The Life and Times of

Nikola Tesla

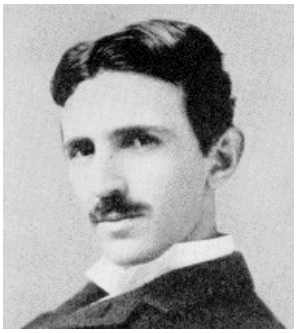
Table of Contents

Biography of Tesla

Nature and Nature's laws lay hid in night: God said, "Let Tesla be" and all was light

- B.A Behrend, AIEE annual meeting, New York City, May 18, 1917

Nikola Tesla invented alternating current, generators and motors to run on it, high voltage Tesla coils, radio, X-rays, highly efficient bladeless steam turbines, radio controlled boats and robots, fluorescent lights and was hugely influential in his industry. Tesla was a metaphysical genius who had a tremendous ability to visualise his inventions and the complete working model of his invention including the minutest details so that when it was manufactured for the first time it worked just as he visualized it.

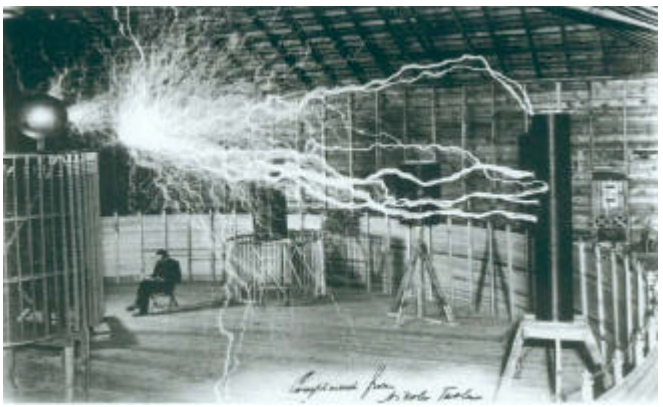


Tesla was born on 10 July 1856, in a small town called Smiljan in the Austria – Hungary border province of modern day Croatian republic. Tesla was born into a poor family whose father was a priest and his mother an illiterate housewife but very talented and to whom he was emotionally very close. Tesla had one elder brother and three sisters. According to Tesla's biography (Cheney ,1999) the elder brother Dane was brilliant and died at the age of 12 and Tesla came under tremendous pressure from his parents to perform as well as his brother. This was a major motivating force in his early life.Tesla studied electrical engineering at the Austrian Polytechnic in Graz.

Throughout his working life there was great animosity between Tesla, Marconi and Edison, the latter two managing to get early industry recognition for their work. This animosity was particularly evident in the "War of the Currents" which nearly broke both the Edison and Westinghouse Company's. However Tesla did manage to be awarded the Edison Medal in 1917 and had the unit for measuring magnetic flux named after him. In 1943 the US Supreme Court upheld Tesla's patent on radio and formally recognising him as the inventor of radio. Tesla died in New York in 1943, alone and destitute and in debt.

Tesla began his formal career in 1881 when he moved to Budapest, to work as the chief electrician for a telegraph company, the American Telephone Company. It was here that he quickly had his first invention which was an amplifier or loudspeaker. In 1882 he moved to Paris, to work as an engineer for the Continental Edison Company, designing improvements to electric equipment. Around this time he had one of his metaphysical visualisations and conceived the principles of an induction motor and began developing various devices that use rotating magnetic fields. In 1884, he emigrated to the US and went to work for Edison in the 'Edison Machine Works'. He was offered in present value terms 1M$ if he completed design improvements to the direct current (DC) motor and generator initiatives that Edison was doing at the time. After one year of hard

work where he produced some very profitable products and patents, Edison reneged on the deal and when finally Tesla was refused a 25$/week raise he resigned. This is a good example of naivety in business which Tesla would exhibit many times in his life. In 1886, Tesla formed his own company, 'Tesla Electric-Light & Manufacturing' and started work on developing an alternating current (AC) motor. He disagreed with his financial investors on his plan for an (AC) motor and he was forced to leave the company. However during this time he worked with a patent attorney who helped Tesla to start work on his AC motor and financed him in setting up his laboratory. In 1887, he constructed the initial brushless alternating current induction motor, which he demonstrated to the American Institute of Electrical Engineers in 1888.



Tesla Coil in operation

Tesla developed the principles of the Tesla Coil around this time and went to work for a brief period at Westinghouse Electric & Manufacturing Company's laboratories. George Westinghouse bought all of his AC patents for a million dollars and ongoing royalties. This transaction precipitated the animosity and power struggle between Edison's DC system and the Tesla AC system which eventually won out and became a global standard and which is still in place. As a result of the "War of the Currents", Edison and Westinghouse nearly went bankrupt by 1897.

In April of 1887, Tesla began his early investigative work in the area of X-rays using his own single node vacuum tubes and where he discovered the phenomenon of braking radiation. This was much before Roentgen's discovery who was a pioneer in this area also. In 1891, he became a naturalized citizen of the United States at the age of 35.When Tesla was 36 years old, the first patents concerning the polyphase power system were granted.

From 1893 to 1895, he investigated high frequency alternating currents. He generated AC in excess of one million volts using a conical Tesla coil (Fig 2) and his most impressive experiment with this coil was in Colorado Springs where he produced artificial lightning discharges which were up to 135 foot long and managed unwittingly to blow up the electricity generators for the Colorado Springs area. He investigated the skin effect in conductors, designed tuned circuits, invented a machine for inducing sleep and cordless gas discharge lamps, and transmitted electromagnetic energy without wires, effectively building the first radio transmitter. His first radio patents were filed in 1896 but it was not until after his death that he was formally recognised as the inventor of radio.

In 1890 he showed for the first time the heating effect of high frequency current in meat tissue which subsequently resulted in the development of micro wave technology. At the 1893 World's

Fair, the World's Columbian Exposition in Chicago, Tesla and Westinghouse introduced visitors to AC power by using it to light the exhibition facility. In 1896 the world's first large-scale power plant producing AC power was set up at Niagara Falls. Both these systems clearly demonstrated the superiority of AC power over Edison's DC power.

In 1894, he was given an honorary doctoral degree by Columbia and Yale Universities and the Elliot Cresson Medal by the Franklin Institute. In 1897, when Tesla was 42 he demonstrated a radio-controlled boat to the US military. In 1898, a radio-controlled boat was demonstrated to the public during an electrical exhibition at Madison Square Garden. In the same year, Tesla invented an "electric igniter" or spark plug for internal combustion gasoline engines which is related to the Tesla coil in its principle of working.

In 1917 Tesla was awarded the Edison Medal, the most coveted prize of IEEE. In his speech presenting Tesla with the Edison medal, Vice President Behrend of the Institute of Electrical Engineers said; "Were we to seize and eliminate from our industrial world the result of Mr. Tesla's work, the wheels of industry would cease to turn, our electric cars and trains would stop, our towns would be dark and our mills would be idle and dead. His name marks an epoch in the advance of electrical science". In 1934, the city of Philadelphia awarded him the John Scott Medal for his polyphase power system.

In his latter years Tesla worked on plans for a directed-energy weapon which he called "death ray". This got articulated as "Star Wars" during the Reagan administration. In 1937, Tesla composed a treatise entitled "The Art of Projecting Concentrated Non-dispersive Energy through the Natural Media" concerning charged particle beams. Tesla tried to interest the US War Department in the developments and a contract was entered into to build a device. Tesla died of heart failure in the New Yorker Hotel in 1943, at the age of 86.

Immediately after his death all his papers were seized and sealed by the FBI marking them "top secret". Despite creating and patenting a large number of inventions, Tesla was essentially a destitute and died with significant debts. Later that year the US Supreme Court upheld Tesla's patent on radio, in effect recognizing him as the inventor of radio. The recognition came after 47 years and he never received the Nobel Prize. Tesla was a highly talented inventor and a man of his time who has made a huge and long lasting contribution to the practical application of science in the commercial world.

Unbelievably, he is little recognised in the pantheon of inventors and he is not mentioned in the Smithsonian Book of Inventions. Like all humans he had his personal weaknesses, driven by compulsions, bad temper and progressive germ phobia and in all of his life he only had a few close friends. While being practical and successful in a technical domain he was very weak in financial matters and he did not really profit personally from his significant inventions and less talented people like Edison and Marconi were able to be commercially successful with Tesla's intellectual property. An interesting thought is what impact Tesla would gave today on our overstressed world where we seek the technological wave that will mitigate the risks of global warming and the depletion of fossil fuels.

References

Cheney: Tesla: Man Out of Time - Google Scholar. Available at: http://scholar.google.com/scholar?hl=en&lr=&q=related:qN-tiM01pGQJ:scholar.google.com/ [Accessed November 2, 2008].

Google Scholar. Available at: http://scholar.google.com/schhp?client=firefox-a&rls=org.mozilla:en-GB:official&hl=en&tab=ws [Accessed October 27, 2008].

Tesla biography - Google Scholar. Available at: http://scholar.google.com/scholar?q=tesla+biography&hl=en&lr=&start=0&sa=N [Accessed October 27, 2008].

Cheney, M. & Uth, R., 1999. *Tesla, Master of Lightning*, Barnes & Noble Publishing.

Life, H.E. & Rajvanshi, A.K., 2007. Nikola Tesla–The Creator of the Electric Age. *Resonance*.

Magnetic, R. & Coil, T., Early Life Of Nikola Tesla.

Rajvanshi, A.K., 2007a. Nikola Tesla—The creator of the electric age. *Resonance*, 12(3), 4-12.

Roguin, A., 2004. Nikola Tesla: the man behind the magnetic field unit. *Journal of Magnetic Resonance Imaging: JMRI*, 19(3), 369-74.

Tesla, N., 1904. The Transmission of Electrical Energy without Wires. *Electrical World and Engineer, March*, 5.

Valentinuzzi, M.E., 1998. Nikola Tesla: why was he so much resisted and forgotten? *Engineering in Medicine and Biology Magazine, IEEE*, 17(4), 74-75.

Vujic, J., Free Energy for all: Are we Closer to Tesla's Dream?

Tesla's Vision

Nikola Tesla's vision has changed and made the world better forever. Vision has two different but equally valid interpretations. A Vision can be used as in a vision for Society. Telsa wrote frequently in the New York Times whereby he communicated how his inventions and work would impact on society. A Vision can also be a creative process whereby complex entities are visualised in your mind. Telsa had the ability to see completed visions of his finished inventions which were inspired by external stimuli.

This article will explore how a creative vision helped Tesla develop Alternating Current (A.C.) stimulated by an external stimulus and how he wanted to put his inventions to work for the good of society. Society was to benefit by distributing A.C. power by wireless media and by the provision of a global telecommunication system by using A.C. as a carrier wave to transfer subscriber data through the earth. These two projects will be developed in this article to demonstrate Tesla's vision.

Tesla's inventions are so numerous and important to mankind that he has been given the title of "The man who invented tomorrow". He was a pioneer in electrical science and has patented many inventions including A.C., A.C. Induction motors, A.C. dynamos etc. He formed a lifelong alliance with Westinghouse to promote A.C. as it had considerable technical advantages over its competing alternative, Direct Current. Nigeria Falls was the site of the world's first commercial 3 phase A.C. power plant. It transmitted A.C. power to Buffalo, N.Y. which enabled Tesla to provide light to this area. Nikola Tesla worked on many varied projects. Indeed, A scientist's scientist.

Nilola Tesla was extraordinary and unique. Not only was he was a prolific inventor throughout his life, which is unusual but also in the way he conceived ideas (Tesla, N. Oct. 1982 Paragraph 10). When he was a boy, he "suffered from an affliction due to the appearance of images, often accompanied by strong flashes of light. When a word was spoken to me the image of the object it designated would present itself vividly to my vision" (Telsa, N. Oct. 1982 Chapter 1 paragraph 8). He harnessed this ability when he became seventeen; "Then I observed to my delight that i could visualize with the greatest facility. I needed no models, drawings or experiments. I could picture them all as real in my mind. Thus I have been led unconsciously to evolve what I consider a new method of materializing inventive concepts and ideas, which is radically opposite to the purely experimental and is in my opinion ever so much more expeditious and efficient." (Telsa, N. Oct. 1982 chapter 1 paragraph 9). In addition he "gained a great facility in connecting cause and

effect".(Tesla, N. Oct. 1982) chapter 1, paragraph 11) He realised that "Every thought I conceived was conceived by an external stimulus".

An example of such an external stimulus is provided by Tesla. Tesla was highly inspired by poetry. It was a passage of Goethe's Faust that inspired him to invent the alternating current-motor (Von ins, J unknown p4). In 1881 Tesla was walking with his friend Antal Szigety through the Varosliget City Park in Budapest, reciting poems. As the sun sets he remembers Faust and Wagner having a walk in the sunset. So he starts reciting from this passage of Goethe's drama because it parallels what he himself does and experiences at this moment:

"But new impulse awakes, to light
I hasten on, eternal brightness drinking,
Before me day, behind me night,[1]
Above me heaven, and under me the billow.
A lovely dream, while glory fades from sight.
Alas! To wings that lift the spirit light
No earthly wing will ever be a fellow." (Trajkovic, l. Jan 2005)

Nikola Tesla patented the A.C. system we still use today and many other A.C. Devices. One such device is the A.C. induction motor which is used in every industry and house hold worldwide. These inventions started the industrial revolution. Around 1900, his vision was to transmit energy without wires so that everybody could have energy for free. The U.S. Government requests Tesla to develop a wireless communication system. Tesla preparation starts by testing the laws of propagation of current through the earth and atmosphere. He moves to Colorado Springs to conduct this research.

In Colorado Springs, Tesla researched ways to transmit power wirelessly over long distances via transverse and longitudinal waves. He transmitted extremely low frequencies through the ground as well as between the earth's surface and a layer of ionised gas occurring 90 to 150 km above the ground (E-Region) which possesses the property of being able to reflect medium frequency radio waves. This reflection allows radio waves to be propagated beyond the horizon. From his laboratory in Colorado Springs, Tesla energised his coil magnifying transmitter; it created sparks 30 feet long from an antenna. Tesla succeeded in generating and sending out wireless waves which mediate energy without wires for miles around. Tesla succeeds in lighting 200 lamps without wires from a distance of 25 miles (40 kilometres) and creates man-made lightning.

During this time Tesla discovered terrestrial stationary waves. Tesla regarded this as his most important discovery. This discovery proves that the Earth could be used as a conductor and would be as responsive as a tuning fork to electrical vibrations of a certain frequency (6.8 Hz). This

means that the earth could be used as a conductor for transmitting data throughout the world (Tesla, N. Oct 3 1915). The Wardenclyffe project and the vision of a global telecommunication system using the earth was conceived (Tesla, N. Oct. 3 1915). The Wardenclyffe tower was dual purpose, uniting Tesla's visions of wireless transmission of energy and a global wireless telecommunications system.

Telsa went about creating this vision by investing his own money until it was exhausted and later by using $150,000, partially funded by J.P. Morgan to finance the Wardenclyffe project. The transmitter at Wardenclyffe was designed to minimise radiated power. The energy from Tesla's steam driven WestingHouse 200KW alternator was to be channelled into a radial structure of iron pipes installed 120 feet below the tower's base(See Fig. 3). By super imposing a low frequency baseband signal on the higher frequency signal coursing through the transmitter's helical resonator, a low frequency current in the presence of an enveloping corona-induced plasma of free charge carrier would have "pumped" the earth's charge. It's believed the resulting ground current and its associated wave complex would have allowed the propagation of wireless transmissions to any distance on the earth's surface with a maximum of 5 percent loss due to radiation. According to Tesla, "Modulations of the human voice can be reproduced more clearly through the earth than through wire" (Tesla, N. Oct. 3r^{d} 1915 Paragraph 4). Because of a dispute between Morgan and Tesla as to the final use of the tower, Morgan withdrew his funds. The financier's classic comment was, "If anyone can draw on the power, where do we put the meter?" (Various, B. Unknown date web reference paragraph 30). However, part of Tesla's vision was realised in the Telefunken project. Three 180 meter radio towers were constructed in West Sayville, New York and in Neuen, Germany. Nikola Tesla assisted in the construction of the towers at Sayville. This created the only wireless communication network between North America and Europe.

Who knows, if Tesla had succeeded, maybe power would be distributed via wireless means today. Nonetheless Tesla's, inventions involving polyphase A.C. allows power to be distributed over wires to every home and business to light, heat and perform mechanical work enabling the modern world as we know it today.

The progressive development of man is vitally dependent on invention (Tesla, N. 1982 P1). Nikola Tesla was a revolutionary scientist whose ideas have shaped the electrical and magnetic sciences. His unique ability to model, refine and perfect a finished functional invention in his mind was triggered by an external stimuli. Tesla has attributed his inspiration for A.C., to a poem he was reciting to a friend when he was out walking. Similar techniques have been used to help understand the "Nature of Creativity".

Tesla had a vision on how society could benefit from his inventions. Two such visions included wireless distribution of A.C. current and a global telecommunication system which used the properties of the earth to enable communication by voice and data. When working in Colorado Springs, on his wireless transmission of A.C., he discovered Terrestrial Stationary waves. This proved that the earth could be used as a conductor and would be responsive to electrical vibrations at a certain frequency. Although Tesla's vision has not been realised by wireless, it has happened using wires(power lines & Telecommunication lines). Tesla's A.C. Induction motor are used in homes and industry worldwide. Tesla started the industrial revolution at the turn of the last century. Electricity is generated, transmitted and converted to mechanical power by Tesla's inventions and is used to light the world using his polyphase A.C current system (Tesla, N. April 21 1908) (Tesla, N. June 21st 1907). Today's and tomorrows world has been invented by Nikola Tesla.

References

Rakovic , D. (Oct. 2006). *Tesla And Quantum-Coherent States Of Consciousness: Case Study For Understanding Nature Of Creativity.* Available : Http://Www.Tesla-Symp06.Org/Papers/Tesla-Symp06_Rakovic%20shorter.Pdf. Last Accessed 31 St Oct. 2008.

Tesla , N. (June 21, 1907). *Nikola Tesla Can Bridge The Gap To Mars.* Available: Http://Query.Nytimes.Com/Mem/Archive-Free/Pdf?_R=1&Res=9C0CE6D9133EE033A25750C2A9609C946697D6CF. Last Accessed 31st Oct. 2008.

Tesla , N. (April 21 1908). *How The Electrician's Lamp Of Aladdin May Construct New Worlds*. Available: Http://Query.Nytimes.Com/Gst/Abstract.Html?Res=9E03E0DB1639E333A25752C2A9629C946997D6CF. Last Accessed 31 St Oct. 2008.

Tesla , N. (Oct. 3 1915). *Nikola Telsa Sees A Wireless Vision.* Available : Http://Query.Nytimes.Com/Mem/Archive-Free/Pdf?_R=1&Res=9B03E4DA133FE233A25750C0A9669D946496D6CF&Oref=Slogin. Last Accessed 31 St Oct. 2008.

Tesla , N. (Oct. 1982). *My Inventions: The Autobiography Of Nikola Tesla*. Available : Http://Www.Lucidcafe.Com/Library/96jul/Teslaautobio.Html. Last Accessed 31 St Oct. 2008.

Trajkovic , L. (Jan. 2005). *TESLA'S VISION OF THE WIRELESS GLOBAL COMMUNICATIONS*. Available: Http://Www.Ensc.Sfu.Ca/~Ljilja/Cnl/Presentations/Ljilja/Ubc/Tesla_01172005_Edited.Pdf. Last Accessed 31 St Oct. 2008.

Von Ins, J. (Unknown). *nikola tesla (1856-1943): vision, creativity and scientific progress.* Available: Www.Teslasociety.Ch/Info/Vonins/Tesla.Doc. Last Accessed 31 St Oct. 2008.

Various, A. (March 2003). *Nikola_Tesla*. Available : Http://En.Wikipedia.Org/Wiki/Nikola_Tesla . Last Accessed 31 St Oct. 2008.

Various, B. (Unknown). *Tesla Biography nikola tesla the genius who lit the world.* Available : Http://Www.Teslasociety.Com/Biography.Htm. Last Accessed 31st Oct. 2008.

Goethe's Faust Goethe, Faust I, 1. Act, 2. Scene; I Put Bold The Passages Tesla Quotes In His Autobiography (2005:51). I Underline Bipolar Pairs Of Terms. Maybe These Inspired Tesla To Visualize Alternating Current.

Teslautomatons

".... I have by every thought and act of mine, demonstrated, and does so daily, to my absolute satisfaction that I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs, and thinks and moves accordingly...."

- Nikola Tesla: On the Art of Teleautomatics, The lecture in the Chicago Businessman Club, Archives of the Nikola Tesla Museum, Belgrade, F. 954, l. .21.

Today cruise missiles, unmanned air vehicles, remote-control tracked vehicles and unmanned underwater vehicles have become a constant of our society. These robotic warriors are in daily use in around the world. The man responsible for giving birth to the automated robot was no other than Nikola Tesla. Tesla, a Serbian-born American immigrant who was responsible for AC power and many of the first breakthroughs in radio, radar and energy fields, invented and tested the first unmanned guided weapons more than a hundred years ago, developing systems and logic that are fundamental in today's high-tech.

Actor David Bowie as Tesla in the film "The Prestige"

In 1898, six years before the Wright brothers flew, Tesla designed and built a pair of radio-controlled boats. The craft were constructed of iron, powered by an electric battery of his own design, and equipped with a radio-mechanical receiver that accepted commands from a wireless transmitter. The boats were equipped with a large whip antenna, a modular space that could carry a charge, diving rudders, a prop and electric running lights that could all be remotely controlled. Tesla demonstrated the vessels to a shocked crowd in an indoor pool at Madison Square Garden in New York. The crowd was amazed how Tesla, always a showman, manoeuvred his six-foot-long boat in patterns through the water, and then stopped and started the craft. He even had the forethought to equip his boats with a crude logic gate, which prevented them from being taken over by another transmitter other than his own. The craft alarmed those in the crowd who saw it and who claimed it to be everything from magic and telepathy to being piloted by a trained monkey hidden inside.

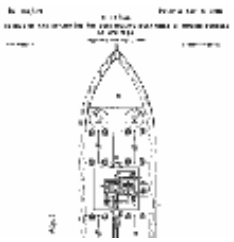
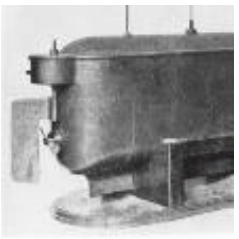


Diagram of Tesla's Boat



Picture of Tesla's Boat

Tesla, who referred to the craft as *telautomatons* envisioned a small group of trained operators could remotely control the craft, which would be armed with warheads and attack naval ships. This did not come to pass, however, as the military establishment could not appreciate the potential of Tesla's weapon for anti-ship uses or of the broader idea of remote control vehicles. He offered the weapon to the United States navy and later to Great Britain without success.

The development of this project led him to devise methods for selectively activating any of several wireless receivers (he called this "the art of individualization") that involved multiple transmissions on separate frequencies. At the receiving end, each one of the individual frequency components had to be tuned in, in order for the receiver to respond—the AND logic gate. Nowadays an essential component of any circuit board.

Just like him, most of his inventions and developments, this concept remained forgotten until after World War II. Today, this technology is widely available and we often don't think much of it because it is and has been part of our world for quite some time now, the weapons are real and the AND logic gate generally used in all electronic apparatus. Amazingly we don't know much about the man who first developed robotics and computer logic, but at least we have his legacy.

References

Vukobratoviæ, Miomir, "Nikola Tesla and Robotics", SERBIAN JOURNAL OF ELECTRICAL ENGINEERING, Vol. 3, No. 2, November 2006, 163–175

Huntley, D, "The true father of Electricity: Nikola Tesla", http://honeymanrp.blogspot.com/2008/02/true-father-of-electricity-nikola-tesla.html

Tesla Life and Legacy - Race of http://www.pbs.org/tesla/ll/ll_robots.html

Nikola Tesla: On Wings of Inspiration

Who was Nikola Tesla? Wikipedia describes him as "an inventor and a mechanical and electrical engineer. ... best known for many revolutionary contributions in the field of electricity and magnetism in the late 19th and early 20th centuries." (Wikipedia , 2008). Born in Croatia in 1856, he moved to the US and settled in New York. It's his work there that brought us, among other inventions, the (alternating current) AC motor and a design for radio. He died at the age of 86, penniless despite all his patents and inventions. What is most remarkable is that he remains relatively little-known – with Edison and Marconi more usually thought of as the inventors of the AC motor and radio. But looking beyond his work, what may be discovered about the man himself? Searching through websites and online biographies of the inventor has uncovered another side to this intelligent and hard-working man, a gentle and sensitive side, which this article will reveal.

Photo: Nikola Tesla, courtesy of the

Federal Communications Commission (FCC)

One of the most intriguing aspects of Tesla's life was his habit of feeding pigeons in New York. This busy man would take time out every day to walk in Bryant Park and feed the pigeons there. It's not recorded when exactly he started but he kept it up for decades, until he died. And he didn't feed them any old bird seed - each week's supply was specially purchased for him by one of his secretaries and mixed in his office (3 pounds each of rape, hemp and canary seed). If he was ill or couldn't make it to the park for any reason, he paid a Western Union messenger boy to do it for him. This may not seem so unusual perhaps – just a nature lover looking after his feathered friends? What places it in a more curious light is that he didn't limit this to the park, he also invited pigeons into his hotel room!

His habit was to leave a window open, allowing the pigeons easy access to the basket nests and bird seed in his room. He may have been popular with the pigeons, but this was unlikely to please the hotels. And it was in one of these hotels - the Hotel St Regis, that his affection for one of his pigeons in particular was revealed.

In his biography, John J. O'Neill tells how Tesla ensured that one special pigeon was cared for in his absence, in 1921 when he was taken ill at his office and unable to return to his hotel room.

"..."Feed the birds," that's what she cries,
While overhead, her birds fill the skies.
All around the cathedral the saints and apostles
Look down as she sells her wares.
Although you can't see it, you know they are smiling
Each time someone shows that he cares ..."

(Disney, 1964)

While ill, he gave his secretary this "important" message:

"Call Hotel St. Regis; get the housekeeper on the fourteenth floor. Tell her to go to Mr. Tesla's room and feed the pigeon today, the white female with touches of light gray on its wings, and continue doing this until she receives further orders from me. There is plenty of feed in Mr. Tesla's room." (O'Neill, 1944)

Tesla later explained this to O'Neill:

"I have been feeding pigeons, thousands of them, for years; thousands of them, for who can tell - But there was one pigeon, a beautiful bird, pure white with light gray tips on its wings; that one was different. It was a female. I would know that pigeon anywhere.

No matter where I was that pigeon would find me; when I wanted her I had only to wish and call her and she would come flying to me. She understood me and I understood her.

I loved that pigeon ... That pigeon was the joy of my life. If she needed me, nothing else mattered. As long as I had her, there was a purpose in my life." (O'Neill, 1944)

On the night she died, *"something went out of my life. Up to that time I knew with a certainty that I would complete my work, no matter how ambitious my program, but when that something went out of my life I knew my life's work was finished.*

Yes, I have fed pigeons for years; I continue to feed them, thousands of them, for after all, who can tell-" (O'Neill, 1944)

So here was the explanation: He fed pigeons in the park or from his hotel window because he knew that then this very special pigeon of his would always find him.

Tesla had placed a great importance on his special lady pigeon. It would seem that she was his inspiration to work and strive for new ideas. He needed to see her and know she was alright, as he believed she was tied to his own destiny. While she could visit him, correspondingly his creativity could continue to flow. When she died, his ambition died with her, as he believed that his creativity and ingenuity had been linked to her. He continued to feed the pigeons after she'd gone; perhaps because they provided a link to her and therefore a link to a happier and more creative and productive time?

References

(Disney, 1964) Disney (1964) “Feed the Birds (Tuppence a Bag)” from Mary Poppins (Song lyrics extract)

(O’Neill, 1944) O’Neill, J (1944) *PRODIGAL GENIUS: The Life of Nikola Tesla* , Cosimo Classics. Also http://www.rastko.org.yu/istorija/tesla/oniell-tesla.html#_Toc496780564 , accessed: November 2008

(Wikipedia, 2008) Wikipedia (-) Nikola Tesla, http://en.wikipedia.org/wiki/Nikola_Tesla , Date Accessed: November 2008

Nikola Tesla and Mark Twain

One of the many interesting aspects of the life of Nicola Tesla was his close friendship with author Mark Twain. The two were both frequent visitors to The Player's Club in New York in its hay-day and despite apparent differences became close friends and correspondents until the famous author's death in 1910. As someone who was regarded as somewhat of a loner, working alone and not mixing much with friends, Tesla's apparently strong friendship with Twain provides an interesting light in which to view the obscure scientist and inventor. Throughout their lives, the two corresponded frequently and Twain in particular took a strong interest in the work and inventions of his friend.

Mark Twain photographed in Tesla's Lab, Tesla himself can be seen in the background

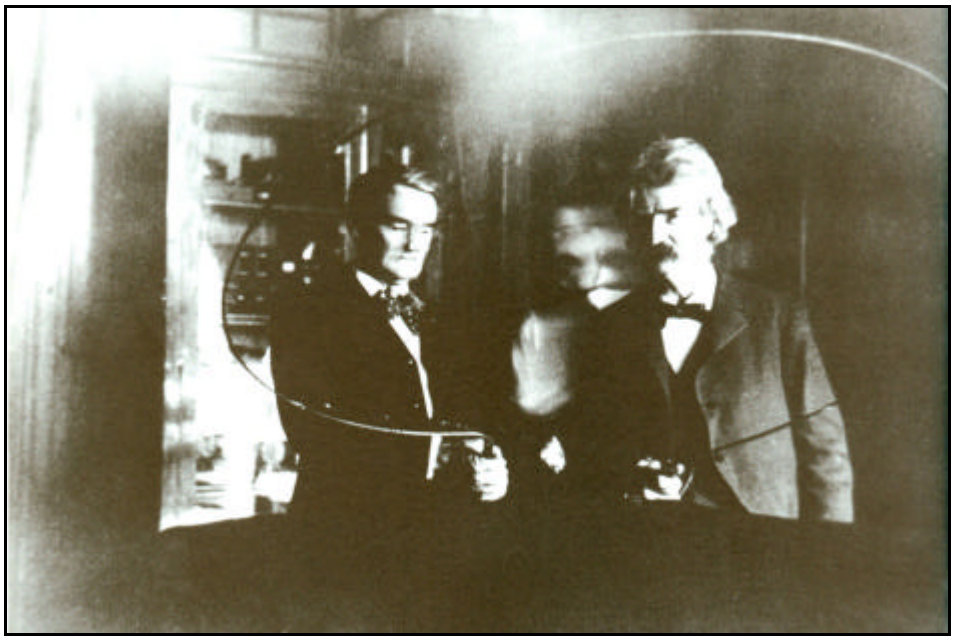
Twain had a strong interest in matters of science and invention. Many of his investments, were made in new technologies and the great writer himself registered at least one patent in his own name, for 'adjustable and detachable straps for garments'. Twain's enthusiasm for science and invention are obvious in works such as *A Connecticut Yankee in the Court of King Arthur* and other works, which revolve around the influence of technology and science on a society and in the triumph of the individual through invention. It's easy therefore to see how the author's interest may have been piqued by the fantastic Serbian inventor.

Tesla by contrast first became aware of Twain through his books while convalescing from a serious illness. He credited the works of Twain as being responsible for his recovery as he was to write himself later in life:

" *One day I was handed a few volumes of new literature unlike anything I had ever read before and so captivating as to make me utterly forget my hopeless state. They were the earlier works of Mark Twain and to them might have been due the miraculous recovery which followed. Twenty-five years later, when I met Mr. Clemens and we formed a friendship between us, I told him of the experience and was amazed to see that great man of laughter burst into tears.*"

- Nicola Tesla - Electrical experimenter magazine, 1919.

By all accounts the two friends were close confidants to the extent that the loss of the great author to a heart attack impacted on Tesla severely.



Mark Twain and Joseph Jefferson in Tesla's South Fifth Avenue Laboratory, 1894, Tesla's image is blurred between them.

References

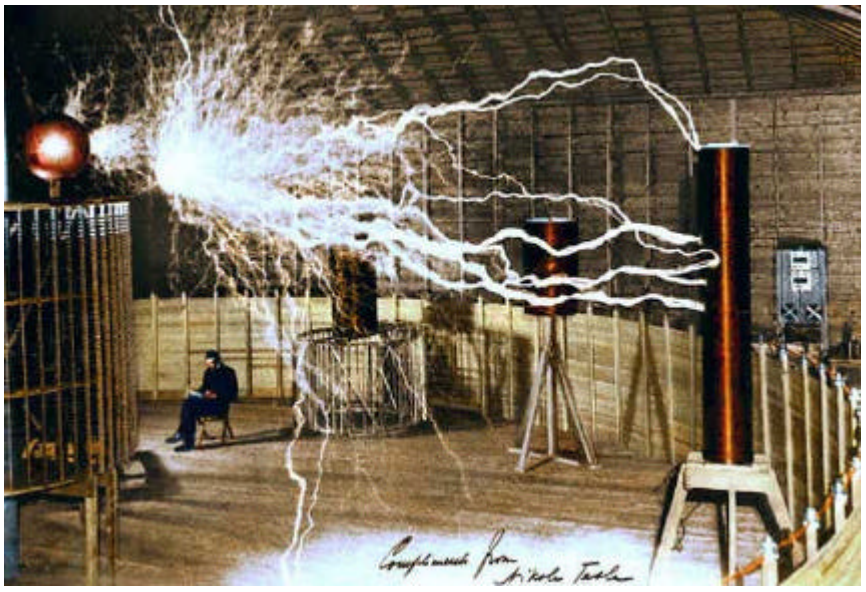
Wikipedia.com, *http://en.wikipedia.org/wiki/Mark_Twain*

Nicola Tesla - Electrical Experimenter Magazine, 1919

Krumme, Katherine. Mark Twain and Nikola Tesla:Thunder and Lightning Berkley 2008

Tesla and X-Rays

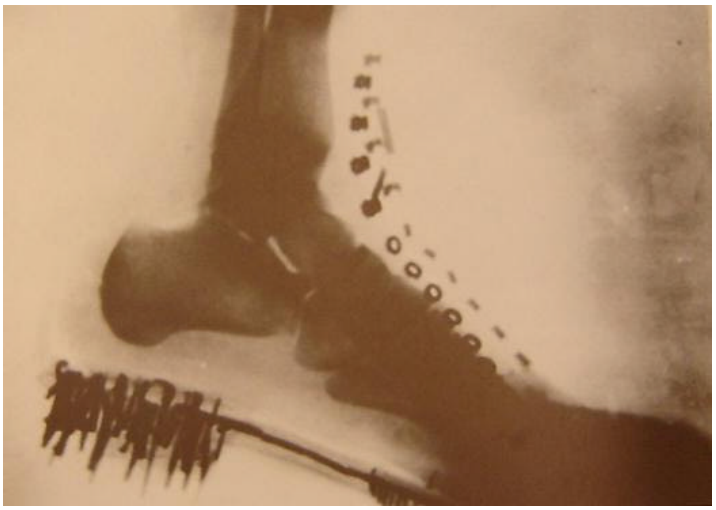
The purpose of this article is to understand and explore Nikola Tesla's involvement with the invention of X-rays and how the work that he carried out with X-rays experiments resulted in alerting people about how dangerous X-rays are and how yet at the same time it has saved many lives. Nikola Tesla was born on 10 July 1856 in Smiljan, Austrian Empire and is considered by some to be the greatest electrical pioneer of all time. He was an inventor in the fields of mechanical and electrical engineering and is even credited with the invention of the radio. He has often been credited as the most important scientist and inventor of the modern age and is best known for many revolutionary contributions in the field of electricity and magnetism. His theoretical work has formed the basis of modern alternating current electric power (AC) systems, including the AC motor.



Nikola Tesla inside his laboratory in Colorado Springs

Today we understand X-rays to be a type of picture or image that is taken by an X-ray machine primarily for the purposes of diagnostic radiography and crystallography. X-Radiation, which is composed of X-rays, is actually a form of electromagnetic radiation and is a form of ionizing radiation and as such can be dangerous. It is a result of some of the experiments carried out by Tesla that resulted in him alerting the scientific community to the biological hazards associated with X-ray exposure.

"*X-rays are longer than gamma rays but shorter than UV rays. They have a wavelength in the range of 10 to 0.01 nanometers, corresponding to frequencies in the range 30 petahertz to 30 exahertz (30 × 1015 Hz to 30 × 1018 Hz) and energies in the range 120 eV to 120 keV.*"



Pre-Roentgen x-ray image of human foot, Nikola Tesla (1895)

Nikola Tesla is considered to be among some of the earliest researchers when it comes to the invention of X-rays. Tesla first began to investigate X-rays in 1887 using high voltages and tubes that were of his own design. These tubes were different to other tubes in that they did not have a target electrode and were a single-electrode X-ray tube. Nowadays we call the principle behind Tesla's device as the Bremsstrahlung process. This is when charged particles, such as electrons pass through matter resulting in the production a high-energy secondary X-ray emission. By 1892 Tesla had performed several such experiments, but he did not categorize the emissions, instead generalising the phenomenon as radiant energy. In typical Tesla fashion he did not publicly declare his findings nor did he make them widely known.

X-rays are just one of the making areas of research that Tesla has been credited with working on. As you look at the picture of the human foot, taken over 100 years ago, you release how the basic principle and image, of what we understand X-rays today, has not significantly changed in that time period.

References

Wikipedia - *http://en.wikipedia.org/wiki/X-rays*

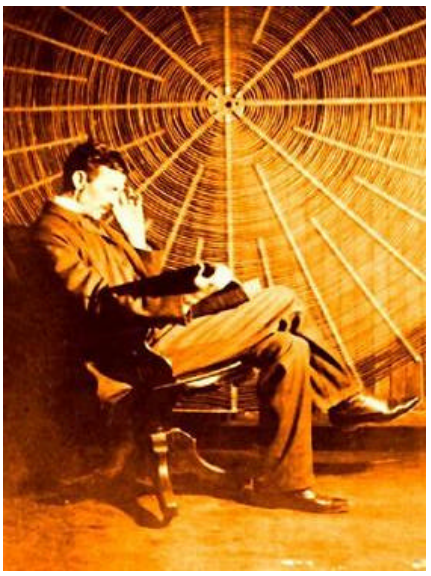
Wikipedia - *http://en.wikipedia.org/wiki/Nikola_Tesla*

The Tesla Foundation of North America - *http://www.tesla.org/*

The Tesla Memorial Society of New York - *http://www.teslasociety.com/biography.htm*

Tesla’s Death Ray: Science Fiction or Science Fact?

Considered by many as one of the most important minds in history, Nikola Tesla's contributions to science and innovation have formed the foundations of modern science. He has been credited with over 250 inventions encompassing a wide range of fields **[1]**. Despite all his accomplishments, he was equally renowned for his radical claims. His speculations concerning communication with other planets and his assertions that he could split the earth like an apple were greeted with jeers from members of the scientific community **[2]**. Another claim, which caused much controversy, was his development of a death ray. The following article looks at the mystery surrounding Tesla’s death ray from its humble beginnings to its possible whereabouts today.



Legend surrounds the origins of Tesla’s death ray. Some have traced back his work to experiments performed in 1893 during the development of X-Rays, from which Tesla experimented “shooting” X-rays distances of, as much as 40 feet, from the source of the gun in order to create photographs of skeletons **[3]**. Other sources claim the first experiments were conducted in 1908 where he test-fired a death ray towards the artic circle. The experiment coincided with 500,000 acres of Siberian forest were flattened **[4]**. Believing this to have been caused by his machine, Tesla dismantled it immediately.

Details of the death ray were first published in an interview in the New York Times on July 23, 1934 **[5]**. In the article, he claimed he had created a machine that had the capability to destroy 10,000 airplanes at a distance of 250 miles. The proposed death ray was based on a machine that fired a stream of bullet-like atomic clusters (liquid mercury or tungsten). The high voltage required to propel the clusters using a huge Tesla Coil **[6]**.

His method required 4 innovations, “a device to nullify the impeding effect of the atmosphere on the particles, a method for setting up high potential, a process for amplifying that potential to 50,000.000 volts and the creation of a tremendous electrical repelling force” **[7]**. The death ray was to be used in conjunction with others to secure a countries border thus providing an impenetrable defense **[5]**. Tesla attempted to sell his idea to the American government as well as several European countries with little success. On his death in 1943, the US government took possession of all his personal effects. However all documents pertaining to the death ray had mysteriously vanished **[7]**. Conspiracy theories about the whereabouts of these documents quickly spread. Claims that the documents had been stolen by the Russians were further compounded in an article by Tom Bearden in 1980 where he stated that a Soviet particle beam weapon was almost a carbon copy of the picture in Tesla's 1937 patent application **[8]**.

Despite his significant contributions to modern science, accounts of his research dismissed by the scientific community have added much more to his mystique. The truth behind the death ray and the mystery behind the whereabouts of its lost documents may never be known. However Nikola Tesla will be remembered as more than just your average scientist.

References

[1] http://portal.unesco.org/ci/en/files/7284/10567229910Serbia_Tesla.doc/Serbia%2BTesla.doc

[2] Encyclopaedia Britannica, www.neuronet.pitt.edu/~bogdan/tesla/bio.htm

[3] Steinberg For Congress, www.bibliotecapleyades.net/tesla/esp_tesla_2.htm

[4] Nikola Tesla Website, www.steinbergforcongress.com/2008/07/tunguska-explosion-youve-probably-never.html

[5] Tesla Memorial Society, www.teslasociety.com/deathray.jpg

[6] Wikipedia, Death Ray, en.wikipedia.org/wiki/Death_ray

[7] Tesla Memorial Society, Lost Tesla Papers about the "Death Rays", www.teslasociety.com/deathray.htm

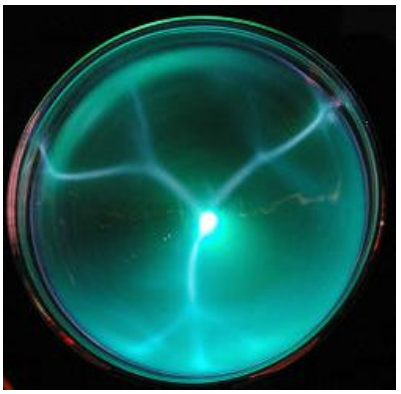
[8] Tom Bearden,"Soviets Build Directed-Energy Weapon," Aviation Week & Space Technology, July 28, 1980, pp. 57-50

Tesla Effect

Nikola was born the son of an Orthodox Priest, Tesla claimed to sleep just 2 to 3 hours a day. Whereas Sir Isaac Newton needed 3-4 hours of sleep daily. When Tesla arrived in New York from Serbia, he had 4 cents to his name. Tesla brought a letter of recommendation to Thomas Edison that read: "My Dear Edison: I know two great men and you are one of them. The other is this young man!"

Tesla achieved the "impossible" by demonstrating a working brushless polyphase AC induction motor to a group of wealthy investors – none of whom would invest a penny. In 1886, Tesla persuaded investors to fund the Tesla Electric Light & Manufacturing Company. Tesla invented a revolutionary arc lamp and the company made money. The investors then promptly reaped the profits and fired Tesla, who was forced into manual labor to survive.

As a boy, Tesla saw a likeness of Niagra Falls, and dreamed of harnessing the power of the water to create electricity. In 1893, he succeeded in doing just that. Investors included W. K. Vanderbilt, son of Cornelius Vanderbilt. Tesla worked for many years attempting his wireless transmission of electricity and believed that electricity could be projected into the upper atmosphere for storage and access at will.



Wireless energy transfer, by definition, does not require direct electrical conductive contacts. A precursor of this technology can be found in the works of Heinrich Rudolf Hertz in the late nineteenth century. In 1888, Hertz experimented with pulsed power transmission at 500 megacycles per second. The development of wireless energy transfer began in earnest with the lectures and patents of the electrical engineer Nikola Tesla (and is described in his 1916 deposition on the history of wireless and radio technology). In experiments around 1899, Tesla was able to light lamps filled with gas (similar to neon) over 25 miles away without using wires using high frequency current (Prodigal Genius, O'Neill; pg 193). A more recent method ultilized is microwave power transmission (MPT). It is the practice of using microwaves to transmit power through outer space or the atmosphere without the need for wires. The first microwave demonstration occurred in 1963 (with 13 percent efficiency). In 1964, William C. Brown (a pioneer in the use of microwaves) demonstrated a helicopter equipped with a device called a rectenna. The rectenna converted microwave power into electricity, allowing the helicopter to fly. By 1975, a 54 percent efficiency was attained by researchers. Other recent proposals include "highly efficient fiber lasers for wireless power transmission". [1]

In various writings, Tesla explained that the Earth itself would behave as a resonant LC circuit that could be electrically excited at predescribed frequencies. However, Earth resonance would be of a very low frequency (about 7 Hz) which would utilize Schumann resonance. Alternatively, a surface or ground wave, similar to the Zenneck wave could have been utilized. Others believe that earth currents were to be utilized. According to Tesla, the planet's large cross-sectional area provides a low resistance path for the flow of earth currents.

Tesla visualized a power-and-broadcasting station which would employ thousands of persons. He undertook the establishment, eventually, of a Radio City, something far more ambitious than the enterprise in Rockefeller Center in New York which bears this name today. Tesla planned to have all wavelength channels broadcast from a single station, a project which would have given him a complete monopoly of the radio-broadcasting business. What an opportunity near-sighted businessmen of his day overlooked in not getting in on his project! But in that day Tesla was about the only one who visualized modern broadcasting. Everyone else visualized wireless as being useful only for sending telegraphic communications between ship and shore and across the ocean. Thus, more than sixty years ago, Tesla planned to inaugurate every feature of modern radio, and several facilities which have not yet been developed. He was to continue, for another twenty years, to be the only "wireless" inventor who had yet visualized a broadcasting service.

The building of a global wireless energy distribution system called the Wardenclyffe Tower was started almost a century ago by Tesla but was abandoned because of lack of funds. The Wardenclyffe facility was meant to be the start of a national (and later global) system of towers broadcasting power to users as electromagnetic waves. There is some evidence that Wardenclyffe might have used extremely low frequency signals combined with a higher frequency signals. In practice, the transmitter electrically influences both the earth and the space above it. He made a point of describing the process as being essentially the same as passing electricity through a wire by conduction. Powered by an industrial alternator, the tower was apparently intended to inject large amounts of energy into a natural Earth circuit, using the Earth-Ionosphere network as the transmission circuit. Tesla called his wireless technique the "disturbed charge of ground and air method."

Laboratory and tower in Wardencliff.

Tesla's mind was too fully occupied with fascinating scientific problems. He had, at times, nearly a score of highly skilled people constantly employed in his laboratory developing the electrical inventions he was continuing to make at a rapid rate. Armed guards were always stationed around the laboratory to prevent spying on his inventions. His payroll was heavy, his bank balance became dangerously low, but he was so immersed in his experimental work that he continuously put off the task of making an effort to repair his finances. He soon found himself facing judgments obtained by creditors on accounts upon which he could not make payments. Tesla spent his remaining funds on his other inventions and culminated his efforts in a major breakthrough in 1899 at Colorado Springs by transmitting 100 million volts of high-frequency electric power wirelessly over a distance of 26 miles at which he lit up a bank of 200 light bulbs and ran one electric motor! With this souped up version of his Tesla coil, Tesla claimed that only 5% of the transmitted energy was lost in the process. But broke of funds again, he looked for investors to back his project of broadcasting electric power in almost unlimited amounts to any point on the globe. The method he would use to produce this wireless power was to employ the earth's own resonance with its specific vibrational frequency to conduct AC electricity via a large electric oscillator. When J.P. Morgan agreed to underwrite Tesla's project, a strange structure was almost completed near Wardenclyffe in Long Island, N.Y. (see Figure 1.) Looking like a huge lattice-like, wooden oil derrick with a mushroom cap, it had a total height of 200 feet. Then suddenly, Morgan withdrew his support to the project in 1906, and eventually the structure was dynamited and brought down in 1917.

References

1. http://www.davidadams.org/monolog/Prodigal_GeniusIIId.htm

2. Margaret Cheney, "*Tesla: Man Out of Time*". Simon and Schuster, Oct 2, 2001. ISBN 0743215362

3. Leland Anderson, ed., "*Nikola Tesla On His Work With Alternating Currents And Their Application to Wireless Telegraphy, Telephony, and Transmission of Power*". Twenty First Century Books, 1992. ISBN 1893817016.

4. http://www.teslaradio.com/pages/tesla.htm

5. http://www.teslaradio.com/pages/wireless_transmission_theory.htm

The War of the Currents

In the 'War of the Currents' there was a monumental struggle between two great inventors Thomas Edison and Nikola Tesla. Edison was known as the 'Wizard of Menlo Park' named after where his laboratory was sited in New Jersey, while Tesla was known as the 'Wizard of the West' named after his laboratory in the Colorado in the west of America. So in essence it was also the 'War of the Wizards' [2]. What was at stake was the technology to deliver the ground breaking distribution of electricity and all of the revenues and power derived from controlling this. On the one side was Edison who promoted direct current (DC) for electricity where the electric current is a unidirectional flow. Edison DC distribution was the first to market, but involved power generation close to the consumers, and a large amount of copper wiring, and hence was quite costly. Whereas Tesla (backed financially by George Westinghouse) espoused alternating current (AC) for electricity distribution where the electric current is alternating in that it changes on a cyclical basis. The AC approach had the benefit of having electricity transformers where power could be generated at large power plants and transferred to consumers using the lighter less costly wires.

The scale of the differences in these technologies was tragically laid bare by the 'Great Blizzard of 1888. In the Great Blizzard where blizzards lashed the East coast of America bringing down snowfall of 100-130 cm, winds of 75km an hour, and snowdrifts of up to 15 meters. In New York there was a mass of heavy overhead wires for DC electricity distribution that cluttered up the overhead of the walkways. With a heavy burden of snow and ice these wires crashed to the ground electrocuting many innocent passers by, obstructing the streets and leading to the distribution networks being closed. The clean up of this high voltage DC network was just as dangerous with several workers perishing with 'flames lashing from his mouth and nostrils' [1]. The public and business of New York naturally moved against these masses of high voltage overhead wires. The AC distribution network was to come to the fore as the safer alternative with less need for high voltage and heavy overhead wires.

How would Edison respond to this? As being cornered by the overwhelming technological inadequacy of DC, he turned to the only alternative left to him. That was to spread rumours, lies, false truths and cruelty in a bid to save the cash cow that was the rights to electricity distribution. The central plank of Edison's attempt to fight the inevitable was the lie that AC had a massive danger of electrocution. Edison would tour the country and state legislatures spreading rumours, hearsay electrocuting to death previously live animals. This included the famous electrocution on film [3] and in front of an audience of thousands of the dangerous condemned Topsy the elephant

with a 6,600 volt AC source. This was then tragically topped by the first use of the electric chair (using an AC source) on the condemned prisoner William Kemmler [4] producing 'an awful spectacle, far worse than hanging'. Edison had run a devastating pre modern PR campaign against AC, yet despite this AC remained a contender.

The decisive turning event came with the World's Columbian Exposition / Chicago World's Fair of 1893. Initially General Electric backed by Edison had been asked to provide electricity for the fair, but they quoted the price of doing so at the exorbitant price of 1 million dollars. Instead Tesla and Westinghouse offered to do it for half the price, and their offer was accepted. This was the chance that they needed to clearly prove the major technology (both in cost and safety) of the AC distribution method. Despite the obstacles put in their place by General Electric by preventing them using the Edison lamp. Tesla and Westinghouse with the use of polyphase generators, transformers, newly designed lightbulbs and the first neon lights. The lighting of the exposition was a tremendous success with thousands of arc lamps and incandescent lamps and where 'the grounds were lighted by the tower system of out-door lighting' [5]. The war had been won.

The 'War of the Currents' was more than just a war; it was a fight for the way technology would influence the lives of future generations. Imagine a world with DC power, there would be noisy smoky power generations stations within a mile of where you live, thick heavy wires throughout your locality & your house, and your laptop would be powered by a six inch thick copper wire [6]. Would we even have laptops?

References

1 - Building the invisible city - http://www.vny.cuny.edu/blizzard/building/building.html

2 - War of the currents (from Wikipedia) - http://en.wikipedia.org/wiki/War_of_the_currents

3 - Electrocuting an elephant - http://www.imdb.com/title/tt0231523/

4 - Electric Chair - http://inventors.about.com/od/hstartinventions/a/Electric_Chair.htm

5 - Electricity at the Columbian Exposition (1894) by John Patrick Barrett

6 - Life with DC power http://www.nuc.berkeley.edu/dept/Courses/E-24/E-24Projects/MariaChang/The_War_of_Currents/thoughts.htm

The Great Radio Controversy

In 1890 Nikola Tesla created a "buzz" in the scientific community with what would turn out to be the single most important development in the history of wireless communication, The Tesla Coil. Tesla had made his focus the wireless transmission of power. At the same time a fellow inventor, Guglielmo Marconi, sought to use wireless transmission of energy for communication purposes, using many of Tesla's own patents.Thus began a ferocious rivalry and legal battle which, ultimately won by Tesla, has to this day failed to transcend the bigotry of history and has allowed people worldwide revere the wrong inventor as the father of radio.

(Left) Tesla demonstrates "wireless" power transmission in his new Houston Street laboratory, in 1899. (Centre) Album cover art of 'The Great Radio Controversy' released by Rock Band, TESLA. (Right) Marconi with his early system of wireless telegraphy, circa 1896.

In 1891, after his development of the Tesla coil, Nikola Tesla turned his attention to generating alternating currents by condensed discharging through a (Tesla) coil coupled to another (Tesla) coil – later known as the Tesla transformer. Using his transformer, Tesla discovered he could transmit and receive powerful radio signals when the coils were tuned to resonate at a similar frequency (Marincic et al. 2006) (Wikipedia n.d.).

During 1891 and 1893 Tesla presented possible uses of these high frequency currents: for illumination, in medicine and for wireless energy transmission. By early 1895, Tesla was ready to use this newly discovered technology to transmit a wireless signal, but in that same year a building fire destroyed his lab and his work. The timing could not have been worse. Using Tesla's research and published works of the time, a young inventor named Guglielmo Marconi, experimented with wireless transmission in 1896. Marconi was successful in transmitting a communication signal across the Atlantic Ocean between Cornwall, England and Newfoundland (December 12, 1901), incorporating 17 of Tesla's basic US patents on wireless energy transmission. This was a feat Tesla had already accomplished, albeit on a smaller scale than a transatlantic transmission (Elbogen 2006).

(Left) Tesla Radio logo from the 1950's, (Middle) one of many emblems of American rock band, TESLA, (Right) stained glass with logo of the Czechoslovak company Tesla Radio.

Before Marconi, Tesla had secured his discoveries with the US Patent Office. In 1897 Tesla submitted two patents on the apparatus and system of electrical energy transmission, issued in 1900 (Elbogen 2006). Marconi's first patent application in America, filed on November 10, 1900, was turned down. Marconi's revised applications over the next three years were repeatedly rejected because of the priority of Tesla and other inventors. But in 1904, the U.S. Patent Office reversed its previous decisions and granted Marconi a patent for the invention of radio. It is believed that powerful financial backing for Marconi in the United States was the cause. Both Thomas Edison and Andrew Carnegie invested in Marconi and Edison became a consulting engineer of the American Marconi company (PBS 2000). Tesla brought a case to the courts, but he lacked the funds to fight it, whereas Marconi was now awash with money. The case was finally resolved in Tesla's favour by the US Supreme Court on June 21, 1943 (six years after Marconi's death and six months after Tesla's death) when they upheld Tesla's original radio patent number 645,576 (Tesla 1900).

Nikola Tesla has become renowned as one of the most intriguing geniuses of the technological age. His works have been some of the most groundbreaking and influential discoveries of the modern era. However, throughout his career Tesla's discoveries have been plagiarised and falsely claimed by his contemporaries, e.g. Thomas Edison & Guglielmo Marconi. The diversity of Tesla's influence has not been restricted to his contemporaries of the 19th & 20th centuries alone. An American rock band, TESLA, have derived their name, certain album and song titles, and some song content from events relating to Nikola Tesla and his life. Today Marconi is still hailed as the father of radio while Tesla's name is waiting the full recognition of his role as the true inventor of radio.

References

Aleksandar Marincic *et al*. (2006) Nikola Tesla's Contributions to Radio. *Serbian Journal Of Electrical Engineering*. 3 (2), p131–148.

Eli Elbogen. (2006) *Nikola Tesla: The Genius Who Lit The World.* Available: http://www.nuc.berkeley.edu/dept/Courses/E-24/EE-Radio.ppt. Last accessed 16 Nov 2008.

Nikola Tesla (1900) System of Transmission of Electrical Energy. New York: United States Patent Office.

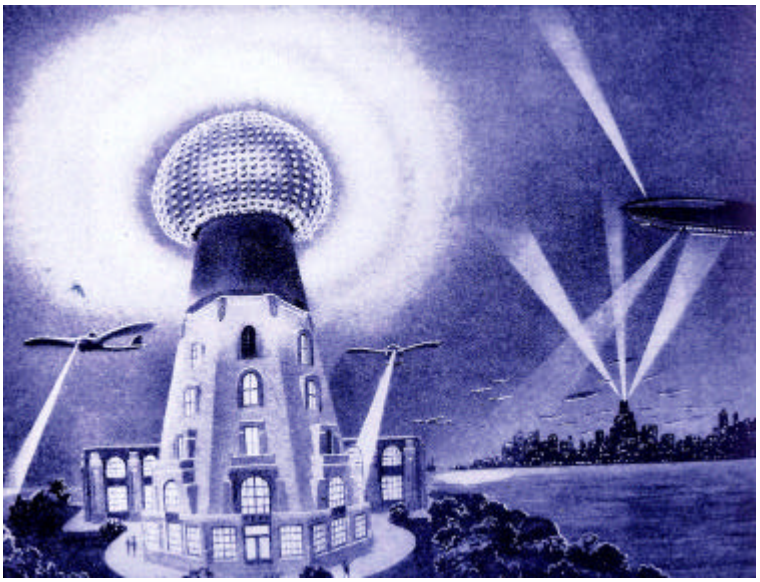
PBS. (2000). *TESLA Master of Lightning.* Available: http://www.pbs.org/tesla/ll/ll_whoradio.html. Last accessed 16 Nov 2008.

Wikipedia. (-) *Nikola Tesla.* Available: http://en.wikipedia.org/wiki/Nikola_Tesla. Last accessed 16 Nov 2008.

Wardenclyffe: Tesla's Tower

Above all of Tesla's great scientific achievements the Wardenclyffe tower is that which sums up his enigmatic genius and impractical idealism. The tower is what some see as a turning point in his career, Wardenclyffe swallowed up his funds as well as those of his investors and came to be described as "Teslas's million dollar folly". The tower itself never actually functioned and was eventually torn down during world war II for fear that it could be used to spy on the USA.

The building of the Wardenclyffe tower began in 1901, Tesla had attracted investment from JP Morgan the famous financier. He promised Morgan a national then global telecommunications platform, he in fact planned to implement his vision for transporting electricity via radio waves as a cheap alternative to wires. However what this meant was that anyone could use it for free. This concept did not go down well with Morgan who was a practical businessman and Tesla subsequently lost financial backing for the project.



Things got worse for Tesla in 1905 when some of his patents expired and the patent for Radio was awarded incorrectly to Marconi after interference from Thomas Edison and J.P. Morgan, who stood to gain from Marconis implementation of Radio (Berardinis, L. 2006. *Waverunner* http://motionsystemdesign.com/mag/waverunner_part_2/). This patent loss is sited as one the reasons why Tesla's research into wireless power was put to an end (ibid). Despite the loss of his income Tesla was to bounce back in 1910 when he patented the Tesla turbine and the Tesla coil. These late successes were however not enough to save Tesla's vision of wireless electricity. *"It is not a dream, It is a simple feat of electrical engineering, only expensive — blind, faint-hearted, and doubting world"* Tesla's response to such opposition was pure exasperation (ibid). What is evident from this quote is his real belief that wireless power was a possibility when all others doubted him. In 1916 (the year he declared bankruptcy) Tesla accepted the Edison Medal, however his credibility was so damaged that his audience doubted his sanity when he announced that he had realised his goal of transmitting energy wirelessly (PBS *2004 "Tesla: Master of Lightning"* Documentary 1.11.08 see link below). Modern thinking seems to conclude that the amount of energy required to work lightbulbs is too great over long distances to work and that wireless energy is too inefficient because it radiates in all directions (ibid).

The methodology behind transmitting energy wireless seems to have involved a souped up version of the Tesla coil. Some sources are suggesting that there was indeed some success in 1899 at Colorado springs where Tesla transmitted *"100 million volts of high-frequency electric power wirelessly over a distance of 26 miles at which he lit up a bank of 200 light bulbs and ran one electric motor" (Melvin D. Saunders http://www.mind-course.com/wireless.html)*. Whether this is true or not there is currently much research being done into short range use of wireless power technology. In the home for example scientists are looking at new ways to power appliances*: "A Powercast transmitter can send juice up to 10 feet over RF signals. A receiver that's either built in or attached with an adapter converts the waves into electricity to charge small devices like phones or cameras." (Fiore, K. 13.9.08, http://electronicdesign.com/Articles/Index.cfm?AD=1&ArticleID=16478)*. Advances in MITs WiTricity have also advanced, it's core technology resonant-coupling could allow the transfer of wireless power over greater distances (ibid).

Tesla died penniless in 1943 at the age of 86. His legacy is best described in his own words:*"The scientific man does not aim at an immediate result, he does not expect that his advanced ideas will be readily taken on, his work is, like that of the planter for the future, his duty is to lay the foundation for those who are to come, and point the way."* Some believe he was at least a century ahead of his time (Valone, T. Book, *Harnessing the Wheelwork of Nature – Tesla's Science of Energy*) and it seems that the potential of many of his ideas have only been realised after his death. What we are left with is an inspiring story of one man, a foreigner, who took on the established minds of his day in the most powerful country in the world and left his own unique scientific legacy.

References

1. Warner Brothers Documentary on Tesla "Master of Lightning"
2. http://www.magnetricity.com/Tesla/Tesla_Biography.php
3. http://en.wikipedia.org/wiki/Wireless_energy_transfer
4. http://www.mind-course.com/wireless.html
5. http://electronicdesign.com/Articles/Index.cfm?AD=1&ArticleID=16478
6. http://en.wikipedia.org/wiki/Nikola_Tesla
7. Thomas Valone, Harnessing the Wheelwork of Nature – Tesla's Science of Energy:

Tesla's Colorado Springs

Nikola Tesla was a genius and as a great mind he knew what he wanted to achieve by his experiments. His whole life was dedicated to science and he established himself as a great inventor. A remarkable number of items has been published about Tesla and not only articles but TV specials, plays, recitals, poetry and even popular songs about the man. An annotated bibliography has been first written twenty – two years ago and it contained 3000 references[1] and this number probably grown since then. This paper is concentrated around one Tesla's life episode based in Colorado Springs in United States and tries to prove that He did not move there only for nice views and fresh air.

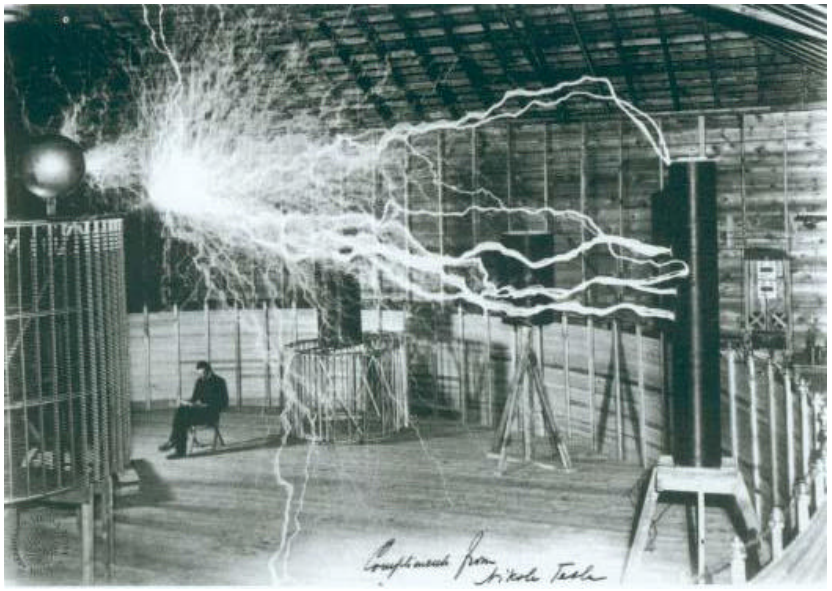
Arriving at Colorado Springs in May 1899 Tesla told reporters that he intended to send a radio signal from Pikes Peak to Paris, but did not give any further details. He stayed there for 9 months conducting experiments and keeping a day-to-day diary that was rich in detail. One question has never been definitively answered: Did Tesla actually transmit wireless power at Pikes Peak? It aims to describe the effort Nikola Tesla put into experimenting on high frequency and is trying to find out whether the mission was accomplished and also haw Tesla changed the perception of Thunders Storms.

Before the end of 1899 Tesla came to the conclusion that it might be possible to transmit electrical power with no wires if only it could be done at high altitudes. The air there is thinner and therefore more conductive. His patent lawyer and dear friend - Leonard E. Curtis found out about Tesla's newest researches and offered to find a land and provide a power from El Paso Power Company of

[1] According to authors of "Who was the real Dr Nikola Tesla?" there has been created something what they refer to as "web rings" dedicated to Tesla. In my limited research I could not confirm that.

Colorado Springs. Colonel John Jacob Astor found himself as another supporter of Tesla's work with $30,000 grant. This help was enough for the inventor and his several assistants to move to Colorado and straight away start building a new experimental station near Pikes Peak. Some sources[2] say that even the closest Tesla's co - workers weren't aware of what the new idea is about.

Soon after arrival huge, wired and weird laboratory rose from the prairie floor. Inside the strange wooden structure, technicians began to assemble an enormous Tesla coil, specially designed to send powerful electrical impulses into the earth. On the way to his main aim in Colorado Tesla made some new inventions. He 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). In his experiments, he made mathematical calculations and computations based on his experiments and discovered that the resonant frequency of the Earth was approximately 8 Hertz (Hz). In the 1950s, researchers confirmed that the resonant frequency of the Earth's ionosphere cavity was in this range (later named the Schumann resonance). Tesla hypothesized that he could transmit unlimited amounts of power to any place on earth with virtually no loss. But to test this theory, he would have to become the first man to create electrical effects on the scale of lightning.



Nikola Tesla and his "magnifying transmitter" in laboratory in Colorado Spring. The coil capable of producing electricity electricity of millions of volts and a frequency of 100,000 alternations per second. The discharge shown is twenty – two feet in length.

And that it was on the evening of the experiments every piece of the equipment was checked. The mechanic was ordered to open the switch only for one second. It worked, second time he meant to open the switch until said to close – unfortunately that was too much for the coil and dynamo at the El Paso Electric Company. Whole Colorado Springs lost electricity and Tesla had to pay for the damage.

---

[2] See website http://www.pbs.org of PBS Foundation

There are some reports that he did transmit a signal several miles powerful enough to illuminate vacuum tubes planted in the ground. But this can be attributed to conductive properties in the ground at Colorado Springs.

Tesla decided to take another approach for wireless power transmission. The goal was to transmit electrical power to the area 80 – kilometres above the ground (ionosphere).

A third approach for wireless power transmission was to transmit electrical power to the area 80-kilometers above the earth known as the ionosphere speculated that his region of the atmosphere would be highly conductive and again his suspicions were correct. What he needed was the technical means to send electrical power to such a high altitude.

In the beginning of July 1899 he observed the thunderstorm and atmospheric electric discharges over his experimental station. According to his words: "The thunder was heard in the evening of July 03 and during the night of 3rd to 4th of July. Rainy showers, mostly strong, stormy wind and atmospheric electrical discharges follow thunderstorms." Tesla noted that the number of electric discharges changes in time and with the distance from the thunderstorm core activity. This enabled to improve the weather radars and synoptic stat ions all over the world.

Tesla left Colorado Springs on 7 January 1900. The lab was torn down and its contents sold to pay the debts. The findings from this period are not that amazing as Tesla first assumed, but still that would be enough to put Tesla among greatest inventors and definitely gave a lot to the world of physics. What is more, those experiments prepared him for his next project, the establishment of a wireless power transmission facility that would be known as Wardenclyffe. Eventually he has accomplished what he first planned in Colorado, but in some other place.

What also is left over by Tesla in Colorado is great deal of mystery surrounding his work. There are many unclear notes from his day – to – day diary and til now there are many researches around this episode of Tesla's life.

"Were we to seize and to eliminate from our industrial world the results of Mr. Tesla's work, the wheels of industry would cease to turn, our electric cars and trains would stop, our towns would be dark, our mills would be dead and idle."

- Bernard A. Behrend

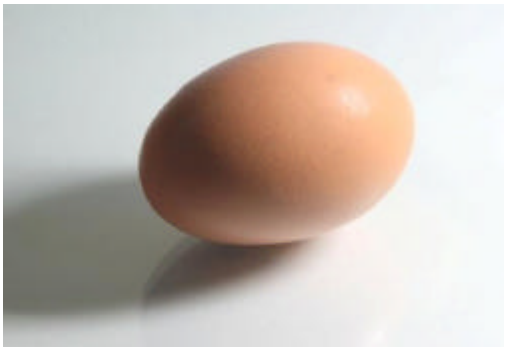
References

1. Wysock W.C., Corum J.F., Hardesty J.M. & Corum K.L., 2001. Who Was The Real Dr. Nikola Tesla? (A Look At His Professional Credentials) In *Antenna Measurement Techniques Association Poster Paper*
2. Wait, J.G., 1980. Nikola Tesla Colorado Springs notes 1899-1900. In Proceedings of the IEEE, Vol. 68, Issue 1, Page(s): 186 – 189
3. Tesla Memorial Society of New York, 2007, http://www.teslasociety.com/
4. Plazinic S., 2006. *Tesla and Thunderstorms in Colorado on July 3, 1899*. In Sixth International Symposium Nikola Tesla, Belgrade, Serbia.
5. *Magnifying transmitter*, http://en.wikipedia.org/wiki/Nikola_Tesla#Colorado_Springs
6. *Colorado Springs*, http://www.pbs.org/tesla/ll/ll_colspr.html

“The Egg of Columbus”

Nikola Tesla was born in July 1856 in the Austrian Empire. He studied electronic engineering at the Austrian Polytechnic in Graz, however he failed to complete his degree course. Instead he read many works with some going so far as to say he had a photographic memory. During his early life he was quite often ill and suffered at least one nervous breakdown. One affliction which he suffered regularly was particularly peculiar. Flashes of light would appear before his eyes accompanied by “visions”. These visions were linked to an idea he would have come across and would be extremely detailed [1].

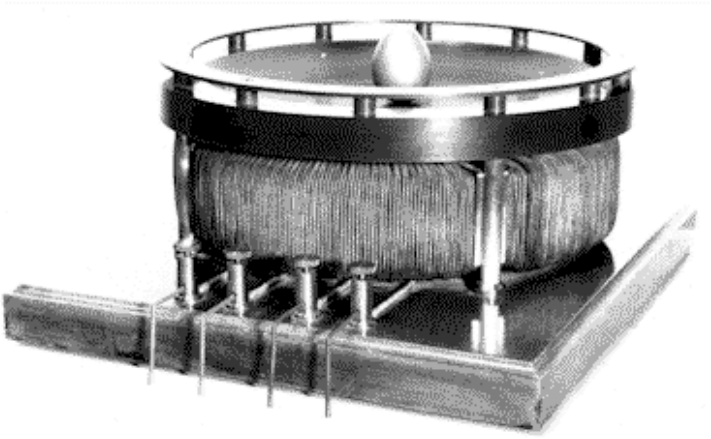
After working in Hungary & Paris he moved to New York in1884 where he took up employment with Thomas Edison at “Edison Machine Works”. After working endlessly to redesign Edison’s motor & generators, for which Edison promised him $50,000, he resigned from the company when Edison reneged on the deal. In 1886 he formed his own company “Tesla Electric Light & Manufacturing”. From here he worked on many projects including The Tesla Coil, the Logic AND gate, RADAR, Vertical Take Off and Landing, the death ray and the Egg of Columbus, as well as AC current (possibly his most significant invention). He is known as “the patron saint of modern electricity”.



It was during a spell when Tesla was experiencing some hard times that he considered “The Egg of Columbus” project. The idea for this project came about when he considered the idea of rotating magnetic fields. He decided to base his project on an old fable related to Christopher Columbus. Columbus, having been told that discovering the Americas was no great accomplishment, challenged his critics to make an egg stand on its tip; and, after they gave up, he did it himself by tapping the egg on the table so as to flatten its tip [2]. Tesla approached a group of investors with his proposal. He asked them to fund him if he could not only make an egg stand but also spin. The investors agreed to the proposal. When Tesla next met the investors he had successfully produced his “Egg of Columbus”. His funding was secured [3].

Tesla had identified the idea of a rotating magnetic field & induction motor. This occurs when a magnetic field changes direction at a constant angular rate. When a number of these magnetic fields are combined a rotor with a constant magnetic field is formed.

In 1893 at the World’s fair, dedicated to Christopher Columbus, Tesla displayed his experiment. He used 4 coils powered by a two phase A/C current source to create the rotating magnetic field. In the centre of this he placed a copper egg, standing on its vertical axis. Once powered up the egg was found to spin on this axis at high speed. It was seen as a symbol of the beginning of a new direction in science, technique and technological development of mankind. [4]



There are few working examples of Tesla's Egg of Columbus to be found around the world. This is due to the cost involved in reproducing the experiment. In order to re-create it one would need an excessive amount of material, huge installed power not to mention the delicate nature of the iron core construction. One full working example can be found in the Nikola Tesla museum in Belgrade [4].

To view working examples please have a look at the following link:

http://www.youtube.com/watch?v=0vKU5ccqJxg

References

[1] http://en.wikipedia.org/wiki/Nikola_Tesla

[2] http://www.nationmaster.com/encyclopedia/Egg-of-Columbus

[3] http://curiousexpeditions.org/?p=30

[4] http://www.tesla-egg.com/jaje_files/datasheet_en.pdf

Nikola Tesla: Magician or modern mystic?

Tesla was a man who has inspired nearly every modern image of the mad magician scientist in his lab, detached from the mundane details of his surroundings and living in some distant place behind his eyes, following inner lightening bolts armed with the wings of imagination. But was he inspired by more than just his own imagination or was he also influenced in his thinking by older advanced religious systems?

We owe many of the wonders of our modern industrial and technological society not only to Thomas Edison but also to Nikola Tesla, including the efficiency of our war machines. Like any technology that in its inception may have been designed for good it can be put to any purpose deemed fit by the one who wields it. The splitting of the atom and the energy it generated can be used to power the world in a clean and efficient manner, available free to millions. The very same power can be used to annihilate the world in orders of magnitude that multiply with each passing decade as a perverse inversion of Moore's' law.

Was a true genius or indeed a modern mystic? The signs of his undoubted uniqueness were with him as a boy but he was destined to become a man strangely in shadow, somehow more alive in another world of the mind. This world of ideas that seemed to miraculously appear before him, fully formed and cohesive as if his subtle mind had a power never before seen, or at least rarely manifest. It often seems that those who are blessed with great vision and insight are also often equally cursed. Tesla was a man apart, his fame, his influence were all in many way as ephemeral to him as the wild currents he helped to tame were to the common man. His strange obsessions and phobias about cleanliness and tendencies to misogyny are less than flattering but there were other more seemingly esoteric qualities that towards the end of his life seemed to manifest.

Was Tesla a modern mystic? Is this a grandiose claim? He was a celibate who never married and this practice is associated often with the attainment of a powerful mind, long life, clarity of thought and good memory. In many eastern philosophies the practice is said to also give mystic powers. Tesla later in his life became vegetarian and again this practice is believed to open an individual to finer philosophical and subtle realms and higher thought.

Tesla had flashes of brilliance and insight but did not function fully in the world and seemed indifferent to it. He is a part of a minority strain that gives humanity and edge, a higher purpose and awareness of itself beyond the humdrum and prosaic. Whether he truly was mystic of not, in many ways Nikola Tesla was a real living magician whose theatre was the realm of possibility.

One of the most touching things about him was his attachment to his favourite pigeon that he stated, "Yes, I loved that pigeon, I loved her as a man loves a woman, and she loved me." He also claimed to have had a mystical experience when the pigeon died, seeing a light emanate from its eyes like the soul departing. Many eastern theological systems support the existence of the soul in all living entities. While mankind only ascribes this quality to himself, other theological ontology's are more universal in ascribing this quality to all other living entities and this realisation should while in the human form of life guide us we should therefore treat all living things with compassion. Tesla did believe that a vegetarian diet was "superior to it [meat] in regard to both mechanical and mental performance." He also argued that animal slaughter was "wanton and cruel". Mark Twain, who was one of his very best friends', shared a similar worldview. (Thomas Commerford Martin, 1894)

> *It is just like man's vanity and impertinence to call an animal dumb because it is dumb to his dull perceptions.*
>
> - Mark Twain (1835-1910)

Tesla was also influenced by the ancient philosophy of India, the Vedas. He used Sanskrit terms to describe many of his concepts, which were also in line with ancient Vedic cosmology. Vedic cosmology, For example has other subtle element like the fifth element, ether. The mind is also considered a subtle physical element. We know now that radio waves travel through ether. Tesla was exposed to eastern philosophy and ideas about subtle energies as well as its complex ontology's after he met with Swami Vivekananda (Bringing the Vedas to America), one of the first to bring this ancient philosophy to the west. Tesla found much in common with his conjectures and ideas about how the universe worked and these ancient Indian scriptures that are held in India to be divinely revealed (Vedic Tesla).

Tesla is currently so under appreciated and in many ways he seems to have been erased from the history of modern engineering and telecommunications, for whatever reason. Whoever the real Tesla was is certainly a mystery (What happened to Tesla?)

References

Commerford, M.T. (1894) . *The Inventions, Researches, and Writings of Nikola Tesla*

Brining the Vedas to America. [Online] Available from: http://veda.wikidot.com/vivekananda

Vedic Tesla. [Online] Available from: http://uncletaz.com/library/scimath/tesla/vedictesl.html

What happened to Tesla?. [Online] Available from: http://answers.yahoo.com/question/?qid=20071006113036AAf9iKA

Tesla's Inventions

Nikola Tesla, the great Serbian-American inventor, electrical engineer and scientist, devoted his own life into inventions that have been making a special contribution to the progress and evolution of the life of mankind. Since college, he had invented with his own or the other assistants astonishing numerous inventions such as a telephone repeater, rotating magnetic field principle, polyphase alternating-current system, induction motor, alternating-current power transmission, Tesla coil transformer, wireless communication, radio, fluorescent lights, and more than 700 other patents listed by Kosanovic (2000, p. 1).

We need to mention two men without whom Nikola would not had been so successful in his inventions. The first man is Tomas Edison, whose company employed Tesla and brought his to America where most of his inventions were born and whose invention, the system of direct-current led his spectacular invention of the alternating-current system which had been used widely and vastly sped up our lives. But it seemed that Edison was so jealous to him that he didn't think the alternating-current would work and he made speeches around America that the alternating-current system would do harm to human which made a hard time for Tesla. But Tesla was not that easy to give up, he tried to illustrate the power of the alternating-current system to people and even experimented on himself during a meeting which made all journalists shocked and curious thus people began to pay attention to it. The second man, George Westinghouse, started to playing his role in 1885, who bought this very patent rights and this alternating-current system became apparent when Westinghouse successfully used it to light the World Columbian Exposition at Chicago in 1893.(Lucidface, 2008)

Tesla was so genius at electrical systems. He then invented the AC motor which “Launched the electrical age of heavy industry. A somewhat more modest lineage of AC motors has powered most of the familiar appliances of twentieth-century life, from refrigerators to coffee grinders”.(PBS, u.d) With the continuous attempts and experiments, he originated and built all of the basic circuits required for the transmission and reception of wireless communications – what we call radio and broadcast television. (Peterson, u.d.) A radio controlled boat which was used to demonstrate the transmission and reception of radio was again so provable that became the ancestor of modern radio systems. Tesla was very good at making his thoughts into practice. He built an experimental station in Colorado Springs to experiment with high voltage, high frequency electricity and other phenomena. When the Colorado Springs Tesla Coil magnifying transmitter was energized, it created sparks 30 feet long by which he proved that the earth could be used as a conductor and would be as responsive as a tuning fork to electrical vibrations of a certain frequency. (Vujovic, 1998)

In Tesla's autobiography, he mentioned how his thoughts turned seriously to invention. He could visualize with the greatest facility, his mind. “When i get an idea I start at once building it up in my imagination. I change the construction, make improvements and operate the device in my

mind" (Teslaplay, u.d.) I tend to agree that he who thinks more and thinks effectively makes great which we can derive from Beethoven and Steve Hokin as well as Einstein. They have the pictures in mind before they actually do something. The brain is a rather powerful tool!

Tesla Invention – World's First AC Generator (Spaceandmotion, 2008)

Tesla's inventions helped shape the world, but it would be more helpful if FBI had not collected and concealed the rest of his work after he died. I would always believe that the science work belonged to the whole world. We should generously thank to Tesla for his everlasting masterpiece without which the society would fall backward hundreds of years. But it is unfair that Tesla had been forgotten by the world until recent years people began to recall his works and honoured him. "Were we to seize and eliminate from our industrial world the result of Mr. Tesla's work. The wheels of industry would cease to turn. Our electric cars and trains would stop. Our towns would be dark, our mills would be dead and idle. Yes, so far-reaching is his work that it has become the warp and woof of industry. The name of Tesla ... Marks (Cheney et. al, 1999)

References

Cheney M, Uth B, Glenn J (1999), *Tesla Master of Lightning*, Barnes & Noble Publishing, New York

Kosanovic, B.R.(2000). *Nikola Tesla*, http://www.neuronet.pitt.edu/~bogdan/tesla/

Lucidcafe, 2008, Nikola Tesla, http://www.lucidcafe.com/library/96jul/tesla.html

PBS, (n.d.), Anatomy of a Motor, http://www.pbs.org/tesla/ins/lab_acmotor.html

Peterson, G.L.(u.d.), Nikola Tesla– A Man of Comprehensive solutions, http://www.tfcbooks.com/articles/ntbio.htm

Spaceandmotion, (n.d.), Tesla Inventions / Pictures & Descriptions, http://www.spaceandmotion.com/Physics-Nikola-Tesla-Inventions-Resonance.htm

Teslaplay, (n.d.), Tesla's autobiography I. My Early Life, http://www.teslaplay.com/autosection1.htm

Vujovic, L.(1998), Tesla Biography, Nikola Tesla, The Genius Who Lit The World, http://www.teslasociety.com/biography.htm

Nikola Tesla and Dinar Banknote

This article dicusses the main elements of the Serbian 100 Dinar banknote and how it honours one of the geniuses of the early electrical age, Nikola Tesla. Although, Tesla was born at Smiljan, in the military border zone of Austro-Hungarian Empire, now in the Republic of Croatia, Tesla's mother and father were Serbian, and he is regarded with pride as a native son by many Serbians. The Serbian 100 Dinar banknote honours him in many ways and includes various images, formula, and designs of his and also features his beloved Dove. He is also honoured in many other ways in Serbia, including the Nikola Telsa Museum in Belgrade, the Nikola Telsa Airport and the Serbian 20 Dinar Coin.

The front of the banknote is light and dark blue on multicoloured underprint. On the left is a portrait of Nikola Tesla (10 July 1956 - 7 January 1943) world-renowned Serbian inventor, physicist, mechanical engineer and electrical engineer. T = Wb/m²: Magnetic induction (or flux density) calculation formula. In the centre of the banknote lies the formula for magnetic induction and SI unit (T) dedicated to Nikola Tesla at the Conférence Générale des Poids et Mesures, Paris, 1960. Above the magnetic induction formula is an image of an instance of electrical discharge. Images of electrical discharge are synonymous with Nikola Tesla. One of the most known and recognisable pictures of him is of him sitting underneath a coil whilst sparks of electricity dance all around him.

On the rear there is a figure of Nikola Tesla (from the photograph of Nikola Tesla from his Museum in Belgrade). In this image Tesla is holding a light bulb. On the top middle there is a drawing of Tesla's electromagnetic induction engine. Nikola Tesla invented the induction motor with rotating magnetic field that made unit drives for machines feasible and made AC power transmission an economic necessity. Alternating current (AC) became the premier form of electrical energy after it overcame objections by Thomas Edison who designed direct current (DC). AC has an electric current whose direction reverses cyclically rather than staying in a constant direction like DC. The waveform of AC is also more efficient than the DC. AC is the form in which electricity is carried to homes and businesses. This drawing demonstrates that Tesla was not only a great inventor but a great constructor. In the centre is a picture of Tesla's Dove.

The dove is an insight into his personality. He told about the white dove to his biographer John O'Neill: "...She understood me and I understood her. I loved that dove indeed. Indeed, I loved her as a man loves a woman, and it loved me. .... Then, one night, while I was lying on my bed as usual solving some problem, she flew in through an open window and landed right on my desk. I knew she needed me. She wished to tell me something important, so I stood up and made a step towards her. As soon as I saw her, I knew what she wanted to tell me – that she was dying. At the very moment when I realized her message, out of her eyes came a flashed some light-powerful rays of light. Indeed, it was a

real powerfully blinding, dazzling light, stronger than any other I had ever produced with my best laboratory lamps. When the pigeon died, some part of my life died too....” Psychologists explain his love to bird as the love to his mother who passed away just like a bird. The way Tesla loved his mother explains some other his habits, his relationship with other people as well as the neurosis he had to restrain all his life.

Watermark of Banknote - Tesla sitting under his coil

Although not born in Serbia, Nikola Tesla is loved by Serbians and treated as one of their own. He is honoured in many ways in Serbia, including the Nikola Telsa Museum in Belgrade, the Nikola Telsa Airport, Belgrade and the Serbian 100 Dinar banknote and the Serbian 20 Dinar coin. The 100 Dinar banknote has many of his inventions, portraits and his beloved dove on it. In Serbia he is considered Serbian and is to this day their most famous and important inventor. He also appeared on many Yugoslavian banknotes before the breakup of Yugoslavia. He will continue to be remembered and loved by Serbians.

References

Tesla Memorial Society of New York, http://www.teslasociety.com/teslacoil.htm

Surrounded by Feathered Friends, http://www.nikolatesla.hr/news.aspx?newsID=64&pageID=23

Serbia the Golden Apple, *Genius From Smiljan*, http://www.nbuv.gov.ua/new/2006/tesla.html

Jacob Lewis Bourjaili, *Physicists on Banknotes*, http://www-personal.umich.edu/~jbourj/money3.htm

National Bank of Serbia, http://www.nbs.yu/export/internet/english/75/75_1/75_1_1.html

Matthew Patay's Note of the Month, *April 2007*, http://aes.iupui.edu/rwise/NoteofMonth/matthew_patayApril2007Serbia&Montenegro.htm

Invent Now, *Hall of Fame/Inventor Profile*, http://www.invent.org/Hall_Of_Fame/143.html

Belgrade in your pocket, July – September 2008, Essential City Guides, 2008

Nikola Tesla and UFOs

When one thinks of Nikola Tesla, it is under the umbrella of a great thinker, inventor and man ahead of time. A staunch believer in the "God" (with parents hoping he would enter the church) and someone seeking logical explanation in everything there was a paradox in his life. It comes then as surprise that this human or "super" human should be linked with thoughts of the "outer limits". In researching his life, you find examples of the unexplained from his own descriptions and from that which he invented. Such was his interest in the creative noticed and followed by government/FBI etc., it is so surprising that "Fox Moulder" wasn't called "Nico Moulder". He is said to be linked to "Foo fighters" and of course the design for "lift and drive" space craft. Here is a man, who it is believed may have been in contacted with an alien race, tapped for his intelligence and possibly through this communication may have enhanced mankind. The following document hopes to outline evidence that there was a link to the two.

Tesla referenced his parents as "Earth Parents" in "My Early Life", the first chapter of his self penned life story, but does not mention them in that way again within the book. Some Tesla historians believe he was born on a spaceship and was entrusted to an earth family. It really makes you think. The great grandchild of an officer in Napoleon's army on one side and a family of inventors on the other, here is a child whose birth was well planned. You cannot help but think that there was some divine intervention in his creation. Both he and his dead brother experienced "seizures" of light followed by intense visions. He also noted that if someone hurt his loved ones, he would suffer immense pain and something would happen to **the tormentor**. While this is unusual, he saw nothing in it as he believed "the gift of mental power comes from God". You have to ask, did he mean the churches idea of God, or something far greater?

Bill Jones wrote in the newsletter "The UFO Enigma", that Tesla did the basic research for constructing the "lift-and-drive" space craft. Tesla's preferred design was a thin disk. This is the common structure for today's view of UFOs. So the question is was he copying or projecting a vision which he had already seen as with some of his other inventions or had this image been planted in his mind to "enhance" mankind? I would like to think somehow the latter is true, but I also know there was popular reference to disk shaped objects in the art works in the 16th and 17th century and that Dean Jonathon Swift wrote about a similar magnetic flying island in "A voyage to Laputa", so maybe it was just the inventions of a creative mind?

One of the most referenced sightings in the UFO folklore is that of "Foo Fighters" during the dog fights of the second Great War where both allied and Axis aircraft were tailed. It has been hinted that these balls of electricity were a secret Tesla project, and possibly Marconi stole the idea from him and ran off with it to South America to develop it further. These objects were classed as UFOs

and similar sightings are reported today of white "orbs" floating in the sky in Mexico, Arizona and in some parts of Europe. So there is the possibility that these UFOs are again man made.

Some UFO groups believe that Tesla was the "first contact". In the late 1890's Nikola was mysteriously invited to come out West to Colorado to conduct some of his electrical experiments. There he claimed that he was contacted by aliens. UFologists belie ve that they communicated telepathically and he was given inventions by them to "better mankind". If this is true, then you can bet the American and foreign governments want a part of this too? In his penned life story he mentions that another time an "odd-looking" gentleman come to him looking for assistance to further develop one of his inventions. Was this one of the famed "men in black" or a member of the Nazi or Fascist groups who would seek to use his talents for evil as opposed to good? Given that it is said that General Electric pirated many of his inventions and that there is UFO folklore that they reverse engineered Alien technology to develop some of their projects today, it seemed for whatever reason, everybody wanted a part of him.

SQUGGLE: The first UFO pictures taken in Malta.

What I have written is my understanding on the links between UFOs and Tesla. It really is not clear whether he just invented craft that shape or did they have a part in his creation. I have provided some indications that he possibly was either not of this earth of chosen specifically for tasks which could enhance the earth. I have not shown uses for his inventions but acknowledge that some parties were interested in them for their own good, maybe or not for the greater good of mankind. I have also referenced the idea that he was directly tapped by a greater race, even if this is against his own religious beliefs. How true it all is I don't know. But if I was a betting woman, I would say the odds are stacked in his favour. Maybe I will place a bet; you know the "truth" is out there, somewhere.

References

Bill Jones - “The UFO Enigma” (-) Http://Www.Zamandayolculuk.Com/Cetinbal/Ufobuild.Htm

Farshoes (2002) Http://Farshores.Org/

Gerry Lovell (-) Http://Farshores.Org/Dy10.Htm

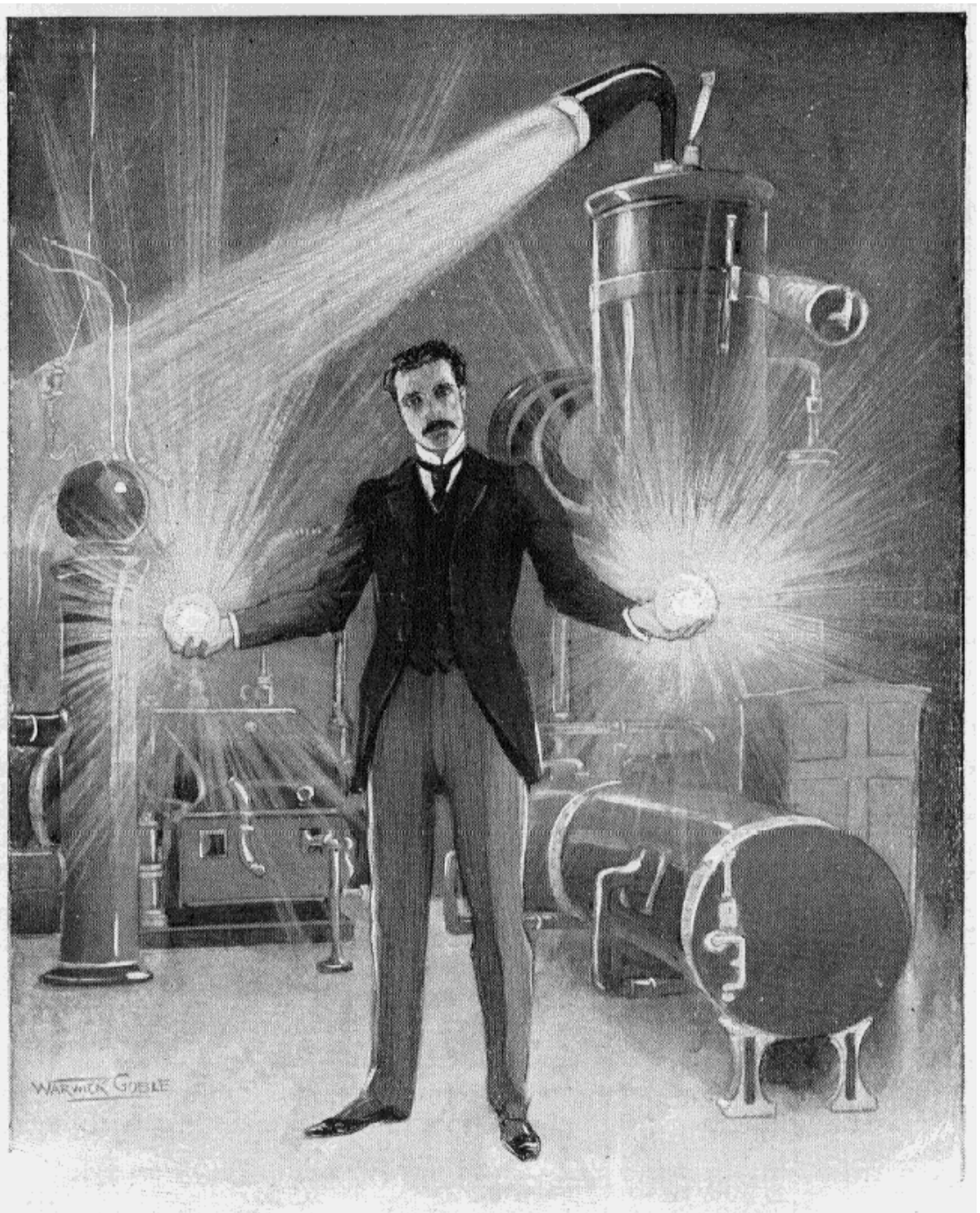
John Roland And Hans Penner (-) Http://Www.Scribd.Com/Doc/259752/The-Strange-Life-Of-Nikola-Tesla

Lampstand Media (-) Http://Business.Gorge.Net/Zdkf/Kufol/Kul-Tsp.Html

Scribd (1995) Www.Scribd.Com

Veldantia (2000) Http://Business.Gorge.Net/Zdkf/(Internet)

Zamanyolculugu (2005) Www.Zamandayolculuk.Com



Nikola Tesla holding in his hands balls of flame