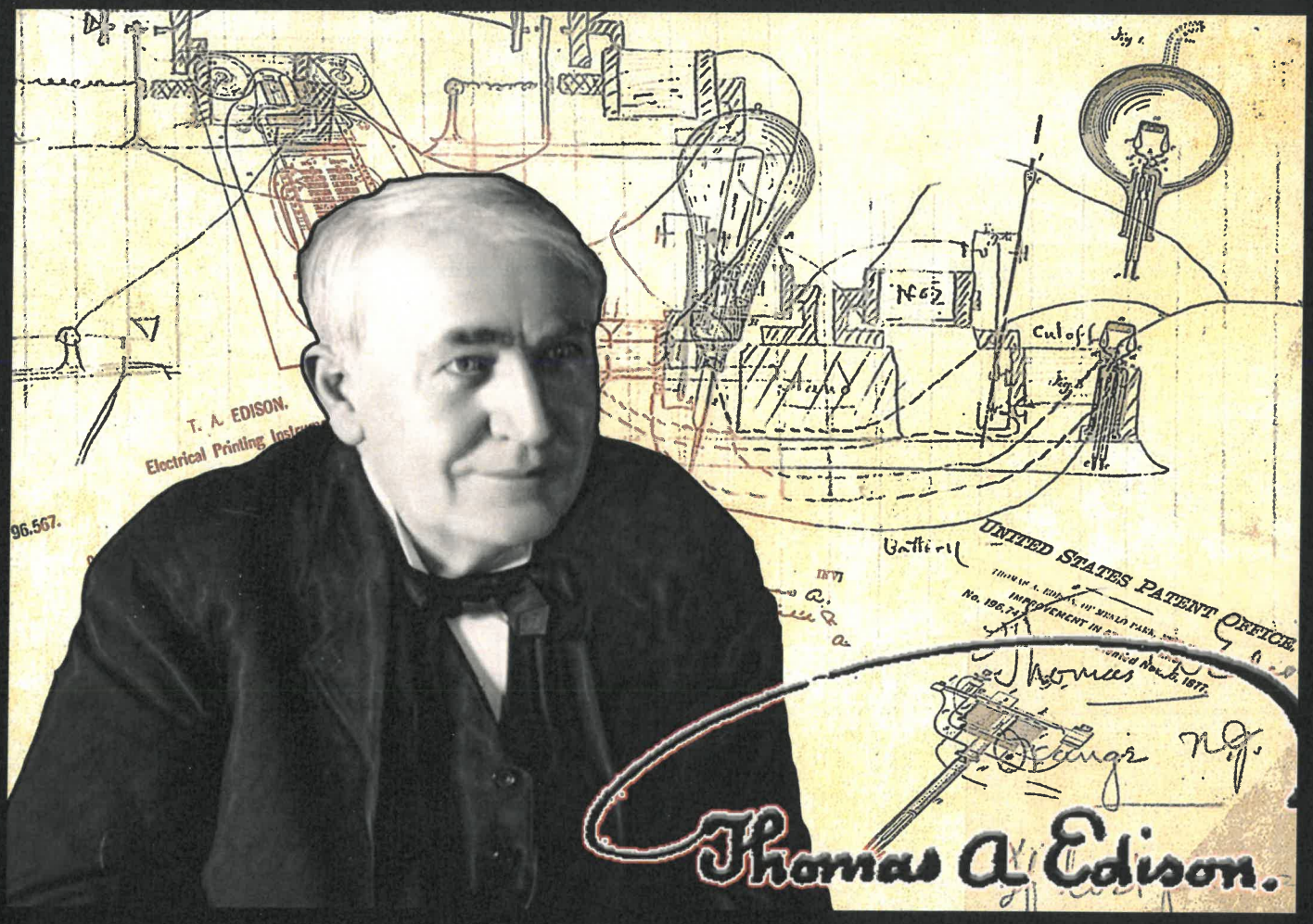
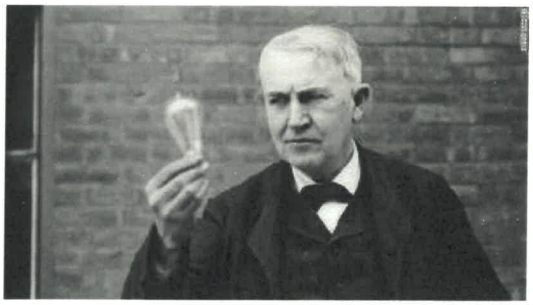
# Thomas Edison

## WORDS-TEXT-QUOTES-PHOTOS

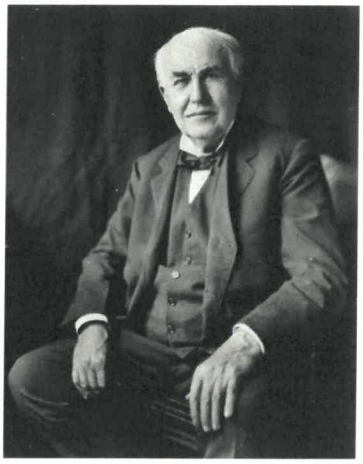


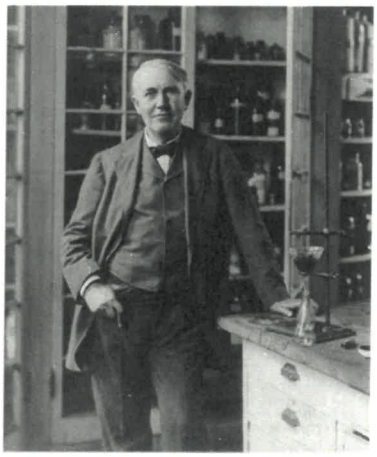

BY: HARRY ROMAN

# Thomas Edison in Words, Text, Quotes and Photos



**By**
**Harry T. Roman**
**Author & Advisor**
**Edison Innovation Foundation**





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# Introduction

Thomas Edison was my boyhood hero. After 36 years working in an industry he created-the electric utility industry-I retired early to be a docent at the Thomas Edison National Historical Park in West Orange, New Jersey; and to apply my life's knowledge of the great inventor as an author & advisor to the Edison Innovation Foundation.

The one-page vignettes that make up this volume are taken from the many talks, lectures, articles and discussions I have had with park visitors and professionals who have engaged my knowledge about Thomas Edison. This compendium is a happy celebration of facts about the great inventor, combined with photos and interesting information about the man and his times. I hope you enjoy me, enjoying my lifelong hero and role model.

Harry Roman
Author & Advisor, Edison Innovation Foundation

# Edison Nickel-Iron Storage Batteries

**His favorite battery is looked on with pride**

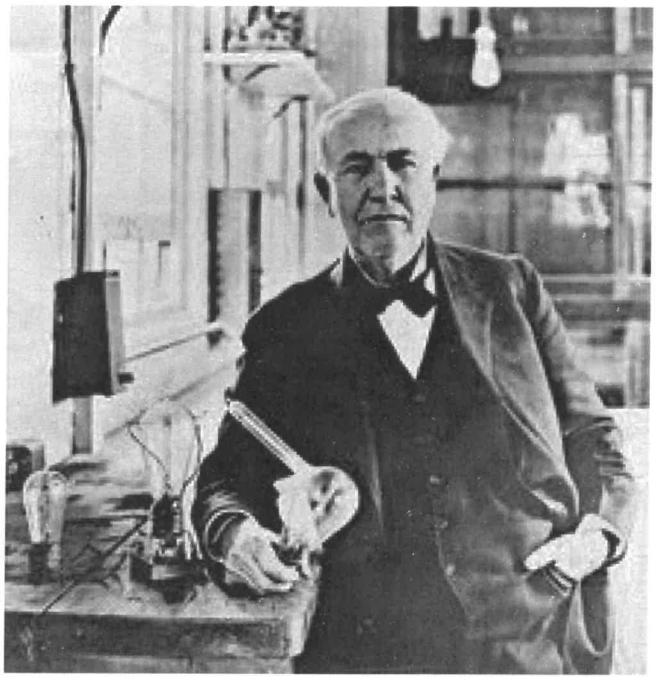
Arguably his most profitable and widely applied product, Edison's rugged nickel-iron storage battery was used initially in electric vehicles and soon found robust service in railroad signal crossings, miner's helmets, military field operations, and naval and merchant marine applications. In 1912, Edison built a huge battery manufacturing facility across the street from his invention factory building in West Orange. Today, the remnant of that building is being renovated into housing apartments. Legend has it, Edison and his muckers performed 10,000 experiments over 15 years of work to make the batteries practical. The Edison battery chemistry ushers in the alkaline storage battery technology. Kids love to make Edison batteries with a nickel, an iron nail and some salt water!

# Edison's Desk

**Edison's Desk-as it Stood at the Time of His Death, October 18, 1931**

From this simple roll-top desk, in his office/library, the great inventor managed the operation of his 30 companies, kept track of 30-40 ongoing new product development teams, and conducted the daily business of Thomas A. Edison Industries, Inc. Visitors often met Mr. Edison at this desk. The little cubby-holes contain routine business concerns including one titled "New Things". The desk appears today as it did upon his death at 3:27 on the morning of October 18, 1931. Edison died at age 84. Notably present on the side of the desk was an Ediphone recording phonograph (made by Edison Industries) for old Tom to make notes for his secretary and assistants to transcribe. Ediphone devices were made and sold for use in offices well into the 1960s.

# The Edison Effect



**Edison holding his special bulb that gave birth to vacuum tubes and modern electronics**

In 1880, Edison observes the transfer of electrons [before the electron was formally discovered!] between electrodes within a specially constructed light bulb. The experiments conducted were originally intended to help improve filament lifetimes. The patent he files is the first electronic patent, and an application he actually uses in his electric utility system demonstration (1880-1882) in New York City. This leads directly to the development and application of vacuum tubes in the early 1900s; and later the progression to transistors (1950s) and integrated circuits (1970s). It can be accurately asserted that the great-grand daddy of the integrated circuit is the light bulb!

# Motion Pictures

**1954 replica of the original Black Maria-world's first motion picture studio**

Think how students learn in the classroom today, using smartboards where videos and various science and math oriented animations help them to grasp complicated information and relationships. In 1910-1912, Edison was expanding his motion pictures industry and making great overtures about how movies would be making great inroads in the classrooms of tomorrow…even trying to get some local schools to work with him. He was way ahead of his time, with an interview that appeared in The Saturday Evening Post in late 1912, entitled "Going to School at the Movies". By the way, this first motion picture studio was solar-powered. The studio was rotated 15 degrees on its circular track every hour to track the sun's light so movies could be made in strong natural sunlight.

# Edison's Home-Glenmont

The lovely Edison family home, Glenmont, is an example of the emergence of what we recognize today as the modern home. Designed by famed architect, Henry Hudson Holly during 1880-82, this Queen Ann Victorian style home boasts 29 and half rooms, 6 bathrooms, 23 fireplaces, central heating, indoor plumbing, a refrigerated kitchen room, and 4 cisterns to collect gutter rainfall to flush toilets. A truly unique aspect of this home design is a Springfield Gas Machine that aspirates gasoline vapors from a tank of raw gasoline (secured in an underground pit) to provide gas lighting for the home. This lighting system was converted to electric lighting in 1887, one year after Edison bought the home as a wedding present to his lovely wife Mina.

# Edison Concrete

**Yankee Stadium 1923**

The city of New York purchased 62,000 barrels of Edison Portland Cement to make the concrete that built Yankee Stadium in the early 1920s. This durable cement actually was an offshoot of Edison's project to capture the iron ore from western NJ mountain rock. When larger and richer deposits of iron ore were found near the Great Lakes, Edison's iron ore could not compete. With $1 million invested in a potential failure, Edison soon learned how valuable concrete was becoming as a building material, thus he sought other markets, and subsequently improved the production output (by 4 times) of traditional cement making operations. This stimulated his cement homes concept, cement for road construction, and the use of cement for industrial buildings--including his own factories at the legendary West Orange site. It seems that Yankee Stadium is the house that Ruth and Edison built!

# Quotes by the Great Inventor

**"I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that. I wish I had more years left."**

**[Edison spoke these words circa 1910-how is that for being ahead of his time]**

**"Of all my inventions, I liked the phonograph best...."**

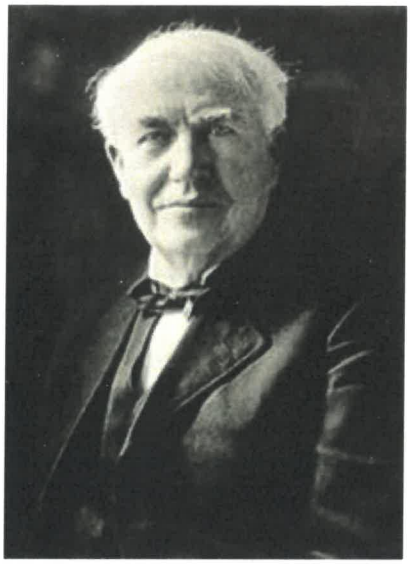
**"Many of life's failures are experienced by people who did not realize how close they were to success when they gave up."**

# The STEM-meister

**Leather belt-driven machine shop at West Orange**

Humbling it is to step into the large machine shop on the first floor of his legendary West Orange invention factory. Here he boasted he could make anything from a locomotive to a woman's watch. Today with all the talk about STEM /STEAM education and makerspaces, we realize that Thomas Edison was the original STEM-meister, the man who taught the world about team-based problem solving, way back in the 1880s, elevated to the status of a national economic model—the very bedrock of technology driven, new product development. His work here was the original makerspace, the foundation for the international model of commercial R&D labs; later to be the impetus for establishing America's suite of national laboratories in the 1950s, including NASA. Actually, the first national lab was established in the early 1920s, the Naval Research Labs, with the help of Edison. A large bust of Edison at the entrance to the labs attests to the great inventor's legacy. Today, about $500 billion a year is spent on R&D in all sectors of the U.S. economy. R&D labs are Edison's greatest and most impactful invention!

# The Legacy of Edison



He died in 1931, and yet his lifetime accomplishments are responsible for 10% of the world's economy today…about $6 trillion. Many economists agree with the mighty legacy of this world's greatest inventor. Some have speculated he is responsible for one-fourth of the current jobs on the planet. Back in 1996, Life Magazine pronounced him the "Man of the Millennium" (1,000 years)…not the man of the century (100 years). Let that sink in. He gave us four giant inventions: recorded sound, the light bulb and electric utility system, motion pictures, and R&D labs. Hold your cell phone in your hand and ponder this. Edison is in there….recorded sound, motion pictures, and the battery you re-charge every evening by plugging it into his electric utility system concept; and future advances to our cell phones and digital economy will come about at R&D labs around the world. Enough said.

# Electric Vehicle Re-charging

**Edison's electric vehicle charging station**

In the Glenmont garage, where the Edison family cars were kept and serviced, there still exists a powerful legacy of the Edison commitment to electric vehicles….probably the world's oldest electric vehicle charging station. That long power cord to the left in the photo would be connected to Mrs. Edison's 1911 and 1914 electric vehicles to re-charge them overnight. Consider how dreamy-eyed we get when we think about a world of electric vehicles we can charge in our own garage. This re-charging station was doing just that in Edison's garage in 1908, over 110 years ago. If alive today, he might be asking us….."What is taking you all so long to use electric vehicles?"

# Edison's Timeclock

**Tom punches in like everyone else**

Everyone, including Thomas Edison, punched in on the old timeclock, installed around 1912 or so. Often, old Tom would log in excess of 90 hours a week at work. During especially intense work periods, Mrs. Edison would send the butler or one of the boys down to bring Thomas home as he would most certainly have lost track of time. If employed by Mr. Edison and involved in the Invention Factory buildings, you could work in your development lab with team members at night or during the day, as long as you accomplished your tasks Perhaps we can credit Edison with flextime…so commonplace today.

# Talking Dolls


All the rage in the 1950s and 60s, talking dolls were on many Christmas lists for the young ladies of the house; but who realizes that Edison created a line of talking dolls way back in 1890. About 3,000 dolls were produced in the hopes of expanding the market for his phonograph. Little phonographs inside the dolls proved to be troublesome and too delicate for clumsy childhood hands. The voice quality of the female adults recording nursery rhymes in a falsetto child's voice seemed "creepy" and "scary" to both children and adults. The talking dolls were an economic flop, and would have to wait for another 60-70 years before becoming technically more feasible with better sound reproduction; but once again, Tom Edison was anticipating the future.

# Silicon Valley East

Who would realize the legendary West Orange site (above) would metaphorically grow into Silicon Valley East, long before the one out in Northern California. In the 1910 photo above, on 25 acres of land, 10,000 people reported every day for work. Imagine the amount of inventing and sales the Thomas A. Edison Industries, Inc. had to accomplish to satisfy that awesome payroll. Today, the modern day population of West Orange is about 40,000 people on a very much larger area of land. People came to the large cluster of building by trolley, horse, bicycle, car, or walked to the site, forever changing the character of "Orange Valley", a formerly sleepy farming area. Today, throughout the valley and nearby suburban communities, many families can trace the roots of their working grandparents to the old Edison labs. Their family members might have assembled batteries, phonographs, electric light bulbs or processed movie film…or worked on many other tasks. Only the original legacy buildings [top center of the photo] exist today, which were given in trust to the American public by the Edison family, a wonderful gift to inspire generations of entrepreneurs and inventors.

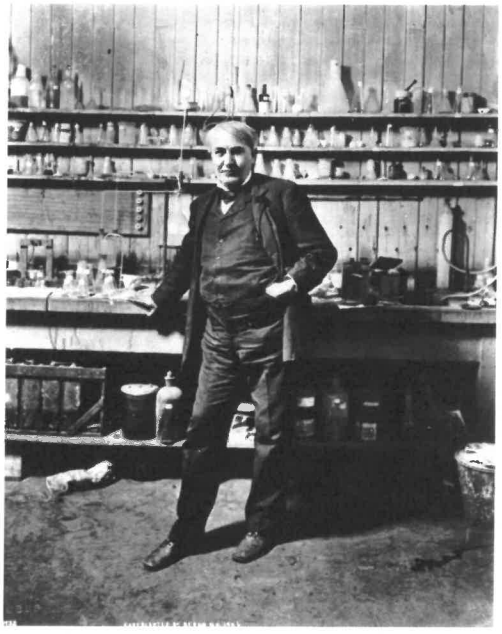
# Quotes by the Great Inventor

**"I never quit until I get what I'm after. Negative results are just what I'm after. They are just as valuable to me as positive results."**

**"To have a great idea, have a lot of them."**

**"Inspiration can be found in a pile of junk. Sometimes, you can put it together with a good imagination and invent something. "**

# Edison Love Affair with Chemistry



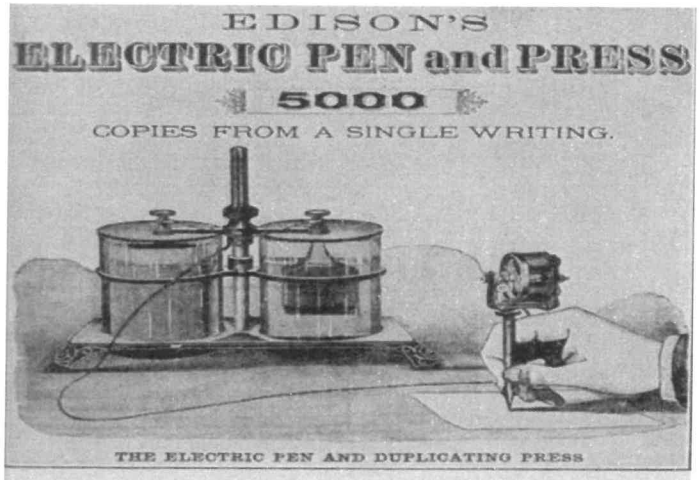
**Edison, at his beloved chemistry lab bench**

No bones about it….Thomas Edison loved the science of chemistry. When he sought some solace or the need to try something out for himself, he usually retreated to Room 12 on the second floor of the Invention Factory and worked at his spacious bench and table there. From his early days to his last major project (a substitute for natural rubber) chemistry came into the picture somehow. He saw this science as being close to nature…and nature to Tom was close to God. He had no use for established religion and liturgies. For him, to look at the beauty and intricacies of nature was evidence enough of a supreme being's handiwork.

# Could You Work for Thomas Edison?

Thomas Edison was famous for giving job applicants a special "practical" test he had composed. Many well-educated "college men" had great difficulty passing this test, as Edison often chided the education system for producing rote memory specialists who had little original thinking power. Various versions of these tests existed over the years, often succumbing to probing newspaper publishers who obtained the tests and printed the answers. There were originally 150 questions for the applicant to answer. A perfect score was not needed, but you had better score high if you expected to work for the great inventor. Thomas certainly looked for people to hire who could cut to the heart of a problem and see the essential pieces and the whole problem simultaneously. Sometimes, he gave serious candidates a real physical problem to solve to see how they organized a solution

# Tom had Some Ink (a Tattoo)




Excerpt from an old advertisement telling about the Edison electric pen and press. Note the Bunsen battery of two glass jars, the plunger by which the plates were lowered into the solution when current was desired, and the tiny motor attached on the upper end of the pen.

Thomas Edison had a tattoo, an image known as a quincunx-four dots arranged in a square, with a single dot in the middle. This image is the way the number five is portrayed on a dice cube. It was inscribed on his right forearm. The only catch is no one knows how the tattoo got there. There is no mention of it in the vast Edison archives. Did old Tom tattoo himself? We'll never know. According to the staff at the Thomas Edison National Historical Park [TENHP] Edison invented the electric pen in 1875 with the assistance of Charles Batchelor. The pen-like shaft had a reciprocating needle that was driven by a small motor powered by a wet-cell battery. As the user wrote or drew on a wax stencil, the needle made thousands of perforations per minute. The stencil was then placed in a press, and a roller forced ink through the holes, creating multiple copies (up to 15,000 according to Edison's advertisements). The electric pen later evolved into the mimeograph and the tattoo needle. Today's tattoo pens are much improved over the Edison electric pen, refined many times to deliver the beautiful tattoo designs that many folks desire, creating a genre of art known as "body art".

# Project Manager Extraordinaire

**Edison and a Project Team Dining**

Thomas Edison crafts the important corporate position we know today as project management. This key position in most companies belongs to men and women who know how to transform raw ideas into new products, using powerful team-based activities and coordination. It was not unusual for Edison to have 30-40 projects proceeding simultaneously, cross-pollinating his ideas, and observations. To accomplish this, Edison used a variety of techniques. Tom worked as hard, or harder, than his teams, often putting in 90 hours a week of work. No one could accuse "the old man" of goofing off. Laughter and practical jokes were an encouraged means by which his teams broke through roadblocks or let off steam creatively. [Tom gave as good as he got in the practical joke department!] Creative tension was inherent in all work as Edison urged his teams to invent something minor every 10 days and something major every 6 months.

# Thomas Edison Receives an Academy Award


In 1929, Edison was given one of the first honorary Academy Awards for his work in founding the motion picture industry. This celebration marked the approximate 40-year anniversary of the original motion picture achievements of Edison, and his building of the first motion picture studio—the Black Maria. That honorary academy award (photo above) now hangs in Edison's famous library/office at the Thomas Edison National Historical Park (TENHP) in West Orange, NJ. Over forty of the great artists of the time including Charlie Chaplin, Douglas Fairbanks, Mary Pickford, and Sarah Bernhardt signed their names on the award parchment. The first Hollywood and major film production companies took root in Fort Lee, New Jersey. In the early 1900s, Universal and 20th Century Fox studios were born in Fort Lee; and prior to WWI, there were 17 movie studios in town, employing many of the people there. By the mid- 1920s, the high cost of heating these studios and sunnier skies beckoned elsewhere, and the Hollywood we know today was born; but Fort Lee was America's first film town.

# On the Road Again

**The vagabonds-Henry Ford, Thomas Edison, John Burroughs, and Harvey Firestone**

Between 1914 and 1924, American giants explored the woods and rural byways of America, in then Model T type vehicles. Some say they started the recreational camping craze that persists today. Their arrival may first have been witnessed as a dusty caravan, jostling along some unpaved country road; or perhaps you and your horse stumbled upon their encampment, under aromatic balsam and fir trees-dinner al fresco tantalizing your nose. Thomas Edison usually navigated the entourage in the lead vehicle with his trusty compass. Henry Ford, Harvey Firestone and famed environmentalist and prolific nature author John Burroughs in tow-all at a time when car travel over long distances was fraught with many hardships. Not to worry though, America's preeminent mechanic, Henry Ford, was at the ready to keep the caravan rolling; and of course they rode on Firestone tires. Mr. Burroughs regaled the gang with his nature stories and keen observations.

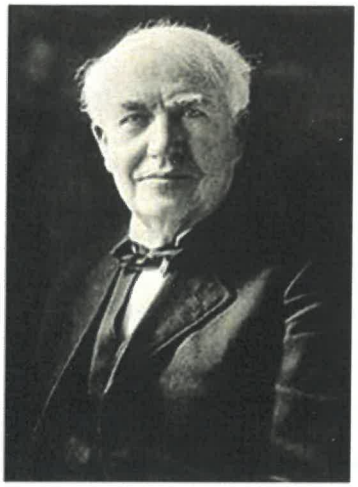
# Quotes by the Great Inventor

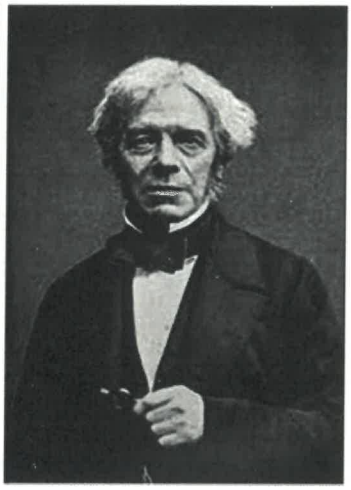
**“I have more respect for the fellow with a single idea who gets there than for the fellow with a thousand ideas who does nothing.”**

**“If we all did the things we are really capable of doing, we would literally astound ourselves....”**

**"Anything that won't sell, I don't want to invent. Its sale is proof of utility, and utility is success."**

# Michael Faraday: Edison's Hero





Michael Faraday [1791 – 1867] was a self-taught physicist and chemist, and a hero to both Thomas Edison and Albert Einstein. Faraday is best known for his discoveries of the laws of electrolysis, his giant invention of the electric motor, and electromagnetic induction [the production of a voltage across a conductor when it is exposed to a varying magnetic field-the very foundation for how motors and transformers work.] Like Edison, Faraday was a brilliant experimentalist and loved chemistry; and also like Edison, was limited in his application of higher math knowledge. Both men probably had no more than limited algebra and some trigonometry skills picked up along the years. When Edison was a budding telegrapher in his teens, he is said to have read Faraday's major work, "Experimental Researches in Electricity", which many later scientists used to extend his fundamental work.

# Edison's Thought Laboratory

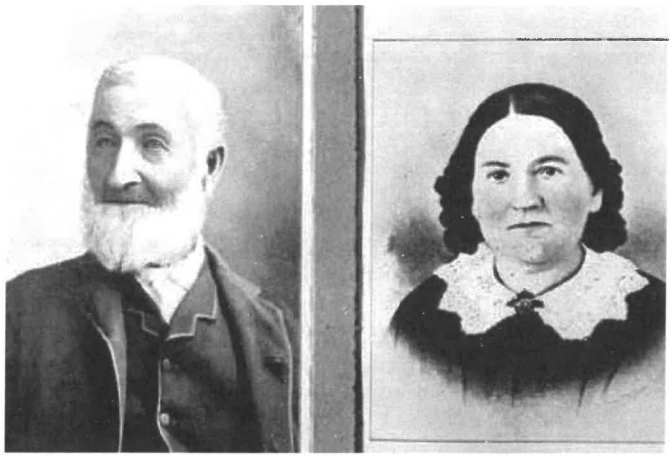
On the second floor of the magnificent Glenwood home, Thomas Edison loved to relax in the family living room and bathe in thought experiments and ideas about future projects he wanted his staff to undertake. His nearby large technical library was well-used as he mined information to support his new ideas. Often his children would help locate information from his books and leave small slips of paper inside the books to show "Papa" where to look. His daughter Madeliene leaves a wonderful memory. She opined that Daddy was never a big fan of the formal dinners mother would arrange in the dining room. He was the only man in the world to have indigestion before dinner. He would greet his guests and make some small talk…..then feign indigestion….. excuse himself, raid the kitchen and take his food (via the servants' back stairs) to the upstairs living room where he would spend the evening in thought and contemplation. That was Tom and everybody knew and forgave him.

# Tom & Mina

**Mina and Tom soon after their marriage in 1886…. circa 1887/88**

At age 39, after the death of his first wife two years earlier, Thomas marries 19 year-old Mina Miller of Akron, Ohio. His friends conspired to find Tom a new wife, and Mina certainly made a lasting impression on him. Despite the age difference, the two were well-suited and the union lasts a lifetime. Not only is Mina cultured and educated, she is "simpatico" with being the wife of an inventor, as her father was an inventor of farm equipment. She understood the mindset and motivations of creative people. Later, her youngest child Theodore would also become an inventor. Affectionately, she called him "dearie", while he named her "billy". While courting Mina, he taught her Morse Code, the language of telegraphy; and supposedly, he tapped out with his finger on her palm…."Will you marry me?"….and she replied "Yes".

# Mama Edison



**Samuel and Nancy --Edison's parents**

Mama Edison-Nancy Elliot Edison- took charge of her child's education when a one-room country schoolteacher told her that Young Tom was probably "backward". As a formally trained normal school teacher, she was certainly up to the challenge, giving him four basic rules to guide his life:

-Do not be afraid to fail. Keep trying, learn from failure; and try again.

-It is OK to work with your hands and your head. Not everything important comes from books. Experience the world and learn from it.

-Read across the entire span of literature, not just what you like.

-Never stop learning, keep improving yourself.

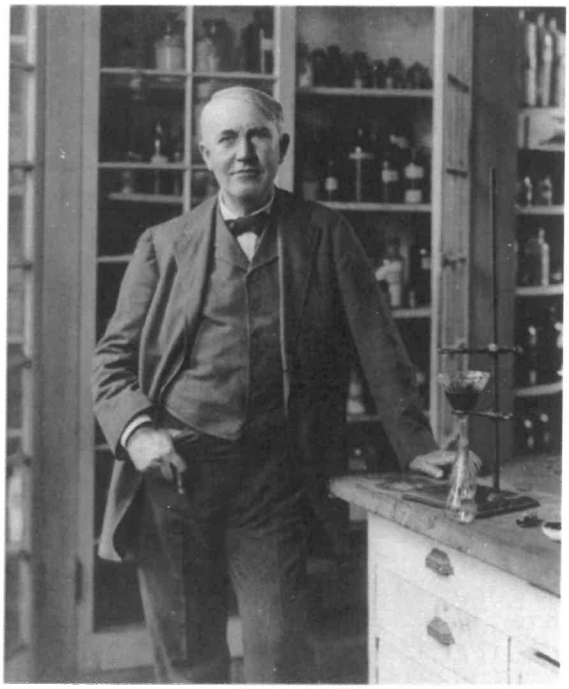
Thomas acknowledged these simple maxims served him well his entire life. Today, Thomas Edison is often looked upon as the patron saint of home schooling. From this early encouragement would spring a favorite quote of his, "Fail your way to success".

# A Better Telephone

**Carbon button transmitter**

Ask anyone…. who invented the telephone?..... and the name Alexander Graham Bell will come to mind. Now ask them who made Bell's phone really work…and then the deer-in-the headlights-stare takes over. The answer is Edison. The big flaw with Bell's phone was it could not be heard clearly at long distances. Edison's invention of the carbon button transmitter neatly fixed this problem. Until the 1980s when electric phones came into the market, every phone had an Edison carbon button transmitter in the mouthpiece. If you have an old phone-unscrew the mouthpiece and in your hand will fall a disc-shaped object. This is the Edison device. Shake it near your ear and you can hear the fine carbon granules inside! Not a bad run for an invention…..100 years of application. This device and other related Edison innovations also became important for loudspeakers, microphones and other forms of human voice amplification. This invention earned Tom $100,000 from Bell Telephone Co.

# The Edison Business Philosophy



Edison's business philosophy can be summed-up in these four statements, a handy guide for entrepreneurs everywhere:

-Think out of the box

-Be entrepreneurial…..take risks

-Fail your way to success

-Success demands that you improve your products

# Quotes by the Great Inventor

**"My desire is to do everything within my power to free people from drudgery and create the largest measure of happiness and prosperity."**

**"Personally, I enjoy working about 18 hours a day. Besides the short catnaps I take each day, I average about four to five hours of sleep per night. "**

**"I believe that the science of chemistry alone almost proves the existence of an intelligent creator."**

# An Office and Library

**Edison office/library space…his desk is to the right**

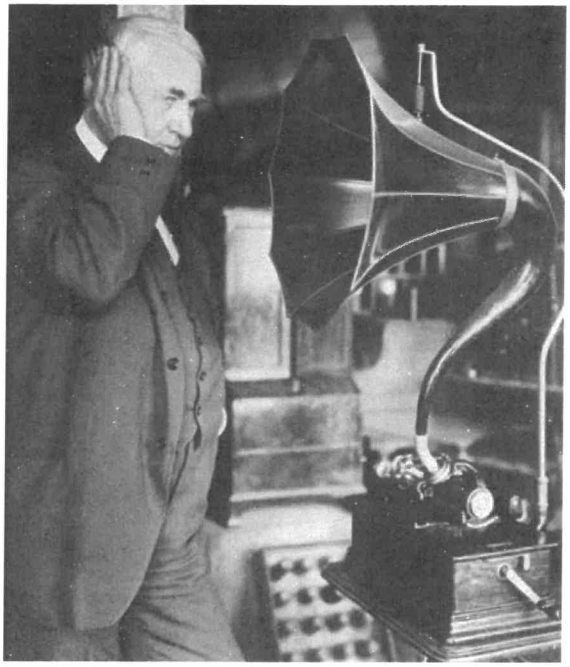
Easily the most loved room in Edison's invention factory…his office/library…..replete with soaring ceilings and double balconies, a room filled with 20,000 books, journals, patent files and everything technical of that time. It reflects the man's feeling about how essential information is to the conduct of business and the act of invention. What executive today would have an office so integrated with a corporate library? Perhaps Edison anticipated the Internet…today's version of a corporate library? This room represents the "R" in research and development, the initial starting point for all creative efforts. His own motion pictures invention also was integrated into the room to allow the projection of motion pictures for his viewing, as well as that for investors, partners, and contractors.

# Three New Jersey Facilities


**Edison's Newark building**

Edison had three great facilities located in New Jersey. His first was in Newark where he had a nascent mix of invention, contract invention, and some light manufacturing—also where he met and married his first wife, Mary Stillwell. From Newark, he moved his enterprises to Menlo Park to concentrate more on new inventions. This site was the birthplace of recorded sound, the electric light bulb, radio telegraphy, the Edison Effect and lots of other wonderful things. He left Menlo Park to build his landmark electric utility system in New York City and returned to NJ in 1886 to marry his second wife and create his legendary West Orange Labs in 1887 where he greatly improved electric light bulbs, invented and patented oodles of electric power equipment, improved his phonograph, invented and commercialized his rugged nickel iron storage batteries, championed electric vehicles and created a substitute for natural rubber. He was a very busy man, leaving a legacy of 1093 American patents, with hundreds more filed overseas too.

# Just 14 Years!



Here is what Edison gave us in just 14 years—a totally different world:

1875 Electric Pen and Document Duplication Systems

1876 Menlo Park Labs (the Wizard of Menlo Park)

1877 Phonograph

1879 Light Bulb

1880 Edison Effect (foundation of modern electronics)

1882 First Central Station Power Plant/Utility System in New York City

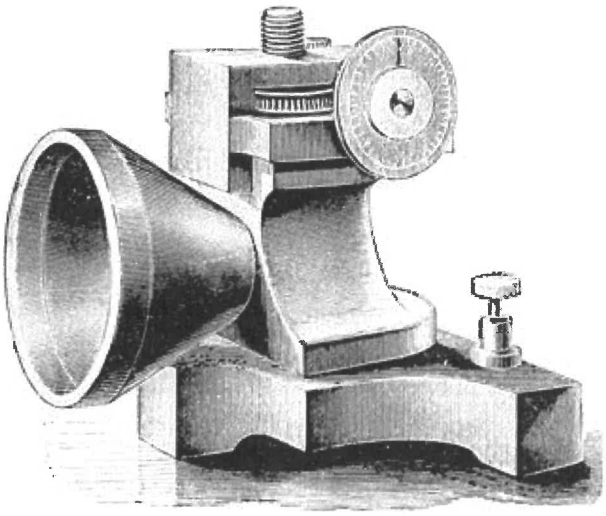
1887 West Orange Labs Established (emergence of R&D Labs)

1889 Motion Pictures

# Edison Aids Marconi

Before moving to Menlo Park, Edison made one of his great discoveries, an electrical phenomenon he called "etheric force." This was the discovery that electrically generated waves would traverse an open circuit – the principle on which wireless telegraphy and radio are founded. The idea that electricity would traverse space was almost beyond belief at that time. In a related field of research, Edison also discovered that messages could be sent through space by induction, in which a current generated in one set of wires induced a like current to flow through another set of wires between which no connection existed. As a result of this research, he received patents in 1885 on the transmission of signals, by induction, between moving train and a station and between ship and shore. Guglielmo Marconi had become a personal friend of Edison's and, because of this friendship, Edison made these patents available to him rather than to a competitor who offered more money. Thus, these patents helped Marconi to become recognized as the inventor of the wireless telegraph.

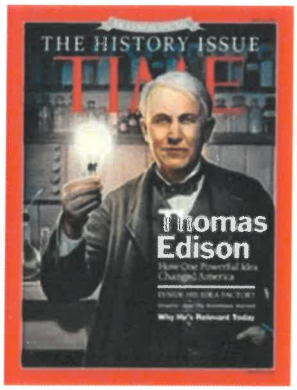
# Out-of-this World



Edison's tasimeter

In 1878, Thomas Edison attended an eclipse in Rawlins, Wyoming to test one of his inventions, known as a "tasimeter", a device designed to measure infrared radiation. Samuel Langley, Henry Draper, and other American scientists needed a highly sensitive instrument that could be used to measure minute temperature changes in heat emitted from the Sun's corona during a solar eclipse. To satisfy those needs Edison devised a tasimeter, which included as an integral component another of his very successful inventions-the carbon button transmitter (which was a key element in telephones; and voice amplification devices like loud speakers and microphones). During the total eclipse of 1878, Edison's tasimeter successfully demonstrated the existence of heat in the sun's corona, but could not quantify it, so his invention had limited success. However, Edison was the first scientist on record to have proposed an experiment to detect radio waves from the Sun. The very useful field of radio astronomy would not mature until 1931, when Karl Jansky and Grote Reber first built and practically applied radio telescopes.

# Kindred Spirits


Here are some very fascinating similarities between Thomas and Ben:

- Had little formal education and were self-made
- Were engaged at an early age in publishing and printing newspapers
- Cultivated a fascination with electricity
- Invented and made scientific discoveries
- Knew the value of human communications and leadership
- Loved humor and realized its creative value
- Enjoyed solving problems
- Were inveterate journal and notebook keepers
- Researched new areas and were constantly learning
- Fundamentally changed the world and improved our standard of living.

Here is the one that is most interesting. Both great men had sons who were governors of New Jersey.

# ***Quotes by the Great Inventor***

"I have friends in overalls whose friendship I would not swap for the favor of the kings of the world."

"The three things that are most essential to achievement are common sense, hard work and stick-to-it-iv-ness....."

"The man who doesn't make up his mind to cultivate the habit of thinking misses the greatest pleasure in life."

# Author's Perspective: My Boyhood Hero

**Harry Roman at home**

Thomas Edison was my boyhood hero. It started way back in 1958, when a 4th grade school teacher and class project motivated me to study Thomas Edison, and write away to one of his local companies for more information. The folks at his battery division in Bloomfield, NJ sent me a lovely comic-style book about him, "Thomas Edison Inspiration to Youth"; and that started my love affair with invention and engineering. I still have that little book, a cherished childhood possession.

My father was taking notice of my interest in Edison. Dad, a master mechanic, had a basement workshop, where he stretched my capabilities in many different ways. We even invented what we needed down in that beloved workshop. I was becoming a problem solver, with engineering school my next destination. Memories of what I learned in that workshop are with me every day.

I spent 36 years in the utility industry developing new technologies for my company—technology spanning the gamut from solar energy systems to mobile robots; from micro-sensors to artificial intelligence thrown in as well. Obtaining patents for my inventions, I felt even closer to the great inventor. After retiring in 2006, I spent almost a year as a park ranger at the legendary Thomas Edison West Orange Labs to learn even more about my hero. Now working as an author and advisor for the Edison Innovation Foundation www.thomasedison.org, I have the honor of writing most of the articles for the Edison Muckers webpage www.edisonmuckers.org. On my own time, I write resource books and

articles for teachers, consult with teaching colleges, and give special lectures and tours at the West Orange Labs. When time permits, I visit local schools and teach kids about invention. Am I lucky or what?

There is a nice kicker to this story. Twenty years after I wrote that letter to the Edison battery plant, I married the girl who is the niece of the man who managed that Edison facility. Tell me that's not fate!

# About the Author

During his very successful 36-year engineering career with PSE&G, Harry worked with many NJ schools and teachers, bringing the excitement of invention and engineering into the classroom. Harry retired early in 2006 to pursue a life-long interest in teaching and writing. Since then, he has published over 80 teacher resource books, and 18 math card games. He also has published approximately 400 papers and articles in education magazines, journals, newsletters, and related forums, always stressing STEM / STEAM, the integration of the curriculum, engineers working with teachers, and use of mathematics in solving problems. He is the recipient of a prestigious IEEE Northeast Regional Award for Teaching Excellence; and a holder of the New Jersey Technology Education and Engineering Association's highest award --Distinguished NJ Technology Educator. He works with teachers in Essex County schools, and often visits classrooms to conduct hands-on, team based learning and problem solving.

For three years, he helped design and co-taught an iSTEM graduate course at Montclair State University teacher's college. The West Orange School District has asked him to serve on their committee to bring STEM/Engineering into the middle and high schools. Harry is a recognized and prolific author in the G&T educational community as well. Every month, over 600,000 educators, technologists and industrial leaders read his feature articles appearing in various national and Internet publications.

Harry holds 12 U.S. Patents; received numerous engineering, and invention awards; and published approximately 200 hundred scientific papers, articles, monographs, and books. He received IEEE's Meritorious Achievement Award; the New Jersey Inventors Hall of Fame Inventor of the Year Award; and an IEEE Power Engineering Society Outstanding Engineer Award. For his robotics work, the Electric Power Research Institute recognized him with an Innovator's Award;

while PSE&G celebrated his work with an Outstanding Corporate Achievement Award. His work in solar energy has led to PSE&G's leadership role in that technology today; and his pioneering robotic applications helped launch the U.S. mobile robotics utility service industry. His work in artificial intelligence and micro sensors presaged what we know today as the smart utility and the Internet of Things.

Since 2006, Harry has been a park ranger / volunteer park ranger at the Thomas Edison National Historical Park [TENHP], the site of Thomas Edison's legendary West Orange, NJ labs and manufacturing complex. At the park Harry gives special lectures interpreting Edison's work, his accomplishments and economic impacts on our world, the emergence of R&D labs, specialty tours, and hands-on programs/maker fairs for teachers, students and members of the public.

Since 2007, Harry has been an advisor and educational author for the Edison Innovation Foundation and Charles Edison Fund. His varied work here has involved new education programs and publications for teachers, development of intellectual properties/marks/logos, teacher seminars/professional development programs, new marketing/advertising programs, social media and website articles, national design challenges, and visits to local schools to spread the legacy of Thomas Edison. He is the chief writer for their very successful Edison Muckers webpage, having authored over 170 articles.

# Continue the Edison Legacy---Licensing and Contributions

In summary, **Thomas Edison** (1847-1931) has been hailed as the world's greatest inventor. Among his many inventions (1,093 patents) are the phonograph, motion picture camera and the light bulb (including the entire electric power industry). He also created the basic approach to industrial research and development (R&D) still used today. Besides being an inventor he really stands out as an innovator and entrepreneur which is one of the reasons TIME Magazine stated he is "still relevant today".

## Supporters of this Book on Thomas Edison

### Edison Innovation Foundation

Edison Innovation Foundation is a non-profit organization that supports the Edison Legacy and encourages students (including women and minorities) to embrace careers in science, technology and engineering. It is committed to educating the next generation of great innovators while using Edison and his Invention Factory as the foundation. www.thomasedison.org

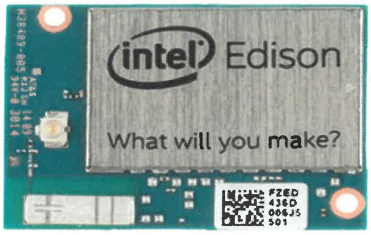
### Charles Edison Fund

Charles Edison was the son of Thomas Edison, the famous inventor and entrepreneur. Charles was a businessman and philanthropist and in 1948 established the Charles Edison Fund ("Fund"). The Fund was created to maintain the legacy of his father, Thomas Edison, and to meet his own philanthropic goals in good and bad economic times. www.charlesedisonfund.org

### Licensing

The Fund engages in commercial licensing of the Edison name and image. Edison Intellectual property ("Edison IP") generates extra revenues to support educational programs run by Edison Innovation Foundation. Licensing is accomplished either with outside representatives or through the Fund's extensive social media platform. A recent example of an Edison license involves the Intel-Edison module (chip)

which evolved out of a formal license between the Fund and Intel Corporation. Below is a photo of the module and the "Edison Tommy" award given to inventors, entrepreneurs and contest winners who participate in ongoing and special programs.





For more information on licensing Edison intellectual property, contact;
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One Riverfront Plaza
1037 Raymond Blvd., Suite 340
Newark, New Jersey 07102
www.charlesedisonfund.org
Phone: 973-648-0500
Email: info@thomasedison.org

## Contributions

Edison Innovation Foundation invites donors to support the ongoing needs of the Edison Foundations by contributing to the continuing efforts to revitalize science education and Edison's legacy. Innovation and Edison drove the United States through the industrial age and will continue to drive it into the future. Please help us carry on our important work. Financial contributions to the Edison Innovation Foundation are 100% tax deductible. See the "donate" button on www.thomasedison.org.

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