

Essay 31: Script for “Nikola Who...?”

A glimpse of the story of Nikola Tesla.

(With the voices of Robert Cheshire and Alan Roy on the accompanying audio broadcast at www.aias.us)

If you looked carefully around the house or in the street, you'd hardly notice Nikola Tesla's legacy. At least, not at first, so what's to see? In the house, you can see light bulbs, maybe a landline, some speakers perhaps, or even a record player; and they were all provided by Thomas Edison early last century. The TV was brought to us in the nineteen twenties by John Logie Baird. The Electric Washing Machine came from the early 1900's courtesy of Alva J. Fisher. You'd probably see a vacuum cleaner which was by...guess who...Yes...William Hoover, back in 1908. Actually no, it wasn't. It was James Spangler the year before, but he sold his patent to Mr Hoover which helped to make the company very rich and well known with a popular product. That's why, even now, some of us still “hoover” the carpet, regardless of who made the machine!

What else?..... Ah yes, the car outside. Well, that was Henry Ford wasn't it? Or Karl Benz? It's difficult to say as the car's had so many contributors in those early days. I do know that Henry Ford definitely improved mass production by the assembly line method and he also invented a transmission system for cars, amongst other things. It's also said to be Henry Ford who, in reference to his famous Model 'T', uttered that immortal line,

“You can have any colour you like..... So long as it's black.”!

What have I missed? Well, you're hearing it everywhere! Nikola Tesla invented Radio and Broadcasting. It wasn't Marconi or Edison despite popular belief. It was Nikola Tesla and he did it years before the others. Marconi did make the first Wireless Transatlantic Transmission in late 1901 and Edison too, was a rival, but it's a matter of historical, and legal fact that Tesla invented Radio itself, and several years too before Marconi's first international call! Marconi used Tesla's plans, designs and components for that transmission and would have held on to the credit but in 1943 after lengthy court action, The American Judiciary removed the credit from Marconi and reaffirmed Tesla as “Father of Radio”. Tesla had demonstrated the whole system of distant Radio broadcast and reception some years before Marconi or his Atlantic Transmission. Sadly, all too late to see, for the man who linked the peoples of the world. He died a few months before the court ruling in mid 1943. Radio was indeed just one of Tesla's many inventions to come.

Let's look again at the lights back in the house. Sure enough, we see Edison's light bulbs glowing brightly. But what makes them work? What powers them? What powers all our light giving or labour saving appliances? Electricity of course. That supply of Electricity is called AC Power - AC meaning alternating current. Everything Electrical you switch on in the house works off this kind of mains supply because of Nikola Tesla. So without Tesla's mains Power, none of the appliances mentioned earlier would work. But why have so few people heard of him?

He was born Nikola Tesla, on July the 10th, 1856 in a small village called Smiljan, in the region of Lika, in what was the Austro-Hungarian Empire. His father Milutin Tesla was a Serbian Orthodox priest and his mother, Djuka Mandic, was an inventor in her own right. She would invent new household aids and appliances. She was also a weaver of fine cloth.

Tesla began to show flashes of his genius during his education years, but he didn't stick to many school schedules or curricula. He studied at Realschule, in Karlstadt in 1873, the Polytechnic Institute in Graz, Austria, and at the University of Prague. At first he intended to specialise in Physics and Maths, but he became more and more fascinated by Electrical phenomena. He would stand rain soaked for ages in a storm, transfixed by the lightning from the sky, and that was to become the primary focus of his life's work and the many discoveries to follow.

Since his childhood, Tesla had had a dream. The first part of this dream was to go to work in America – particularly to (somehow) harness the power of Niagara Falls. The second part Well, we'll hear more about that later. In 1881, Nikola Tesla went to work as an electrical engineer for a wire telephone company in Budapest. It was there one day, whilst walking through the city park with a friend, that Tesla suddenly crouched to the ground excitedly. With surety and a stick, he began to sketch rapidly in the sand and explain breathlessly - the elusive solution to the rotating magnetic field. It was a true Eureka moment. What was flashing though Tesla's mind in those seconds, was the complete principle of the Modern Electric Motor which today, can be found in almost any AC appliance needing a strong driver or motor. You'll find these motors in so many things, such as; Washing machines; Vacuum Cleaners; Food Mixers; Trains, cars, ships and planes; Ski Lifts and Cable Cars; Power Stations; Petrol Stations; We don't have time to list them all. It's sufficient to say that today, we depend on Tesla's invention almost totally, in all our electrical needs. Nikola Tesla once wrote:

"The day when we shall know exactly what electricity is, will chronicle an event probably greater than any other recorded in the human race."

The Tesla Coil is another phenomenon which he invented in 1891, and the principle of it is widely used today in radio and television sets and other electronic equipment. Its most basic function is to step up relatively low electric current into very high voltages - which can create dramatic arcs of thousands if not millions of volts. But this coil played a significant role in Tesla's existing discoveries as well as major inventions to come. Varieties of it are often used in the classroom or lecture hall to

demonstrate - in a fun way, (like plasma balls) - some of the principles used in Radio and Electronics.

Let's hear more about his youth as an inventor and some more of the things he brought us. That may throw some more light on why he seems so obscure and forgotten now.

In his mid twenties, Tesla changed jobs and went to work for the Continental Edison Company in Paris. There, he designed dynamos that ran on DC power. In 1883 in Strasbourg, he built a revolutionary prototype of his own Induction Motor and ran it successfully. The trouble was, remember, that this was very advanced "state of the art" technology and at that time and it proved too "radical" for European interests. Tesla was already way ahead of his time. So in 1884 Tesla set out for the USA and secured work directly for Thomas Edison in New York. His Introduction letter to Edison from Englishman, Charles Batchelor stated,

"I know two great men Mr Edison, one is you and the other is this young man."

The reality of his dream had begun. Nikola Tesla was in America! But it was here that Edison and Tesla were to eventually fall out with conflicting opinions about power types mainly. It is said that once, impressed by his new employee, Edison offered \$50,000 - about \$1million in today's money - if Tesla could dramatically improve a particular DC dynamo line. Tesla worked diligently on the project and improved it beyond Edison's requirement or expectation and so asked for his prize. At this point, it's reported that Edison refused, saying,

"Mr Tesla, you don't understand our American humour".

- And it's said that later on, when he asked for a pay rise from \$18 a week to \$26 a week, that was refused too, causing Tesla to resign. This was also to be the beginning of a bitter "War of the Currents" - AC versus DC - Tesla versus Edison.

With no job or income, and for the next year or so, Tesla was forced into lowly and hard labour. But, with the inspiration of his dream, finally managed to attract enough investment to finance a laboratory and the development of his own motors and of AC power.

Later, amongst his losing and more desperate strategies, Edison had taken to publicly electrocuting stray animals with AC Electricity to try to show people how dangerous Tesla's AC was in comparison to his own Direct Current. One of Edison's more infamous stunts, was to electrocute a rogue elephant in a sideshow at Coney Island, in an attempt to belittle or demonize Tesla and his AC.

Edison's DC empire was at stake now, and it was a huge empire. Everything electric in the world was so far run on DC power which was, by comparison, grossly inefficient, and to power the world, would be much too cumbersome and expensive. Not only were Edison's light bulbs inefficient and less bright on DC, but to supply his mains power over any distance would require a power station every 2 miles! Tesla's AC on the

other hand - by its totally different and flexible nature, could be stepped up in voltage to much more cheaply and easily provide the long- distance power delivery needed. You may now begin to see how threatening a man like Tesla would be to the very wealthy Edison and his investors.

However, it was Tesla who astonished the world with his AC power. Firstly, his demonstrations, lighting and power for the World Columbian Exposition in Chicago in 1893, then soon after, Tesla designed, and with his newly-found and eager partner, George Westinghouse, built the first ever Hydro-Electric Power Station at Niagara Falls. That clinched it. From then on, America and the entire globe were to be powered by Tesla's AC mains Power. Tesla had realised the first part of his dream. He had come to America and he was supplying cleaner, more efficient energy to the American people from Niagara Falls as he'd dreamed. Niagara Falls power station was said to be "another wonder of the world". But there was a second part to the dream. It was this part of Tesla's dream that may have cost him his fame, his wealth and, in the end some say....even his life.

Not only had Tesla introduced brand new, and world shattering technologies, but in doing so, had threatened many wealthy industrialists with his stunning inventions and potential. Thomas Edison was just one of many such powerful men. There were many like Edison who had invested heavily in Direct Current and related technologies, and here was this young upstart who would put the kybosh on their existing and future profits with his new AC Power and Motor technology. They'd now be stuck with a dead or dying duck. Edison hated Tesla, and his AC, declaring that,

"The man just has no sense of humour"

- which may have something to do with the fact that, having got what he wanted from Tesla, Edison insisted that he was "only joking" when it was time to settle up.

At the height of his fame, Tesla was a superstar. Celebrities and the top of society would queue up to be seen, or to be friends with this stately and eloquent young man. Tesla was often in the company of the great and famous and he would turn down many offers from kings and dignitaries from all over the world to come and demonstrate his discoveries for princely reward. He was tall, dark and brilliant, often quite literally!

Mark Twain was one of his close friends and is pictured in some of Tesla's glowing experiments. Other notables would regularly attend his amazing demonstrations, such as the famous French actress, Sarah Bernhart, President Theodore Roosevelt, Stanford White the famous architect - to name but a few of the hundreds from high society who have flocked to be thrilled, and amazed by this rare, and brilliant man. He could speak 6 different languages since childhood. He was a poet and something of a mystic. Apart from his copious treatises and scientific papers, he wrote reams of poetry and prose - all in several languages. He was also a lifelong bachelor in service only to his important works. Tesla had been gifted with exceptional memory and intense powers of visualisation since his childhood. He could construct, develop and perfect his inventions completely in his mind - before ever committing them to paper.

What else did Tesla Invent?

**Basic
Laser Technology**

Basic Radar, Neon Lighting

Vertical Take-off Aircraft

Robotics

Remote Control

Fluorescent Lighting

Basic Cellular Technology

“Star Wars” Tactical Warfare

X-Rays

Although Tesla never claimed the invention of X-Rays and accredited Wilhelm Röntgen - even on the X-Ray pictures first ever taken, Tesla had acknowledged Röntgen’s work.

Tesla filed over 700 patents on his new and incredible technologies. He also lectured to the scientific community all over America, in France and in Britain too. Way back in the late 1800’s Tesla had said,

“Electric power is everywhere present in unlimited quantities and can drive the world’s machinery without the need of coal, oil, gas or any other of the common fuels.”

- That was the crunch of the second and most dangerous part of Tesla’s dream. To supply power to all the people of the world, new, clean and, most importantly, free electrical energy.

In 1900, Tesla secured financial backing of 150,000 dollars (that’s about \$3 million by today’s standard) from the banker/overlord - with the ominous nickname “The Devil Himself” – then thought to be one of the richest men in the world, J P Morgan.

This money was to finance Tesla’s most ambitious and controversial project to date, The Wardencllyffe Tower.

Outwardly, Wardencllyffe was an elaborate Radio “Tranceiver” designed for worldwide, wireless radio communications – but Tesla had a secret. He had designed and built Wardencllyffe so that it could also transmit **wireless electrical power**, and was the demonstration prototype for his greater dream – free energy, on tap, no common fuels required, and for the whole world to benefit. Tesla had already transmitted electrical power to precise reception many miles away and, without wires! When JP Morgan found

out about it - just as Wardencllyffe was nearing completion, and, knowing Tesla would most likely deliver, Morgan went ballistic, shouting at Tesla,

*“Are you insane? If the whole world can get power out of this for free...
Where am I supposed to put the meter?”*

This was a man, said to control assets of some 22 billion dollars. He had no time for scientific or humanitarian benevolence. JP then pulled the plug and ceased all funding, blackballed Tesla and, through his mighty influence, deterred investment from any other viable sources. Tesla tried in vain to refinance the project. It was no good. No one would fund him. Some of his major patents were expiring and his personal funding from these was also to dry up. Tesla had a nervous breakdown and went into a decline. Though later, he was to go on inventing and discovering fantastic things we take for granted today, and things our children may marvel at tomorrow, he was never able to recover his peak status. He then went on to suffer indignities and ridicule for his innovations. Some of those innovations and theories that today, scientists are only just realising to be matters of scientific fact. You don't always get a “happy ever after” with great invention. Some people just don't want it.

It's also little ironic that Edison, shortly before he died, admitted that the biggest mistake he had made in his life was DC power – finally showing something of a backhanded respect for Tesla's achievement - after well over a decade of bitter antagonism. But JP Morgan pulled out of the project, because he couldn't make money out of the energy production. And those words, “Where do I put the meter?” about sum it up. And though Morgan was sitting on a potential fortune from the other purpose of Wardencllyffe, and the thing he'd originally invested in - World Wide Radio, he still pulled the plug.

It turns out that Tesla was full of surprises. That part of the system would indeed transmit and receive Radio from all over the globe, but it was also to do the same with pictures and text. What Tesla had built into this project was effectively, the first World Wide Web...and well over a hundred years ago!

If you think that controlling Radio and the World Wide Web for around a century or so would make you rich, then yes, JP and his heirs, and their heirs, and their heirs' heirs would have made a lot of cash. So why not fund the project to completion? - You may ask. Well, there's the rub. You've got to understand that in total contrast to Tesla, JP Morgan was a very shrewd business tycoon. Over his business life, his interests in huge concerns included setting up the Federal Reserve Bank of America, the so called 'Independent Entity' that it is today. His associations included governments at home and abroad, Presidents, kings, queens and worldwide leaders. He had most of his fingers in lots of big pies. He was also known for setting up conglomerates or large trusts. These were made up of merged, smaller concerns in order to minimise costs and remove competition. He would have global interests in oil and gas and other fossil fuels. He'd also invested quite a lot in Edison's ideas and machinery. Tesla's free electrical energy plan would threaten ruin or redundancy to many of the really “big boys” if it were allowed to spark up. And anyway, unlike Tesla, Morgan may not have imagined the World Wide Web as we have it now. Maybe it's better for JP to write off the Radio concern as well, - rather than lose billions more from coal, oil and gas if Tesla's latest

power system was to go public. Maybe he just thought that Tesla's new free power should be simply switched off.....Permanently.

Tesla spent the rest of his life in isolation; occasionally announcing new discovery or invention but the world had become deaf to, or ignoring of this now neglected genius. He died in a lonely hotel room early in 1943. The internet reports a variety of causes of death; from old age, to heart failure, to poisoning.

It seems that in his time, he had three characteristics that his enemies just didn't want or need. He was open, he didn't care for business or money, and he could change the world.

Robert Cheshire- May 2010