My Inventions: The Autobiography of Nikola Tesla Study Guide

My Inventions: The Autobiography of Nikola Tesla by Nikola Tesla

BOOKRAGS

Contents

Plot Summary

"My Inventions: The Autobiography of Nikola Tesla" is a brief account in Tesla's own words of his early life and education and his career as an important and prolific inventor in the late nineteenth and early twentieth centuries.

"My Inventions" is an assemblage of six magazine articles Tesla is asked to provide to the periodical "Electrical Engineering." Originally published in 1919, each article focuses on a certain period of Tesla's life, beginning with his early childhood in Croatia and spanning his education in Gospic and Prague, the beginning of his career in Budapest and Paris, and his moving to New York to work for Thomas Edison before founding a successful laboratory of his own.

Aimed at a readership with a particular interest in electrical engineering, Tesla's articles focus on two of his best known inventions, the induction motor and the oscillating transformer, also called the Tesla coil. He describes his development of the concepts for these devices and explains the theory behind them with the use of illustrative diagrams.

Tesla devotes a good portion of his work to explaining a recent project of his that involves transmitting power through the air. He envisions a worldwide network of transmitting towers that will allow for the transmission of information around the globe as well as make possible the remote control of electrical devices from anyplace on the planet. Tesla is optimistic that his "World Wireless System," as he calls it, will someday be built and recognized as a revolutionary advance.

Throughout the articles, Tesla expounds on his unique theory of mind which holds that human thoughts and actions are all responses to some kind of external stimulus. He comes to this conclusion based on his own unusual experiences from an early age where he frequently has vivid hallucinations where he sees scenes from his own memory played out again before his eyes. He realizes they are always triggered by certain things, and devotes much of his thought to identifying the causes of these visions. From his own experience, he begins to think of humans as a kind of extremely complex automaton and from this premise theorizes that it is possible to build machines that might approximate independent behavior and judgment.

Tesla is writing at the end of the First World War, and in his concluding article he muses over the role his technological discoveries might play in the establishment of a peaceful world. He proposes that his latest inventions that have the potential to control devices from remote distances might be used in the future to elevate warfare to even more horrific levels. Or, he suggests, his inventions might be used instead to create a worldwide network of shared information and culture that will bring the world closer together, eliminating the root cause of war.

My Early Life

My Early Life Summary and Analysis

In the opening chapter, Tesla explains that he has been asked by the editors of Electrical Experimenter magazine to produce a series of articles outlining his inventions for their readers. This Tesla is eager to do, but first, he explains, he feels it is appropriate to talk about his childhood and early years, even though he is reluctant to do so.

Part of this reluctance is because he regrets having suppressed his talent for inventing at a young age. This was partly because of the early death of his older brother, he explains, which devastated his parents. Growing up in the shadow of his dead brother undermined his confidence in himself, Tesla believes, and delayed his development as an inventor. Another factor is that as a child he is regularly distracted by a kind of very realistic hallucination where complete scenes from his own memory appear before his eyes, blocking out reality. To rid himself of these pictures, he tries to conjure up different ones, which keeps him occupied much of the time. Tesla will later use his remarkably vivid imagination to his advantage, since it allows him to construct machines in his mind, imagining them so precisely in every detail that he can run the machines and test their function using only his mind.

Tesla's father is a professor of mathematics, and described as having a prodigious memory. He drills the young Tesla in performing mental calculations and memorization, which Tesla believes provided his young mind with practical skills. He attributes his creativity and inventiveness to his mother, however, whom he describes as a tireless worker and a resourceful inventor herself, albeit within a domestic setting.

Tesla explains that as he matured, he realized that the vivid hallucinations he experienced, as well as other sensory experiences such as flashing lights and strange tastes in his mouth, are caused by certain external stimuli. He develops several extreme aversions, partly because of the sensory distractions they produce in him. He dislikes women's earrings, for example, and pearls. The smell of camphor irritates him greatly. He also describes some compulsive habits, such as mentally calculating the volume of the food on his plate before eating and performing repeated tasks in multiples of three.

Tesla concludes from his own experiences that all of his own thoughts are preceded by some external stimulus. From this premise, he concludes that the human mind is itself a kind of automatic machine and hints that it might be possible to control it externally. Tesla does not seem to believe that he himself is at the mercy of external stimuli, however, as he provides examples of how he has been able to harness the activity of his own mind to his advantage and to overcome some of his own habits, such as smoking and gambling, through willpower.

My First Efforts in Invention

My First Efforts in Invention Summary and Analysis

The second chapter of Tesla's series covers his early development as an inventor. He focuses first on his own physiology and relates it to his success as an inventor. Although he is in his middle age, Tesla explains, he has the physical condition of a man much younger. This is despite having had several extended illnesses as a child, he adds. He explains this is due partly to his observation of moderation in consuming stimulants such as caffeine or excessive alcohol. Tesla derides the contemporary prohibition movement that seeks to outlaw alcohol, however. He observes that other substances like caffeine and tobacco cause just as many ill effects and are just as dangerous. He also hints that it is preferable for people to have free access to these addictive substances, because it will allow for nature to weed out those who do not have the will power to overcome their use.

Tesla also attributes his success as an inventor to his devoted introspection. This began as a child out of necessity as he sought to banish the sometimes disturbing visions he experienced and replace them with others, and to seek out the external causes of his hallucinations. Most people lack this ability to look within, he claims, being more concerned with outward happenings.

Tesla proposes that an inventor's primary purpose is to save lives by improving the happiness and safety of mankind. His resourcefulness and observational ability allow him to better identify dangers and preserve himself from them, and he gives some examples from his early life. One example is when he seeks to play a trick on some friends by swimming under a dock to hide on the other side of it, making them believe he has disappeared. When he tries to emerge on the other side of the dock, he finds he is still underneath it and cannot find his way. He begins to panic, unable to breath, and is beginning to sink when an image of the dock flashes in his mind. He sees that there is a small gap between the water surface and the boards of the dock, and he rises up to press his mouth up against the planks to get a little air. He repeats this as he finds his way out from under the dock. He finds his friends have already assumed he drowned and are fishing for his body. He relates a similar experience where he is nearly washed over a weir while swimming in a mill pond, but saves himself by placing himself in a position that reduces the force of the rushing water on his body so he is able to work his way ashore.

Tesla takes to creating things at an early age, making pop guns and carving swords from wood. He spends the first years of his life living in the countryside village of Smiljan, in Croatia. When he is about six, his family moves to the city of Gospic. Tesla dislikes the city compared to his life in the country, and is terrified of the city boys. His uncle, his father's brother, is a bishop in the Serbian Orthodox Church and Tesla has his first experiences attending church, which he also dislikes. It is at church that he gets in

trouble for jumping on the train of a wealthy lady, tearing it from her dress. His father slaps him for his misdeed, and he claims he is made an outcast for his bad behavior.

He redeems himself however, through his inventiveness. The town purchases a new fire engine, and a crowd gathers near the river to watch the firemen hand pump the engine in its first trial. They place a suction hose in the river and begin to pump, but nothing happens and they are unable to determine the problem. They have given up by the time the young Tesla arrives. Despite knowing nothing about the machine or how water pressure works, he seems to instinctively know how it works and what is wrong. The suction hose in the river has collapsed. He wades out into the river and opens it back up, causing water to be sprayed over the crowd. They are delighted, he writes, and lift him onto their shoulders like a hero.

Tesla enters the "Real Gymnasium," a preparatory school in Gospic meant for boys who will go on to college. Here he is fascinated by the mechanical models, including models of waterwheels. He has read a description of Niagara Falls, and tells his uncle, who also lives in Gospic and is a bishop in the Serbian Orthodox Church, that he will someday build an enormous waterwheel driven by Niagara Falls. This premonition will come true, after a fashion, Tesla adds, referring to the power station he helps build at Niagara.

Tesla continues to be an adventurous boy who sometimes gets in trouble. He brags about his ability to catch crows by imitating their calls, and about his uncanny ability with a bow and arrow and a sling. He relates a few incredible stories about his prowess, hinting that there are even more that his reader will find even harder to believe.

My Later Endeavors

My Later Endeavors Summary and Analysis

Tesla enjoys his studies at the Real Gymnasium for the most part. He excels at math, and is able to do quite complex computations in his head by visualizing them. He is attracted by the mechanical models and attributes his early interest in invention to them, fired by his experience with the fire engine. He makes an early attempt at inventing a perpetual motion machine by partly surrounding a carefully-constructed wooden cylinder with a vacuum. His machine seems to work in principle as the cylinder rotates slightly. Later he realizes that it moves because there is a leak in the device, and is devastated.

One of the requirements of the curriculum is drawing, and this Tesla finds he has no talent for at all. This is worrisome, because drawing is a requirement for advanced study under the curriculum at that time, Tesla explains.

At the age of ten, Tesla completes his studies at the Real Gymnasium and shortly afterward falls very ill with several maladies. Doctors are unable to help him, he claims, and eventually give up on him. During this time he is bedridden and is able to read as much as he wants. It is during this illness that he discovers the books of Mark Twain and they become favorites. He is to meet Samuel Clemens, he writes, and even become his friend as an adult. When he tells the author how important his books were to him as a child, Clemens is moved to tears.

Tesla recovers and is moved to Carlstadt in Croatia to live with his aunt and attend a higher school. His aunt is married to a colonel and lives in a fine house. Tesla's life is not easy, however, as he describes a regimented routine under his strict aunt.

Tesla attends the higher school for three years, where he is fascinated by the study of electricity under the encouragement of a professor of physics. He has a strong desire to go into engineering himself, but his father is intent that he will enter the clergy. This depresses Tesla greatly, since he sees no way out of his fate. Again, he falls deeply ill and feels he is near death when his father comes to visit. He tells his father that perhaps he would recover if he would be allowed to study engineering. His father promises that he will allow it. Tesla recovers, and his father keeps his promise, sending him to the Polytechnic School in Gratz, Styria. Before beginning his engineering studies, however, Tesla's father insists he spend a year traveling and being outdoors to build his strength. Tesla takes the vacation recommended by his father and his health does improve. He spends much of his time hiking and dreaming up new inventions, some of them strikingly outlandish, such as a ring hovering around the earth's equator that could be held in place as the earth revolved beneath it, allowing people to travel at the speed of the earth's rotation, or about 1,000 miles per hour.

Tesla dives into his engineering studies with extreme vigor, sleeping very little and staying up all night reading and studying. As a result of his extra studying, he is able to

excel and achieve high honors. When he displays his high marks and awards to his father, however, his father seems indifferent and does not encourage him. Tesla writes that this nearly causes him to give up his studies. Years later, after his father's death, he discovers letters written from his professors at the school to his father telling him they fear that Tesla will kill himself through overwork and should be encouraged to take things more slowly.

Tesla reveals another of his compulsive habits that is present during this time of his life. He must complete things he has started, no matter how long they may take or how difficult they may be. He begins reading the works of Voltaire and, after starting, learns that Voltaire's works run to about a hundred large volumes of small print. Regardless, Tesla is compelled to complete his reading, although it exhausts his time.

Tesla is inspired by his professors at the Polytechnic School, and names some of them in particular. Professor Poeschl, a German professor, teaches theoretical and experimental physics. He introduces his students to a kind of electrical motor called a Gramme dynamo, which has a magnetic coil that rotates and transmits electricity through brushes that ride along its surface. While watching a demonstration of the dynamo, Tesla remarks that it might be possible to create such a device without the brushes. Professor Poeschl disagrees, and devotes a lecture to the subject of why it would not work. Tesla is temporarily convinced that his idea is wrong, but he returns to his conviction that a brushless electric motor is possible. He begins to imagine how such a device might work, and devotes much of his remaining time at the Polytechnic School trying to solve the problem. He is unable to find a solution and nearly gives up the idea.

In 1880, Tesla moves to Prague at the wish of his father to attend the University there, and where he continues to work on his idea. After a year of study, Tesla decides that his parents are sacrificing too much to support him and resolves to get a job. He has connections with the company that is about to install a telephone system in Budapest, and he goes there to take a position.

It is in Budapest that he suffers from a severe breakdown. He describes a miserable condition where his senses become especially acute and he is unable to function. The smallest sounds seem like explosions in his ears, and he cannot bear light. After a time, he recovers, and his enthusiasm for solving the problem of a brushless electric motor increases. He believes the solution is somewhere in his mind but that he has not yet found out how to express it.

One day he is walking in a park in Budapest with a friend, reciting poetry from memory. After repeating a few lines from Faust by Goethe, the solution suddenly appears in his mind as clearly as if the machine actually existed. Stunned, he stops and draws a diagram of it in the dirt for his friend. He is elated and deeply moved, calling it the greatest discovery of his life.

Here, a diagram is inserted in the text that explains the function of Tesla's "Two Phase Induction Motor," the invention he has spent so many years seeking, and the concept

for which he hits upon suddenly during his walk in the park. The induction motor uses two alternating currents of electricity that are out of phase with each other by 90 degrees. When these currents are passed around a circle, they create a rotating magnetic field inside the circle. A magnetic rotor placed within the loop rotates along with the magnetic field without touching any wires or brushes, converting the electrical energy into a rotational motion that can be used to power all manner of devices. The diagram provides an analog example of how the motor works by comparing it to a hydraulic engine, a device that is presumably more familiar to Tesla's readers.

The Discovery of the Tesla Coil and Transformer

The Discovery of the Tesla Coil and Transformer Summary and Analysis

Tesla discovers that the position he had expected at the new telephone company in Budapest does not yet exist and he is forced to take a position as a draftsman for the Hungarian government in the central telegraph office, where he works until the telephone company is ready to begin operations. He takes control of the telephone company for the financier, a Mr. Puskas. Tesla quickly draws notice for inventing and improving on the telephone equipment, and when the Budapest company is sold, Mr. Puskas invites him to take a position in Paris. Tesla eagerly agrees.

In Paris, Tesla works for Charles Batchellor, whom he describes as an important assistant of Thomas Edison. His daily routine involves rising early, walking to a bathing house on the River Seine where he has a strenuous swim before arriving at work. It is while working under Batchellor that Tesla gets to know some Americans, to whom he relates his idea for the induction motor. The Americans are enthusiastic and propose creating a stock company to develop and produce the idea. Tesla is ignorant of business and finance matters and thinks the idea ridiculous at the time, and the proposal goes nowhere.

Tesla's skill make him indispensable to the company, and he is sent to several plants to make repairs and improvements to the telephone and power equipment. He is sent to Strassburg, in Germany, to help repair the power plant at a train station. His work keeps him busy, but it is in Strassburg that he finds time to construct an example of his induction motor for the first time. With the help of the mayor of the city, a Mr. Bauzin, he tries to attract the interest of some wealthy businessmen but finds no supporters. Eager to return to Paris to look for other possible supporters, Tesla instead finds himself bogged down in the bureaucracy of the project on which he is working. He relates an amusing story demonstrating the sometimes ridiculous procedures he must endure. Before a certain light fixture can be placed in a hallway, approval has to come from several different levels of management, with each manager moving the fixture slightly one way or the other, until the final approval is made to put the fixture exactly where Tesla had originally proposed it go.

Once the project is finished, Tesla returns to Paris in anticipation of finding support for the production of his motor. Instead he finds he is given a runaround by people who seem to be interested, but are not willing to make any commitment of support. Finally, at the recommendation of Batchellor, Tesla decides to go to America with the possibility of working for Thomas Edison. He sells everything he owns and sets out for New York City.

Tesla quickly proves his worth as an assistant to Edison, working extremely long hours. He is put in charge of designing electric motors based on Edison's concept using direct current, but eventually quits after a disagreement over pay. Tesla claims he was told that he would receive $50,000 from Edison's company for his work, but that this turned out to be a "practical joke."

Tesla wants most of all to start an electric company to produce his induction motors, but finds that potential investors are mostly interested in another of his inventions, the arc lamp. He lends his name to the company created to produce the lamps and is satisfied to make enough to start up the Tesla Electric Company in 1887. He builds his motors exactly as he has envisioned them, with no alterations, he claims. Within a year, he has made a deal with the Westinghouse Corporation to produce his motors on a large scale. He runs into a problem, however, which is that the current that Westinghouse uses as a standard is of a higher frequency than that he has used to create his motors. When trying to run his low-frequency motors with the higher frequency current, he finds it difficult to produce steady motion and keep the motors tuned.

This sets him on a field of investigation to develop a way to create a steady oscillation from any kind of electrical current. He solves the problem by creating a device that has a condenser designed to discharge current across an air gap at a preset level of charge. The result is that direct or alternating current can be converted into a charge of any desired frequency. The invention is called the "Tesla Coil," and Tesla likens his elation at discovering its principal to that from his discovery of the concept for the induction motor.

The Magnifying Transmitter

The Magnifying Transmitter Summary and Analysis

Tesla writes he is often asked which of his inventions he feels is the most important. He answers that the importance of an invention is often not immediately known. His induction motors, which are in wide use as he is writing these articles, were at first not widely recognized for their advantages and importance.

All of his inventions to this point, however, have been primarily improvements on existing devices, aimed at adding to their development, and not at replacing them. His current project, however, he suggests, is of a different type. The "Magnifying Transmitter" has the potential to radically change the world, he claims.

Tesla writes that the editors of "Electrical Engineering" have asked him to provide a detailed description of his magnifying transmitter, which he does in somewhat technical terms. Its primary function is to allow for the creation of an electrical field of any desired strength in an open area. This field can be used just as wires are currently used to transmit power through the air at a practically infinite distance around the globe.

Tesla describes his early experiments with this technology, which he has successfully built in a laboratory in Colorado. He imagines that by creating a large enough transmitter, electrical fields, which can be used for many different purposes, can be created that span the entire globe. Some if the potential uses Tesla envisions are the transmission of images and sounds to any location on the planet instantly. Any device that can be controlled using wires could also be controlled using this field, but at any distance away. He also imagines that the field might be used to control the weather, bringing rainfall to the desert, for example.

Following his experiments in Colorado, Tesla returns to New York and undertakes the construction of a large transmitter on Long Island as a first step in creating this "World Wireless System" as he calls it. The tower is never completed, however, and Tesla does not go into detail about why the project is abandoned. At the close of the chapter, he makes reference to the wealthy banker J.P. Morgan, implying that there are rumors that Morgan's withdrawal of his initial support for the project had doomed it. Tesla defends Morgan, however, and denies that he had anything to do with the failure of the project. The time has not yet come for the importance of his invention to be known, Tesla remarks, but is confident that it will be recognized one day.

The Art of Teleautomatics

The Art of Teleautomatics Summary and Analysis

In the final article of the book, Tesla examines the theoretical possibilities of his "World Wireless System" if developed along the lines of his theory that humans are actually very complex automatic machines. He reiterates his childhood experiences which strengthen his conviction that thoughts and actions come about because of specific external stimuli. It should be possible, he theorizes, to build an automatic machine that behaves much in the way a human does, exhibiting independent activity and even approaching a certain level of judgment.

As a first step toward such a development, he describes briefly his invention of remote-controlled boats and other remotely-controlled devices using what he calls "teleautomatics." Using his wireless system, he has created these machines that can be controlled from a distance with no wires attached to them. He remarks that he has tried to interest the military in his technology, but has been rejected despite what he feels is an obvious use for such devices in war. The next step in the development of teleautomatics, Tesla proposes, is to extend their range by means of his world wireless system so that it would be possible to control such devices anywhere in the world. Tesla also hints that he has developed plans for a kind of flying machine that uses no wings or rotors to fly, but that could be precisely controlled in flight using his wireless system.

Tesla mentions that his teleautomatics seem almost magical or supernatural to some, and he takes the opportunity to give his opinions on the occult and mystical beliefs. He returns to his theory that most people do not examine their own actions and thoughts carefully so as to judge their origins or causes, and so are often at a loss to explain experiences that actually have identifiable causes. He gives an example of a vision he has of his mother, appearing in a certain form to him just as she is dying while Tesla is away. He is troubled by this vision for some time, but eventually realizes the form of it matched that of a painting he had seen earlier.

In this final article, Tesla addresses the use of technology in war. He mentions that he sees obvious uses for remote-controlled devices in war, and writes that as a younger man he saw this as a major advantage of his work. He is now older and is writing at a time just following the end of the First World War. The nations of the world are forming the League of Nations, an organization intended to avert such a worldwide crisis again. Tesla is skeptical, however, believing that no agreements or organizations will ever end war as long as the root cause is not removed.

This root cause, Tesla suggests, is the vast distance between peoples. Only by bringing people closer together so they might see the rest of the world as their true neighbors will relations between nations become peaceful, he suggests. This will be the major contribution of his world wireless system to mankind, he believes. By allowing for the

instant transmission of information anywhere on the globe, it will create a close world community.

Tesla does not support the proposed League of Nations, feeling that it will actually create more problems in the future. War in the future will be even more horrific, he adds, because his inventions will make it possible for any nation to destroy any city on the planet from a vast distance. He ends his autobiography with the hope that his discoveries will be used to draw the world together rather than perpetuate war.

Characters

Nikola Tesla

The author and the subject of the autobiography, Nikola Tesla is born in Smiljan, Croatia, in the late 19th century. His father is a professor of mathematics and his uncle a high-ranking clergyman in the Serbian Orthodox church. Tesla is educated in Gospic and Carlstadt, Croatia, with his father insistent that he enter the church for a career. Tesla himself is fascinated by physics and electricity and eventually convinces his father to allow him to study engineering. He completes his education in Gratz and in Prague.

Tesla finds his first steady job helping construct a new telephone system in Budapest, then moves to Paris where he makes connections with Americans who convince him to go to America. He is hired by Thomas Edison to help design electric motors, and later starts his own laboratory.

Tesla is an innovative inventor whose major contributions to electrical engineering are the induction motor and the Tesla coil. At the end of his career, his primary project is the transmission of power through the air with the intention of creating a "world wireless system" that he claims will revolutionize communication and bring peace to the planet.

Thomas Edison

A well-known American inventor and a one-time employer of Nikola Tesla, Thomas Edison hires Tesla as an assistant and soon puts him in charge of designing electrical motors for his electric company. He is deeply impressed by Tesla's devoted work ethic, long hours and considerable abilities. Edison and Tesla have a falling out over pay, which Tesla refers to only briefly, but which results in Tesla leaving Edison's employ. Tesla later sells the patents for his own design of electric motor to Westinghouse, which competes directly with Edison.

Tesla's Mother

Tesla considers his mother to be the source of his own creativity and inventiveness. He relates stories about her intelligence and ceaseless work habits that seem to be mirrored in Tesla himself.

Tesla's Father

Tesla's father is a professor of mathematics. He is a stern man who insists that Tesla will become a clergyman, but who relents when Tesla becomes very ill and asks if he might be allowed to study engineering instead.

Tesla's Uncle

Tesla's uncle is a high-ranking religious figure in the Serbian Orthodox Church and is an early influence on Tesla's education. He is also a teacher at the Real Gymnasium, the first school attended by Tesla.

Samuel Clemens

Samuel Clemens is also known as Mark Twain. Tesla indicates that during an illness as a boy he discovered the books of Mark Twain and found them fascinating, attributing his recovery in part to them. Later, after moving to America, he meets and befriends Samuel Clemens.

Charles Batchellor

An assistant to Thomas Edison who hires Tesla in Paris to help design and maintain electrical equipment, Charles Batchellor later influences Tesla's decision to go to America.

J.P. Morgan

A wealthy banker, J.P. Morgan backs Tesla's initial efforts to build the "world wireless system."

Professor Poeschl

One of Tesla's college professors piques Tesla's competitive spirit, Professor Poeschl tells him that an electric motor without brushes is impossible. Tesla later builds just such a motor.

Mayor Bauzin

Mayor Bauzin of Strassburg, Germany befriends Tesla while he is working there. Bauzin is a supporter of Tesla and tries to help him find support among the businesspeople of Strassburg, but is unsuccessful.

Mr. Puskas

A businessman who is installing the first telephone system in Budapest, Mr. Puskas gives Tesla his first steady job after leaving school.

Objects/Places

Smiljan, Croatia

The rural area of Croatia where Tesla is born and where he spends his early boyhood

Gospic, Croatia

The city where Tesla's family moves when he enters into the Real Gymnasium for his schooling

Carlstadt, Croatia

The city where Tesla continues his education and where he lives with a strict and wealthy aunt

Gratz, Styria

The city where Tesla begins his training as an engineer

Prague

The eastern European city where Tesla completes his education in engineering

Strassburg

The city in Germany where Tesla is employed designing and building a power supply system for the train station

Paris

The largest city in France, where Tesla finds work under Charles Batchellor, an American assistant to Thomas Edison

New York City

The home of Edison's laboratories and the city where Tesla comes to live when he decides to leave for America. Tesla later founds his own laboratories in New York City.

Induction motor

Tesla's breakthrough invention, an electric motor that uses a rotating magnetic field to convert electrical energy into rotational motion

Tesla Coil

Another of Tesla's major inventions, a device that allows for the precise control of electrical currents

Magnifying Transmitter

One of Tesla's later projects, a device for transmitting power through the air. Tesla begins construction of a large magnifying transmitter on Long Island, but construction is halted.

World Wireless System

An interconnected system of magnifying transmitters envisioned by Tesla that will allow for instant communication worldwide and make it possible to control devices from long distances away

League of Nations

A proposed international organization of countries following the end of World War I. Tesla offers his opinion that the League's mission to avoid future world conflict will fail.

World War I

The major international war that takes place in the early 20th century. As Tesla is writing the articles that make up his book, the war has recently ended.

Themes

The Role of Technology in Society

Tesla opens his autobiography with the statement, "The progressive development of man is vitally dependent on invention." (p. 27) It is clear throughout his writing that he feels he has played a crucial role in the advancement not only of technology but human happiness through his own crucial work.

Tesla continues in his opening statement, "[Invention] is the most important product of his creative brain. Its ultimate purpose is the complete mastery of mind over the material world, the harnessing of the forces of nature to human needs." Technology is not only important to progress in Tesla's view, it is humankind's most important purpose.

Tesla remarks that he is often asked which of his inventions he thinks is the most important, noting that he has critics who claim that aside from the induction motor he has not really made any practical advances. He replies that it is a mistake to judge the importance of an invention based on its immediate practical use. In many cases the importance of a certain advance is not known for some time after it is made. Taking this forward view is crucial to the inventor, Tesla suggests. He himself is optimistic that some of his more unusual ideas, such as the "world wireless system," which appear impractical and inefficient, will some day change the world into a peaceful community. Tesla believes that technology has this capability to produce worldwide happiness, and he is clearly motivated by this belief.

Tesla's Theory of Mind

From an early age Tesla is aware that he has an unusual mental capacity. He has a photographic memory that frequently imposes itself on his thinking in the form of vivid hallucinations of events he has experienced. These are so real that he is able to inhabit them, examining objects and places in his memory as if they are real. Later in his career, Tesla is able to use this unusual ability to design complex machines in his mind before building them, even to the point he claims, of letting them run in his mind so he can examine them for wear.

Tesla has other unusual sensory experiences, such as seeing flashing lights or experiencing tastes. Through extensive self-examination, he realizes that these experiences are triggered by external stimuli, some of them strange. From his own experience, Tesla develops a theory that all human thoughts and actions are responses to external stimuli. Based on this premise, he concludes that it would be possible to create a kind of automatic device that would approximate human intelligence. Tesla is forming his idea in the early 20th century, well before the advent of computers, artificial intelligence or robotics. While his theory of the inner workings of the human mind are anecdotal and based mostly on his own individual experience, his conclusions about the

possibility of creating devices capable of complex actions based on external input proves to be prophetic.

Rejection of the Supernatural

Many of Tesla's inventions and claims are so new as to seem outlandish or impossible, even to the modern reader. His early experience of vivid hallucinations leads him to believe that one day it will be possible to project thoughts like one projects images on a screen, for example. Other inventions of his that seemed equally strange to his contemporaries are now more commonplace. Tesla's invention of remote controlled boats, for example, was an advance that seemed impossibly magical at the time. He writes that an examiner from the US patent office insisted on seeing the devices demonstrated before granting the patent. Tesla also used his remote-control technology to create a machine that could apparently answer questions from onlookers, but which was actually controlled by him.

He regrets that his theories have been grabbed onto by some who see them as evidence of a supernatural presence or mystic abilities on his part. Tesla rejects these interpretations strongly. Most people, he exclaims, do not take any care to examine the workings of their own mind, as he has done, and so do not recognize the true source of their own experiences. He gives an example of a vision he has of his dead mother in which she appears as an angel. This is not an image he has ever actually experienced and he is at first puzzled about its source. He eventually realizes that he has placed the image of his mother's face onto the image of a painting he had seen. Someone less analytical and self-aware might have given the vision a supernatural explanation, he suggests. According to his theory of mind, however, we are all extremely complicated automatons. We are sometimes ignorant of the external stimuli that provoke experiences, but these stimuli have rational explanations nonetheless.

Style

Perspective

Tesla is writing "My Inventions" in 1919, when he is in his early 50s. His perspective is of a successful inventor and scientist looking back on his career. Tesla has made some significant advances in the development of electricity, and he is proud of his achievements. His intended audience is the readership of "Electrical Engineering," a magazine devoted to the field in which he has excelled. This gives Tesla the freedom to include technical details of his inventions with the knowledge that they will be understood by his readers, and to expand on the details of his career knowing that his audience is likely to be very interested.

Tesla, by his own admission, is reluctant to write about his childhood and early years. These periods in his life lacked the structure and purpose of his later career, and he seems to regret the time he lost that might have allowed him to achieve even greater things had he started earlier. Tesla focuses on two of his most prominent inventions, the induction motor and the Tesla coil, which have brought him widespread fame, although not great riches. Tesla does not display any real interest in the commercial aspects of inventing, admitting to being nearly ignorant of such things as how companies are formed or run.

Tesla is apparently aware of the importance of promoting ones inventions, however, and does so throughout the work. His promotional skills are more evident in the final chapter on "teleautomatics" where he outlines a radical revolution in communication that will come about once his latest invention is adopted and developed.

Tone

Tesla's prose is concise and straightforward, as one might expect from a practical inventor. He adopts a suitable tone of humility in describing what he knows are important contributions he has made, but his pride at his own achievements is evident as he describes his inventions and their potential use. He calls himself "fortunate" to have had such success as an inventor, but it is plain from his writing that he attributes his success to his ceaseless work habits, strong personal willpower, and a unique mental capacity.

Tesla peppers his writing with several anecdotes, many of which are humorous stories about himself. These often self-effacing stories temper the sometimes boastful tone of Tesla's prose, showing that he does not always appear to take himself too seriously.

Tesla describes some serious disappointments in his career, and adopts a pointed tone that is couched in reserved language. He describes his parting of ways with Thomas Edison, apparently over the issue of pay, as the result of a "practical joke" on the part of an unnamed manager. When he addresses the failure of his first attempt to build a

"world wireless system," he berates the nameless critics who have speculated about the reasons for the failure.

Tesla uses similarly impatient language when discussing the lack of introspection he finds in most people, and in the willingness of many of his fellow scientists and inventors to buy into the newest most sensational claims without any forethought. Tesla is also sharply critical of the efforts in the wake of the First World War to create a League of Nations intended to end such conflicts, predicting (correctly as it turns out) that such agreements will not prevent another world war.

Structure

"My Inventions" is an autobiography comprised of six separate chapters, each of which originally appeared in successive editions of the magazine "Electrical Engineering" in 1919. The chapters are in general chronological order of Tesla's life, with each addressing a major period.

The first chapter is entitled "My Early Life," and describes Tesla's boyhood in the countryside of Croatia and his early education in the city of Gospic. The second chapter, called "My First Efforts at Invention," outline the young Tesla's fascination with machines and the scale models he encounters at the school he attends in Gospic. He also elaborates on his unusual mental and physical abilities that appear to be much higher than normal.

The third chapter is called "My Later Endeavors: The Discovery of the Rotating Magnetic Field." This chapter covers Tesla's later education and early career as an electrical engineer, a period during which he regularly thinks about the problem of creating an electric motor that does not use wire brushes. The chapter concludes as the solution to the problem suddenly occurs to Tesla while he is walking in a park in Budapest.

Chapter Four, entitled "The Discovery of the Tesla Coil and Transformer," describes another of Tesla's noteworthy inventions, the Tesla Coil, a device that allows for the control of electric currents. It is during this period in Tesla's life that he moves to New York, first to work as an assistant to Thomas Edison, then founding his own electric company and laboratory.

In Chapter Five, called "The Magnifying Transmitter," is a somewhat technical article on a recent invention of Tesla's that can transmit power through the air. He has high hopes for the usefulness of this invention, which he expands upon in the final chapter, "The Art of Teleautomatics." This final chapter sets forth several potential uses for a "world wireless system" based on Tesla's invention that will allow for the transmission of information around the globe instantly, and make it possible to remotely control devices anywhere on the planet. Tesla closes the final chapter with the prediction that his invention will change the world, and the hope that it will be used for peace.

Each article is illustrated with a portrait of the inventor at about the time of the period covered within the article. Photographs and diagrams are also included to explain the function of the inductive motor and the Tesla coil.

Quotes

"The progressive development of man is vitally dependent on invention. It is the most important product of his creative brain." Chapter I, p. 27

"Of all things I liked books the best. My father had a large library and whenever I could manage I tried to satisfy my passion for reading. He did not permit it and would fly into a rage when he caught me in the act." Chapter I, p. 36

"An inventor's endeavor is essentially lifesaving. Whether he harnesses forces, improves devices, or provides new comforts and conveniences, he is adding to the safety of our existence." Chapter II, p. 42

"In our new house I was but a prisoner, watching the strange people I saw thru the window blinds. My bashfulness was such that I would rather have faced a roaring lion than one of the city dudes who strolled about." Chapter II, p. 47

"During all those years my parents never wavered in their resolve to make me embrace the clergy, the mere thought of which filled me with dread." Chapter III, p. 53

"I had a veritable mania for finishing whatever I began, which often got me into difficulties." Chapter III, p. 56

"For a while I gave myself up entirely to the intense enjoyment of picturing machines and devising new forms. It was a mental state of happiness about as complete as I have ever known in life." Chapter IV, p. 65

"I wish that I could put into words my first impressions of this country. In the Arabian Tales I read how genii transported people into a land of dreams to live thru delightful adventures. My case was just the reverse." Chapter IV, p. 71

"A new idea must not be judged by its immediate results." Chapter V, p. 80

"My project was retarded by laws of nature. The world was not prepared for it. It was too far ahead of time. But the same laws will prevail in the end and make it a triumphal success." Chapter V, p. 91

"No subject to which I have ever devoted myself has called for such concentration of mind and strained to so dangerous a degree the finest fibers of my brain as the system of which the Magnifying Transmitter is the foundation." Chapter VI, p. 93

"The by far greater number of human beings are never aware of what is passing around and within them, and millions fall victims of disease and die prematurely just on this account." Chapter VI, p. 102

Topics for Discussion

How do Tesla's views on the role of technology in war change over time, according to his own account?

Discuss Tesla's idea of the "World Wireless System" in the context of modern communications.

Is Tesla a reliable narrator of his own life story?

By his own account, Tesla spends a good deal of time in thought and introspection. What are the advantages and disadvantages of this habit as he describes it?

What modern technologies did Tesla foresee?

How does Tesla's method differ from his contemporaries such as Thomas Edison?

How does Tesla's self-admitted ignorance of financial matters affect the events in his life?