



Tesla: The Electric Magician

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Despite his relative obscurity, the greatest genius of all time may have been Nikola Tesla. With over 700 patents in his name, Tesla shaped our current technological landscape more than any other individual. How, then, did this great man end up dying destitute and in obscurity? Did Tesla's extraordinary mind decline into insanity... or was he simply far, far ahead of his time?

In this epic-length series, ParaScope takes a look at the early life and bizarre eccentricities of the great inventor, and his hard-fought first victory with the alternating current engine.

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Tesla's early life was tormented by various afflictions.

1: The Man Behind the Mind

In the small village of Smiljan, Croatia (then Austria-Hungary), Nikola Tesla was born exactly at the stroke of midnight between July 9 and 10, 1856 -- an incidental schism that befits the beginnings of a man who always seemed out of time with the world around him.

From early childhood, it was apparent that Nikola possessed an extraordinary mind. His father, Milutin Tesla, was a minister who trained Nikola to strengthen his memory and reasoning skills through a variety of regular mental exercises. But Tesla gave the highest credit for his talents to his mother's side of the family, whom he referred to as a long line of inventors. Despite Djouka Tesla's lack of formal education, she created numerous original tools for sewing and other tasks around her household.

Tesla had an older brother, Dane, whom he considered his superior in every way. When Nikola was five and Dane was twelve, Nikola was jealous of Dane's white stallion, which their father said Nikola was too young to ride. One day Nikola used a blow gun to shoot a pea at the horse, causing it to throw Dane from its back. Dane later died from his injuries. Feelings of guilt over this tragedy haunted Tesla throughout his life. No matter how great his achievements, he always believed that Dane could have outdone him.

During his early life, Tesla was stricken with illness time and time again. He suffered a peculiar affliction in which blinding flashes of light would appear before his eyes, often accompanied by hallucinations. Much of the time the visions were linked to a word or idea he might come across; just by hearing the name of an item, he would involuntarily envision it in realistic detail. The flashes and images caused Tesla great discomfort, and by the time he reached his teens he had taught himself to repress them from occurring except in certain times of stress. When they did happen, they sometimes had a nature that might

be described as psychic.

In one case, the young Tesla recklessly attempted to swim beneath a large floating structure that extended further than he realized. Finding himself trapped in the dark water with no sign of the surface, a flash appeared, and with it a vision of a small opening to air. Tesla's vision turned out to be correct, and the strange curse apparently saved him from drowning. Upon the deaths of his father and mother, Tesla claimed to have detailed premonitions just before each passing. In his later years, Tesla boasted of successfully transmitting an image from his mind into that of a person in another room.

Shortly after his graduation from high school, Tesla suffered a devastating bout with cholera and nearly died. He was bedridden for nine months, and doctors announced that he would not live much longer. Tesla was occupying his still-active mind by reading as much as his body would permit, when he encountered a strange new kind of literature: "Innocents Abroad," by Mark Twain. Tesla was captivated by the humor and humanity of this up-and-coming American author, whose work so raised his spirits that he made a miraculously abrupt recovery to health. Years later in the United States, Tesla met Samuel Clemens and was able to thank him for having saved his life. Clemens went on to become one of Tesla's few close friends.

Tesla underwent another debilitating trauma a few years after recovering from cholera. This time, the nature of the illness and its causes were a complete mystery. Tesla's physical senses, which had always been remarkably acute, seemed to go inexplicably into overdrive, paralyzing him with an overabundance of sensation. The ticking of a pocket watch had become painfully deafening to him, even from several rooms away. He needed rubber cushion inserted beneath the feet of his bed to lessen the vibrations from outside passersby, which felt to him like an earthquake. Exposure to light was excruciating not only for his eyes, but to the surface of his skin, as well. After a time, the crippling condition eased, and Tesla returned to normal sensory perception with a mental breakthrough that led him to the invention of the alternating current motor.

The physical and emotional travails of Tesla's early life undoubtedly helped shape him into the singular man he was: a man of immense brilliance, and a nearly equal level of eccentricity. Tesla shunned physical contact with other people, with a special aversion to touching hair. To avoid shaking hands with people he met, he lied that he had injured his hands in a laboratory accident. He apparently never took part in a romantic relationship of any kind. A female acquaintance who grew enamored of Tesla reportedly once took the initiative to kiss him, causing the startled inventor to flee in agony. Still, Tesla exhibited some appreciation for feminine beauty by demanding that his secretaries conform to an exacting standard of dress and physique. His female employees were forbidden to wear pearls, which Tesla for some reason found hideously

repulsive.

Other behaviors of Tesla's seemed to drift into the realm of compulsive-obsessive disorder. He required any repeated actions in his daily life (such as the footsteps he took in a walk) to be divisible by three, and would keep repeating them until he arrived at a suitable total. Quantities of twenty-seven were the most prized of all, since that number was three cubed. Tesla also felt compelled to calculate the exact volume of his food before he ate it. This involved measuring his meal portions with a ruler and dipping pieces in water to determine how many cubic centimeters they displaced. He was especially fond of saltine crackers because of their uniformity of volume. Many times, such as during the heat of a major project, Tesla would forget to eat altogether, and work for days without sleep. At one point his all-consuming devotion to the laboratory brought on an exhaustion so severe that for several days he lost all memory of who he was.

Tesla asserted that it was not until he reached adulthood that he discovered he was an inventor. He discounted his early years (perhaps unreasonably) as a time of undisciplined impulses, entirely lacking focus. But he did invent a wide array of creations and schemes as a child. The first was a simple hook-and-line device for catching frogs. All his young friends imitated it, and the mechanisms performed so well that the local frog population was nearly eradicated. He also built a miniature water wheel which was unique in that it propelled itself without blades. This memory would later inspire his innovation of the bladeless turbine.

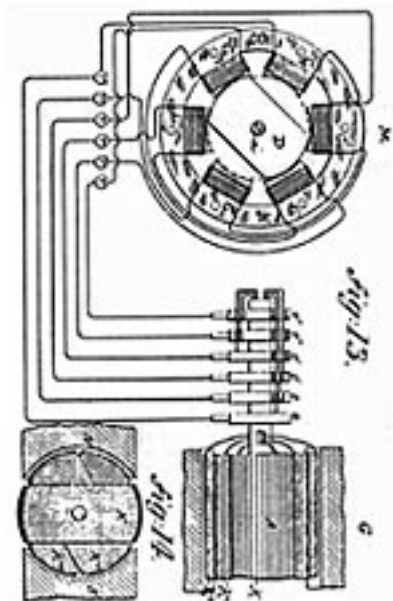
The young Tesla created a remarkable machine powered by another natural energy source: June bugs (or, as Europeans call them, May bugs). He glued sixteen of the live insects to the blades of a small windmill-like structure, and they set the rotor spinning vigorously in their vain attempt to fly away. Some accounts have jokingly cited this effort as one of Tesla's rare failures, although the inventor himself remained rather proud of the June bug motor. In his autobiography, Tesla explained why he discontinued his research into insect energy:

"These creatures were remarkably efficient, for once they were started, they had no sense to stop and continued whirling for hours and hours and the hotter it was, the harder they worked. All went well until a strange boy came to the place. He was the son of a retired officer in the Austrian army. That urchin ate May-bugs alive and enjoyed them as though they were the finest blue-point oysters."

Adding one more entry to his long list of idiosyncrasies, after beholding that spectacle Tesla refused ever to touch another insect again.

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This diagram from a 1888 patent shows Tesla's AC motor.

2: The Fight for AC

Tesla began his college education at Graz Polytechnic Institute, pursuing studies of the topic that fascinated him above all others: electricity. He had done fairly well in grade school, but his lack of facility at freehand drawing kept him from excelling in technical courses. But in college, Tesla was delighted to find, he was permitted to focus exclusively on what he was best at.

He studied feverishly almost around the clock, in a routine that began at 3 a.m. and ended at 11 p.m., every day. He aimed to impress his parents with his scholarly achievements, in part because his father had been reluctant to send him to the university, wishing Nikola would follow in his footsteps in the clergy. He also entertained fantasies of going to America and teaming up with the reigning leader of electrical invention, Thomas Edison, so that their combined forces might revolutionize the world.

Tesla was an extraordinary student who frequently enraged his professors, questioning the technological status quo with an insight that surpassed his instructors'. He rebelled most stringently against the acceptance of direct current as the sole means of delivering electrical power. It was plain to him that DC was inefficient and incapable of adequately transmitting power over long distances, and there had to be a better way. There was talk of a theoretical "alternating current" system, but no one had figured out how to make it work. AC was frowned upon as a fanciful dream by the scientific establishment, in much the same way as cold fusion is regarded today. Tesla's merest suggestion of AC brought scorn in his lecture halls, but he was never discouraged enough to abandon the enticing riddle.

In the middle of Tesla's sophomore year of college, his father was felled by a stroke. Nikola returned home, and his father died soon after. Tesla never returned to the Polytechnic Institute. Lacking funds for tuition, he took a job at a government telegraph office. Tesla despaired for his interrupted education,

but held on to his dream of becoming an electrical pioneer.

It was at this time that Tesla endured his ordeal with hypersensitivity that reduced him to a bedridden invalid. Considering the depressing turns his life had just taken, the bizarre affliction could possibly have been psychosomatic in origin. Whatever its cause, when Tesla finally emerged from the prolonged fugue state, he was armed with a powerful new insight on how alternating current could be successfully attained.

His great mental leap was this: two coils positioned at right angles and supplied with alternating current 90 out of phase could make a magnetic field rotate, with no need for the cumbersome commutator used in direct current motors. Tesla knew it would work without even having to build it and test it. Constructing it mentally and letting it run in his mind was proof enough for him.

This was Tesla's method for developing inventions throughout his career: no journals, no blueprints, no prototypes. The propensity for turning ideas into concrete visualizations which had tormented him in his youth was now turned to Tesla's advantage. He believed his technique was not only a valid one, but actually superior to the common practice of getting everything down on paper and conducting tentative trials. "The moment one constructs a device to carry into practice a crude idea, he finds himself unavoidably engrossed with the details of the apparatus," Tesla wrote in his autobiography. "As he goes on improving and reconstructing, his force of concentration diminishes and he loses sight of the great underlying principle."

Tesla now possessed the answer, but the problem of putting it into practice remained. In 1882 he found employment with Continental Edison Company in Paris, distinguishing himself as a fine engineer. Two years later he traveled to New York to meet the company's president, Thomas Edison himself.

It was not the harmonious meeting of the minds Tesla had once dreamed of. Edison regarded the hotshot European with contempt, and assuredly held no intentions of collaborating with him on some harebrained AC scheme. Edison viewed AC as a pipe dream at best, or, at worst, a threat to usurp his DC-based empire.

Tesla tried to make the best of the situation by offering to improve Edison's existing technology to the highest level possible. He promised to increase the efficiency of the DC dynamos by 25%, within two months' time. The skeptical Edison said he would pay Tesla fifty thousand dollars if he succeeded.

Exerting a massive, virtually non-stop effort, Tesla accomplished the feat, enhancing the dynamos by an even better margin than he proposed. But when he asked for his fifty thousand dollars, Edison refused to honor the deal,

claiming that he had only been joking. Infuriated, Tesla quit and never worked for Edison again.

Tesla was soon approached by a group of investors who wished to market the arc lamp he had developed. Thus was the Tesla Electric Company founded. Tesla was eager to seize this opportunity to bring AC into existence at last, but his investors wanted nothing to do with it -- so Tesla found himself rejected by the company that bore his own name.

That company soon ran afoul of financial hardships, leaving Tesla's stock shares worthless and stripping him of his rights to the arc light. Penniless, his enterprising spirit finally broken, one of the world's most brilliant men was reduced to shoveling in a labor crew for a dollar a day. He planned on committing suicide on his upcoming thirtieth birthday, at the stroke of midnight.

Before that could happen, A. K. Brown of Western Union learned of Tesla's plight. Aghast, Brown was determined to restore the genius to a worthy place, and offered to furnish him with a laboratory of his own. And what's more, Brown wanted Tesla to pursue the possibilities of alternating current.

Granted a blessed salvation, Tesla immediately went to work assembling his AC dynamo at last. It functioned in reality precisely as it had all those years inside his head. Tesla demonstrated his invention in a heavily publicized lecture, and instantly became the toast of the engineering community.

Among the AC converts in the lecture's audience was George Westinghouse, who negotiated with Tesla to manufacture the dynamos. The first application of the new technology: Niagara Falls. Westinghouse won the coveted contract to harness Niagara, bidding half of what Edison bid for the installation of a DC system. In 1895, the Niagara AC power system enjoyed a flawless inauguration, transmitting electricity to Buffalo twenty-two miles away -- a complete impossibility in the suddenly outmoded world of direct current. No longer a curious luxury reserved for the urban upper class, electric power in the home would now be commonplace.

For the first time in his life, Nikola Tesla was an indisputable success.

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Another busy day
in Tesla's
Colorado Springs
laboratory.

3: Free Energy

From the beginning of A. K. Brown's and George Westinghouse's fortuitous partnerships with Tesla, the inventor was at work on other projects above and beyond the AC dynamo. Able to devote himself to the unhindered realization of his countless ideas, he would later recall these years of his life as "little short of continuous rapture."

Tesla's New York laboratory was a hive of continuous activity, with a small staff of assistants working solely from their employer's verbal instructions. His distaste for putting ideas down on paper, coupled with his tendency to get bored with a completed invention and move on to the next challenge, led Tesla to toss aside a large number of creations that he never even bothered to patent. Once, when exhaustion left Tesla in a state of temporary amnesia, his assistant filed for patents on many of the unregistered inventions on Tesla's behalf, and had the master sign the papers while still incapacitated. Tesla's shunning of documentation was of some benefit when fire destroyed the lab in 1895, right after the success at Niagara. The loss was a setback, but not a catastrophic one, since the most valuable of the laboratory's assets remained intact in Tesla's brain.

In 1891, Tesla developed the invention by which his name is most commonly known today: the Tesla coil. Simple enough for today's hobbyists and science-fair entrants to construct in fully functional homemade models, it was nonetheless a remarkable innovation which remains the basis for radios, televisions and other modern means of wireless communication.

Tesla became known for the lectures at which he demonstrated his inventions and concepts with a theatrical flair. Many attendees were laymen who had little comprehension of what Tesla said, but were mesmerized by the bolts of lightning that leapt from his ominously humming coils, and the unwired light bulbs that lit at the touch of Tesla's hand. These spectacular displays led Tesla to be popularly regarded as some sort of magician -- a title that was bestowed

not in ridicule, but in awe.

The wireless transmission of energy would become the ultimate pursuit of Tesla's career. He discovered that a vacuum tube held in proximity to a Tesla coil would burst into illumination, without wires, without even a filament inside the glowing tube. Electrical resonance was the key to this discovery. By determining the frequency of the needed electrical current, Tesla was able to turn a series of different lights on and off selectively, from yards away. He had just become an American citizen in 1891, and this new technology was to be his gift of thanks to his adoptive country: a means of transmitting energy instantly, across any distance, through thin air. Free energy for everyone.

One of Tesla's assistants reportedly questioned the implications of putting such an energy distribution plan into practice. He wondered what incentive there would be for the electrical power establishment to begin giving away its goods for free, and whether Tesla could possibly be "allowed" to introduce such an arrangement. The presence of such doubts enraged Tesla, who was convinced, somewhat naively, that his plan would be accepted simply because it was the right thing to do.

As the years passed, Tesla's vision of wireless energy grew even grander in scope. He solved one of the problems implicit in his first theory, which was that transmission of power through air over long distances would result in a significant loss of energy. Rather than using air as a medium, he decided to send energy through the ground. This makes little sense in conventional electrical terms, whereby the earth's surface is regarded as, literally, "the ground" -- a sinkhole used for discharging excess current from a conductor. But Tesla found that if it were charged highly enough, the ground could become the conductor itself. In this way, the entire planet could be transformed into a colossal electric transmitter.

In 1899, as logistics prevented him from conducting the necessary experiments within the confines of New York City, Tesla headed west. A Colorado attorney named Leonard Curtis, who had previously defended Tesla in court, offered to help Tesla set up a testing facility in Colorado Springs. Curtis was also an officer of the local power company, and provided electricity to Tesla at no cost.

Tesla and his assistants built a one-of-a-kind laboratory on the outskirts of town, which looked like a large barn topped by a 180-foot metal tower. This was Tesla's "magnifying transformer," which he called the greatest of his inventions.

The townspeople of Colorado Springs were naturally curious about what this great inventor was up to, and respected the signs around the perimeter of the compound reading "KEEP OUT -- GREAT DANGER!" Still, they soon felt the effects of Tesla's apparatus. Sparks leapt from the ground as people walked the

streets, singeing their feet through their shoes. The grass around the Tesla building glowed with a faint blue light. Metal objects held near fire hydrants would draw miniature lightning bolts from several inches away. Switched-off light bulbs within 100 feet of the tower spontaneously lit.

And Tesla was only tuning up his equipment. These were the side effects of adjusting the magnifying transformer into perfect resonance with the earth. Once it was properly calibrated, Tesla was ready to conduct his career's boldest symphony, using the entire planet as his orchestra.

Late one night in the fall of 1899, Tesla fired up his machine at full blast, in hopes of producing a phenomenon he called resonant rise. His tower pumped ten million volts into the earth's surface. The current raced through the earth at the speed of light, powerful enough to keep from dying out over the course of its journey. When it reached the opposite side of the planet, it bounced back, like ripples of water returning to their origin. Upon returning, the current was greatly weakened; but Tesla was sending out a series of pulses which reinforced one another, resulting in a tremendous cumulative effect.

At ground zero, where Tesla and his assistant stood bedazzled, the resonant rise manifested itself in an unearthly display of lightning that still stands as the most powerful man-made electrical surge in history. The returning current formed an arc of lightning that stretched skyward from Tesla's tower and progressively grew to an incredible 130 feet long. Apocalyptic crashes of thunder were heard twenty-two miles away. Tesla had been concerned that there might be an upper limit to generating resonant surges, but now he believed the potential was limitless. The demonstration did come to an unexpected halt, but that was because the power surge caused the overloaded Colorado Springs power generator to burst into flames. Tesla received no further free power from the plant's furious owners.

He returned to New York in search of backing for the global implementation of a resonant energy system. Now cognizant of the business world's inevitable reluctance to support giving away free energy, Tesla pitched his new project as a means of transmitting communication, rather than electrical power. Decades before the birth of the Internet, Tesla was envisioning an information superhighway that was a far more sophisticated communication network than the one we use today.

George Westinghouse passed on the idea. Tesla next proposed it to J. P. Morgan, the wealthiest man in America, who had previously declined to finance the inventor. The idea of a monopoly on world communications intrigued Morgan, and he enabled Tesla to build a new laboratory on Long Island. Named Wardenclyffe, it was to be a bigger and better version of his Colorado facility.

While Tesla worked on the project, a string of accidents and bad luck struck Wardenclyffe, and he was beginning to run out of money. Morgan's funds and enthusiasm seemed to evaporate. In a last-ditch effort to keep his investor from deserting him, Tesla revealed to Morgan that his true goal was not to replace the telegraph, but to replace the conventional transmission of electricity. Morgan responded by withdrawing his support entirely.

Tesla would never get another opportunity to bring free energy to the world.

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Tesla's Wardenclyffe laboratory, where he tested his death ray.

4: Tesla's Death Ray

Given that Tesla's inventions generally possessed an element of social conscience, of doing good for humanity, it may seem surprising that he created a number of devices with military applications. And the notion of the Tesla harnessing his mind for purposes of war may seem immensely frightening. After all, this is the man who boasted that with his resonance generator he could split the earth in two... and no one was ever quite sure whether he was joking.

The first Tesla invention with a proposed military use was his automaton technology, with which the labor of human beings could be performed by machines. Specifically, Tesla produced remote-controlled boats and submarines. He demonstrated the wireless ship at an exposition in Madison Square Garden in 1898. The automaton apparatus was so advanced, it used a form of voice recognition to respond to the verbal commands of Tesla and volunteers from the audience.

In public, Tesla spoke only of the humanitarian virtues of the invention: it would lessen the toils and drudgery of mankind and keep human lives out of harm's way. But Tesla actually had his hopes on a contract with the U.S. military. In a presentation before the War Department, Tesla argued that his unmanned torpedo craft could obliterate the Spanish Armada and end the war with Spain in an afternoon. The government never took Tesla up on his offer.

Tesla then decided to pitch the automated submarine to private industry, and submitted it for the approval of J. P. Morgan. According to some accounts, Morgan offered to manufacture Tesla's vessels, but only if Tesla would agree to marry Morgan's daughter. Such a deal was of course anathema to Tesla, and he and Morgan would not work together until Wardenclyffe, a couple of years later.

Tesla eventually landed a successful military contract -- with the German

Marine High Command. The product here was not unmanned sea craft, but sophisticated turbines which Admiral von Tirpitz used to great success in his fleet of warships. After J. P. Morgan cut off his support of Wardencllyffe, this foreign contract was Tesla's only substantial source of income. Upon the outbreak of World War I, Tesla chose to forfeit his German royalties, lest he be charged with treason.

Nearly broke, and finding the United States on the brink of war, Tesla dreamed up a new invention that might interest the military: the death ray.

The mechanism behind Tesla's death ray is not well understood. It was apparently some sort of particle accelerator. Tesla said it was an outgrowth of his magnifying transformer, which focused its energy output into a thin beam so concentrated it would not scatter, even over huge distances. He promoted the device as a purely defensive weapon, intended to knock down incoming attacks -- making the death ray the great-great grandfather of the Strategic Defense Initiative.

It is not certain if Tesla ever used the death ray, or indeed if he even succeeded in building one. But the following is the often-related story of what happened one night in 1908 when Tesla tested the foreboding weapon.

At the time, Robert Peary was making his second attempt to reach the North Pole. Cryptically, Tesla had notified the expedition that he would be trying to contact them somehow. They were to report to him the details of anything unusual they might witness on the open tundra. On the evening of June 30, accompanied by his associate George Scherff atop Wardencllyffe tower, Tesla aimed his death ray across the Atlantic towards the arctic, to a spot which he calculated was west of the Peary expedition.

Tesla switched on the device. At first, it was hard to tell if it was even working. Its extremity emitted a dim light that was barely visible. Then an owl flew from its perch on the tower's pinnacle, soaring into the path of the beam. The bird disintegrated instantly.

That concluded the test. Tesla watched the newspapers and sent telegrams to Peary in hopes of confirming the death ray's effectiveness. Nothing turned up. Tesla was ready to admit failure when news came of a strange event in Siberia.

On June 30, a massive explosion had devastated Tunguska, a remote area in the Siberian wilderness. Five hundred thousand square acres of land had been instantly destroyed. Equivalent to ten to fifteen megatons of TNT, the Tunguska incident is the most powerful explosion to have occurred in human history -- not even subsequent thermonuclear detonations have surpassed it. The explosion was audible from 620 miles away. Scientists believe it was caused by either a meteorite or a fragment of a comet, although no obvious

impact site or mineral remnants of such an object were ever found.

Nikola Tesla had a different explanation. It was plain that his death ray had overshot its intended target and destroyed Tunguska. He was thankful beyond measure that the explosion had -- miraculously -- killed no one. Tesla dismantled the death ray at once, deeming it too dangerous to remain in existence.

Six years later, the onset of the First World War caused Tesla to reconsider. He wrote to President Wilson, revealing his secret death ray test. He offered to rebuild the weapon for the War Department, to be used purely as a deterrent. The mere threat of such destructive force, he claimed, would cause the warring nations to agree at once to establish lasting peace.

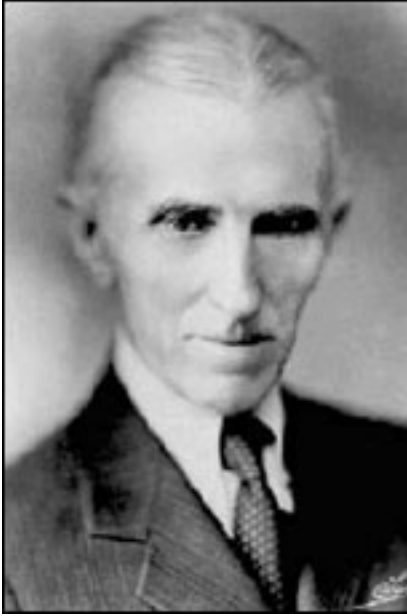
The only response to Tesla's proposal was a form letter of appreciation from the president's secretary. The death ray was never reconstructed, and for that we should probably all be thankful.

Tesla made one one further attempt to aid in his country's war effort. In 1917, he conceived of a sending station that would emit exploratory waves of energy, enabling its operators to determine the precise location of distant enemy craft. The War Department rejected Tesla's "exploring ray" as a laughing stock.

A generation later, a new invention exactly like this helped the Allies win World War II. It was called radar.

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Tesla's ideas seemed to grow markedly weirder in his later years.

5: His Wildest Dreams

Forever restless, and untethered by concerns of practicality and marketability, Tesla's mind spawned a vast miscellany of odd inventions.

Many of these were never developed beyond the concept stage, and the ideas seemed to grow markedly weirder in the final years of Tesla's life.

Invention was normally a deliberate process for Tesla, his every intention and goal fully formed before he and his crew lifted a finger. But there were times when he stumbled upon a new discovery by mistake. Tesla performed his first experiments with resonance technology at his New York laboratory by firing up a small oscillator, which caused a minor amount of vibration. Suddenly, an alarmed squad of police officers stormed into the lab, demanding that Tesla stop at once. Manhattan was shaking for miles around. Tesla had not taken into account how resonance waves grow stronger the further they travel from their source. He had unintentionally created what became known as Tesla's earthquake machine.

Tesla also applied his resonance engines in bizarre forms of physical therapy. He created machines that flooded the human body with electrical currents and strong vibrations, intended to soothe aches and promote healing. And Tesla wasn't just the inventor of the "electrotherapeutic" device -- he was also a client. He reportedly became somewhat addicted to administering the treatment to himself, insisting that a session with the machine rejuvenated him on his long stretches of work without food or sleep. Tesla once let his friend Samuel Clemens try out the healing machine. The author is said to have enjoyed the experience tremendously -- until the vibrations brought him a case of spontaneous diarrhea. Tesla marketed this invention, and the Tesla Electrotherapeutic Company was one of the few commercial enterprises of his old age that was marginally successful.

Tesla gained another accidental revelation during his testing of the magnifying

transformer in Colorado Springs. One evening during the construction of the device, the apparatus began to sound out a series of precise clicks, similar to Morse code. Tesla was convinced that these were signals being sent by extraterrestrial life. Tesla had expressed his belief in life on Mars, and now he thought he had proof. He later conceived of transmitters for communicating with Martians, espousing his view that the establishment of peaceful relations with our neighbors from outer space was among the most pressing duties that lay before humanity.

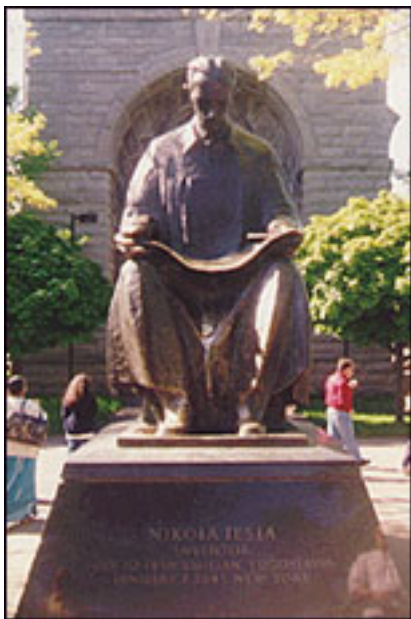
In his later years, Tesla was fascinated with the idea of light as both a particle and a wave -- the fundamental proposition of what would become quantum physics. This field of inquiry led to the development of his death ray. Tesla also had the idea of creating a "wall of light" by manipulating electromagnetic waves in a certain pattern. This mysterious wall of light would enable time, space, gravity and matter to be altered at will, and engendered an array of Tesla proposals that seem to leap straight out of science fiction, including anti-gravity airships, teleportation and time travel.

The single weirdest invention Tesla ever proposed was probably the "thought photography" machine. He reasoned that a thought formed in the mind created a corresponding image in the retina, and the electrical data of this neural transmission could be read and recorded in a machine. The stored information could then be processed through an artificial optic nerve and played back as visual patterns on a viewscreen.

It's a pity Tesla never made this last invention a reality. With the dearth of written notes and documentation he left behind for modern science to study, we can only conclude that Tesla's weirdest ideas were misconceived fantasies -- maybe even symptoms of madness. Nothing less than a comprehensive recorded catalog of his brain waves could prove otherwise.

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Tesla died penniless in obscurity, but his legacy is slowly gaining recognition.

6: The Forgotten Genius

On January 7, 1943, Nikola Tesla died in New York City at the age of 87. He was virtually penniless, living at the dilapidated Hotel New Yorker in a room that he shared with a flock of pigeons, which he considered his only friends.

The thriving industries he had built had long since turned their backs on him. The scientific community shunned him and his eccentric views. To the general public, he was either unknown or an object of ridicule, a lunatic whose ravings were fit only for sensational tabloids. The popular Max Fleischer "Superman" cartoons of the 1940s pitted the Man of Steel against the death rays and electromagnetic terrors of a scheming mad scientist, whose name was Tesla.

How could this have happened? Whatever his flaws, however far afield he may have strayed at times, Tesla surely deserved better than this. Modern society owes him just as much as the people of his time did, if not more, and yet we have forgotten him.

There are several schools of thought on the question of Tesla's fall into obscurity. The first, and probably the most irrefutable, is that Tesla failed to make the history books because he failed as a businessman. The most successful people aren't necessarily the most brilliant, but those who can play the game to reach the top. Tesla was a disciple of the pure sciences as opposed to applied science, with little facility at figuring out how to profit from his ideas. His business associates often did not act on behalf of his best interests, and Tesla himself made scores of bad financial decisions.

For example, in the wake of Tesla's successful implementation of AC, he stood to collect an enormous amount of wealth. He had signed a contract with Westinghouse which could conceivably have put him among the richest men in America. But when George Westinghouse told Tesla that the financial drain of

the arrangement would put his company's future in jeopardy, Tesla ripped the contract to shreds, as a gesture of friendship. Had he held Westinghouse to the deal, or at least negotiated for a fraction of it, Tesla would have died in luxury, and may have preserved his notoriety much more fittingly.

Other analysts take the blame off Tesla's shoulders, and propose that big business and the U.S. government conspired to suppress the inventor's genius. At the top of the suspected conspirator list is Thomas Edison. Edison despised his former employee's success with AC, and it is known that he set out on a campaign to smear Tesla's name. He held demonstrations at which animals were lethally electrocuted with AC-powered devices, in a deceptive and inhumane effort to warn the public of the danger posed by Tesla and Westinghouse's "unsafe" new electrical system. Edison also sat on the War Department advisory board that rejected Tesla's proposals of the death ray and his radar-like device.

J. P. Morgan is also implicated in the anti-Tesla cover-up. Morgan counted on increasing his already monumental wealth by exploiting Tesla's ideas, until he learned that Tesla was considering the free distribution of energy -- a terrifying idea to any self-respecting capitalist. He ended his funding of Tesla's experiments at once, and some think he used his considerable clout to ensure that no one else would bankroll Tesla's threatening schemes.

The government, which had always held Tesla at arm's length when he attempted to pitch a proposal, became suddenly fascinated with his work as soon as he died. The FBI ordered the Office of Alien Property to seize all of Tesla's papers and possessions. This confiscation was unequivocally illegal, since Tesla had been an American citizen since 1891.

The records of Tesla's work were judged to pose no threat to national security, and the FBI's file on Tesla was closed in 1943. It was reopened in 1957 in the wake of reports that the Russians were performing mysterious Tesla technology experiments. Many are convinced the Pentagon has followed suit with top-secret Tesla-based projects of its own, the most infamous being HAARP, the High-frequency Active Auroral Research Program. Reminiscent of Tesla's giant magnifying transmitter, only pointed in the opposite direction, the \$30-million experiment is designed to pump enormous quantities of energy into the atmosphere over Alaska. The purposes of HAARP are unclear, although researchers probing the project have called it everything from a communications and surveillance network to a mass mind-control device.

A final theory is that Tesla ruined his reputation with his own outlandish inventions and claims. Some claim that Tesla went wrong as soon as he struck upon his quest for wireless energy. Others believe that he descended into insanity or senility when he began to speak of death rays and Martians. Tesla never accepted the work of Albert Einstein, which he criticized as being vague

and incoherent. Given his adherence to these beliefs, many question how great a scientist Tesla could have been.

Strictly speaking, such arguments are probably correct. To the best of modern scientific knowledge, Tesla's free energy system simply would not work, there are no signals broadcast from Mars, and the theory of relativity is sound. But there are two things left to consider.

First, even if Tesla's later ideas were dead wrong, they by no means diminish the immense quantity of very right ideas that he contributed to our world. And second, it bears remembering that alternating current was also perceived as unrealistic Tesla gibberish for quite some time before its true brilliance was finally proven. There is the possibility, however remote, that Tesla's most bizarre concepts will be validated at some point in the future, when science finally catches up with him. Only time will tell.

For now, Tesla's true legacy is increasingly being recognized, bit by bit. The Supreme Court ruled shortly after his death that Tesla was the legal inventor of radio, not Guglielmo Marconi. Similarly, Tesla has been rightfully acknowledged as the inventor of the fluorescent bulb, the vacuum tube amplifier and the X-ray machine. History books are now starting to include these facts. Finding exposure in our current so-called "information age," in which technology is king and strange new ideas are tolerated more and more, Tesla is becoming something of a folk hero. This may run the risk of reducing Tesla and his work to an Internet fad, but any effort that keeps his name alive is worthwhile.

The final fate of Tesla's Wardenclyffe laboratory was strangely fraught with meaning. In 1917, it was consigned to demolition. Tesla's money for its upkeep had run dry, and its meager remaining contents were reportedly coveted by German spies. As a preemptive move, it was dynamited. But the proud steel tower of Wardenclyffe remained. The demolition crew blasted the site repeatedly, but the tower would not collapse. They had to return at a later date and dynamite it once more. It fell to the ground, but did not explode, nor did it shatter into pieces upon its thunderous impact.

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