NIKOLA TESLA

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- Nikola Tesla (10 July 1856 – 7 January 1943) was an inventor and a mechanical and electrical engineer. He was one of the most important contributors to the birth of commercial electricity, and is best known for his many revolutionary developments in the field of electromagnetism in the late 19th and early 20th centuries. Tesla's patents and theoretical work formed the basis of modern alternating current (AC) electric power systems, including the polyphase system of electrical distribution and the AC motor, with which he helped usher in the Second Industrial Revolution.

- Born an ethnic Serb in the village of Smiljan, Croatian Military Frontier in Austrian Empire (today's Croatia), he was a subject of the Austrian Empire by birth and later became an American citizen. After his demonstration of wireless communication through radio in 1894 and after being the victor in the "War of Currents", he was widely respected as one of the greatest electrical engineers who worked in America. Much of his early work pioneered modern electrical engineering and many of his discoveries were of groundbreaking importance. During this period, in the United States, Tesla's fame rivaled that of any other inventor or scientist in history or popular culture,but because of his eccentric personality and his seemingly unbelievable and sometimes bizarre claims about possible scientific and technological developments, Tesla was ultimately ostracized and regarded as a mad scientist.Tesla never put much focus on his finances and died impoverished at the age of

EARLY YEARS

- Tesla was born to Serbian parents in the village of Smiljan, Austrian Empire near the town of Gospić, in the territory of modern-day Croatia. His baptismal certificate reports that he was born on 28 June (N.S. 10 July), 1856, to Father Milutin Tesla, a priest in the Serbian Orthodox Church, Metropolitanate of Sremski Karlovci and Đuka Mandić. His paternal origin is thought to be either of one of the local Serb clans in the Tara valley, or from the Herzegovinian noble Pavle Orlović His mother, Đuka, daughter of a Serbian Orthodox Church priest, came from a family domiciled in Lika and Banija, but with deeper origins to Kosovo. She was talented in making home craft tools and memorized many Serbian epic poems, but never learned to read.

- Nikola was the fourth of five children, having one older brother (Dane, who was killed in a horse-riding accident when Nikola was five) and three sisters (Milka, Angelina and Marica).His family moved to Gospić in 1862. Tesla went to school in Karlovac. He finished a four-year term in the span of three years.

UNITED STATES AND FRANCE

In 1882 he moved to Paris, to work as an engineer for the Continental Edison Company, designing improvements to electric equipment brought overseas from Edison's ideas. According to his autobiography, in the same year he conceived the induction motor and began developing various devices that use rotating magnetic fields for which he received patents in 1888.

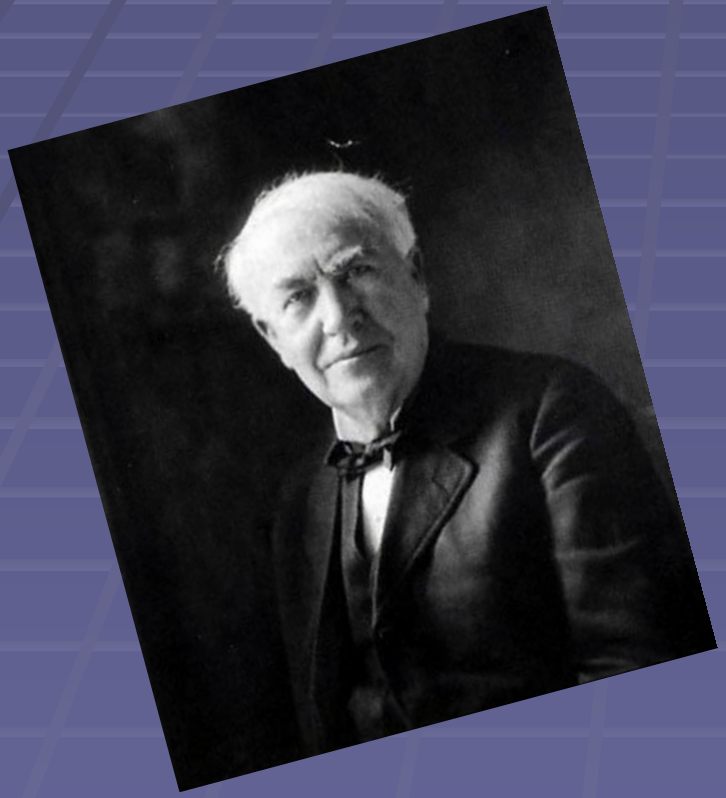
Soon thereafter, Tesla was awakened from a dream in which his mother had died, "And I knew that this was so".After her death, Tesla fell ill. He spent two to three weeks recuperating in Gospić and the village of Tomingaj near Gračac, his mother's birthplace.

On 6 June 1884, Tesla first arrived in the United States, in New York City[with little besides a letter of recommendation from Charles Batchelor, a former employer. In the letter of recommendation to Thomas Edison, Batchelor wrote, "I know two great men and you are one of them; the other is this young man." Edison hired Tesla to work for his Edison Machine Works. Tesla's work for Edison began with simple electrical engineering and quickly progressed to solving some of the company's most difficult problems. Tesla was even offered the task of completely redesigning the Edison company's direct current generators.

Middle years

- In 1886, Tesla formed his own company, Tesla Electric Light & Manufacturing. The initial financial investors disagreed with Tesla on his plan for an alternating current motor and eventually relieved him of his duties at the company. Tesla worked in New York as a laborer from 1886 to 1887 to feed himself and raise capital for his next project. In 1887, he constructed the initial brushless alternating current induction motor, which he demonstrated to the American Institute of Electrical Engineers (now IEEE) in 1888. In the same year, he developed the principles of his Tesla coil, and began working with George Westinghouse at Westinghouse Electric & Manufacturing Company's Pittsburgh labs.
- In April 1887, Tesla began investigating what would later be called X-rays using his own single terminal vacuum tubes.This device differed from other early X-ray tubes in that it had no target electrode. The modern term for the phenomenon produced by this device is bremsstrahlung (or braking radiation). We now know that this device operated by emitting electrons from the single electrode through a combination of field electron emission and thermionic emission.

Edison

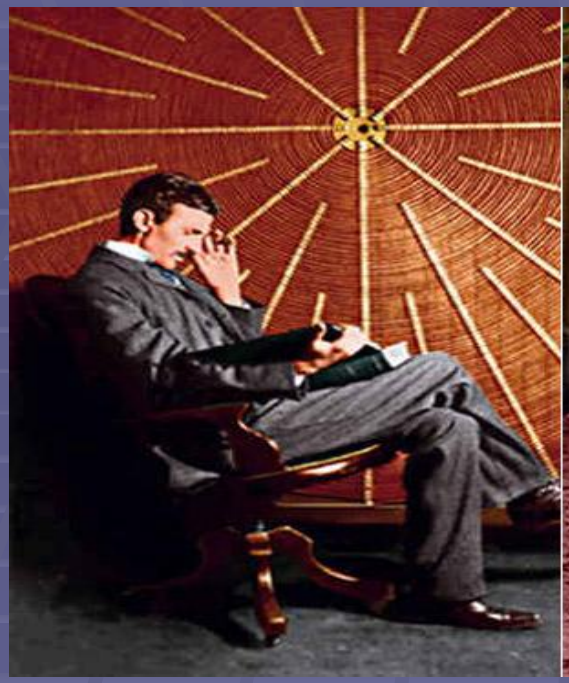


Also in the late 1880s, Tesla and Edison became adversaries in part because of Edison's promotion of direct current (DC) for electric power distribution over the more efficient alternating current advocated by Tesla and Westinghouse. Until Tesla invented the induction motor, AC's advantages for long distance high voltage transmission were counterbalanced by the inability to operate motors on AC. As a result of the "War of Currents", Edison and Westinghouse went nearly bankrupt, so in 1897, Tesla released Westinghouse from contract, providing Westinghouse a break from Tesla's patent royalties. Also in 1897, Tesla researched radiation, which led to setting up the basic formulation of cosmic rays.

Colorado Springs

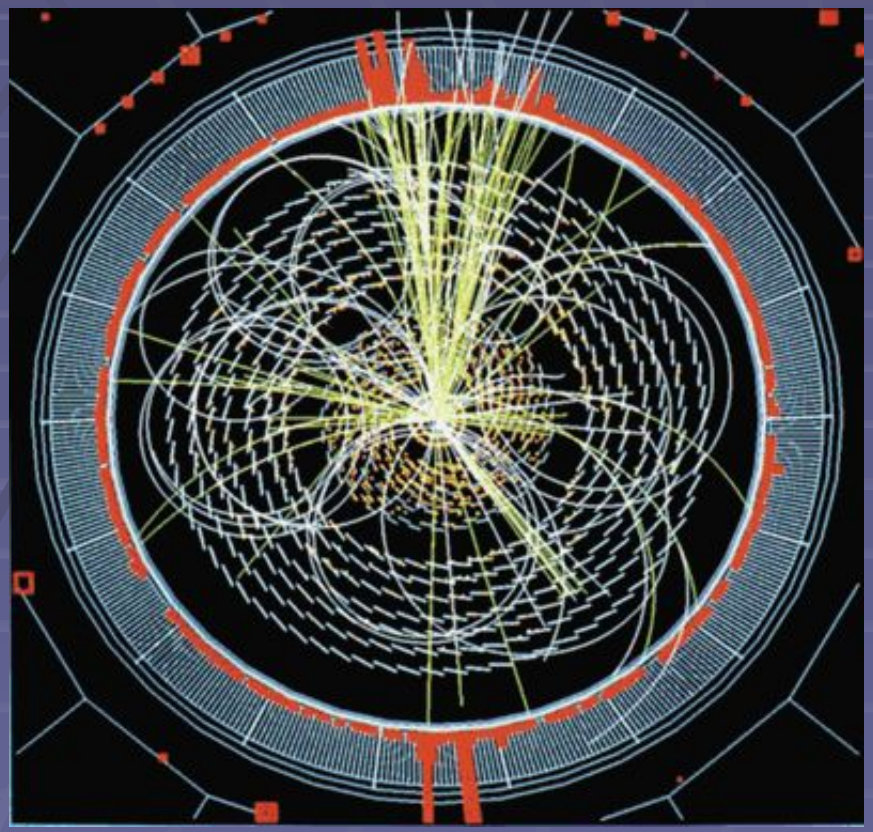
- In 1899, Tesla decided to move and began research in Colorado Springs, Colorado, where he would have room for his high-voltage, high-frequency experiments. Upon his arrival he told reporters that he was conducting wireless telegraphy experiments transmitting signals from Pikes Peak to Paris. Tesla's diary contains explanations of his experiments concerning the ionosphere and the ground's telluric currents via transverse waves and longitudinal waves. At his lab, Tesla proved that the earth was a conductor, and he produced artificial lightning (with discharges consisting of millions of volts, and up to 135 feet long).Tesla also investigated atmospheric electricity, observing lightning signals via his receivers. Reproductions of Tesla's receivers and coherer circuits show an unpredicted level of complexity (e.g., distributed high-Q helical resonators, radio frequency feedback, crude heterodyne effects, and regeneration techniques). Tesla stated that he observed stationary waves during this time.

Later years



- In 1900, with US$150,000 (51 % from J. Pierpont Morgan), Tesla began planning the Wardenclyffe Tower facility. In June 1902, Tesla's lab operations were moved to Wardenclyffe from Houston Street. The tower was dismantled for scrap during World War I.] Newspapers of the time labeled Wardenclyffe "Tesla's million-dollar folly". In 1904, the US Patent Office reversed its decision and awarded Guglielmo Marconi the patent for radio, and Tesla began his fight to re-acquire the radio patent. On his 50th birthday in 1906, Tesla demonstrated his 200 hp (150 kW) 16,000 rpm bladeless turbine. During 1910–1911 at the Waterside Power Station in New York, several of his bladeless turbine engines were tested at 100–5000 hp.
- In 1915, Tesla filed a lawsuit against Marconi attempting, unsuccessfully, to obtain a court injunction against Marconi's claims. After Wardenclyffe, Tesla built the Telefunken Wireless Station in Sayville, Long Island. Some of what he wanted to achieve at Wardenclyffe was accomplished with the Telefunken Wireless. In 1917, the facility was seized and torn down by the Marines, because it was suspected that it could be used by German spies.
- Before World War I, Tesla looked overseas for investors to fund his research. When the war started, Tesla lost the funding he was receiving from his patents in European countries. After the war ended, Tesla made predictions regarding the relevant issues of the post-World War I environment, in a printed article (20 December 1914). Tesla believed that the League of Nations was not a remedy for the times and issues. Tesla started to exhibit pronounced symptoms of obsessive-compulsive disorder in the years following. He became obsessed with the number three; he often felt compelled to walk around a block three times before entering a building, demanded a stack of three folded cloth napkins beside his plate at every meal, etc.

Field theories



- When he was 81, Tesla stated he had completed a "dynamic theory of gravity". He stated that it was "worked out in all details" and that he hoped to soon give it to the world. The theory was never published.
- The bulk of the theory was developed between 1892 and 1894, during the period that he was conducting experiments with high frequency and high potential electromagnetism and patenting devices for their use. Reminiscent of Mach's principle, Tesla stated in 1925 that:
- here is no thing endowed with life—from man, who is enslaving the elements, to the nimblest creature—in all this world that does not sway in its turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and the universal motion results.
- Tesla was critical of Einstein's relativity work, calling it:
- ...[a] magnificent mathematical garb which fascinates, dazzles and makes people blind to the underlying errors. The theory is like a beggar clothed in purple whom ignorant people take for a king ... its exponents are brilliant men but they are metaphysicists rather than scientists ...
- Tesla also argued:
- I hold that space cannot be curved, for the simple reason that it can have no properties. It might as well be said that God has properties. He has not, but only attributes and these are of our own making. Of properties we can only speak when dealing with matter filling the space. To say that in the presence of large bodies space becomes curved is equivalent to stating that something can act upon nothing. I, for one, refuse to subscribe to such a view.

Directed-energy weapon

- Later in life, Tesla made remarkable claims concerning a "teleforce" weapon.The press called it a "peace ray" or death ray.In total, the components and methods included:
- An apparatus for producing manifestations of energy in free air instead of in a high vacuum as in the past. This, according to Tesla in 1934, was accomplished.
- A mechanism for generating tremendous electrical force. This, according to Tesla, was also accomplished.
- A means of intensifying and amplifying the force developed by the second mechanism.
- A new method for producing a tremendous electrical repelling force. This would be the projector, or gun, of the invention.

- Tesla worked on plans for a directed-energy weapon from the early 1900s until his death. In 1937, Tesla composed a treatise entitled "The Art of Projecting Concentrated Non-dispersive Energy through the Natural Media" concerning charged particle beams.] Tesla published the document in an attempt to expound on the technical description of a "superweapon that would put an end to all war". This treatise of the particle beam is currently in the Nikola Tesla Museum archive in Belgrade. It described an open ended vacuum tube with a gas jet seal that allowed particles to exit, a method of charging particles to millions of volts, and a method of creating and directing nondispersive particle streams (through electrostatic repulsion).

Personal life

- Tesla was fluent in many languages. Along with Serbian, he spoke seven other languages: Czech, English, French, German, Hungarian, Italian, and Latin.

- Tesla may have suffered from obsessive-compulsive disorder,] and had many unusual quirks and phobias. He did things in threes, and was adamant about staying in a hotel room with a number divisible by three. Tesla was physically revolted by jewelry, notably pearl earrings. He was fastidious about cleanliness and hygiene, and was by all accounts mysophobic.

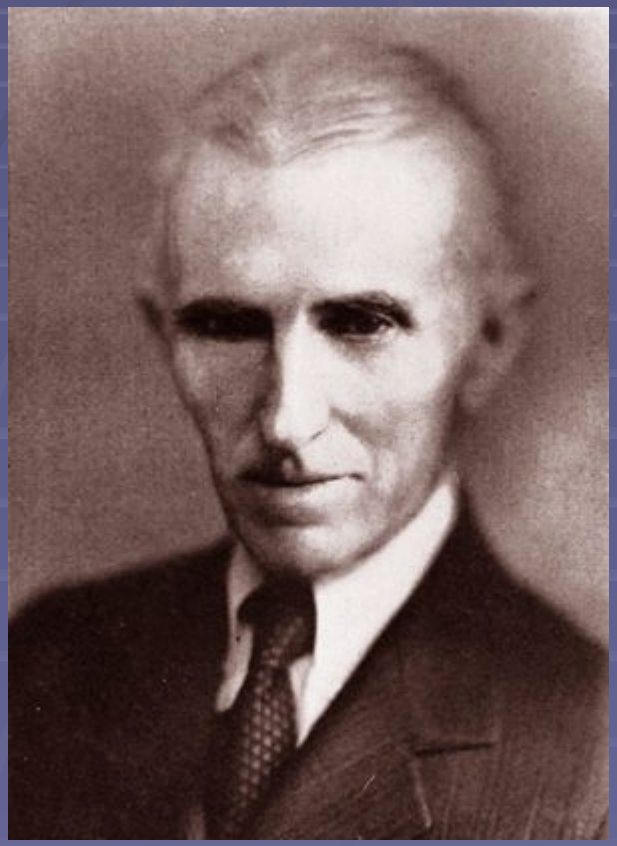
- Tesla was obsessed with pigeons, ordering special seeds for the pigeons he fed in Central Park and even bringing some into his hotel room with him. Tesla was an animal-lover, often reflecting contentedly about a childhood cat, "The Magnificent Mačak." Tesla never married. He was celibate and claimed that his chastity was very helpful to his scientific abilities.Nonetheless there have been numerous accounts of women vying for Tesla's affection, even some madly in love with him. Tesla, though polite, behaved rather ambivalently to these women in the romantic sense.

- Tesla was prone to alienating himself and was generally soft-spoken. However, when he did engage in a social life, many people spoke very positively and admiringly of him. Robert Underwood Johnson described him as attaining a "distinguished sweetness, sincerity, modesty, refinement, generosity, and force." His loyal secretary, Dorothy Skerrit, wrote: "his genial smile and nobility of bearing always denoted the gentlemanly characteristics that were so ingrained in his soul." Tesla's friend Hawthorne wrote that "seldom did one meet a scientist or engineer who was also a poet, a philosopher, an appreciator of fine music, a linguist, and a connoisseur of food and drink."

- Nevertheless, Tesla displayed the occasional cruel streak; he openly expressed his disgust for overweight people, once firing a secretary because of her weight.He was quick to criticize others' clothing as well, on several occasions demanding a subordinate to go home and change her dress.
- In middle age, Tesla became close friends with Mark Twain. They spent a lot of time together in his lab and elsewhere.

- Tesla remained bitter in the aftermath of his dispute with Edison. The day after Edison died the New York Times contained extensive coverage of Edison's life, with the only negative opinion coming from Tesla, who was quoted as saying:
- He had no hobby, cared for no sort of amusement of any kind and lived in utter disregard of the most elementary rules of hygiene ... His method was inefficient in the extreme, for an immense ground had to be covered to get anything at all unless blind chance intervened and, at first, I was almost a sorry witness of his doings, knowing that just a little theory and calculation would have saved him 90 percent of the labor. But he had a veritable contempt for book learning and mathematical knowledge, trusting himself entirely to his inventor's instinct and practical American sense.

Death



- Tesla died of heart failure alone in room 3327 of the New Yorker Hotel, on 7 January 1943.[100] Despite having sold his AC electricity patents, Tesla died with significant debts. Later that year the US Supreme Court upheld Tesla's patent number 645576 in a ruling that served as the basis for patented radio technology in the United States
- Dr. John G. Trump was the main government official who went over Tesla's secret papers after his death in 1943. At the time, Trump was a well-known electrical engineer serving as a technical aide to the National Defense Research Committee of the Office of Scientific Research & Development, Technical Aids, Div. 14, NTRC (predecessor agency to the CIA's Office of Scientific Intelligence). Trump was also a professor at M.I.T., and had his feelings hurt by Tesla's 1938 review and critique of M.I.T.'s huge Van de Graaff generator with its two thirty-foot towers and two 15-foot diameter balls, mounted on railroad tracks—which Tesla showed could be out-performed in both voltage and current by one of his tiny coils about two feet tall.Trump was asked to participate in the examination of Tesla's papers at the Manhattan Warehouse & Storage Co. Trump reported afterwards that no examination had been made of the vast amount of Tesla's property, that had been in the basement of the New Yorker Hotel, ten years prior to Tesla's death, or of any of his papers, except those in his immediate possession at the time of his death.

Nikola Tesla museum in Belgrade, Serbia