Edison Tower

THE EDISON TOWER AT A GLANCE

Marking site of Edison's Menlo Park activities, 1876-1886

Total height .										151 ft. 4 in.
Concrete structur	e									117 ft. 8 in.
Incandescent lam	рг	opl	ica							15 ft. 8 in.
Comprised of and	it t	lint	led]	Pyr	ex	las	s			2 in. thick
Made with .					-			-		155 pieces
Weight of glass										S tons
Total light capac	ity									9500 watts
Tower constructe	d in	n								8 months
Tower required		1	1200	ha	trel	s E	dis	00]	Pur	iland cement
Tower required			-							50 tons steel

Commemorating the invention of the first practical incandescent lamp is the huge lamp surmounting the Tower

Commemorating invention of the world's first sound reproducing machine -Edison Phonograph

Eight loud speakers, 150 foot radius Four wide-range loud speakers Heavy duty amplifiers and controls Transcription turntable for reproducing all types of records

The Tower complete gift of William Slocum Barstow To The Thomas Alva Edison Foundation Incorporated In behalf of Edison Pioneers

All lighting of the Tower is a gift from the Public Service Electric and Gas Company of New Jersey

Built June-December, 1987 Dedicated February 11, 1938 Massena & DuPont, Architects Louis H. Doane, Consulting Engineer Walter Kidde Constructors, Inc., Builders Giant Lamp made by Corning Glass Works Sound System, BCA-Victor, installed by William C. Kelly, Jr.

Tower Winter Hours

Monday	Closed
Tuesday	Closed
Wednesday	1:00 - 3:30
Thursday	1:00 - 3:30
Friday	1:00 - 3:30
Saturday	1:00 - 4:00
Sunday	1:00 - 4:00

The EDISON TOWER MENLO PARK · NEW JERSEY

Man Anten Ivit

PHONE 201-549-3299



EDISON - People from 50 countries, and all 50 states, paid homage last year to Thomas Edison by making the pilgrimage to the Edison Memorial Tower.

Located in the Menlo Park section of the township, on the site where the inventor tinkered in his lab and emerged with his remarkable prod-ucts, the tower has become an inter-national symbol for American inventiveness and diligence. But the outside walls to the adjacent museum are decaying, and the landscaping would be a bit threadbare had a local garden club not donated some shrubs. g ... rali Faced with rising costs throughout the township, and budgetary limitations, municipal officials are hoping

the state will chip in funds to improve and expand the site. And, the officials point out, virtually every business in the nation -and specifically within Middlesex County - owes an immeasurable debt to Thomas Alva Edison.

Contributions to the site for main-tenance and expansion would be wel-come, they said.

come, they said The tower stands 131 feet high, topped by a 14-foot replica of an-incandescent bulb, which beams out \$,500 watts of light every night. Made of steel and Portland Cement - another Edison invention - the

tower is on the list of "must-see" items in the New York area for many visitors from overseas.

But many local residents have never been to the tower, or the 48-acre park located off Christie Street, acre park located on Christle Street, up a hillside from Route 27 and over-hoking the Harrison A. Williams MetroPark Station. "T can't believe I lived here so many years and never came before," one township resident said yesterday

as she and her family visited the small museum adjacent to the tower. Residents may not realize Edison built the first electric train, which ran to copper mines located behind the modern-day site of the drive-in on

Oak Tree Road, and in the direction of the Metuchen Country Club.

Edison sent employees to Japan to bring back bamboo filament for his incandescent lights.

According to tower curator George Campbell, there is a shrine in Japan that pays homage to Edison. He said Japanese tourists comprise the largest group of foreign visitors to the historical site in Menlo Park.

The tower lies on property that was taken over from the state by the township in 1979, when the tower was declared a national historic site and listed in the National Register of Historic Place

Public attendance has been "terrific," according to Campbell, who also tends the museum and small gift shop which sells Edison memen-toes that help finance routine operations at the park.

In addition to the deteriorating walls, valuable relics found by neighbors and given to the museum, such as 19th century battery acid bottles and pieces of Edison-built electric cable, are stacked on shelves instead of housed within display cases.

Rememberin

The Wizard'

unteer Fire Compa place a wreath at ment to Thomas A near the Edison

Tower yesterday morating the inver birthday on Feb

to right are Mike Ta fant chief, Bud Mc

president, and W

chick, chief. Edison

with having found company through organized to combe fires at his labora tower, seen at lef photo, attracted to

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Admission to the museum and tower is free but a donation box inside the museum solicits funds.

"It's not enough," Campbell said." His wish-list for the site includes a movie theatre for small groups, to show early Edison classics including "The Great Train Robbery," and more displays - with more roots for the

"The Italian government donated millions of lira to save the Leaning Mr Tower of Pisa: I think our govern ment could do the same for the Edison Tower," Township Council member Angelo Orlando Jr. said yes terday, during the annual "Edison Day" ceremonies held at the tower.

Township Recreation Supervisor Tricia Campbell said she will contact. Gov. Thomas Kean's office and also members of the business community to solicit support for the size. —MARK S. PORTER





THE EDISON TOWER

By CHESTER MERRILL WITHINGTON

THE EDISON TOWER, located on the site of the original laboratory at Menlo Park, New Jersey, to which Thomas Alva Edison moved in 1876, was erected in 1937 as a monument to the great inventor. The Tower is the gift of William Slocum Barstow to The Thomas Alva Edison Foundation Incorporated, of which he is President, in behalf of the Edison Pioneers. It was dedicated on February 11, 1938, the ninety-first anniversary of the inventor's birth.

Rising 131 ft. 4 in. above the ground, the Tower looms as the highest discernible object for many miles. Surmounting the 117 ft. 8 in. concrete-slab structure is a 13 ft. 8 in. replica of the original incandescent lamp which, illuminated nightly, can be seen for a distance of several miles, serving as an airplane beacon. The foundation of the Tower consists of a reinforced concrete pad 2 ft. 6 in. thick under the entire The space between this pad and the floor of the structure. entrance room to the Tower, containing the "Eternal Light," was back-filled with earth for the purpose of adding weight to increase its stability against wind pressure, in the same manner as the keel on a sailboat is provided to counteract the pressure of wind on its sails. The Tower is designed for pressure of wind at a velocity of 120 miles per hour. In its construction, which consumed slightly less than eight months, there were used approximately 1200 barrels of Edison Portland cement and 50 tons of reinforced steel.

COMMEMORATIVE OF ACTIVITIES

The Tower is commemorative of Thomas Alva Edison's activities at Menlo Park from 1876 to 1886, during which period he produced and tested the first practical incandescent lamp; invented a complete system for generating and distributing electric current; invented the phonograph, the first sound and voice reproducing machine in the world; and invented and perfected many other devices known and daily utilized throughout the world.

The large bulb atop the Tower was cast by the Corning Glass Works, which fifty-nine years ago, in 1879, furnished from a sketch the first commercial electric light bulb. The replica bulb contains 153 separate pieces of amber tinted Pyrex glass, 2 in. thick, set upon a steel frame. The bulb is 5 ft. in diameter at the neck and 9 ft. 2 in. in diameter at the greatest width and weighs, without the steel frame on which it is placed, in excess of three tons. Inside this Pyrex glass bulb are four 1000 watt bulbs, four 200 watt bulbs and four 100 watt bulbs. A duplicate of each is so arranged as automatically to cut in should its companion bulb fail. The glass in the Pyrex bulb was placed on its steel frame at the Corning Glass Works, Corning, New York, and then, after being numbered, each piece was dismantled, packed and shipped to Menlo Park, where the work of permanent assembly atop the Tower itself was undertaken early in December, 1937.

-1-

On seven of the eight sides of the octagonal base are bronze tablets inscribed with descriptions of major Menlo Park inventions. In front of a bronze and glass door in the eighth side, in the concrete base of the tower, is buried a copper box containing, along with several documents, copper plates on which are inscribed the names of the officers and members, past and present, of the Edison Pioneers, and the names of the officers and directors of The Thomas Alva Edison Foundation Incorporated, together with the names of the technical bodies which they represent. The use of copper, apart from its ability to withstand the elements over the years, is in recognition of Edison's inestimable contributions to that industry's growth through the enormous demands for copper metal made necessary by the expansion of the electric light and power industry, in the creation of which Edison was so prominent a factor.

EFFECTIVE DESIGN

In a darkened room on the other side of this bronze door is the "Eternal Light," a replica of Edison's first incandescent lamp, which has been giving light continuously since October 21, 1929, when, on the occasion of Light's Golden Jubilee in Dearborn, Michigan, Edison pressed the button to set it aglow. Of interest in this connection is the fact that although the original steel structure, which this Tower replaced, was destroyed by lightning on August 11, 1937, during the construction of the present Tower, the "Eternal Light" was unharmed and continued to glow brightly, although surrounded by and covered with debris of the wreckage.

In designing and selecting materials to be used in the construction of the Tower, great care was taken to use masses and lines which would be as effective in sunlight as at night in the rays of floodlights. The effect retains the monumental bulb as the main feature of the Tower. A group of eight buttresses rising from the ground to the bulb emphasizes its dominant importance and catch the beams from the floodlights concealed at the top of the dark columns.

The choice of aggregate on the concrete facings—glittering quartz and ceramic—was specially treated so that the many faceted particles are intensified at night. The Tower also represents the most successful treatment of reinforced concrete as a finished material, a material in which Mr. Edison was deeply interested. The precast reinforced concrete facing units, which are two inches thick, were erected in successive stages and fastened to the interior wooden frames with steel anchors. Concrete then was poured between the facing units and the frames, producing perfect anchorage and a completely monolithic construction of the entire Tower. At the top sixteen anchor bolts are imbedded in the concrete, to which is attached the steel framework for the glass bulb. This bulb is the first circular casting work ever produced in the glass industry.

LIGHTNING PROTECTION

As a protection from lightning, about one-third of the distance down from the top of the light bulb, there are 16 aluminum points projecting about six inches beyond the face of the glass. These points, together with one at the very

-2-

top of the bulb, are inter-connected by a 3%-inch copper cable. From this cable four 3%-inch cables are carried down inside the Tower, where they are connected under the foundation to twelve ground rods. Each ground rod is comprised of a steel rod encased in a copper tube and measures about threequarters of an inch in diameter; these are driven into the earth below the foundation to an average depth of seventeen feet. These twelve ground rods are also inter-connected by copper cables to which the four cables coming down the Tower are attached.

This method of lightning protection was devised from recommendations received by the architects from Professors Dahl and Woodruff of the Department of Electrical Engineering of Massachusetts Institute of Technology, with some slight additions supplied by the insurance underwriters.

SOUND SYSTEM

Emblematic of the invention on this spot in 1877 of the phonograph, is a sound system designed and manufactured by the RCA-Victor Company of Camden, New Jersey. Electrically transcribed phonograph records can be broadcast from the top of the Tower ninety-six feet above the ground. There, beneath the huge lamp, are decorated grilles behind which are wide-range, high-powered, loud speakers. The speakers are designed to transmit chimes, music of all kinds, as well as speech, over a radius of two miles. The group of specially designed, heavy duty amplifiers, with all controls, is located in the operating room in the Tower. Here are also installed the transcription turntable and the lateral and vertical sound heads for reproduction of standard or special recordings of all types. This transcription turntable is the highest quality available and, in combination with "hill and dale" (vertical) recordings, which Edison invented and always used, provides extremely faithful reproduction of any type of music or speech. Part of the general installation is a group of eight loud speakers located thirteen feet from the base of the Tower; these are designed particularly for speech reproduction over a radius of at least one hundred and fifty feet. They are equipped with a high duty, portable microphone for use at locations provided with connections to amplifiers. Provision has been made for any addition of electric organ or electric carillon, as well as for Westminster chimes, in combination with a time clock, for striking the hour, half-hour and quarter hour.

THE TOWER A SYMBOL

Through the sound system installation in the Tower the first broadcast was held on February 11, 1938, on the dual occasion of the dedication of The Edison Tower and the commemoration at the Hotel Astor, New York City, of the ninety-first anniversary of the inventor's birth.

The effect of The Edison Tower as a whole is dynamic, a symbol of the forceful, forward-moving results of Thomas Alva Edison's genius.

-3-

BRONZE TABLETS ON THE EDISON TOWER

THIS TOWER MARKS THE SITE OF THIS TOWER MARKS THE SITE OF THE EXPERIMENTAL LABORATORY BUILT BY THOMAS ALVA EDISON, BORN MILAN, OHIO, FEBRUARY 11, 1847. THE LABORATORY STRUCTURE OCCUPIED BY THE INVENTOR FROM 1876 TO 1886 WAS TRANSPORTED IN 1929 BY HIS FRIEND AND ADMIRER HENRY FORD TO DEARBORN, MICHIGAN.

THE CENTER OF THIS TOWER MARKS THE EXACT SPOT WHERE THE FIRST PRACTICAL INCANDESCENT LAMP WAS TESTED. A LAMP IN THE INTERIOR WAS LIGHTED BY MR. EDISON ON OCTOBER 21, 1929, FROM DEARBORN, MICHIGAN, DURING THE JUBILEE CELEBRATION OF THE INVENTION OF THE LAMP AND SINCE THEN HAS GLOWED CONTINUOUSLY.

IN 1937 THIS PERMANENT TOWER WAS ERECTED, REPLACING A TEMPORARY TOWER ON THIS SITE, WHICH WAS ERECTED IN 1929. A LARGE LIGHT SURMOUNTING THE TEMPORARY TOWER WAS ALSO LIGHTED BY MR. EDISON ON OCTOBER 21, 1929, AND CONTINUED TO BURN NIGHTLY UNTIL THE TOWER WAS DESTROYED BY LIGHTNING ON AUGUST 11, 1937, WHILE THE BUILDING OF THE PERMANENT TOWER AROUND SAME WAS IN PROCESS.

HERE AT MENLO PARK, MANY OF EDISON'S IMPORTANT INVENTIONS WERE MADE. IN 1886, THI CONTENTS OF THE LABORATORY WERE MOVED TO ORANGE, NEW JERSEY, WHERE IN A LARGER EXPERIMENTAL LABORATORY HE CONTINUED HIS DISCOVERIES AND WHERE NUMEROUS EXHIBITS OF HIS WORK ARE PRESERVED. THE

II

AFTER INNUMERABLE UNSUCCESSFUL EXPERIMENTS WITH VARIOUS KINDS AND SIZES OF EXPERIMENTS WITH VARIOUS KINDS AND SIZES OF FILAMENTS, EDISON PRODUCED ON OCTOBER 21, 1879, AN INCANDESCENT LAMP CONTAINING A FILAMENT OF CARBONIZED COTTON THREAD IN A HIGHLY EXHAUSTED GLASS BULB, SUPPLIED WITH CURRENT FROM A VOLTAIC BATTERY OF BUNSEN CELLS. IT GLOWED FOR FORTY CONSECUTIVE HOURS-

AN EPOCH MAKING RECORD. AN EPOCH MAKING RECORD. THIS UNPRECEDENTED ACHIEVEMENT LED STEADILY THROUGH MANY IMPROVEMENTS AND FURTHER INVENTIONS, SUCH AS METALLIC BASE SCREW SOCKET, SWITCH-KEY AND SUPPORTS TO A COMMERCIAL TYPE OF INCANDESCENT LAM SIMILAR IN FORM TO THE BEACON WHICH SURMOUNTS THIS TOWER. LAMP

A SCORE OF COUNTRIES WERE SEARCHED FOR UNIFORM WOOD FIBERS. THOUSANDS OF FOR UNIFORM WOOD FIBERS. THOUSANDS OF SAMPLES WERE TESTED AND DISCARDED. THE SEARCH LED TO A SELECTED SPECIES OF JAPANESE BAMBOO FROM WHICH CARBONIZED FILAMENTS WERE MADE FOR SEVERAL YEARS.

TO SUPPLY HIS NEW INCANDESCENT LAMPS WITH A STEADY VOLTAGE OF ABOUT 110 VOLTS, EDISON HERE INVENTED AND DESIGNED THE FIRST DYNAMO-ELECTRIC-GENERATOR WITH A SHUNT FIELD WINDING AND A LOW-RESISTANCE ARMATURE CAPABLE OF BEING DRIVEN EITHER BY A BELT AND PULLEY, OR BY DIRECT COUPLING TO A SPECIALLY DESIGNED STEAM ENGINE.

-4-

THE EFFICIENCY OF THESE NEW GENERATORS WAS APPROXIMATELY NINETY PER CENT WHICH WAS ABOUT DOUBLE WHAT HAD PREVIOUSLY BEEN OBTAINED OR WAS SUPPOSED POSSIBLE.

SUCH A MACHINE THE INVENTOR ALSO UTILIZED AS:A DIRECT-CURRENT MOTOR, RECEIVING ITS POWER BY CONNECTION ACROSS THE MAINS OF HIS CONSTANT-VOLTAGE SUPPLY SYSTEM.

IN CONJUNCTION WITH THESE NEW GENERATORS AND MOTORS HE INVENTED SUITABLE CONTROLLING, REGULATING, AND MEASURING DEVICES FOR USE IN A CONSTANT-VOLTAGE CENTRAL STATION, WHICH HE WAS THE FIRST TO CONSTRUCT. THIS MARKED THE BEGINNING OF CONSTANT POTENTIAL COMMERCIAL PRODUCTION AND DISTRIBUTION OF ELECTRIC LIGHT AND POWER.

TO SUPPLY ELECTRIC CURRENT TO CONSUMERS' PREMISES FROM A CENTRAL GENERATING POWER SUPPLY, EDISON HERE INVENTED AND DESIGNED THE FIRST PARALLEL DISTRIBUTION SYSTEM, SUPPLYING ELECTRIC CURRENT FOR LIGHTING, HEATING AND MOTIVE POWER. LAMPS, HEATERS AND MOTORS WERE CONNECTED IN PARALLEL ACROSS THE DELIVERY MAINS OF EITHER TWO-WIRE OR THREE-WIRE CONDUCTORS, KNOWN AS EDISON THREE-WIRE SYSTEM.

IV

HE HERE INVENTED AND DESIGNED AN UNDERGROUND STREET SYSTEM OF CONTINUOUS IRON PIPES, CONTAINING INSULATED COPPER CONDUCTORS, WITH CONNECTING JUNCTION BCXES AND SERVICE BOXES FOR SUPPLYING ELECTRIC CURRENT THROUGHOUT CITIES TO INDIVIDUAL BUILDINGS.

TO FACILITATE THE USE AND CONTROL OF ELECTRIC LIGHT AND POWER INSIDE OF BUILDINGS, HE HERE INVENTED AND DESIGNED SWITCHES, METERS, FUSES, BRANCH BLOCKS, OUTLETS, ETC.

HE LIKEWISE INVENTED AND DESIGNED A SYSTEM OF HIGH TENSION DIRECT-CURRENT TRANSMISSION, WITH LOW TENSION DIRECT-CURRENT DISTRIBUTION, THROUGH THE USE OF MOTOR-GENERATOR STEP-DOWN CONVERTORS. ALSO A HIGH TENSION, 1200 VOLTS, SERIES SYSTEM FOR INCANDESCENT LAMPS FOR CITY LIGHTING.

HERE IT WAS THAT EDISON INVENTED AND PUT INTO EXPERIMENTAL OPERATION THE FIRST COMPOUND-WOUND ELECTRIC RAILWAY MOTOR AND TRUCK, OPERATED FROM CONSTANT-VOLTAGE CONDUCTORS. HE OPERATED THIS ELECTRIC RAILWAY LOCOMOTIVE ON A SPECIAL TRACK AT MENLO PARK, ONE RAIL SERVING AS THE SUPPLY CONDUCTOR AND THE OTHER AS THE RETURN CONDUCTOR, THE MOTOR BEING BELTED TO THE LOCOMOTIVE SHAFT. SO BEGAN CONSTANT-VOLTAGE ELECTRIC TRANSPORTATION, DESTINED TO TRAVEL AROUND THE WORLD.

-5-

THEN FOLLOWED HIS UNDERGROUND ELECTRIC CONDUCTORS BENEATH A SLOT FOR THE OPERATION OF ELECTRIC RAILWAY MOTORS IN CITY STREETS,; ALSO A THIRD-RAIL CONTACT SYSTEM FOR SUCH RAILWAYS; A SYSTEM OF MULTIPLE CONTROL OF ELECTRIC RAILWAY MOTORS, AND AN ELECTROMACNETIC BRAKE AND AN ELECTROMAGNETIC BRAKE.

HE INVENTED THE

HARMONIC SYSTEM OF TELEGRAPHY BY WIRE, EMPLOYING MULTIPLE FREQUENCIES ON THE SAME WIRE FOR CARRYING DIFFERENT MESSAGES SIMULTANEOUSLY. ALSO THE QUADRUPLEX SYSTEM, FOR SENDING FOUR MESSAGES SIMULTANEOUSLY ON ONE WIRE—TWO IN EACH DIRECTION.

HE INVENTED WIRELESS COMMUNICATION WITH MOVING TRAINS, WIRELESS TELEGRAPHY USING BOTH DIRECTIONAL AND NON-DIRECTIONAL ANTENNAE WITH HIGH FREQUENCY CURRENT SUPPLY TO BOTH SHIP AND SHORE STATIONS. THE BASIC PRINCIPLE OF THERMIONIC EMISSION IN VACUUM TUBES, KNOWN AS THE EDISON EFFECT, ULTIMATELY BECAME OF OUTSTANDING IMPORTANCE IN RADIO AND ITS DEVELOPMENT.

IN TELEPHONY HE INVENTED THE CONDENSER TELEPHONE TRANSMITTER, THE "DYNAMIC MICROPHONE", THE ELECTROMOTOGRAPH LOUD SPEAKING TELEPHONE RECEIVER, AND ALSO THE CARBON MICROPHONE TRANSMITTER, WHICH MARKED AN EPOCH IN TELEPHONE ART AND BROUGHT THE ELECTRIC TELEPHONY SYSTEM TO A COMMERCIAL SUCCESS.

VI

EDISON HERE INVENTED THE PHONOGRAPH A MARVELOUS ACHIEVEMENT FOR RECREATION AND BUSINESS. FOR THE FIRST TIME IN HISTORY SOUNDS AND HUMAN SPEECH WERE IMPERISHABLY RECORDED.

EDISON ORIGINATED INNUMERABLE OTHER INVENTIONS. HE RECEIVED RECOGNITIONS, MEDALS, AND HONORS FROM GOVERNMENTS, NATIONAL EXPOSITIONS, AND ORGANIZATIONS IN COUNTRIES ALL OVER THE WORLD.

WHEN PRESENTING TO EDISON THE UNITED STATES CONGRESSIONAL MEDAL

THE UNITED STATES CONGRESSIONAL MEDAL OCTOBER 28, 1928, PRESIDENT CALVIN COOLIDGE SAID: "NOBLE, KINDLY SERVANT OF THE UNITED STATES AND BENEFACTOR OF MANKIND, MAY YOU LONG BE SPARED TO CONTINUE YOUR WORK AND TO INSPIRE THOSE WHO WILL CARRY EDWITED YOUR TOPCH " FORWARD YOUR TORCH."

EDISON CONTINUED MAKING INVENTIONS UNTIL HIS DEATH AT ORANGE, NEW JERSEY, OCTOBER 18, 1931, AND HIS BURIAL MARKED THE 52ND ANNIVERSARY OF THE MAKING OF HIS FIRST SUCCESSFUL CARBONIZED FILAMENT LAMP.

PRESIDENT HERBERT HOOVER, ON LEARNING OF THE DEATH OF THOMAS A. EDISON, BROADCAST BY RADIO A NATION-WIDE COMMEMORATIVE ADDRESS ON EDISON'S GREAT ACHIEVEMENTS AND CONTRIBUTIONS TO THE PROGRESS OF MANKIND.

THOMAS ALVA EDISON "HE HAS LED NO ARMIES INTO BATTLE— HE HAS CONQUERED NO COUNTRIES— HE HAS ENSLAVED NO PEOPLE—YET HE WIELDS A POWER THE MAGNITUDE OF WHICH NO WARRIOR HAS EVER DREAMED. HE COMMANDS A DEVOTION MORE SWEEPING IN SCOPE, MORE WORLD-WIDE THAN ANY OTHER LIVING MAN—A DEVOTION ROOTED DEEP IN HUMAN GRATITUDE, AND UNTINGED BY BIAS OF RACE, COLOR, RELIGION OR POLITICS."

Arthur J. Palmer

THE EDISON TOWER IS A GIFT TO THE THOMAS ALVA EDISON FOUNDATION Incorporated IN BEHALF OF THE EDISON PIONEERS From WILLIAM SLOCUM BARSTOW PRESIDENT OF THE THOMAS ALVA EDISON FOUNDATION Incorporated AND EDISON PIONEERS 1929-1936.

> The Lighting of The Tower is a Gift of the Public Service Electric and Gas Company of New Jersey Thomas N. McCarter, President

> > -7-

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THE BIRTHPLACE OF GREAT INVENTIONS

THE INCANDESCENT LAMP

On preceding pages are descriptions of various inventions and developments made in the Menlo Park laboratory of Thomas A. Edison during the years 1876 to 1886. The most important of these, directly affecting public life, were the incandescent lamp, the telephone transmitter (now the basis of the microphone) and the phonograph. His other outstanding inventions, such as the moving picture, the storage battery, etc., were made after his laboratory was moved to West Orange in 1886. Of Edison's incandescent lamp, Francis Jehl, one of the original Edison Pioneers, a laboratory assistant of the inventor at Menlo Park, has written at some length, and that which follows is taken largely from this source.

It was on October 21, 1879, that Thomas A. Edison terminated his marvelous researches in the Menlo Park laboratory in establishing all the fundamentals necessary for making a practical and commercially successful incandescent lamp. An understanding is obtained of that remarkable period from a quotation of Edison's citing the engagement in December, 1878, of Francis R. Upton as his mathematician. The inventor was greatly aided by Mr. Upton in making calculations of the multiple arc problem, and it was proven by figures that the lamp which Edison had in mind must have at least 100 ohms resistance to compete successfully with gas. Then followed experiments, during the course of which it occurred to Edison, according to a statement made later by the inventor, "that perhaps a filament of carbon could be made to stand in the sealed glass vessels or bulbs, which we were using, exhausted to a high vacuum. Separate lamps were made in this way independent of an air pump and, in October, 1879, we made lamps of paper carbon and with carbons of common sewing thread placed in a receiver or bulb made entirely of glass, with the leading-in-wires sealed in by fusion. The whole thing was exhausted by a Sprengel mercury pump to nearly one-millionth of an atmosphere. These filaments of carbon, although naturally quite fragile owing to their length and small mass, had a smaller radiating surface and higher resistance than we dared hope. We had virtually reached the position and condition where carbons were stable. In other words, the incandescent lamp as we still know it today, in essentially all its particulars unchanged, had been born."

SUCCESS OF EXPERIMENTS

"Thus, on October 21, 1879," writes Mr. Jehl, "Edison was fully aware and convinced that all his researches on carbon lamp filaments, as regards their resistance, stability and life, were crowned with success."

It was just sixty years ago, in 1878, that Edison, adequately financed by G. P. Lowrey and the elder J. P. Morgan, began on a large scale his work on electric lighting at Menlo Park. "He erected a machine shop and library building, both fully equipped," recalls Mr. Jehl, "and the two-story

-8-

frame building which he had erected in 1876 was transformed in 1879 into his research and experimental laboratory."

Among his assistants during the epoch-making experiments on electric lighting during 1879, were Charles Batchelor, Francis R. Upton, John Kruesi, Martin Force, Francis Jehl and Ludwig Boehm.

There were many puzzling phases of the work undertaken by Edison while experimenting with carbonized lamp filaments, made from every conceivable material. Over a period of many weeks lamps were made and tested and, despite repeated failure, much important information was gleaned by Edison.

PATIENCE AND ENDURANCE

As filaments were made from various raw materials during October, 1879, Edison kept close watch on his assistants, in order that he might readily confer and check with them. For many of these pioneers it was virtually twenty-four hours a day service. "When a raw filament was ready," writes Jehl, "Edison himself carbonized it, and, standing before a hot furnace for hours, waited until it was finished. After the carbonizing crucible was cooled he unpacked it again and directed the attachment of the filament to the leads of the glass stem; then he took it to Boehm, the glass blower, to have it fused to the bulb. Next the lamp was taken to the Sprengel pump to be evacuated and there again Edison stood patiently, sometimes for ten hours at a stretch, until all air and gases had been removed. During this time he himself subjected the filament gradually to the electric current in order to drive out the occluded gases, and when that process was ended the lamp was put on a life test.

"For this test the lamp generally was placed in a wooden stand with an adjustable arm, such as chemists use for holding test tubes or funnels. The current was supplied from a large battery of bi-chromate cells, and it was Edison himself who switched in one cell after another when the voltage dropped, regulating it in this manner and without resistance...

"In the testing of these experimental lamps Edison's main object was to obtain a filament of high resistance which gave adequate life. The candle power was judged by sight, or with the shadow of a pencil and a common candle as a standard. The consumption of electricity was considered of little account, although it was known to be small, as the thin copper leads exhibited no heat when touched with the hand."

Later, however, the efficiency of these experimental lamps was determined. Early in October, 1879, Edison made some filament of thread obtained from the Clark Thread Mills in Newark. By this time the experience which he had acquired in research work made Edison a master in the art of carbonization and the preparation of filaments.

STILL A YOUNG MAN

Edison at this time was but thirty-two years of age, while the majority of his laboratory assistants were mere youngsters. The spirit of devotion exhibited by this group was an outstanding factor, and it is not astonishing, therefore, that with the unusual and baffling work he was doing, and the surroundings in which he always stood, that friends and strangers alike commonly called him "The Wizard of Menlo Park."

"Electricity and physical facts connected therewith were in their infancy," observes Jehl, "and it was Edison who, without erroneous dogmatism or speculative opinions, sought and found the truths hidden in nature and developed them for man's good and for future generations."

READY FOR LIFE TEST

Quoting from Jehl's observations: "We now come to October 19, 1879, a Sunday morning, when another sewing thread carbonized filament lamp that had already been finished on Saturday was placed by Edison on the pump for extracting the air . . . Edison . . . watched as it worked and noted the large cylinders of air that were being pressed down by the likewise large cylinders of mercury which, as time passed on, successively became smaller and smaller. When the stage of metallic clicking arrived he took a small alcohol flame and began to heat the bulb of the lamp, as in past experiments, in order to heat, expand and dry the air remaining in it. This operation he continued from time to time until the clicking increased in its violence. Then he attached one of the wires from the battery of the bi-chromate cells to one of the lamp's terminals, while with the other end of the battery wire, he touched, just for an instant, the lamp wire. The result was that the vacuum in the lamp became suddenly depressed and large bubbles of air appeared again in the pump tube. . . . Edison continued to apply the battery current to the carbon lamp filament, increasing the current in intensity as well as in time of its application until all the occluded gases were driven out and the air pump exhibited the highest possible obtainable vacuum. The full current was then left on the lamp for some time while the pump still worked . . . The lamp now was ready for its life test about eight o'clock in the evening."

BURNS FORTY HOURS

Continuously the lamp burned until between one and two o'clock in the afternoon of Tuesday, October 21, 1879. Then, having reached over forty hours of life, the longest duration of any of the lamps thus far made and tested, it died. Under the usual minute examination of Edison, the bulb was broken open, Jehl recalls, and the filament subjected to his microscope, thereby making impossible the retention of this particular lamp as a relic for posterity. "October 21, 1879, commemorates a great event," Mr. Jehl concludes his article on this subject, "and the consummation of a notable achievement in the annals of incandescent electric lighting. It has been celebrated ever since the world over as Edison Lamp Day."

THE PHONOGRAPH

Two years before his successful experiment with the incandescent lamp, Edison had conceived and made in the Menlo park laboratory his original phonograph, the world's first sound-reproducing machine. Years later, having spent half a century on its improvement, Edison conceded the phonograph to have been the favorite among all his inventions. At the time of its conception Edison was seeking a device for recording telegraph messages automatically. Adapting the principle of the power of a diaphragm to take up sound vibrations, on August 12, 1877, he made a hurried sketch with a notation:

"Kruesi,

Make this,

Edison."

Three days later a working model was placed on Edison's desk by an astonished Kruesi. Affixing a bit of tinfoil to the cylinder, Edison talked into a mouthpiece and then, for the first time, a human voice was reproduced as "Mary Had a Little Lamb" was heard to issue therefrom. Following this event came nationwide publicity and, as improved models were made and curiosity broadened, crowded excursion trains to Menlo Park became the order of the day. All of this sixty years ago!

Edison's original phonograph reposed for many years at South Kensington Museum, London, but was returned to the inventor shortly before his death.

FIRST PHONOGRAPH PATENTS

The records indicate that Edison had for some time been seriously considering a sound-reproducing machine, as two weeks prior to his now famous message to Kruesi he had applied, July 30, 1877, for his first British patent. Application for the first phonograph patent in the United States was not made until December 15, 1877; on February 19, 1878, it was issued without a single reference.

The original model embodied a revolving cylinder which was wrapped with tinfoil and pregrooved for recording with a metal stylus. Recording was accomplished by means of a diaphragm which actuated the stylus and produced "hill and dale" indentations on the tinfoil corresponding to sounds impressed on the diaphragm. The motion of the stylus was vertical with respect to the groove in the "record" and produced a variation in the depth of the groove.

The first phonograph is described, in the patent issued to Edison, in part as follows: "The object of this invention is to record in permanent characters the human voice and other sounds, from which characters such sounds may be reproduced and rendered audible again at a future time." Anticipating future development of the phonograph, Edison foresaw the day when many records of both voice and music would be made from a "master" recording as he revealed in the following, which is also quoted from his first phonograph patent: "The record, if it be upon tin foil, may be stereotyped by means of a plaster of paris process and from the stereotype, multiple copies may be made expeditiously and cheaply

-11-

by casting or by pressing tin foil or other material upon it. This is valuable when musical compositions are required for numerous machines."

On April 24th, 1878, the Edison Speaking Phonograph Co. was formed at Norwalk, Connecticut. This company was granted the exclusive sales right to the phonograph as covered by Edison's patent application of December 15th, 1877. It is interesting to note that a part of this old agreement between Edison and those granted exclusive sales right describes a method of recording by means of equipment "causing such sounds to vibrate a mobile body, the movements of which are recorded by indentation, displacement, subtraction from or deposit upon any material, and the reproduction of the movements of such mobile body, by causing its record or copy thereof to give motion to another or the same body..."

WORLDWIDE INTEREST AROUSED

During the ten year period between 1877 and 1887 the phonograph aroused wide interest in this and all other countries of the world, but few improvements were made as Edison was busy on the many problems pertaining to the electric lighting industry. Early in 1888, however, he again turned to the phonograph, and soon the molded wax cylinder and the sapphire recorder were introduced. These basic improvements are in use today in the modern Ediphone for business dictation, a specialized application of the original phonograph principle which utilizes a shavable record.

With the coming of the disc record, Edison invented a diamond point to replace the sapphires used on the Ediphone and cylinder phonographs. One of the earliest widely used phenol-formaldehyde plastics was also developed in the Edison Laboratories for disc records with which the diamond reproducers were used.

During more than fifty years work on the phonograph Edison never abandoned his "hill and dale" principle of recording and reproduction, originally conceived in 1877. While other methods, notably the "lateral cut," came into general use with the widespread manufacture and sale of phonographs after the turn of the century, Edison would allow only the "hill and dale" method as "correct." That he was right in his convictions was evidenced not only by the exceptional quality and faithful reproduction which characterized phonographs of Edison manufacture for many years, but is confirmed today whenever his original phonograph principle is combined with electrical devices to make modern high fidelity recordings. The leading sound recording studios today are turning to and employing Edison's original method of "hill and dale" recording.

ENTHRALLS GREAT MEN

Perhaps no other invention of modern times has aroused more interest than the phonograph did for more than a generation after 1877. Great men of the late nineteenth century, including some of the crowned heads of Europe, had their voices recorded for posterity, while the phonograph was received in thousands of homes as a new and novel means of entertainment. With the development of the wax record, making home recordings possible, phonograph parties were

-12-

formed and it was used in schools and colleges as an educational means. In the office, the business phonograph, forerunner of the modern Ediphone, was making its appearance.

Improvements gradually brought the phonograph from the level of novel entertainment to the status of a fine musical instrument. Thus until the middle ninetcen twenties, the phonograph was an instrument preeminent in the field of home entertainment.

With the advent of radio broadcasting, both the popularity and technical characteristics of the phonograph changed. It quickly gave way to the new and unique appeal of radio entertainment and, like the radio, became transformed into an electrical instrument. The old acoustic phonograph gave way to the modern type with sound reproduction electrically controlled, although the original recording and reproducing principle, first demonstrated by Edison in 1877, was retained.

At the present time there are probably more applications of the original phonograph principle in use than ever before. It is used as an accessory to modern electrical recording and "transcriptions," in combination with electric amplifiers which, incidentally, have grown from the first thermionic tube made by Thomas A. Edison in 1883.

A PREDICTION FULFILLED

As the phonograph industry grew, the business phonograph developed from a relatively crude instrument to the highly specialized device of which the modern Ediphone is typical. While acoustic methods have been retained, quite generally because of their basic simplicity and effectiveness, the modern Ediphone is electrically controlled, and more and more Ediphones are used in the field of business every year, thus fulfilling Thomas A. Edison's prediction made as far back as 1878.

EDISON RE-ENACTS HISTORICAL EVENT

On the evening of October 21, 1929, at Dearborn, Michigan, where Light's Golden Jubilee was being celebrated on the Fiftieth Anniversary of Edison's perfection of his incandescent lamp, the inventor, then eight-two years of age, pushed a button which set alight a large replica of this lamp on the top of a temporary steel tower and the "Eternal Light" at Menlo Park, New Jersey.

From a reincarnated Menlo Park created by Henry Ford in the Middle West, Mr. Edison reenacted the historical laboratory event of perfecting his first incandescent lamp, and gladdened the hearts of his former "boys," Edison Pioneers, by lighting the huge replica on the site of its original birthplace. This large lamp, visible for many miles around, was lighted nightly during the intervening years until August 11, 1937, when the structure was entirely demolished by lightning. But without interruption, the "Eternal Light" at the base of the Tower, lighted at the same time, has glowed since October 21, 1929. On this light are inscribed these words from the pen of the late R. R. Bowker, an Edison Pioneer:

"The light once lit shall never dim, But through all time shall honor him."

The "cornerstone" of the permanent Edison Tower was laid with appropriate ceremony on July 1, 1937. Thomas N. McCarter, first Chairman of the Edison Park Commission, presided, and addresses were made to several hundred persons gathered for this occasion by the Honorable Harold G. Hoffman, Governor of New Jersey; Charles Edison, The Assistant Secretary of the Navy, son of the inventor, and William S. Barstow, donor of the Edison Tower, President of The Thomas Alva Edison Foundation, and past President of Edison Pioneers. Into one of the very first phonographs invented by his father sixty years earlier, Charles Edison recorded upon tinfoil the identical "Mary Had a Little Lamb" that his father had spoken on the original working model.

PERPETUATING EDISON'S MEMORY

The Thomas Alva Edison Foundation Incorporated was organized as a non-profit institution in June, 1935, for the broad purpose of honoring and perpetuating the memory of the inventor, for whom it was named. Its Board of Directors is comprised of representatives of various organizations, as follows:

Edison Pioneers American Institute of Electrical Engineers Association of Edison Illuminating Companies The American Society of Mechanical Engineers The American Society of Civil Engineers Society of Motion Picture Engineers The Electrochemical Society, Inc. The American Institute of Mining & Metallurgical Engineers International Electrotechnical Commission Illuminating Engineering Society

-14-

LIGHTNING STRIKES TWICE

By a strange quirk of nature the temporary steel tower at Menlo Park, marking the site of Edison's famous laboratory where he delved into the mysteries of electricity and put many of them to work, was visited by lightning on the evening of June 30, 1937, as preparations were being made for a cornerstone laying the next day for the permanent concrete Edison Tower. Apart from blowing a fuse or two and temporarily disabling a loud-speaker system, no damage was done.

Several weeks later, however, on August 11, the old adage of "Lightning never strikes twice in the same place" was shattered, as a bolt struck and demolished the temporary steel tower around which the concrete structure was to have been erected.

Construction, as a result, was necessarily delayed, but The Edison Tower finally was built and dedicated on February 11, 1938, the ninety-first anniversary of the inventor's birth.

THE "ETERNAL LIGHT"

The "Eternal Light" is made to represent the original Edison incandescent lamp of 1879, but is without filament. Its illumination is effected by reflected light from nine lamps beneath it. Four of these lamps are on two circuits supplied by Edison Primary Batteries of 128 cells in two banks of 64 each, each bank lighting two lamps; and five on one circuit are controlled by current furnished by Public Service Electric and Gas Company through suitable transformers.

Originally placed at the base of a temporary steel structure, destroyed by lightning August 11, 1937, and illuminated by Mr. Edison on October 21, 1929, as he pushed a button at Dearborn, Michigan, on the occasion of Light's Golden Jubilee, the "Eternal Light" is enclosed in a heavy plate glass box in the entrance room of The Edison Tower. This may be seen through the glass aperture in the bronze door at the base of the Tower.

EDISON TWP. FREE PUBLIC LIBRARY

-15-

THE EDISON TOWER AT A GLANCE

Marking site of Edison's Menlo Park activities, 1876-1886
Total height
Concrete structure
Incandescent lamp replica 13 ft. 8 in.
Comprised of amber tinted Pyrex glass 2 in. thick
Made with
Weight of glass 3 tons
Total light capacity 9500 watts
Tower constructed in 8 months
Tower required . 1200 barrels Edison Portland cement
Tower required
Commemorating the invention of the first practical incan-
descent lamp is the huge lamp surmounting the Tower
Commemorating invention of the world's first sound repro-
ducing machine—Edison Phonograph
Eight loud speakers, 150 foot radius
Four wide-range loud speakers
Heavy duty amplifiers and controls
Transcription turntable for reproducing all types of records
The Tower complete gift of William Slocum Barstow
To The Thomas Alva Edison Foundation Incorporated
In behalf of Edison Pioneers
All lighting of the Tower is a gift from the Public Service
Electric and Gas Company of New Jersey
Built June-December, 1937
Dedicated February 11, 1938
Massena & DuPont, Architects
Louis H. Doane, Consulting Engineer
Walter Kidde Constructors, Inc., Builders
Giant Lamp made by Corning Glass Works
Sound System, RCA-Victor, installed by William C. Kelly, Jr.



-16-



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ON THE FLET PUBLIC LARGE

THE EDISON TOWER

By CHESTER MERRILL WITHINGTON

THE EDISON TOWER, located on the site of the original laboratory at Menlo Park, New Jersey, to which Thomas Alva Edison moved in 1876, was erected in 1937 as a monument to the great inventor. The Tower is the gift of William Slocum Barstow to The Thomas Alva Edison Foundation Incorporated, of which he is President, in behalf of the Edison Pioneers. It was dedicated on February 11, 1938, the ninety-first anniversary of the inventor's birth.

Rising 131 ft. 4 in. above the ground, the Tower looms as the highest discernible object for many miles. Surmounting the 117 ft. 8 in. concrete-slab structure is a 13 ft. 8 in. replica of the original incandescent lamp which, illuminated nightly, can be seen for a distance of several miles, serving as an airplane beacon. The foundation of the Tower consists of a reinforced concrete pad 2 ft. 6 in. thick under the entire structure. The space between this pad and the floor of the entrance room to the Tower, containing the "Eternal Light," was back-filled with earth for the purpose of adding weight to increase its stability against wind pressure, in the same manner as the keel on a sailboat is provided to counteract the pressure of wind on its sails. The Tower is designed for pressure of wind at a velocity of 120 miles per hour. In its construction, which consumed slightly less than eight months, there were used approximately 1200 barrels of Edison Portland cement and 50 tons of reinforced steel.

COMMEMORATIVE OF ACTIVITIES

The Tower is commemorative of Thomas Alva Edison's activities at Menlo Park from 1876 to 1886, during which period he produced and tested the first practical incandescent lamp; invented a complete system for generating and distributing electric current; invented the phonograph, the first sound and voice reproducing machine in the world; and invented and perfected many other devices known and daily utilized throughout the world.

The large bulb atop the Tower was cast by the Corning Glass Works, which fifty-nine years ago, in 1879, furnished from a sketch the first commercial electric light bulb. The replica bulb contains 153 separate pieces of amber tinted Pyrex glass, 2 in. thick, set upon a steel frame. The bulb is 5 ft. in diameter at the neck and 9 ft. 2 in. in diameter at the greatest width and weighs, without the steel frame on which it is placed, in excess of three tons. Inside this Pyrex glass bulb are four 1000 watt bulbs, four 200 watt bulbs and four 100 watt bulbs. A duplicate of each is so arranged as automatically to cut in should its companion bulb fail. The glass in the Pyrex bulb was placed on its steel frame at the Corning Glass Works, Corning, New York, and then, after being numbered, each piece was dismantled, packed and shipped to Menlo Park, where the work of permanent assembly atop the Tower itself was undertaken early in December, 1937.

-1-

On seven of the eight sides of the octagonal base are bronze tablets inscribed with descriptions of major Menlo Park inventions. In front of a bronze and glass door in the eighth side, in the concrete base of the tower, is buried a copper box containing, along with several documents, copper plates on which are inscribed the names of the officers and members, past and present, of the Edison Pioneers, and the names of the officers and directors of The Thomas Alva Edison Foundation Incorporated, together with the names of the technical bodies which they represent. The use of copper, apart from its ability to withstand the elements over the years, is in recognition of Edison's inestimable contributions to that industry's growth through the enormous demands for copper metal made necessary by the expansion of the electric light and power industry, in the creation of which Edison was so prominent a factor.

EFFECTIVE DESIGN

In a darkened room on the other side of this bronze door is the "Eternal Light," a replica of Edison's first incandescent lamp, which has been giving light continuously since October 21, 1929, when, on the occasion of Light's Golden Jubilee in Dearborn, Michigan, Edison pressed the button to set it aglow. Of interest in this connection is the fact that although the original steel structure, which this Tower replaced, was destroyed by lightning on August 11, 1937, during the construction of the present Tower, the "Eternal Light" was unharmed and continued to glow brightly, although surrounded by and covered with debris of the wreckage.

In designing and selecting materials to be used in the construction of the Tower, great care was taken to use masses and lines which would be as effective in sunlight as at night in the rays of floodlights. The effect retains the monumental bulb as the main feature of the Tower. A group of eight buttresses rising from the ground to the bulb emphasizes its dominant importance and catch the beams from the floodlights concealed at the top of the dark columns.

The choice of aggregate on the concrete facings—glittering quartz and ceramic—was specially treated so that the many faceted particles are intensified at night. The Tower also represents the most successful treatment of reinforced concrete as a finished material, a material in which Mr. Edison was deeply interested. The precast reinforced concrete facing units, which are two inches thick, were erected in successive stages and fastened to the interior wooden frames with steel anchors. Concrete then was poured between the facing units and the frames, producing perfect anchorage and a completely monolithic construction of the entire Tower. At the top sixteen anchor bolts are imbedded in the concrete, to which is attached the steel framework for the glass bulb. This bulb is the first circular casting work ever produced in the glass industry.

LIGHTNING PROTECTION

As a protection from lightning, about one-third of the distance down from the top of the light bulb, there are 16 aluminum points projecting about six inches beyond the face of the glass. These points, together with one at the very

- 2

top of the bulb, are inter-connected by a 3%-inch copper cable. From this cable four 3%-inch cables are carried down inside the Tower, where they are connected under the foundation to twelve ground rods. Each ground rod is comprised of a steel rod encased in a copper tube and measures about threequarters of an inch in diameter; these are driven into the earth below the foundation to an average depth of seventeen feet. These twelve ground rods are also inter-connected by copper cables to which the four cables coming down the Tower are attached.

This method of lightning protection was devised from recommendations received by the architects from Professors Dahl and Woodruff of the Department of Electrical Engineering of Massachusetts Institute of Technology, with some slight additions supplied by the insurance underwriters.

SOUND SYSTEM

Emblematic of the invention on this spot in 1877 of the phonograph, is a sound system designed and manufactured by the RCA-Victor Company of Camden, New Jersey. Electrically transcribed phonograph records can be broadcast from the top of the Tower ninety-six feet above the ground. There, beneath the huge lamp, are decorated grilles behind which are wide-range, high-powered, loud speakers. The speakers are designed to transmit chimes, music of all kinds, as well as speech, over a radius of two miles. The group of specially designed, heavy duty amplifiers, with all controls, is located in the operating room in the Tower. Here are also installed the transcription turntable and the lateral and vertical sound heads for reproduction of standard or special recordings of all types. This transcription turntable is the highest quality available and, in combination with "hill and dale" (vertical) recordings, which Edison invented and always used, provides extremely faithful reproduction of any type of music or speech. Part of the general installation is a group of eight loud speakers located thirteen feet from the base of the Tower; these are designed particularly for speech reproduction over a radius of at least one hundred and fifty feet. They are equipped with a high duty, portable microphone for use at locations provided with connections to amplifiers. Provision has been made for any addition of electric organ or electric carillon, as well as for Westminster chimes, in combination with a time clock, for striking the hour, half-hour and quarter hour.

THE TOWER A SYMBOL

Through the sound system installation in the Tower the first broadcast was held on February 11, 1938, on the dual occasion of the dedication of The Edison Tower and the commemoration at the Hotel Astor, New York City, of the ninety-first anniversary of the inventor's birth.

The effect of The Edison Tower as a whole is dynamic, a symbol of the forceful, forward-moving results of Thomas Alva Edison's genius.

-3-

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THE EDISON TOWER

Marking site of Edison's Menlo Park activities, 1876-1886 131 ft. 4 in. Total height · · · · · · · · 117 ft. 8 in. Concrete structure Incandescent lamp replica 13 ft. 8 in. Comprised of amber tinted Pyrex glass . . 2 in. thick Made with 153 pieces 3 tons Weight of glass **9500** watts Total light capacity Tower constructed in 8 months 1200 barrels Edison Portland cement Tower required 1.2.1 · · · · · · · · . . . 50 tons steel Tower required

Commemorating the invention of the first practical incandescent lamp is the huge lamp surmounting the Tower

Commemorating invention of the world's first sound reproducing machine—Edison Phonograph

Eight loud speakers, 150 foot radius Four wide-range loud speakers Heavy duty amplifiers and controls Transcription turntable for reproducing all types of records

The Tower complete gift of William Slocum Barstow To The Thomas Alva Edison Foundation Incorporated In behalf of Edison Pioneers

All lighting of the Tower is a gift from the Public Service Electric and Gas Company of New Jersey

Built June-December, 1937 Dedicated February 11, 1938 Massena & DuPont, Architects Louis H. Doane, Consulting Engineer Walter Kidde Constructors, Inc., Builders Giant Lamp made by Corning Glass Works Sound System, RCA-Victor, installed by William C. Kelly, Jr.





Special to The News Tribune EDISON - Rising 131 feet in the Menlo Park section of this township, stands the

Edison Tower and Museum. It memorializes the "Wizard of Menlo Park" and his experimental laboratories. where in 1879 he invented the incandescent lamp, a major invention along with so many other attributed to him which have revolutionized modern society.

With the occurence of the 135th birthday of Thomas Ava Edison on Feb. 11, a visit to this site on Christie Street, off Route 27, is a chance to vividly experience the giant impact of this man on the lives of everyone.

Although the greater amount of his memorabilia are enshrined in West Orange and in Dearborn, Mich., nevertheless, there is a mystique to be experienced here, though the artifacts be few.

Each night, a huge light bulb is lighted



TNT photos by Arlene Zatz **His works survive**

George Campbell, right, curator at the Edison Tower, shows visitor the Kinetoscope, a coin operated "moving picture" machine. The incandescant lamp mounted on marble, right, and lighted Oct. 21, 1929 by Edison during the 50th anniversary of his invention has remained lighted since that day.

atop the tower, erected in 1937. Designed to withstand winds of 120 miles per hour, the tower required 1,200 barrels of Portland Cement - an Edison discovery - 50 tons of reinforced steel. The replica of his incandescent lamp, was made by Corning Glass Works. It stands 13 feet, eight inches high, is five feet in diameter and weights three tons.

Edison inventiveness has never been paralleled. Born in Ohio in 1847, he was an inquisitive child, who as a preschooler tried to solve the mystery of hatching eggs by sitting on them in a barn. Shortly after the family moved to Michigan he was withdrawn from school and taught by his mother, because he was a "difficult" student.

At age 12, he sold newspapers on a train while maintaining a chemistry laboratory in the baggage car. At 13, he was taught telegraphy by the station agent as a reward for saving the agent's son from death under a moving freight car. It was the beginning of

1879

"nays" of lega he wouldn't be paid for the

decided never to invent anything unless was a demand for it.

In 1869 he invented the Universal Stock Printer, for which he received \$40,000. With this, he opened a factory in Newark and by age 23, was working 20 hours a day trying to keep up with his brain as he thought up inventions. In 1876, he bult a laboratory, here, a two-story wooden structure 100 feet long and 30 feet wide. Chemicals, rolls of wire, books, a steam engine and a gasoline converter were brought in. He surrounded himself with scientific apparatus and trained assistants for the drudgery, thereby leaving himself time for thinking and inventing.

Newspapers predicted doom for his new venture, pointing out that he lacked education. He proved everyone wrong by inventing the phonograph, a feat which attracted worldwide attention.

People journeyed here by carriage, train, and in some cases after ocean voyages to see this remarkable machine and the man who had created it. At first glance, visitors were disappointed upon learning Menlo Park was but a flag station on the railroad, an area containing only six houses and a laboratory. But seeing the man and his machines caused him to become known as "The Wizard of Menlo Park."

Though it was thought impossible for one man to come up with another great idea. Edison lighted the way for mankind with the incandescent light, a project of massive research and development which culimanted in success on Oct. 21, 1879.

Though the museum here is small, visitors may browse among some of his inventions for an hour or two. Curator George Campbell explains in detail inventions displayed and tells the story of Edison's full-sized electric railway, a first in the United States. which he installed at Menlo Park. Pictures show what he, his associates and the machine shop looked like.

Other items visible are a tin foil phonograph which was demonstrated at a meeting of the National Academy of Sciences in Washington, D.C. while Hayes was presi- p.m.



Soaring Edison Tower dwarfs pole bearing American Flag.

dent; the Kinetoscope, and various light bulbs

Before you leave, view the exterior of the tower at close range. Seven sides of the octagonal base hear inscriptions on bron-

tablets. One ide William Slocu **Edison** Pione Edison. In the interi

lighted on Oct. o during the 50t o the invention o His continuously ev On Dec. 8, declared a na

listed in the Na There is a **Admission free** on Wednesday,

12:30 to 3:30 p.m. and on weekends from 12:30 to 4 p.m. Summer hours are Tuesday, Wednesday, Thursday and Friday from 12:30 to 4 p.m. and weekends from 12:30 to 4:30

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March 30, 1990-ME REVIEW-PAGE A-5

Tower stands as guiding light, provides link to Edison's past

By GEORGE CAMPBELL

EDISON – April 10 will mark the bicentennial of the U.S. Patent Act signed into law by President Washington.

It provided for an examination of patent applications by a board headed by the secretary of state. If the board should "deem the invention or discovery sufficiently useful and important," it would grant a patent for a term of 14 years. Thomas A. Edison, Ame-

Thomas A. Edison, America's most prolific inventor, had received more than 1,000 patents before his death in 1931. They included improvements for the telegraph, telephone, electric motor, electric locomotive and, of course, incandescent lamp (in 1879) and phonograph (in 1877).

More than 400 of his patents were for inventions and discoveries made in his Menlo Park laboratories on Christie Street in the township.

Edison and his co-workers labored between 1876 and 1886 in a rambling, 100-by-30foot wood-frame clapboard laboratory, and Edison lived in a handsome home at the corner of Christie Street and what is now called Tower Road.

Also located on Christie Street was Mrs. Jordan's Boarding House, home to many of Edison's workers. More notably, however, it is known to be the first residence ever to be illuminated by incandescent lamps.

Middlesex Avenue, which intersects Christie Street near the Edison Memorial Tower, was the site of the railroad tracks upon which Edison's patented electric locomotive first traveled. Described by many as "the enchanter" and 'the wizard of Menlo Park,' Edison also was a true showman. To demonstrate the practicality of his incandes-cent lamp to an often skeptical public, Edison and his workers strung more than eight miles of cable throughout the property of his 45-acre laboratory site and placed incan-descent lights and globes atop simple wooden posts. Then during Christmas week of 1879, he set in operation 11 dynamos of his own invention, and the illumination of these lamps gave the bare fields the look of an imaginary town," according to one report. The lighting display, which was attended by actress Sarah Bernhart, was described as "the sensation of the year." Sightseers came by the thousands. Old-fashioned wagons and carts brought farmers and their families and private parties wheeled up in carriages. On New Year's Eve, more than 3,000 "gawkers" trooped through the laboratories. After Edison left Menlo Park for West Orange in 1886, the buildings of Edison's "invention factory" underwent a succession of uses, a house was destroyed by lightning and the site gradually deteriorated through disuse and neglect. Edison's close friend Henry Ford purchased the property in the 1920s, dismantled the structures and shipped them - and even a great deal of the topsoil - to his Greenfield Village Museum in Dearborn, Mich., where they can be seen today fully restored. It was fitting, then, that after Edison's death in 1931, a memorial would be erected to honor him and his accom-plishments at Menlo Park. To mark the historical site, a 131foot tower was erected in 1937. While it was originally maintained by Stevens Institute of Technology, the state assumed responsibility for the tower in 1960. In 1979 - the centennial of the invention of the incandescent lamp, Edison Township became the guardian of the tower. The tower is constructed of Portland ce'Wizard of Menlo Park' perfects electric locomotive, incandescent lamp in lab at Christie Street location



ment, yet another invention of Thomas Edison. It is topped by a replica glass bulb, made by the Corning Glassworks, Corning, N.Y. The company designed the bulb using sketches Edison made for the first commercial light bulb. At the base of the tower, an eternal bulb glows as a symbol of the dedication and determination of one man and his contribution to the world.

A little known but interesting fact is that Edison once received an unusual gift from an admirer. The gift was a bear. According to Menlo Park Reminiscences, Edison kept the bear and chained it to a tree outside his Christie Street laboratories "for the entertainment of his workers and the discomforture of salesmen." The workers named the bear Mr. Bruin.

Edison allowed the use of one of the garages at his laboratories to house the hook and ladder apparatus of the Menio Park Fire Company. It's speculated that because of the many chemicals housed and the experimentation conducted at the site that Edison's offer to the fire company was really more one of mutual aid.

Because of the offer, however, and to honor him for his many accomplishments in Menlo Park, the fire company named Edison an honorary member, and each year the firefighters mark the anniversary of Edison's February 11 birthday with a wreath laying ceremony on the grounds of the tower. In 1979 during the township's yearlong celebra-tion of "A Century of Light," the Edison Memorial Tower was placed on the National Register of Historic Places. In 1983, the Edison Township Historical Society donated a plaque which recorded its na-tional historic status as a premier example of art-deco monument architecture. In 1985, the Society erected 12 period street lamps encircling the tower to commemorate the lighting of Christie Street the first street to be illuminated by incandescent lamp. Visitors from around the world travel to the Edison Memorial Tower to see its artifacts and, of course, to see the tower itself, which marks the exact spot where the incandescent lamp was invented.

of the Edison Township Historical Society

The Edison Memorial Tower, erected in 1937, stands at the Christie Street location, Edison, where the "Wizard of Menlo Park" perfected the incandescent lamp, the phonograph and many other inventions. Thomas Jefferson once said, "The issue of patents for new discoveries has given spring to inventions beyond my concep tion." And a generation later, the French commentator Alexis de Toqueville called America "a land of wonders in which everything is in constant motion and every change seems an improvement."

Edison's developments in Menlo Park were truly wonders and beyond the conception of many. The tower, which honors him, is more than steel and concrete. It is a fitting memorial to Edison's efforts and accomplishments.

Late Mayor Anthony Yelencsics said it best in ceremonies at the tower in 1985: "This tower has become a symbol of our town and stands as a guiding light for future generations."

There is a small museum on the tower's grounds which houses a collection of phonographs, light bulbs, pictures and other Edison memorabilia. In addition, the museum has a gift shop.

The tower, located off Route 27 at Christie Street and Tower Road, is open Wednesday through Friday from 12:30 to 4 p.m. and Saturdays and Sundays from 12:30 to 4:30 p.m. After Memorial Day, it also is open Tuesdays from 12:30 to 4 p.m.

Admission is free. George Campbell, curator of the Edison Memorial Tower, is a member of the Edison Township Historical Society. This article is one in a series by society members for the Metuchen-Edison Review on the history of the area.