decade of the Nineties.

But where were the celebrated divas and symphony orchestras? And what happened to the operas and concertos that were to be captured by the phonograph for the edification of the present and the benefit of the future? Since 1878 the press had been predicting for Edison's invention a vital role in the forward march of musical culture. "The voice of Patti," was a phrase that fell easily from the editorialist's pen when it was called upon to praise the wonders of the phonograph. But one will search uselessly through the catalogues of those early years for mention of any Patti cylinders. This is saddening but hardly surprising. Who could have expected Patti to make commercial recordings in the 1890s. That temperamental lady would certainly have boggled at the proposal to sing "*Casta Diva*" several hundred times over before the recording horn—even if the phonograph had been capable of doing justice to her voice, which it was not. The time was not yet right for enterprises of serious musical substance. Major technical drawbacks combined with a lack of vision to form the restricted repertoire of the Nineties. For a decade the chattering of a Michael Casey and the lachrymose balladmongering of a Dan Quinn were to rule the record grooves.

Whatever the ultimate artistic value of their efforts, these recording artists of the early Nineties succeeded in casting the phonograph in its rightful role. By 1894 Edison had to admit that his objectives needed an overhauling. After having opposed the idea for years, he finally agreed to promote the phonograph as a medium of entertainment, and he began to outline the design of a simpler and far cheaper model—

one that would fit the means of the average American family. But before he could proceed with these plans, Edison felt obliged to liquidate the North American Phonograph Company. Jesse Lippincott's cumbersome sales organization had been discredited by sad experience. Most of the subsidiaries were quiescent, and the active ones kept invading each other's territories and cutting each other's throats. Edison deemed it essential to regain the right to sell phonographs directly from his factory instead of having to deal through thirty autonomous subsidiaries; and to this end, early in 1894, he threw the North American Phonograph Company into bankruptcy.

For two years the phonograph industry fell into turmoil. Edison was restrained by law from selling phonographs to anyone, pending settlement of the receivership. With the important exception of Columbia, the territorial companies —cut off from a fundamental source of supply, and each with a huge investment tied up in the bankrupt parent company —began to founder one by one. While Edison struggled to extricate himself from the ruins of Lippincott's empire, the American Graphophone Company seized the opportunity to till the field singlehanded. Having dealt originally with Lippincott as an individual and not with the North American Phonograph Company, the Graphophone enterprise was exempt from the legal restraint imposed upon Edison. The close relationship between the Columbia and Graphophone companies was now cemented under the over-all management of Edward D. Easton, and together they prepared to capitalize on Edison's enforced retirement.

Like Edison, the Graphophone people had finally concluded that the future of the talking-machine industry lay down the avenue of mass entertainment. The manager of the Graphophone factory in Bridgeport, Connecticut, was a brilliant Scotsman by the name of Thomas Hood Macdonald who saw, long before Edison did, that the phonograph

needed a far cheaper form of motive power. While Edison remained wedded to his expensive electric motor and his inefficient storage batteries, Macdonald went ahead and developed a machine with a reliable clockwork motor. It was called the Graphophone Grand and was on sale in 1894, retailing for \$75, when the Graphophone-Columbia coalition began its large-scale assault on the phonograph market.

Thus, by trial and many errors, the Edison-Bell-Tainter phonograph had at last evolved into a form acceptable to the public. Its primary function as a medium of entertainment was finally recognized and it was about to enter its years of glory. Yet they were to be few in number; for a new development already gaining momentum was shortly to relegate the cylinder phonograph to the backwoods and eventually to render it obsolete altogether.

4 *EMILE BERLINER'S DISC*

THE NEW DEVELOPMENT THAT WAS TO CUT OFF THE CYLINDER phonograph in its prime owed its impetus to a young immigrant from Germany named Emile Berliner. He had landed in New York in 1870, aged nineteen and in the proverbially penniless state, and for three years had clerked in a Washington, D. C., dry-goods store owned by a fellow immigrant from Hanover. Then he quit, and for three more years he drifted from one job to another in various parts of the country. During his travels he worked for a time as a bottle washer in the laboratory of Constantine Fahlberg, the man who later compounded saccharin. These surroundings evidently imbued Berliner with a taste for science. He began to spend his evenings in the library of New York's Cooper Union Institute, where he educated himself in the basic principles of chemistry and physics.

In 1876 his former employer in Washington persuaded him to return at a higher salary and in a more responsible position. But though Berliner went back to earning money in the dry-goods business, his enthusiasms were irretrievably removed from the world of drapery. Like many other young men of his time, he had acquired an appetite for invention. He built a small laboratory in his boardinghouse and began to make practical experiments in the two fields that interested him most: electricity and acoustics. Specifically, he addressed himself to the problem of improving Alexander Graham Bell's newly invented telephone. In his home exper-

iments after store hours Berliner worked out the principle of an improved telephone transmitter. He applied for a patent and took his model to the Bell people. Berliner's visit could not have come at a more auspicious moment. Edison had also invented an improved telephone transmitter and had sold it to Bell's biggest competitor. The Bell interests were compelled to counterattack, and Berliner's invention became their weapon. In 1878 they paid him a large sum for his telephone transmitter and put him on a monthly retainer to continue his researches.

Berliner's association with the Bell Telephone Company was not very fruitful: his first invention for the telephone proved also to be his last of any consequence for that instrument. In 1881 he took a leave of absence and with his brother Joseph set up in Hanover the Telephon-Fabrik Berliner to manufacture telephone apparatus for the German market. Two years later, back in the United States, he severed his connection with the Bell company entirely, built a large house on Columbia Road in Washington, D. C., and began to work on his own.

Just when his thoughts turned to an improvement of the phonograph is not clear. We know only that his interest was first aroused by the phonautograph of Léon Scott. Edouard-Léon Scott de Martinville, to give his full name, was a French amateur scientist who had invented an instrument to transcribe a visual record of sound vibrations—hence its name phonautograph, or sound writer—on lampblacked paper. It dated from 1857 and for some years was manufactured by a Paris firm for use as a laboratory instrument in measuring and analyzing sound; however, its career had been short-lived, and in Berliner's time it was relegated to the display case of a Washington museum.

The characteristic of the phonautograph that attracted Berliner was its laterally moving stylus. He reasoned that if

he could devise a talking machine employing a lateral zigzag system of recording instead of the vertical "hill-and-dale" system then in use, he might get greatly improved results—and he would certainly have a patentable invention differing in essential particulars from Edison's phonograph. Berliner's first steps were to carry out in practice what Charles Cros had suggested in theory. He covered a disc of heavy plate glass with lampblack, set it revolving on a turntable in contact with a stylus, and mounted the stylus on a feed screw so that it would create a spiral pattern on the disc. When actuated by sound waves, the stylus vibrated laterally and left a visual tracing on the lampblacked disc. Berliner "fixed" this delicate tracing with varnish and had the record photoengraved in metal. As Cros had predicted, when this photoengraved record was played back through a stylus-and-diaphragm reproducer, the original sounds were re-created. Not very well, it is true, but sufficiently so that Berliner could apply for his first patent. The date of his application was September 26, 1887—ten years after Edison's tin-foil phonograph and one year after the Bell-Tainter graphophone.

To differentiate his invention from its predecessors, Berliner named it the "gramophone." Today the terms "gramophone" and "phonograph" have become synonymous. They were not so in the nineteenth century. "Gramophone" then referred specifically to a talking machine employing *lateral-cut discs*, "phonograph" to a talking machine employing *vertical-cut cylinders*. For reasons that will be explained later on, the word "gramophone" was eventually dropped from the American vocabulary (though not from the English) and "phonograph" began to do verbal duty for all types of talking machines. But the distinction between the two terms was a useful one, and it will be observed in this book up to the chronological point where it ceases to have any significance.

Although Berliner's photoengraved record may have been

patentable, it was far from practical. It depended on a complicated manufacturing process, and it sputtered forth with a grating, almost indecipherable approximation of the human voice. Nevertheless, Berliner had the wit to perceive elements in his crude gramophone that were of vast potential promise, and he persevered in its improvement. A prime weakness of his invention lay in its reliance on photoengraving, at that time a slow, intricate, and imperfect process. If Berliner's gramophone were to have any practical utility, a better method of engraving the disc would have to be developed.

In his original patent specifications, Berliner had mentioned the possibility of engraving a gramophone record by chemical action; he turned toward the realization of this idea in the winter of 1887-88. Berliner proposed to coat a zinc disc with some workable substance, inscribe a recording on that surface, and then immerse the disc in an acid bath; the acid, he reasoned, would eat away the metal where the recording stylus had made its tracings, leaving a thin shallow groove of even depth etched into the zinc. It took several months of experimentation to find a suitable coating. Lampblack would not do; for, though it registered the delicate vibrations of the stylus, it did not resist the acid solution. At length, Berliner developed a method of coating the zinc disc with a thin fatty film that responded to the stylus and yet was impervious to acid.

By March 1888 he had begun making test records by this direct chemical process. To his home came a procession of local musicians—pianists, violinists, singers—who gladly performed into the recording horn in the interests of scientific progress. What they heard on the playback (and it took only fifteen or twenty minutes for the acid bath to produce a finished record) seemed excitingly loud and lifelike—and doubtless it was, for 1888.

On May 16 of that year Berliner demonstrated his gramophone before members of the Franklin Institute in Philadelphia. At this session he began by describing his inven-



RECORDING APPARATUS FOR ACID-ETCHED DISCS

tion; then he played some discs previously recorded in his Washington laboratory and proceeded to dilate on the potentialities of the gramophone. Much of what he said merely echoed the rosy prognostications then current about the talking machine. He invoked the magic name of Patti, prophesied vast musical and educational boons, and pictured the happy day when "future generations will be able to condense within the space of twenty minutes a tone picture of a single lifetime: five minutes of a child's prattle, five of the boy's exultations, five of the man's reflections, and five from

the feeble utterances of the death-bed." It is significant that he made no claims for the gramophone as a dictating instrument. He viewed it solely as a medium of home entertainment, and he looked to the day when the mass distribution of first-rate musical recordings would be technologically and economically feasible. It was possible, Berliner explained, to "make as many copies as desired" from an original zinc recording. This being so, "prominent singers, speakers, or performers may derive an income from royalties on the sale of their phonautograms."

Home entertainment, duplication, and royalties: these were all novel concepts at a time when the phonograph and Graphophone entrepreneurs still thought principally in terms of office equipment, and they were to prove powerful forces with which to combat the competing wax cylinder.

Yet many years passed before the gramophone was developed to a competence that offered any real threat to the phonograph and Graphophone. Although Berliner did not abandon his invention as Edison had abandoned the phonograph in 1878, he hardly pressed its perfection with excessive haste. Berliner later acknowledged the slow development of the gramophone, explaining that he had not been concerned at all with time. "Fortunately," he said, "I have been spared the spur of commercial rivalry to add to the complexity of the situation, and could, with due leisure and caution, feel my way through the various technical problems and their labyrinthine courses."

The chief problems centered on the question of duplication. When Berliner spoke at the Franklin Institute of making as many copies of a gramophone record as desired, he had in mind metal duplicates manufactured by the cumbersome process of electrotyping. Indeed, one of the discs he demonstrated at Philadelphia was a copper duplicate made in this fashion. But soon thereafter he conceived of a far more feasible way of producing duplicates. It involved mak-

ing a reverse metal matrix from the original acid-etched recording, and then using this "negative" matrix to stamp "positive" records in some suitable material, very much as a metal seal stamps an impression into molten sealing wax. Upon this conception, which provided for an almost illimitable supply of duplicates from one master recording, a great industry was erected. But Berliner's method of duplication, for all its commercial potentialities, evolved at a sluggish pace. Six years of painstaking research elapsed before he was ready to put his gramophone on the American market.

In the interim Berliner went to Germany to demonstrate his invention, and it was there that the gramophone made its world debut as an article of commerce. In 1889 a toymaker (Kämmerer & Reinhardt) in Waltershausen obtained a license from Berliner to manufacture miniature hand-propelled gramophones for the novelty gift trade. They were flimsy affairs, and the five-inch celluloid or hard rubber discs that went with them were not calculated to inspire much faith in the gramophone's artistic capabilities. The instruments from Waltershausen turned up all over Europe. In England they were sold for two guineas, including six records. Most of the selections were in German, though a small number were recorded in English, French, Spanish, Italian, and Russian. *The Lord's Prayer* and *Twinkle, Twinkle, Little Star* became the big sellers in England. Kämmerer & Reinhardt manufactured gramophones for two or three years, then dropped them in favor of more lucrative products.

By 1893 Berliner felt that the gramophone was ready for commercial exploitation in America. He was at last able to produce an adequate stamping matrix, and he thought he had found in hard rubber a suitable material for the records. In conjunction with a few friends and relatives, Berliner formed the United States Gramophone Company, of 1410 Pennsylvania Avenue N.W., Washington, D. C., the main assets of which were the Berliner gramophone patents. Its cap-



Thomas Alva Edison, aged thirty-one, photographed beside his tin-foil phonograph by Levin Handy of the Mathew Brady studio in Washington, D.C., on April 18, 1878. Edison was there to demonstrate his invention to President Rutherford B. Hayes.

The Miracle of the 19th Century.

The Talking

WONDER.



WONDER.

The Talking

Edison's Phonograph.

THE DREAM OF THE INVENTOR REALIZED.

It will Talk, Sing, Laugh, Crow, Whistle, Repeat Cornet Solos, imitating the Human Voice, enunciating and pronouncing every word perfectly,

IN EVERY KNOWN LANGUAGE.

This wonderful machine, which has attracted the attention of thinking men all over the civilized world, and who have pronounced it without a dissenting voice, the most Marvelous Acoustical Phenomenon of the Century. Will be exhibited in Grand Rapids, at

FRIEDRICH'S MUSIC HALL,
NO. 80 CANAL STREET,
Commencing WEDNESDAY, JULY 3d,

Exhibited Daily July 3d, 4th, 5th and 6th.

To accommodate those who desire not only to hear the Phonograph speak, but to inspect and examine it closely, it will be exhibited every day from 10 to 12 a. m., from 2 to 5 p. m., and from 8 to 10 evenings. The operator will fully explain the machine and test its powers at every entertainment.

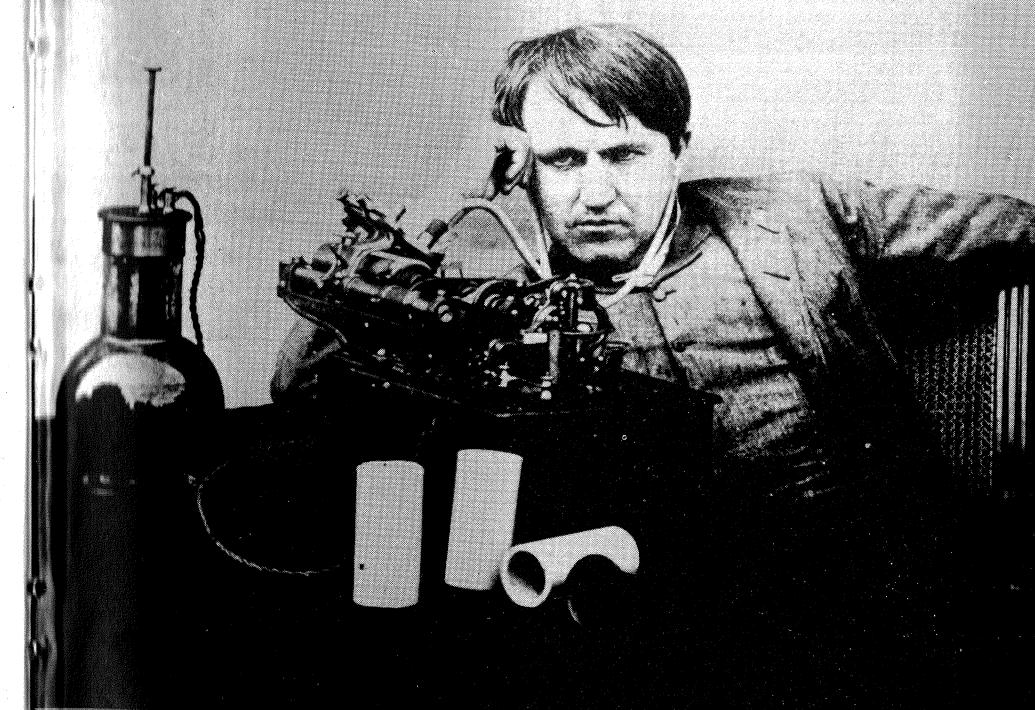
Special attention paid to Ladies and Children.

ADMISSION, only 25 Cents,

Children, 10 Cents.

Eagle Steam Job Rooms—W. C. Dennis & Co.

As a show property the phonograph won an immediate success. This poster announces four days of exhibitions in Grand Rapids, Michigan, during the summer of 1878.



Edison listens to his wax-cylinder phonograph at 5:30 A.M. on June 16, 1888. Genius, he said, was one per cent inspiration and ninety-nine per cent perspiration.



Entertainment for a nickel in 1891.



Gianni Bettini posing beside his Micro-Phonograph
in the Bettini studio, 110 Fifth Avenue,
New York City.

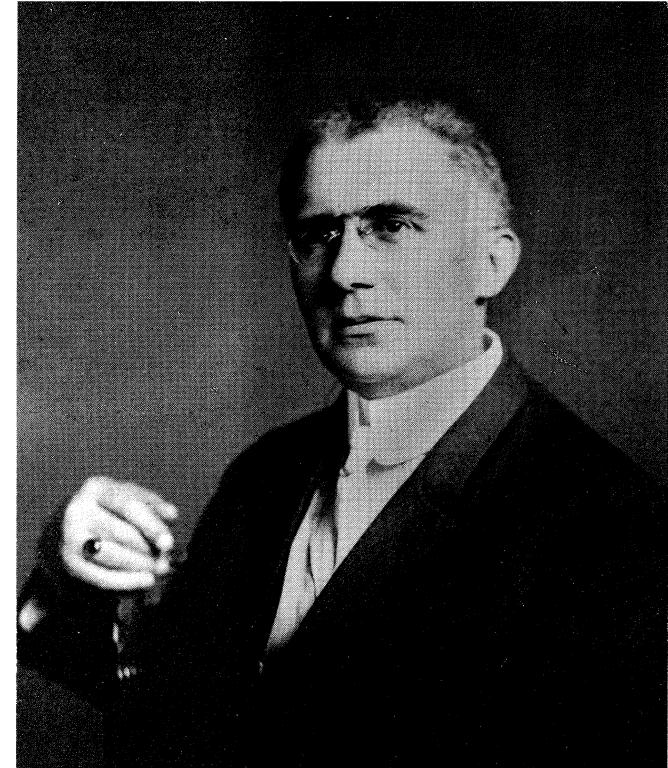


Sarah Bernhardt recording a cylinder for
Bettini in the same studio during the mid-1890s.

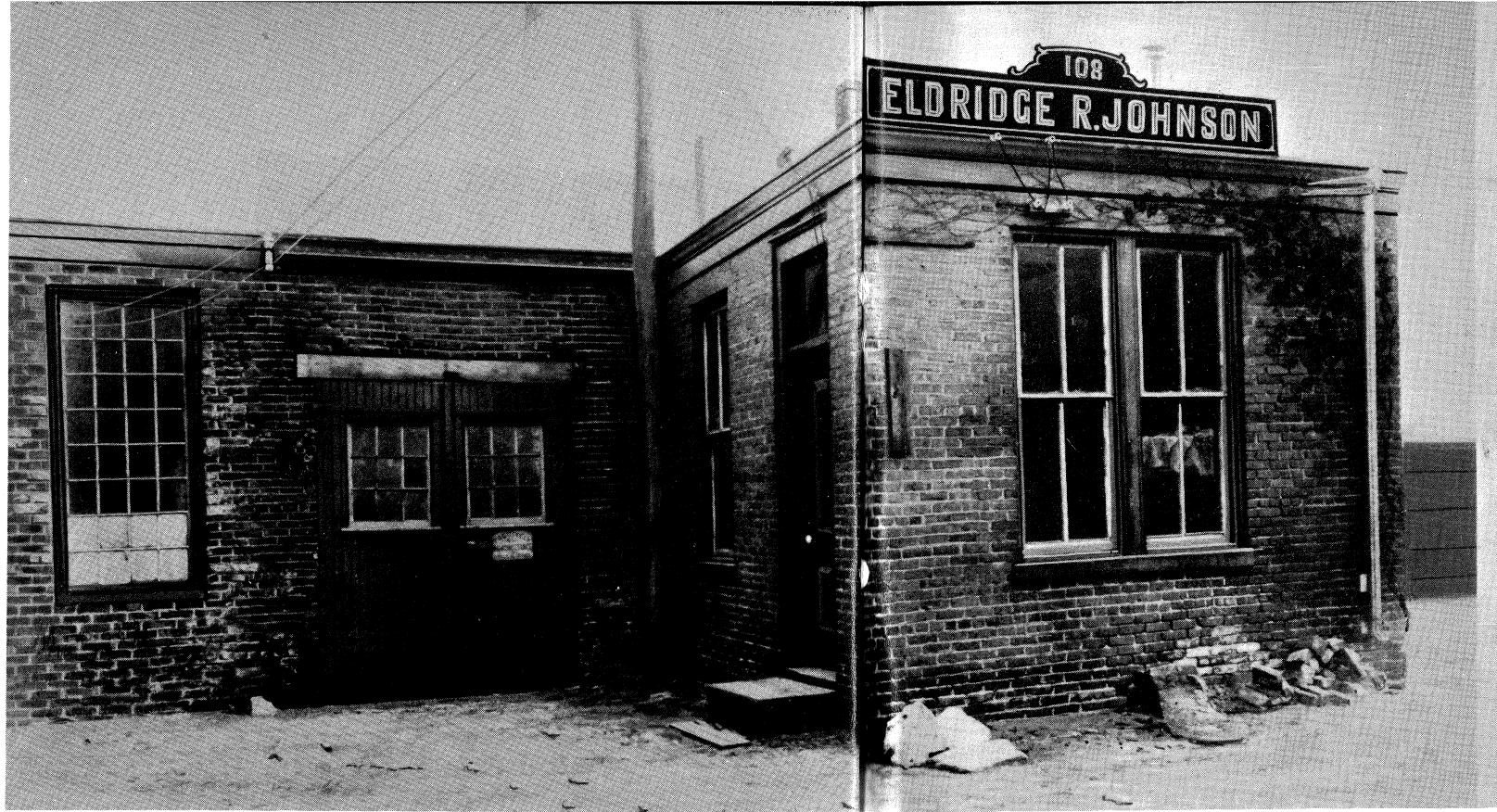


The Berliner gramophone, circa 1894. Its turntable was rotated manually, like an egg beater, to play seven-inch discs at a speed of 70 rpm.

Emile Berliner, 1851–1929, the inventor of the gramophone.



Eldridge R. Johnson, 1867–1945, founder of the Victor Talking Machine Company.



Johnson's machine shop in Camden, New Jersey, as it appeared when he began supplying motors and parts to the Berliner Gramophone Company.

The Improved Gramophone, circa 1898,
immortalized in a famous trademark
(see overleaf).





Francis Barraud with one of his many copies of "His Master's Voice" on the easel. The original painting is shown at left.



There are 12,000 Gramophone records on our Catalogues. Among light operatic artistes the following have made Gramophone records—

Miss Ellaline Terriss.	Miss Ethel Sydney.	Mr. Richard Green.	Mr. Louis Bradfield.
" Evie Greene.	" Louie Freear.	" Maurice Farkas.	" Henry Lytton.
" Connie Ediss.	" Madge Crichton.	" G. P. Huntley.	" Arthur Grover.
Miss Lena Maitland.			

The late William Paull.

The Gramophone makes the home bright. DAN LENO has made 24 Gramophone Records.

The word "Gramophone" is not a generic term applicable to all kinds of talking machines, but is the name of the instrument, the Gramophone, which is made only by the Gramophone and Typewriter Ltd. There are over 12,000 Records in our Catalogues.

Send us a postcard—the result will interest you—and we will send Catalogues of Gramophones and Records, and the name and address of the nearest dealer in our Gramophones, Gramophone Records, and genuine Gramophone Needles, sold only in metal boxes with our trademark picture "His Master's Voice" on the lid. (No other Needles should ever be used for playing Gramophone Records.)

The GRAMOPHONE & TYPEWRITER Limited, 21, City Road, London, E.C.
And at Berlin, Hanover, Paris, Vienna, St. Petersburg, Brussels, Amsterdam, Milan, Lisbon, Sydney, Calcutta, Barcelona, Cape Town.

An advertisement of the London-based Gramophone Company from the early 1900s. The artists featured were well-known music hall performers.

The Gramophone

is closely connected with the lyric stage.

The Gramophone

brings all that is best and brightest into your home.



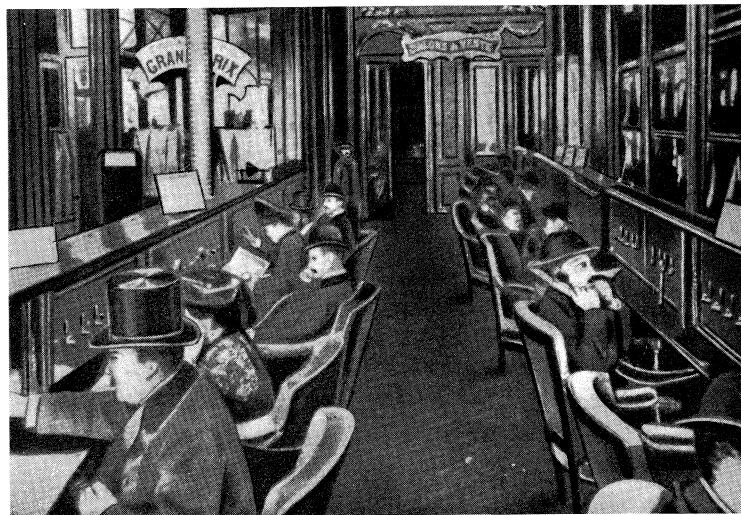
THE GREAT COQUELIN

writes of the
Gramophone :

"Your wonderful Gramophone has at last given me what I have so much desired, the surprise and (shall I confess it?) the pleasure of hearing myself. I have heard the recitation 'Les Limacons,' which I recite in the rôle of M. de la Motte in the 'Mercure Galant,' of Boursault, and my word . . . I did what I have seen the public do for a long time, I laughed. Thank you for having made me amuse myself—that does not often happen to me—and I congratulate you on your Gramophone, which must render great service to everybody."



An unidentified singer (Felia Litvinne?) in the Gramophone Company's Paris studio, circa 1905. When actually recording, the singer would of course face the horn jutting out from the rear wall. *Below*, top-hatted Parisians sample the latest cylinders in Pathé's Salon du Phonographe on the Boulevard des Italiens.

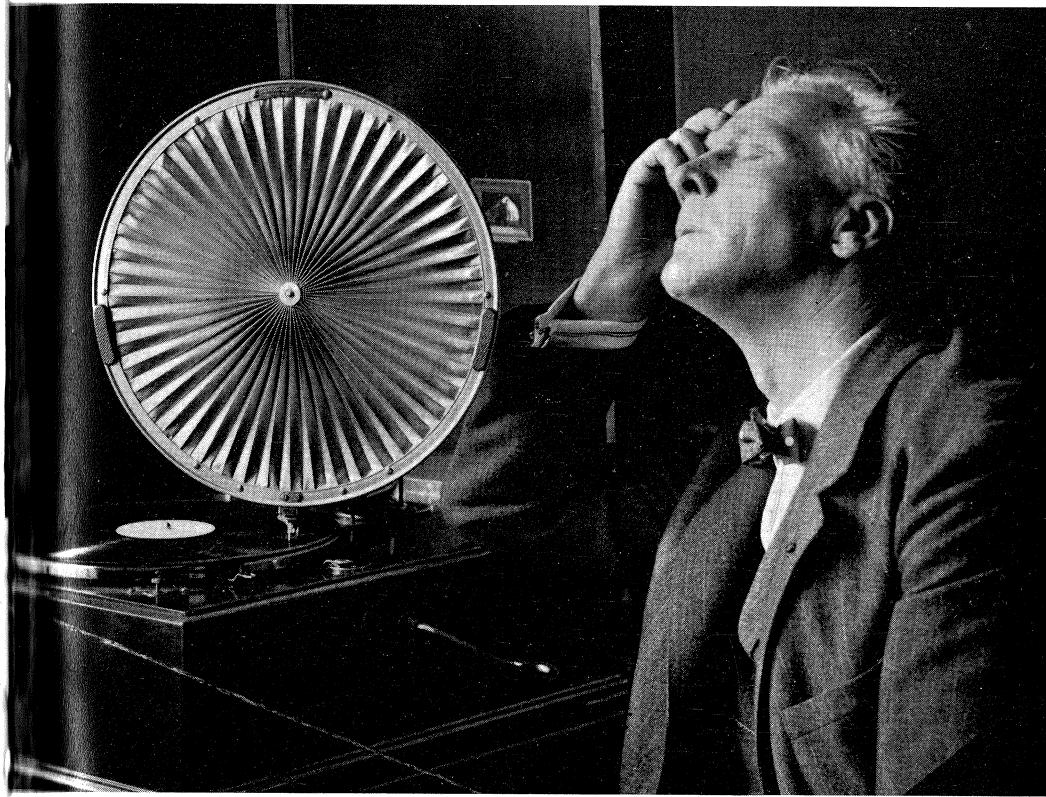


Alfred Lester, Violet Loraine, and George Robey—stars of *The Bing Boys*—record excerpts from the show for Columbia in London, 1916. *Below*, a home recording session in America at about the same time.

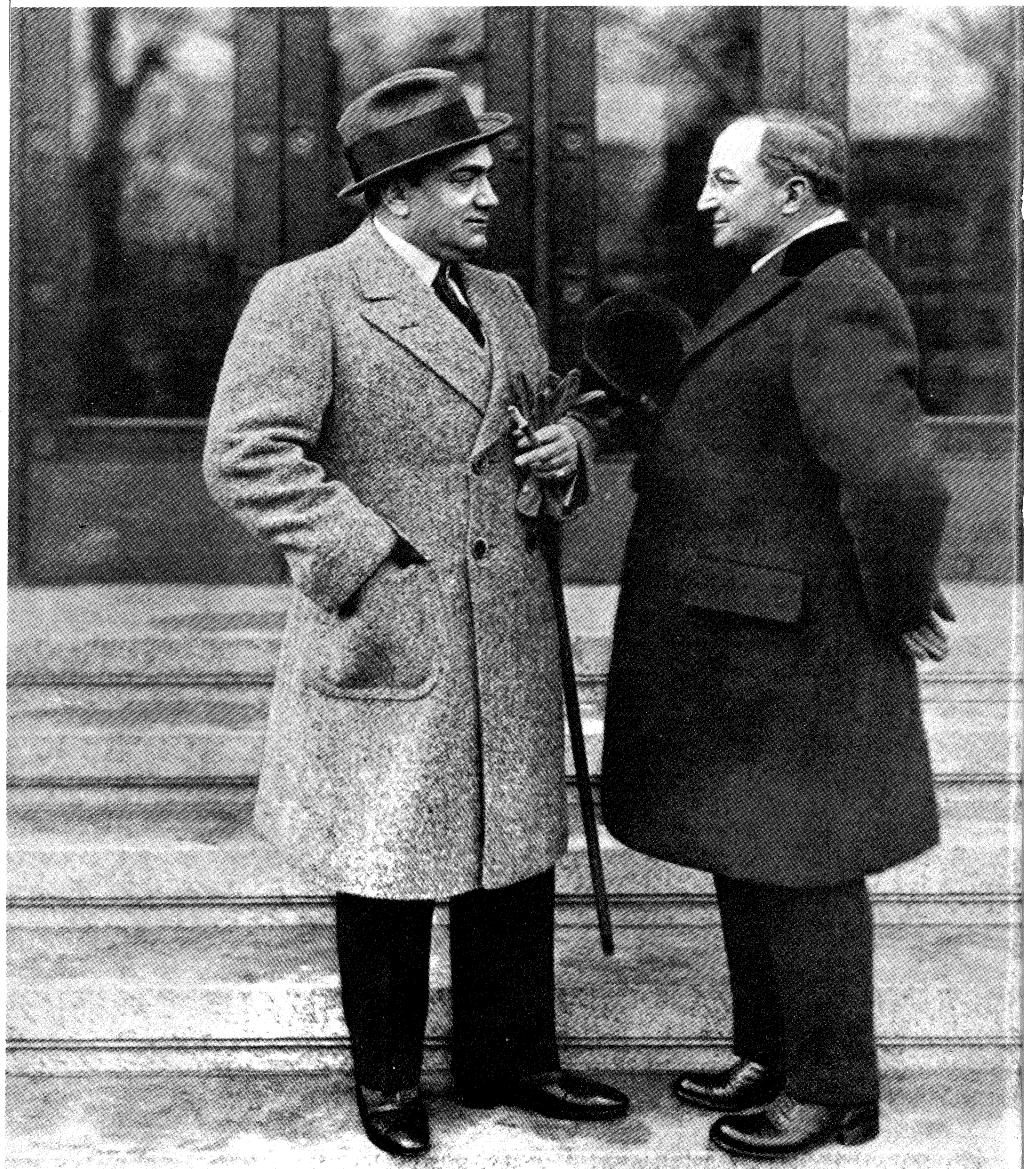




Ernestine Schumann-Heink poses with a Victor talking machine, vintage 1904.



The rapt auditor is Feodor Chaliapin, listening to an HMV "pleated diaphragm" gramophone of the early 1920s.



Enrico Caruso with Calvin G. Child, Victor's director of artists and repertoire. The photograph shows them at the entrance to Victor's headquarters in Camden, New Jersey, February 1917.

italization in dollars and cents was small. Neither Berliner nor his associates had the funds to launch the gramophone with proper éclat. They proposed to manufacture gramophones on a small scale and to begin a program of recording, but the operation was to be a token one aimed principally at demonstrating the gramophone's potentialities and attracting outside capital.

For the position of accompanist and talent scout Berliner hired twenty-one-year-old Fred Gaisberg, who had been employed previously in a like capacity for the Columbia Phonograph Company. Gaisberg knew many experienced recording artists of professional caliber, and he persuaded several of them to come to Washington and record for the gramophone. Toward the end of 1894 the first gramophone records (or "plates," as they were then called) appeared on the market. They were pressed in hard rubber and embodied all "the Latest Improvements regarding Articulation and Freedom from Friction." The United States Gramophone Company released a new batch of records every month and printed regular listings of the latest titles. Many of the recordings were anonymous, being listed merely as "Songs (baritone)" or "Songs (basso)" followed by a few popular titles—"The Old Folks at Home," "Marching through Georgia," "Rocked in the Cradle of the Deep," and the like. These anonymous recordings were the products of local Washington talent whose names possessed no sales appeal. But along with their journeyman efforts went a leavening of stellar fare: "Casey" recitations by Russell Hunting, for example, and tearful ballads by George J. Gaskin. They were all single-sided seven-inch discs, with a playing time of two minutes, and they sold for fifty cents each, or \$5.00 a dozen.

To play these records, the United States Gramophone Company manufactured three types of gramophones. The cheapest and most popular model was the Seven-Inch Hand Gramophone. Its turntable was rotated manually, like an

egg beater, and it was no easy task to keep it going at the correct speed. A manual accompanying each Hand Gramophone explained that "the standard velocity for seven-inch plates is about 70 revolutions a minute." * "A more rapid motion," it warned, "will raise the pitch and sharpen the sound; a slower motion will deepen the same." How was the operator to know when he was turning at the right speed? On this point the manual was not too helpful; it merely suggested that "the handle should be turned with a *wrist* movement, resting the elbow on the table, and at a uniform speed." Once the operator got the record revolving at about 70 rpm, he would use his free hand to "place the reproducer and needle into the outer groove," the "reproducer" in question consisting of a sound box and a small metal horn coupled directly to it, both mounted on a swinging wooden arm. Metal needles were to be inserted into the sound box and held tight by a screw. It was necessary to change them periodically; and if no regular gramophone needles were available, the manual was ready with excellent alternative suggestions: "If a magnifying glass of about 4 diameter power and a small Kansas oil-stone be handy, the worn needles can easily be reground to the rounded point of a darning needle. In fact, the broken-off end of darning needles ('Thorpes' No. 14), which are of the same thickness as our standard needles, are excellent substitutes."

The Seven-Inch Hand Gramophone, which sold for \$12, was by far the lowest-priced talking machine on the market in 1894. But very few people beyond the vicinity of Wash-

* This speed represented a compromise between fidelity and playing time. Had Berliner recorded at a faster speed, say 100 rpm, his records would have sounded better but their playing time would have been impractically short. Had he recorded at a slower speed, say 40 rpm, he would have achieved a record of fairly long duration but impossibly bad sound. Later the speed of gramophone records was somewhat increased. From 1900 to 1925 it hovered between 74 and 82 revolutions per minute, then became stabilized at 78 rpm with the introduction of electrically powered turntables. The synchronous motor ran at 3600 rpm. With a 46:1 gear this produced a speed of 78.26 rpm, which became the standard.

ington knew of its existence, or of the more expensive electrically powered gramophones that were also offered by the United States Gramophone Company. There was no national advertising to tout the new gramophones, no system of distribution, no organized sales effort. Berliner and his associates were conducting a trial business geared only for local sales in the District of Columbia. They were looking not for customers but for backers.

And for a while it seemed as though no backers were to be found. Investors could be induced to take a good-natured interest in the gramophone, but not to part with any money on its behalf. Berliner hired a former Methodist preacher, named B. F. Karns, to promote his invention and sent him to the Bell Telephone Company in Boston. The Bell directors did not pounce on Berliner's gramophone as they had on his telephone transmitter back in the 1870s. They were amused by it—especially by the recording of *Twinkle, Twinkle, Little Star* rendered by Berliner himself in pungent German-American—but they refused to consider it a musical instrument worthy of serious exploitation. "Has poor Berliner come down to this?" one of them asked. "How sad! Now if he would only give us a talking doll perhaps we could raise some money for him." The talking-doll motif was echoed by the toy dealer F. A. O. Schwartz and other potential investors in New York to whom the gramophone was demonstrated. But Berliner, like Edison, resented the implication that his invention should be treated primarily as a toy.

Finally, in the autumn of 1895, Karns got together a syndicate of Philadelphia investors who were willing to put up a total of \$25,000. The syndicate was headed by Thomas S. Parvin, a jobber of structural steel. Other investors were Max H. Bierbaum, Parvin's partner; Joseph Goldsmith, a clothing manufacturer; and William J. Armstrong and Thomas H. Latta, contractors. Under the auspices of this

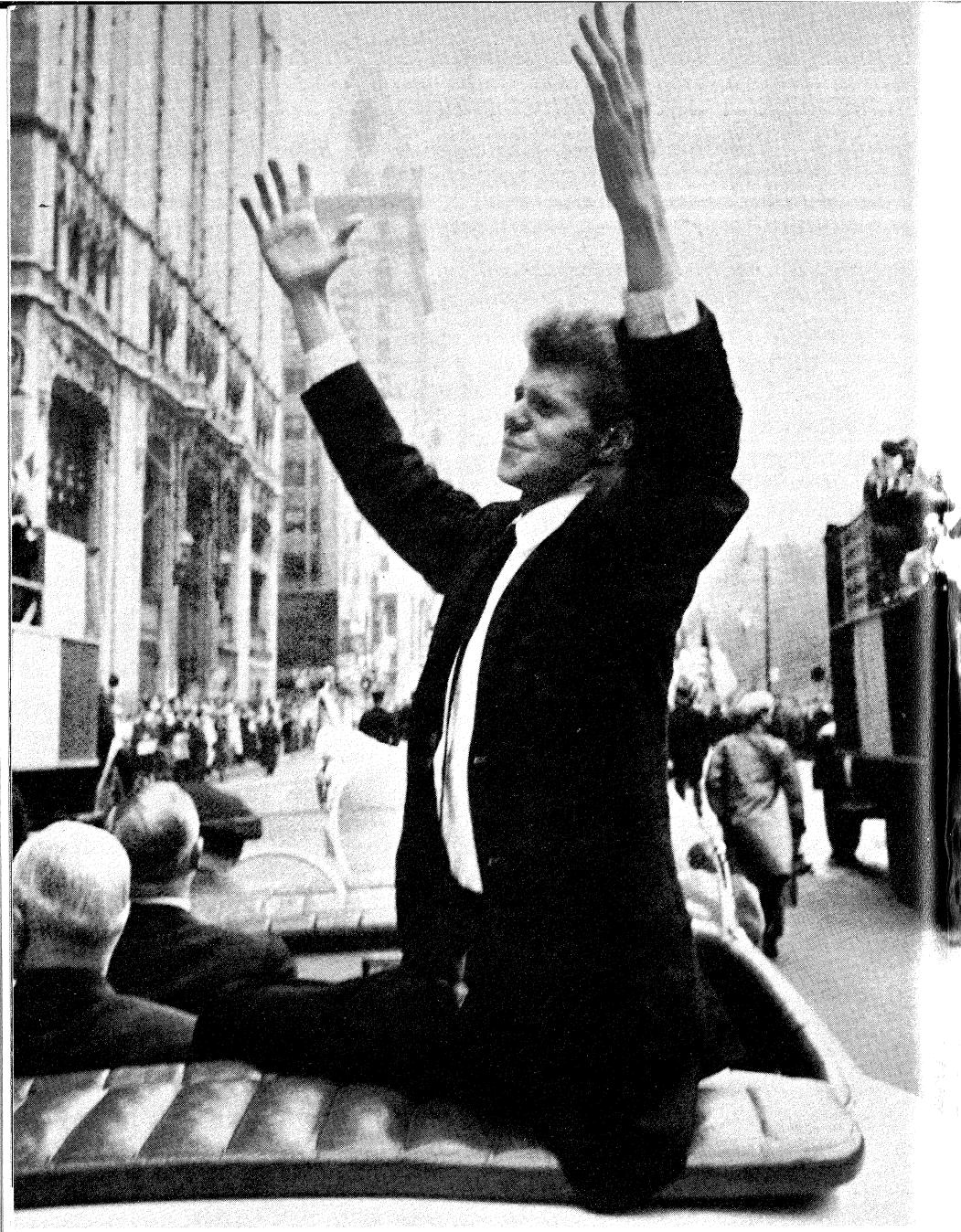
group, the Berliner Gramophone Company was established to manufacture instruments and records under license from the patent-holding United States Gramophone Company. It was incorporated in Philadelphia on October 8, 1895.

From this date began a lively contest between gramophone and phonograph, the issue of which was to remain in doubt for several years. When we review the struggle with all the benefits of hindsight, the outcome seems foreordained. The gramophone was a simpler, more rugged mechanism than the phonograph; it could lay claim to the immense superiority of easily duplicated records made of tough, resistant material; it reproduced sound with far greater volume and, consequently, was better suited for home entertainment. But these advantages were much less evident to the onlooker in 1895 than they seem today. The gramophone was a crude and untried upstart, the phonograph an established invention bearing the valued imprimatur of Edison. In its coin-in-the-slot manifestation, the wax-cylinder apparatus had swept the country and fixed itself in the minds of most Americans as *the* talking machine. Since then, two large companies had been developing it steadily so that at last it could be offered at a reasonable price for home use. Viewed side by side, the gramophone seemed a poor relation, the phonograph a bejeweled *grande dame*. All eyes were turned on her as she moved forward into her years of glory.

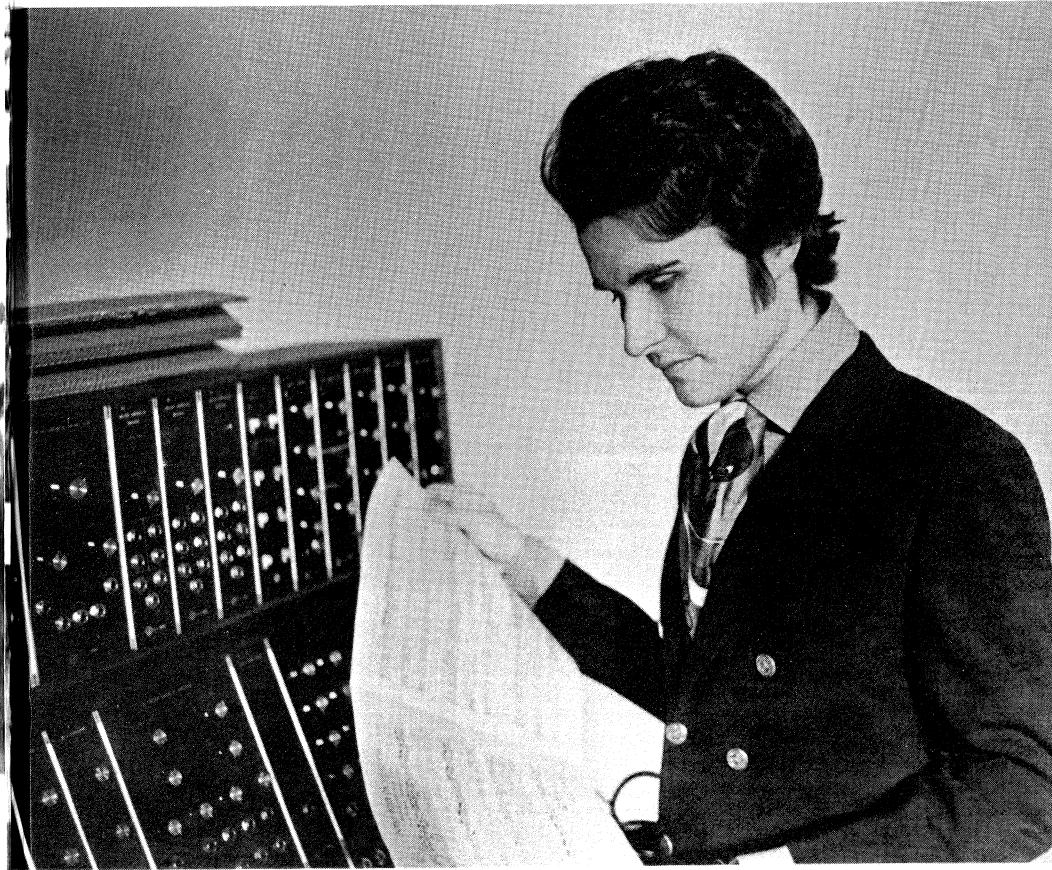
5 AT HOME WITH THE PHONOGRAPH

A READER OF LARGE-CIRCULATION AMERICAN MAGAZINES IN the winter of 1895-96 could not fail to notice the ubiquitous advertisements sponsored by the Columbia Phonograph Company. They pictured a family in a moment of rapt delight: grandfather sitting relaxed in an easy chair, his son and daughter-in-law standing attentively to his either side, and his grandson—clad in knee breeches and a Little Lord Fauntleroy jacket—hopping up and down between his knees. The attention of all four was directed to the horn protruding from a small phonograph on a near-by table. They were clearly being entertained in imposing fashion by “the machine that talks—and laughs, sings, plays, and reproduces all sound,” a machine “so simple that even a child can make it pour forth the most enchanting selections of the world’s greatest Musicians, Singers, Actors, and Speakers.” Prices began at \$50. An illustrated catalogue and a “list of thousands of cylinder records” were free for the asking.

The talking machine’s assault on the American home had begun—with the Columbia Phonograph Company, as sole sales agent for the American Graphophone Company, leading the attack. It trumpeted its message through the pages of *McClure’s* and *Cosmopolitan*, *Munsey’s* and *Harper’s*. The happy family enraptured by the phonograph was unavoidable. And apparently irresistible. Columbia’s business soared; the company moved from its original headquarters in Washington, D. C., to New York City and set up branches



Van Cliburn became a national hero upon his return to the United States from Moscow, after winning the Tchaikovsky Piano Competition in 1958. His best-selling recording of the Tchaikovsky Piano Concerto was made at this time.



Another best-selling classical record was *Switched-On Bach*, created on the Moog Synthesizer by composer-physicist Walter Carlos.