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Inventions of Tesla. A Man Whose Mind Works While He Sleeps.
by Frank G. Carpenter the Boston Sunday Globe on December 18th, 1904

“Let us suppose I have my plant at Niagara and you are running a sugar factory in Australia; by my discoveries it will be possible to send you 100 or 500 or 1000 horse power for your factory and supply the regularly by the force furnished from Niagara Falls.”— Nikola Tesla.

New York. I give you today the substance of two remarkable talks with Nikola Tesla. The first I had in his laboratory on East Houston at nine years ago last September. The second was held in the Waldorf last night.

The first interview was most interesting, giving a wonderful insight into Tesla the inventor and Tesla the man, but it was never published, for Mr. Tesla at its close, for business reasons, begged that I say nothing about him for months to come. I wrote out the notes, however, and laid them away, and when I met Mr. Tesla tonight I told him I how intended to use them. At the same time we had the extraordinary conversation about his recent discoveries and inventions as to the transmission of force, which I reproduce in the latter part of this article.

Tesla the Man. First take a glance at Tesla the man. He looked more like an Italian savant than a hard working inventor when I saw him in the Waldorf. He was in evening dress and was the most striking figure of the score of public men who stood about the lobby. Mr. Tesla is now 47 years of age and is in his physical and intellectual prime. He is tall and slender, his head is long, thin and intellectual, with a forehead high and full. He was born in Hungary and educated there, but he speaks English perfectly and is one of the most charming conversationalists I have ever met.

His father was a clergyman of the Greek church, and Nikola was intended for the priesthood. He had a brother older than himself, whom the family considered much brighter. That brother died young, and this so crazed his father and mother that it took them long to realize the genius of Nikola. If he stood well in his studies his father's eyes would fill as he thought how much better, perhaps, the other son might have done, and whatever Nikola did was always compared with the possible work of the boy who had passed away.

His first education was in the public schools of Gospich, and after that he went to the Real Schule at Karlstadt. As he went on with his studies he liked mathematics so much that he intended to fit himself to be a professor of mathematics and physics, and with that view studied at the polytechnic school at Gratz. He changed to the engineering course, and later on studied philosophy and languages in the colleges at Prague and Budapest. He has since been made a doctor of laws by Yale and Columbia.

Shortly after completing his studies Mr. Tesla was associated with the government of Austria-Hungary in the telegraph engineering department, where he invented several improvements. From there he went to Paris to be engineer of a large lighting company, and thence to the United States, where he was employed by Thomas Edison in his laboratory. His next position was that of electrician to the Tesla Electric Light company, and at the same time he established the Tesla laboratory here, from which his great inventions have come.

Tesla Science Center at Wardenclyffe is a US 501c3 nonprofit organization with a mission to develop the site of Nikola Tesla's last remaining laboratory into a transformative global science center that embraces his bold spirit of invention, provides innovative learning experiences, fosters the advancement of new technologies, and preserves his legacy in the Tesla Museum.

Tesla the Inventor. During my chat with Mr. Tesla I asked him when he first realized that he had the inventive faculty and he told me he had always been inventing something or other. When he was quite a small boy he made toy guns, which would shoot birds, and as he was the only one who could make them he supplied the boys of his neighborhood. He made clocks at eight or nine years and began to dabble in electricity before he was in his teens.

His first determination to devote his life to invention came shortly after he went to London to deliver a lecture before a scientific society there. At this lecture he met Lord Rayleigh, the great physicist, and showed him some of the experiments. Rayleigh said that he had, undoubtedly, the faculty of discovery and that he would succeed as an inventor.

“Shortly after this my mother died,” said Mr. Tesla, “and I concluded to exert this faculty. Lord Rayleigh had said I possessed it and, upon examining myself, I believed him correct. I did not want to waste my powers on small things and I decided to strive toward something that would benefit humanity. I am working on an invention for the transmission of force. This invention will, I believe, revolutionize the world of labor. I am also working on electricity and I cannot remember when I was not working more or less in the direction of a successful flying machine. My idea, as to that, is along different lines than any yet proposed and I expect to see it realized. Indeed, we shall eventually have flying machines that will be large enough to carry crowds through the air. They must be large in order to succeed.”

These words were uttered by Mr. Tesla nine years ago. Today he says he has completed his force transmission invention, as will be seen by my Waldorf conversation, which follows. He has also done other things which he proposed in that interview. Remember it was before the time of the wireless telegraph, but he then said to me the following:

“I tell you, we are on the threshold of a new era. We have only begun to master the great forces of nature, and the inventions of the next few decades will be far superior to any of the past. What would you think of standing on the shore and telephoning to your friends in midocean? What of being in the centre of a room and making your whole body blaze with light? What of sending power to and fro over the earth at will and making it do its work anywhere and almost anyhow?”

How it Feels to Invent. Mr. Tesla told me that his greatest pleasure was in his work, and that he could conceive no moment so exciting and rapturous as that connected with the discovery of a new principle which, when put into use, would revolutionize the work of the world.

Take, for instance, the invention which brought forth the apparatus used in the transmission of power at Niagara Falls. Said he, as he took me to a great coil of wire wound about a stationary magnet, which was connected with the dynamo, and held above it a little glass globe in which was a steel wheel moving on a pivot: “I had been working upon that experiment for a long time, and this was the test. I knew that if I were correct that the wheel in this globe would revolve as soon as I turned on the electricity. It did revolve, and I knew I had discovered what would revolutionize the labor of the world. You can run all sorts of power by that principle. You can take power from Niagara and bring it to New York. The cars can be pulled by it, factories run, houses heated and dinners cooked. I cannot describe my sensation when I saw the wheel revolve. I thought I should go crazy, and I went to my laboratory and took some bromide of potassium to quiet me.

“It has been the same in some of my experiments with electric lights and other things. No; the greatest rapture one can have is to discover a new force or series of forces, which will reduce man's working necessities to the minimum. I do not believe in laziness, and I should like to see the loafer wiped from the face or the earth; but I want that those who are willing to work should accomplish their results with the least labor and in the best way.”

How Tesla Works. As to Mr. Tesla himself, there is no harder worker known. He told me that he seldom slept more than four hours of a night, and during some periods not more than three. When in the thick of a new invention it is hard to sleep. His work is always with him and he says that his mind sometimes works in his sleep. He awakes in the morning to find that the problem which had worried him when he went to bed has been practically solved over night. He has always been a light sleeper. His mother died at seventy and she never took more than four hours' sleep. His father was a light sleeper.

Tesla is a peculiar worker. Failures do not trouble him. After he undertakes a thing and decides that it should come out a certain way, he keeps on experimenting and experimenting, believing in his success. He says that if he doubted his ability it would make him crazy. He seems to have a dual mind. He told me that he often found himself carrying on two trains of thought at the same time, and said that while he was talking to me he could see the figures of some of his calculations behind me and could carry them on at the same time. He is always figuring. His scrap basket is filled with the calculations which he has torn up and thrown away. He keeps a record of his experiments, and when his laboratory burned some years ago he lost the work of years in ideas and suggestions which had been thus recorded.

His New Inventions. And now to Mr. Tesla's latest discoveries. If he has what he thinks he has he will revolutionize labor and give man greater benefits than have come from any inventor since the world began. Indeed, the statements made me tonight in the mouth of any other man would be a fair test of insanity. But many of Tesla's wild statements of the past have been verified by great working inventions. He said he could harness Niagara, and through his experiments in the rotary magnetic fields Niagara is now furnishing a power equal to that of tens of thousands of horses, and electrical works are being run by the same principle all over the globe. The New York subway, for instance, is founded upon it. Tesla demonstrated that wireless telegraphy could be done in 1893, and it is a question whether his inventions in that field are not prior to those of Marconi or De Forrest.

Last evening he told me that he had almost completed inventions by which he could send electrical power to any distance without wires, and that in any quantity, small or great. Said he:

"I have proved that power can be thus transmitted. Let us suppose I have my plant at Niagara and you are running a sugar factory in Australia; by my discoveries it will be possible to send you a hundred, five hundred or a thousand horsepower for your factory, and to supply the same regularly by the force furnished from Niagara Falls. Suppose you are traveling in the wilds of the Andes and make your camp on the shores of Lake Titicaca. By the outcome of this principle you may have telegraphed to you there instantaneous reports of the news of the world as it happens from time to time. You may cook your dinner over an electric fire thus transmitted, and you may have the same at will on any part of the globe. We shall be able to send power from place to place at will, and that at such a small cost that it will be industrially profitable."

"How did you discover that this might be done, Mr. Tesla?" I asked.

"I have for years been working on the transmission of electrical energy, and in 1898 established a laboratory on the edge of the Rocky mountains near Colorado Springs. My laboratory there was over six thousand feet high, higher than the top of Mount Washington, and I had extraordinary conditions for my experiments. Colorado is famous for its natural displays of electrical force. The earth at times is alive with electrical vibrations and the air is full of electricity. I have seen 12,000 lightning discharges within two hours and all within a radius of 30 miles of my laboratory. These discharges were of great violence, some of them looking like trees of fire on the heavens. It was among such discharges that I had my electrical instruments and studied the principles of electrical transmission through the earth and air. One day while watching the lightning I noticed that discharges afar often affected instruments in my laboratory more than those near by. Upon examination I found that this could not be caused by the difference of intensity in the individual discharges.

"What could it be?"

"Through instruments made for the purpose I tested the matter from time to time and finally came to the conclusion that the vibrations caused by the lightning moved around the world and that there were stationary waves. I could gauge the discharges near the laboratory and see them fade away and after a certain fixed period find them returning with almost no loss of power. In short, this planet, as big as it is, was acting as a conductor, and I became convinced that upon it not only telegraphic messages, but also the modulations of the human voice and electrical power in unlimited amounts, could be carried around the entire globe and sent to any part of it with hardly any perceptible loss. With my transmitter I actually sent electrical vibrations around the world and received them again, and I then went on to develop my machinery. I had, as I have told you, been studying and inventing along the lines of electrical transmission and was ready to take advantage of my discovery. I have since so improved the means of individualization and isolation that such energy may be sent in any amount to any fixed place without danger of its going elsewhere or affecting others, and I believe the individualization can be carried out to almost any degree."

Niagara for the World. "Will this enable the power of Niagara to be sent anywhere over the world?" "Yes. I have been experimenting at my laboratory on Long Island. I have machinery and buildings there which have cost in the neighborhood of \$350,000, and the results show me that a plant could be erected at Niagara which can transmit its force to any place desired. I am designing such a plant now at my laboratory, and would have had it completed had it not been for unforeseen delays, which have nothing to do with its technical features. The design which I have adopted will have a transmitter which will emit a wave complex of a total maximum activity of 10,000,000 horse power, 1 percent, of which is enough to girdle the globe. This enormous rate of energy delivery it is twice as much as the force at Niagara Falls is obtainable only by the use of certain artifices which I shall make known some time in the future.

"We have been offered 10,000 horsepower from the Canadian Power company. What I want to do is to build machinery there and transmit this power to different parts of the globe. The value of that amount of horse power would be about \$200,000 per year, and a plant erected to take advantage of it will pay large dividends."

“How much would the plant cost?”

“It might cost in the neighborhood of \$2,000,000, but its value would be enormous, and its success would revolutionize the working forces of the globe. It would result in other plants being erected otherwheres and in the utilization of all the great water falls for the work of man.”

Mother Earth Put to Work. “By this invention every live part of Mother Earth's body would be brought into action. Energy will be collected all over the globe in amounts small or large, as it may exist, ranging from a fraction of one to a few horse power or more. Every water fall can be utilized, every coal field made to produce energy to be transmitted to vast distances, and every place on earth can have power at small cost. One of the minor uses might be the illumination of isolated homes. We could light houses all over the country by means of vacuum tubes operated by high frequency currents. We could keep the clocks of the United States going and give everyone exact time; we could turn factories, machine shops and mills, small or large, anywhere, and I believe could also navigate the air.

Transmission of Intelligence. “One of the most important features of this invention,” said Mr. Tesla, “will be the transmission of intelligence. It will convert the entire earth into a huge brain, capable of responding in every one of its parts. By the employment of a number of plants, each of which can transmit signals to all parts of the world, the news of the globe will be flashed to all points. A cheap and simple receiving device, which might be carried in one's pocket, can be set up anywhere on sea or land, and it will record the world's news as it occurs, or take such special messages as are intended for it. If you are in the heart of the Sahara, your wife can telegraph to you from Washington, and if the instrument is properly made you alone will get the message. A single plant of a few horse power could operate hundreds of such instruments, so that the invention has an infinite working capacity and will cheapen the transmission of all kinds of intelligence.”