Tesla, Man Out of Time Study Guide

Tesla, Man Out of Time by Margaret Cheney

BOOKRAGS

Contents

Plot Summary

This is an incredible biography of one of the most amazing men of the late 19th and early 20th centuries. He was a scientific genius, who managed to convince the right people of the value of his work, which enabled him to procure funding for numerous projects and helped to ensure that he would have "a name."

Tesla was born a Serb in Croatia and his childhood was reasonably normal. His father, a cleric, was a respectable man and Nikola, himself, was very obviously exceptional. He claimed to have received his gifts from his mother, whose genius was evident to him. Tesla's main tasks in childhood were to cultivate his own mind and to open his father's mind. The boy nearly died twice prior to persuading his father that a scientist-engineer might be an acceptable occupation rather than that of a military officer or cleric. He became socially well connected while in his late twenties and thirties with a good deal of help and persistence.

The biographer provides an in-depth and extensive account of Nikola Tesla's life. The concise description of his childhood in the preceding paragraph is an example of the completeness of her work. She finds people who have at least met the deceased scientist in person. This enhances the author's ability to create accurate and interesting material. Many of those who met the inventor decades later, after he had moved to America and grown highly successful were able to recount what they knew of him to the biographer.

The title is rather apt. In truth, much of Nikola Tesla's work has only begun to be understood and become of functional use in our society today. Some of Tesla's work would be able to progress much further with additional research in other areas of scientific development. In fact, much of Tesla's work has evolved into the field of applied electrical engineering and has been helped along by those younger than Tesla. Many breakthroughs based upon Tesla's work began while he was still alive. Fortunately, the generations since have added to what he was able to accomplish. One example of this is the presently-existing ability to use wireless transmission for communication. Tesla made some headway in this area and as such, has been a vitally important member of the "team science of humanity." Tesla was ahead of his era, which shows directly in the ways in which those who followed have been able to do more with his work, and there is no sign of this stopping. He left enough patents and supplemental notes that have been preserved to allow other people to work with ideas of his that could not be implemented in his lifetime.

Acknowledgement; Introduction; Chapter 1, Modern Prometheus and Chapter 2, A Gambling Man

Acknowledgement; Introduction; Chapter 1, Modern Prometheus and Chapter 2, A Gambling Man Summary and Analysis

The book begins with a set of acknowledgments and then an introduction. Though the author is Margaret Cheney, the introduction contains numerous quotes by others. The introduction explains a bit about the history of writings both by and about Nikola Tesla. This is a slightly complex material. The biography by Ms. Cheney is the first one written in some time. An earlier work titled Prodigal Genius was the first and foremost biographical work about Tesla; it was written by John J. O'Neill and came out in 1943. The first Touchstone edition of the present title was published in 2001. The author explains in the introduction that there were a few other biographies, but they were outlandish.

The first chapter is titled Modern Prometheus. It begins with a unique kind of realism. There is nothing but a tall, slender brown-haired man, going to dinner by himself. He exhibits "weird behavior." He sits at a table with a large pile of napkins and wipes down everything as if he were in a hospital, though he is at a fancy restaurant. He is relatively famous, the author explains. This is Nikola Tesla. He is served in an individualized manner. He is admiringly observed but remains aloof. Two other people actually interact with him. He also receives a note. Readers are now aware that at this time the inventor is socially well connected. This is always helpful for funding and publicity.

At the lab, Tesla demonstrates a very small number of devices to his friends. One is a method that allows him to survive high voltage. When he uses this device, it generates an awe-inspiring glow. Another involves some uncertain system that creates the very glow that we customarily associate with daylight. It is most likely rooted in some type of refraction and diffusion, but there remains no revelation regarding the source of his light.

He has a couple of other "tricks," which does not mean "lies," but rather scientific effects that his observers frequently do not understand. One of these is what appears to be a fireball but it is it does not burn.

It is in the second chapter, not the first, that the author begins to tell the tale of Nikola Tesla's birth and childhood. Beyond any shadow of a doubt, his mother was brilliant, and Tesla himself was certain that his own brilliance was due to his inheriting her genes. She was an inventor, and hence his whole business was taking after her. The author explains that Tesla was terribly sorry his mother had not been able to do more with her

incredible gifts due to gender biases of the time and place. Even so, she apparently invented a great deal, usually practical devices for use around the farm and home.

Tesla was fourth of seven children. There was a strange "aura" about much of his life for two specific reasons. First, was that one of his favorite elder siblings died when they were both quite young. The sadness left a mark upon the entire family, each affected in their own way. The other main issue was that the family's tradition was rather limiting. While the girls had one choice (marriage and family); men had two options. They could go into the military or clergy. However, Nikola's father had decided that Nikola would be clergy. Nikola's father himself had switched to the clergy in rebellion after trying a career as an Army officer. While this does not explain everything to readers, it intimates that what Tesla ended up doing was a very radical departure indeed: he set a precedent in numerous ways.

The author explains for readers the reality that Nikola made the most of cultural traditions for the cultivation of the human memory. While methods in the literary era remain, the oral cultures had more sophisticated means of achieving tremendous mental discipline, including memory powers. Cheney informs readers that because of this and other methods, it is not possible to discern which of Tesla's mental powers are natural and which are the results of cultivated, second nature. Nevertheless, Tesla also had shortcomings or areas of difficulty and uneven development. When the author describes these, readers can appreciate the holistic approach to the biography. The biography is really about the actual Nikola Tesla, rather than portraying a simplified image of him.

Chapter 3, Immigrants of Distinction; Chapter 4, At the Court of Mr. Edison

Chapter 3, Immigrants of Distinction; Chapter 4, At the Court of Mr. Edison Summary and Analysis

This chapter begins with a humbling yet significant set of events. Tesla gets a job that is neither that of cleric or military officer. This is viewed as helpful after the card playing years.

He manages, with help, to obtain work at a telegraph office in Hungary. Doing so, he is participating in a "new age" of communications technology.

He is later given the opportunity to work for Edison's company, which is superb, except for one thing. Tesla, at this time, though still rather young has already begun to develop alternating current. Thomas Edison was very emotionally attached to direct current, and was known to have been very closed to the solution of a problem they were having, which Tesla saw as imminent and harboring the very best and greatest of potential—the use of alternating current.

After gaining some experience with Edison's corporation, Tesla managed to get promoted into the field of his personal career choice—electrical engineering. Tesla invented or contributed to his first professional inventions at this time.

In 1883, Tesla is convinced of the preference of using alternating current (AC) over direct current (DC) for carrying and moving electricity. He ran many of his experiments on the job but was always able to use his mind. One of the features of his psyche was that he was able to use visual thinking in vivid detail, which empowered him to come up with inventions and to test them, make corrections, and improve them—all without using any notes or sketches. While readers may feel unimpressed now that alternating current has been accepted and integrated into vast portions of the world's technological systems, it must be emphasized that AC was a discovery of the utmost importance. The use of alternating current is one of Nikola Tesla's most significant contributions to humanity.

The chapter concludes after he has had both triumphs and challenges. He solved another problem for a business, for which he was promised as incentive a good bonus. He was denied this bonus and he really felt disappointed about it. Nikola Tesla was urged to abandon Continental Europe for the sake of his career, so at age 28, still single and childless making it both easier and harder, Nikola took the advise and made his way to America despite precarious financial conditions.

Chapter 4 begins with Nikola's arrival in New York City in the same year that the French gave the USA the Statue of Liberty. It is imperative that readers understand the context

in which these events took place. Electrical engineering and the development of electrical lighting was at that time "cutting edge." The role of incandescent lightbulbs and making electricity available and safe for use in industry and in homes was akin to the present state of computer technology's recent advances in systems technology (and which, by the way, Tesla contributed to with his wireless technology, although at the time he invented wiresless, computers were still a future invention). As glamorous as Manhattan and New York are to many readers, for Tesla it was simply a place of potential work opportunities. He was given a most helpful letter of introduction to the now famous and rather young Thomas Edison, whose genius, once discovered, was well used by society. Edison was 32 years old at the time, to NIkola's 28 years.

Tesla was able to secure work with Edison by being willing and able to solve a problem that Edison had promised to "have taken care of" but for which Edison needed assistance. Edison was highly effective and had his reputation to live up to. Batchelor told Edison, that Nikola was "the other great man."

The two inventors were able to work together for a time, but there was also terrible friction between them. Their personalities were not particularly compatible. Edison was apparently only alive thanks to the care and tending of his wife; whereas, Tesla took care of himself. The former was thorough but in a manner that Tesla felt was offensively inefficient, relying upon the process of elimination rather than using the mind to come up with a better way to hone in on the solution to a problem. For example, where Tesla might use a magnet to find the needle in a hay stack, his perception was that Edison was more apt to sort through the whole pile until he found the "odd one."

The other problem was that alternating current was going to be come between them. Even so, being younger and willing to submit to his boss Edison, Tesla worked diligently to improve the quality of the direct current apparatus, partly in the hopes of a major $50,000 bonus. Instead he was radically disappointed and offered a raise of $18/week, which was viewed as quite good at the time. Apparently, Edison was astounded that Tesla had achieved the task.

Tesla had another up and down cycle. He was approached by people who invested in him enough to create his own company. Then, the financial investors told him what inventions they wanted and he was thereby constrained to do that. He had ardently hoped to develop alternating current technology but his investors did not want Tesla wasting his time on what they viewed as unimportant technology.

Chapter 5, The War of the Currents Begins; Chapter 6, Order of the Flaming Sword

Chapter 5, The War of the Currents Begins; Chapter 6, Order of the Flaming Sword Summary and Analysis

The story picks up right where readers have left off from the previous chapter. Nikola Tesla, around 30 years old was depressed because he had been promised work and financial wealth. He had hoped to advance his most beloved project. He had made some progress but then was severely disappointed and felt both let down and deceived. On top of everything else, this caused him to be faced with the common need for funding and what is often called "a day job."

In 1887, Tesla was in another good situation : he had received substantial funding for a half a million dollars, which translates to at least ten times that amount today. Now, at last, he could proceed. His first project was to work on another dynamo.

During this chapter, one of the changes is that the inventor Tesla has "gone up in levels"; his influence is apt to reach far more people. He has begun to develop greater skill in securing funding, while also learning to distribute much of the labor involved with his projects to others under him. Madam Cheney elucidates on the matter of Nikola Tesla's personal growth by citing a case wherein he caused trouble to himself by the way he handled many of his staff. Westinghouse had to make adjustments in order to sync what had previously been independent projects into a set of equipment that ran electricity in the same way. When Tesla mishandled his staff, it cost him months of inefficient activity before the desired goal was achieved.

At this time, conflict arose surrounding Tesla's alternating current. The difference of opinion between Tesla and Edison impacts the social fabric. Tesla's solution was superior to Edison's, and for that reason it won the day. However, they had to put up a fight for using AC in order to win the conflict. Edison was offended for a few reasons.

The next chapter focuses more on the next set of inventions and phase of work. During this time, Tesla devised a peculiar and impractical object with long-term implications of surprising magnitude. He created a "button," which permitted a system for particles down to the atomic level to pour through a directed channel and then to display themselves in the form of visible patterns upon a closely connected surface. This allowed for a controlled method of magnification. The author describes this method of magnification as having been a precursor to the so-called Atomic Age, particularly because it had the foundations for working with atomic particles. Tesla's carbon button lamp, as this item was called, ended up as an independently-created "close relative" of the first electron microscope. For those who do not know, the electron microscope

allows magnifications to such a degree that the atomic level of organization can be perceived. Bizarre but meaningful images result, just as the more limited microscopes make it possible to visually perceive the cellular level, which is very peculiar when compared with the view by the naked eye without any magnification.

Chapter 7, Radio; Chapter 8, High Society

Chapter 7, Radio; Chapter 8, High Society Summary and Analysis

This chapter opens with the discussion of "wireless." In this case, "wireless" meant the transmission and broadcasting of radio waves. This is another one of those technological inventions now frequently taken for granted. The emergence of wireless Ethernet, wireless telephones, and other wireless remote control devices are all a furtherance of this same type of transmission.

The author has also included a bit of information about noteworthy aspects of the scientist's mind. In the early 1890s, she said, he suffered from temporary partial amnesia apparently from the stress from his work. Earlier she had provided accounts of his descriptions of the ability to visualize, but also the phenomenon of his "visions," and a few other rare and puzzling qualitative perceptions with which the man simply lived. They did not cause him trouble but because his work was so intensely mental, these events are more noteworthy than they might be with other people.

The next major direction of Tesla's energy was based upon a matter that is just as impressive today as it was in his era. He determined that humanity needed to harness the power of lightning, and that through doing so, people would also come to grasp what was "running the Sun." He felt his aspiration to control lightning was a bit outrageous or far-fetched but decided to go ahead and try.

The Chicago World's Fair of 1893 featured Tesla using alternating current to literally light up the place. This also gave Tesla an opportunity to share his radio efforts with the world.

During the Fair one of Tesla's "trademarks" occurred. He managed to suffuse himself with high voltage: 200,000 volts at times, without killing himself. His intimacy with electrical power was profound.

Although Tesla was still not viewed as affluent, he had turned into a regular at the famous Waldorf Astoria, and had become one of the "400," which was a slang term for the 400 most important and prominent people in New York City. This meant he had become a member of a group that took him years of work experience and social climbing to even learn of, let alone to meet personally. As such, his status had risen a great deal, but he was not yet at the top. Now, however, when he thought of his future and his experiments, he thought of the "captains of industry," i.e., the big names in finance, and had the confidence that he would be able to make contact with them if he wished.

Tesla was known to be quite charming, and this had a most beneficial affect upon both men and women. It was a business advantage with other men. He is reported to have liked women, but he was also perhaps old fashioned or simply quite self-controlled. The overall impression is that he remained a celibate bachelor, and that while friendly enough towards women he never went past responding to light flirting. He did take ladies to dinner, but was rumored to have never indulged in a sexual experience with any of them. There was tremendous social pressure for him to marry even though he was a phobic and obsessed electrical engineer, and the fact that he did not was written about and publicly acknowledged as a "peculiarity."

However, he did learn some social skills; he learned to host parties and special events that included permitting exceptional individuals to visit his laboratory. Typically guests were journalists or fellow scientists, and every so often other types, probably financiers.

Chapter 9, High Road, Low Road; Chapter 10, An Error in Judgment

Chapter 9, High Road, Low Road; Chapter 10, An Error in Judgment Summary and Analysis

Niagara Falls was not tamed, but rather harnessed. After stiff competition for the rights to provide the building services, General Electric won. This victory allowed them to do a great deal of work. Horsepower was generated at the world famous Falls, and Buffalo, New York was lit up with electricity.

Margaret Cheney explains something more to readers. Nikola Tesla, although still hoping to become far wealthier, he was famous during his lifetime. During the 1890s, he was often in the headlines. This gave him a general aura of rich and famous to some, while to others who knew him better, he represented, the famous but not rich.

The scientist's lines of research were naturally influenced by funding. At this time, his main preoccupations related to the detection of radio waves, which required using a great amount of glass. His other main occupation was the production of artificial lightning, without killing himself.

The efforts continued to be strenuous. Perhaps because Tesla seemed to have no sexual relationships, perhaps he was able to channel all his energy into his work.

The book's 10th of 30 titled chapters begins with another period of difficulty. In this case, the cause of the trouble is actually a natural disaster. Tesla's laboratory catches fire. With the fire, plans, but more tragically, equipment for running his experiments were lost. The engineer's financial situation was such that he could not just take this set back. A good friend rescued him from emotional distress as a result of the fire, and financially, he was also rescued. This task was done by Edward Dean Adams, a powerful financier.

Tesla followed up accepting this help by actively asking for more. He had learned to ask for help and had learned to whom he might turn. In this respect he had grown far more resilient as a more mature man. It was by having been through other disappointments, combined with having acquired helpful applicable skills in the past, that the inventor felt more confident that the fire was a temporary setback rather than the final demise of his work. Asking for money is a skill and both acceptable and necessary behavior among inventors and other business people then and today.

Margaret Cheney shows readers that Tesla's main judgment error was his desire to maintain his freedom. The reason it was viewed as a mistake was that he only secured $40,000 in funding this way instead of a great deal more by accepting some investors who would act as parent companies. Investors often tend to be controlling to one degree or another in the scope of research for the projects they finance.

The author provides an anecdote from the subject's life. In it there is a brief question of why the inventor does not marry. It is as one might suspect. Should he fall zealously in love and treat his wife with great adoration, there will no longer be so many inventions. This, he felt, was his reason for not marrying. Along with this, there is a concise reference to the homespun precedent for what later became known as electroshock therapy. Tesla disclosed that he did at times run electricity through himself as an effort to eradicate or to reduce depression. He told at least one reporter that he felt he had been able to hold many illnesses at bay or to cure them using a bit of his electricity.

Chapter 11, To Mars; Chapter 12, Robots

Chapter 11, To Mars; Chapter 12, Robots Summary and Analysis

This section covers Chapters 11 and 12. Chapter 11 focuses upon Tesla's next sequence of adventures. It begins when Westinghouse and Adams fund the continuance of Tesla's experiments.

Soon after the repairs from the fire have been completed, Tesla focuses on Mars. This neighbor planet is the next away from the sun when compared to our earth. Instead of the bounty of life, it is cold and probably lifeless due to the distance from the sun. Tesla believed it to be possible to establish communication with the planet Mars. He also believed that Mars might be inhabited by other life forms. He felt this was "statistically probable."

The author endeavors to clearly describe another facet of Tesla's inventive work. This has to do with the transmission of power. Tesla has made a few radical observations. In one case, Tesla claimed that power is fully accessible in every location and that power generators will ultimately not be needed. In this respect, he uncannily mimics an old esoteric teaching that is not explained.

Tesla was working with electricity. He managed to generate multi-million volts in his laboratory, simulating some lightning. He linked this with the transmission of power through the atmosphere. Part of what is going on in nature is that the lightning generated in the sky is able to move without resistance to another location. Tesla figured out that lightning could be harnessed by devising technology to send lightning or other electrical power and transmissions through the higher levels of Earth's atmosphere.

The scientist also developed a new peculiar fear—that of the possibility of setting the sky itself on fire. Though this did not occur, knowing that Tesla had this seemingly irrational fear certainly gives color to the psychological drama that was present in the scientist's life. It also adds to the dramatic flair for every reader, when the fearful possibility of this results in a kind of "ooh aah" more commonly associated with fireworks then when we face the potential dangers of human transmission of synthesized lightning.

There is another dramatic tale stemming directly from one of Tesla's inventions. He is described as having been viewed by the local police "with suspicion" but not because he was a criminal. Even so, he exuded an aura of a dark wizard and so, one night when there was a mysterious problem, the local police approached the "technology wizard," Tesla. There was an earth tremor in a 2 block radius that had no discernible cause. The location was not commonly a place where there were earthquakes. When police went to Tesla's laboratory they found the lights on. Upon entering, they discovered Tesla with a

sledge hammer in his hand standing near a piece of machinery that he had recently hit. Tesla assured them that all was well, but he also remarked some time after the event that he could unleash destructive forces and cause the Brooklyn Bridge to fall apart using this type of device. What he had used for this was a small machine called an oscillator.

Robotics is another area in which Tesla made some important inroads. The great movement in mechanical domestic servants, such as stoves and dishwashers, were all part of his work in robotics. Readers have heard of robots and of robotics. There are several times of machines that can be considered robotics. One is the fictional humanoid robot (such as 3CPO in Star Wars) and the other consists of things such as washing machines and mechanical arms located in manufacturing factories.

Tesla managed to secure funding and to move forward in the field of robotics. Remote control devices are another type of robot. Some have become quite practical but others remain as either playthings or impractical exhibitions of theoretical principles. Effectively, readers do best to view what otherwise seem to be useless items in this manner: Principles of a given theory are managing to take on shape in the physical world. These are a transitional mode of development, and more advanced types will be readily applied to suit a number of occasions.

One of Tesla's famous triumphs in this field was a remote-controlled, mechanical miniature of a real ship. This is another case where readers may find it virtually laughable because of how common such toys have really become. He devised the communication system, and the Hertzian combination of signals. These gave protected control and allowed for encoded messages to be sent. In this manner, he developed the remote control device, the model boat, and communication systems. Obviously, this worked, especially when others added their abilities to the same sort of projects. Now remote-controlled devices and model cars are both common.

Lastly, in this chapter, Ms Cheney explains another aspect of Tesla's craft to readers. Tesla was a strong advocate of replacing human combat soldiers with mechanized warfare. This alters the types of force used and preserves human life while still engaging in hostilities. He looked far into the future on this matter, and he lived well into the invention of tanks, aircraft, and submarines. He felt that one of the best weapons of war would cause the enemy to have no idea of "what hit them." While perhaps not congruous with ideas of "fair fighting," in terms of pure effectiveness mechanized fighting machines are superior to human soldiers.

Chapter 13, Hurler of Lightning; Chapter 14, Blackout at Colorado Springs

Chapter 13, Hurler of Lightning; Chapter 14, Blackout at Colorado Springs Summary and Analysis

There are both personal and professional notes at this point in the biography. The author writes about Nikola's women friends. He was known to date and probably even was a virgin. Since he was a bachelor and did not involve himself overly much with women, the bulk of the social excitement was in the little attention that he paid to one woman or another and who he might take out to dinner. He did like women, however, and female friends in whom he had no romantic interest. The author emphasizes how much energy there may have been in the area of two women friends of his. He showed personal preference and favoritism to two women: one was a married lady who took the time to help care for the inventor. The other is not described as married so may not have been, and is mentioned more than once because "Tesla actually likes her." Katherine and Marguerite are the names of these significant ladies.

Another peculiarity that had developed at this time was Tesla's living arrangements. He had begun living in hotels. Tesla lived in the same hotel for quite a while and then changed. This is not an unheard-of lifestyle, but is rare, even more so in the present than it was in Tesla's time. This way, although single, he receives domestic services, including having his bed made and readily available meals that he did not cook. This allows for a special type of "stripped down elegance," making for an efficient but still fancy domestic lifestyle. As the inventor was also known for fashionable attire, this made the hotel room living well suited to his way of life.

In this chapter, the most prominent event is that Nikola Tesla finds funding for, and gets to open his laboratory at Colorado Springs. He does not achieve this all by himself. Tesla found a construction crew to build his towers. He was required to contact the French government in order to get permission for part of his radio signal transmission experiments. This is one of those details that helps readers see into the change in complexity of the situation. On a simpler level, DANGER signs were truthfully posted at the edges of the site.

Once built, the tower was involved with a number of major experiments. His work with radio waves was not identical to his work with the electrical forces themselves, especially lightning, but both types if experiments were conducted with great passion during this time. The warnings to others were well warranted, as the tall brunette from the region of Coatia-Serbia managed to generate millions of volts and to emit blasts of synthetic lightning in a field in the countryside. The difference between scientific advancement and the wide-eyed awe with which nearly everyone might view an old-fashioned "high voltage tower" cranking out simulated lightning with all the attendant

violent sounds is interesting. No wonder then, that Tesla, like Carl Jung after him, liked to quote from Goethe's Faust.

Tesla and his assistants had to be protected from the lightning. They wore ear plugs and also rubber or cork on the soles of their shoes to reduce the likelihood of being blasted to smithereens or fried on the spot or simply permanently deafened.

Introducing ELF: extra low frequency transmission. This is an area pioneered by Nikola Tesla that has progressed since his work over a century ago. Tesla was able to approximate the planet's natural resonance using ELF. This relates both to his oscillators and to the dynamics between the planetary bodies within the solar system. Margaret Cheney explains that the Earth's current day resonance occurs at 8, 14, and 20 Hz.. This seems to echo Tesla's development of the three-phase machines for running electrical current from power plants.

Tesla observed that his receiver was picking up information more accurately from a greater distance than from close range. He did not know why. Most readers won't know either but are familiar with what is intuitively known as some sort of attunement that shows readily in how a person can be physically close to one group and yet is more receptive to signals received via cell phone from people located a greater distance away.

Nikola Tesla's diaries are the ideal resource for his perspective about his personal and professional life. The 3rd of July 1899 proved to be a triumphant day. He decisively concluded that stationary waves could be produced on earth using an oscillator and that there were two basic means for transmitting them. This power was worldwide. Readers rely on the truth of this on a day-to-day basis.

The Earth's resonance, by being "imperfect" is able to contain energy that is directly accessible globally. However, Tesla felt it required a set of tools to channel and release the power technologically. Ms. Cheney writes that this theory has either not been tested or else the results have not been both found and utilized. A radio receiver, and an instrument that looks like a lightning rod- a metal pole, and a grounding instrument would allow for the gathering of freely available electrical energy from lightning. Tesla did not have the time or the resources to take this further into the realm of domestic batteries.

The chapter covers up to 1900. During his time at the Colorado Springs laboratory, he achieved yet another grand result of his experiments. He discerned what ancients had repeatedly given rumor to: he heard the "music of the spheres"—actual radio signals emitted from other planets in the solar system to Earth. He was able to pick these up using technology but held onto the secrets. When he did share his idea, he was met with some derision.

Chapter 15, Magnificent and Doomed; Chapter 16, Ridiculed, Condemned, Combatted

Chapter 15, Magnificent and Doomed; Chapter 16, Ridiculed, Condemned, Combatted Summary and Analysis

The next chapter opens with the author sharing a story about Tesla being met by the press. This leads into what is going to be a lengthy discussion of interplanetary signals. Again, the present technological perspective will help readers to understand both how Tesla was wrong and correct.

These chapters are devoted to the difference between radio signals and wireless electrical transmissions and end with a crucial remark by Tesla. Margaret Cheney emphasizes that these were separate projects, although they had a close association with one another. In the text itself, the material covered here are chapters 15 & 16.

Tesla believed that the radio signals he received from outer space were just that. He suspected Mars and Venus as the planetary sources because they are the closest and therefore most likely. Due to astronomical knowledge at the time, there was little understanding of why there is probably not currently life on those planets, or at least, not life of the nature with which Earthlings are familiar. This subject matter is presently being addressed and has been since Tesla's lifetime. It is possible that in the future, humanity will have entirely cleared up the question of life on other planets and moons in the local Solar System. The radio signals from off world are currently being received and sorted regularly. Distinguishing the noises that planets themselves make from those of stars, moons, and intelligent or even unintelligent lifeforms is relevant. Astronomers have done a great deal in that area and continue to research. Readers can thank Tesla for being one of the pioneers in this area. Meanwhile, the SETI program focuses on efforts to be open to signals that are communiques from sentient lifeforms from off-world sources. Naturally, it is recognized that there is also a matter of the temporal differential. How long ago was a particular signal sent? Thanks to knowledge of the Light Year, for example, it is presently believed that signals from other locations are ancient history by the time we even register them here on Earth. All of this and more can be said to have sprung from the very projects that Nikola and his colleagues were performing in the last decades of the 1800s.

Obviously, Nikola Tesla and Marconi are two of the scientific giants associated with the transmission of radio waves upon the Earth. These areas of science occasionally reflect old superstitions. In this case, after Tesla's and Marconi's work, it was found that quartz crystals can be used to pick up signals. This gave rise to the crystal radio fad that

allowed young people to build and use their own radios. Quartz, as it happens is the same stuff as the arcane crystal ball that supposedly allows an individual to perceive distant events through sensitive attunement without the need for any additional technology other than the chunk of quartz.

Cheney places some of Tesla's experiments and inventions in modern-day context. The Russians have done much work with Tesla's theories and his first steps in applying newly-understood principles. The use of superconductors, which Tesla also suggested, has been cultivated. While popularized as a means of creating magnetic levitation for transportation without resistance, Cheney explains that supper conductors are being used to transport vast quantities of electricity safely through humanly-devised channels. While this moving of bulk electricity may seem less dramatic than superconducting levitation, on a daily basis it is more important if only because in the present era, this is how the theory is practically applied.

Margaret Cheney goes on to describe another ability that Nikola Tesla cultivated. He learned to ask for money. Instead of it being viewed as begging or selfishness, the inventor had to find investor and making the best use of financiers that were available. Wealthy persons invested in such as Tesla in order to make more money, i.e., through inventions, which explains why they did. Tesla's turned to George Westinghouse, J P Morgan, Thomas Fortune Ryan, Colonel JJA, and C Jordan Mott. He had long ago burned the bridge of Edison, who had turned into too much of a rival.

During these chapters, Tesla began to work on war weapons projects. One such weapon was a prototype for wireless torpedoes. At the same time, he yielded to Marconi who was on Edison's team for the advancement of radio. He did not do so easily, and he had considered suing Marconi, who is recorded as having said that Marconi relied upon 17 of Tesla's patents in order to proceed with his own work.

Anyone who does not think Tesla wanted money was sorely mistaken. The author presents what was probably the most accurate assessment of the reality. Tesla was motivated to invent. He passionately loved his work when he was able to pursue electrical developments. It was as if he had found a cosmic fountain of endless good ideas for projects on this topic and a "voice" that just wouldn't shut up. This drove him to work continuously. At the same time, he was a normal man, wanting fame, power and wealth. Like many ordinary people, when he became well aware of his extraordinary natural gifts and abilities, he wanted to make something of them: contributions to humanity and science, and also he desire fame and lots of money.

The rest of the chapter is devoted to the next "down" cycle of Tesla's life. His reputation faltered. He developed financial difficulties yet again. The author explains what some of the trouble was and how it was taken care of. It turns out that he had rather thoughtlessly abandoned the site at Colorado Springs. Only when others plagued him with lawsuits did he clean up the site years after his research had ended. In reality, this enabled him to pay off some people by selling off remainders of the research site.

Chapter 17, The Great Radio Controversy; Chapter 18, Midstream Perils

Chapter 17, The Great Radio Controversy; Chapter 18, Midstream Perils Summary and Analysis

This section begins with what was a major controversy. In many fields, people like to credit the creator or inventor. Readers believe that Marconi the Italian had invented the radio. Those who have been "sticking with this story" are now aware of the various factors involved. Tesla had come up with the first devices that by some definitions are radio. Ms. Cheney explains how the courts had to define radio as it related directly to the work of the Patent Office.

People are also aware of the other elements involved. If it had not been for Edison, it is not clear how Tesla would have been able to get started in electrical engineering and obtained original funding as an inventor. However, it is also equally true that Tesla was a veritable nemesis to Edison because of alternating current. The fact that the young man from Continental Europe also managed to devise a radio before Marconi but not until after the separation induced by alternating current only added to Edison's sense of competitiveness with Tesla. That, and the pertinence of these conditions to the industrialization of these processes, threatened Tesla's radio patents. Tesla's financial decisions, along with his relation to Edison actually caused his radio patents to originally fall to Marconi, because Marconi had become one of Edison's pets after Tesla had ceased to be so. However, it seems that in the long run, the truth shall be triumphant. Others have been going to bat for Tesla, and he is now on the verge of being publicly recognized as having been the actual inventor of the radio.

His "down cycle" approached its end with respect to his funding and his inventions. During his fifties Tesla had at times grown difficult. This was most probably because his emotional needs were unmet. Many would simply argue it was his fault for having not married. Others would sympathize: he had lost some of the special few near to him, such as Mark Twain. Possibly in an effort to cheer up and focus upon life, for a while he developed the hobby of helping some pigeons. His age and the years of hard work showed.

Part of the solution that would lead to his next "up cycle" was the Tesla turbine. This is a steam engine based upon two principles that had often been neglected. One of these was viscosity and the other was adhesion. These both occur naturally and emerge with changes at the molecular level with respect to the surrounding space.

Chapter 19, The Nobel Affair; Chapter 20, Flying Stove

Chapter 19, The Nobel Affair; Chapter 20, Flying Stove Summary and Analysis

Each word in the section heading indicates part of the title of the next two chapters of the book. The first is dedicated to Tesla's relationship to the Nobel Prize; whereas, the second, which is chapter 20 is titled "Flying Stove." During these chapters the author continues on in her amicable yet objective writing style.

The case in point has to do with the Nobel Prize in Physics. There was a newspaper story that stated that Tesla & Edison would both win the 1915 Nobel Prize in Physics as a team. Stranger still, is that turned out to not be factually true. The author says in the end that the Nobel Committee did view Thomas Edison and Nikola Tesla as their first choice, but granted it instead to a father & son team for the development of X-rays. Whether this was the truth or if rather, it was a kind lie to preserve the respect of the Americans is unclear. The winners that year were British. What makes this humorous is that there were several newspaper articles stating the same thing about Tesla and Edison. So, although both Tesla and Edison were aware that the Nobel Committee had not really come to them confirming this idea, gossip abounded. Both were afflicted with the suggestion to their minds and hearts that they had won. Anyone who has even once been suckered into believing that he or she has won multi-millions by a new ad campaign before realizing that it is merely an invitation to participate in the drawing can feel empathethic. The entire drama was certainly a forceful reminder to not believe everything you read in the papers.

The other main topic of these chapters was Nikola's steam engine. He faced considerable challenges when working as part of a team. Effectively, what happened was that Tesla ran straight into the very kinds of problems seen in both business and military life. With every movement up in rank, there emerges new types of decisions and responsibilities. Many do very well at some work or task and then when they face a new kind of situation, difficulties emerge. This happened to Tesla in being forced into the role of manager or management. He repeatedly disappointed and upset those engineers employed by his Electric Company or other business organized to support his research and development. The painful truth was that this man, perhaps in part due to his own loneliness or as a consequence of his being focused, was not a great boss.

Madam Cheney describes Tesla's reaction to other people's efforts regarding flight. It turns out his ego was as "present" as anyone else's, meaning that he was fine about some matters but surly and negative regarding others. In his case, his attitude towards others working in aeronautics was unhelpful. He had ideas about aircraft but those ended up pushed aside or otherwise dismissed.

It turns out that it was important that the inventor have at least a few friends. Among them was a woman, a member of the JP Morgan family, who he knew from when she was young. She was a heavy smoker, but otherwise charismatic, prominent, and a wonderfully-effective proponent of civil rights for many, and a strong advocate for women. Nikola's mother was able to work only with funding provided by a local cleric using the family farm as a laboratory and children, a spouse, and perhaps neighbors as "laboratory assistants." In comparison, are Edison and Tesla, who were able to do so much more when funded by people such as Westinghouse, and able to to work vigorously without the distraction of child rearing. It might be said that Ann Morgan was able to support the right of woman and other minorities on a grand and powerful scale, thanks to the family fortune, along with her very real virtues and skills.

This chapter mentions a man named Lowenstein, who was younger than Tesla and who made Tesla nervous. Tesla's intuition was correct. He was forced to go through the same cycle with Lowenstein that he had been through with Edison only from the other end so to speak. Lowenstein was a brilliant young man whose specialty was a next-stage development in one of Tesla's areas of expertise—radio. Lowenstein was a young man and needed funding; due to his position, he was forced to seek employment.

Luckily, Tesla was powerful enough to own an entire company, and there was such an affinity between Tesla and Lowenstein that Lowenstein could work in the general area of his greatest interest by working as a Tesla employee. Years later, with a great deal more experience, his own passion, and an improved ability to find funding in other ways, Lowenstein left the realm beneath Tesla's proverbial wing and headed off on his own. Away from Tesla, Lowenstein proved to be quite successful in the area of radio, but he left Tesla feeling a bit betrayed. This is almost exactly what Tesla did to Thomas Edison.

Chapter 21, Radar; Chapter 22, The Guest of Honor

Chapter 21, Radar; Chapter 22, The Guest of Honor Summary and Analysis

Through these two chapters it becomes apparent that our inventor's life has another cycle of difficulties followed by improved conditions. It is a bit sad and perhaps disconcerting to discover that the inventor may not have been happy for quite a bit of his life. He may have been, but even the author is not able to say so with definite certainty. Goal achievement brings one source of pleasure and happiness but when done with such extremity as Tesla's, it is often at the expense of other types of happiness, such as that in a stable social and family life.

During these years he was able to achieve more. This time, his work was cultivating the fundamentals of radar. His intention, now during World War I, was to figure out how to find sea faring vessels. He wanted to figure out how to find solid boats maneuvering in water.

He also managed to both give and receive help with his friends, the Johnson couple, albeit the assistance was quite variable depending upon whether he was working with the male or the female part of that union. He helped Mr. Johnson with money, but with the appearance that he was simply paying off a debt. Mrs. Johnson sought to share extra emotional and mental involvement. She obviously cared for Tesla, but appears to have suffered from chronic feelings of hurt and anger because of feeling ignored. She also made a great effort to be patient, tolerant and forgiving, since he was this hard-working genius. She never overstepped her bounds though sexual attraction probably had a role in their dynamic, but pure friendship was their real, shared aim.

By now there was something else going on. For the first time in his life, Tesla began to feel the other side of the generation gap. The younger scientists were distinctive, and the issues upon which they focused were not the same as Tesla's focus. Their approach to solving these problems had been influenced by the works of their predecessors and so hinged on different points. Einstein's theory, the conclusions of which even Einstein found to be disturbing, were motivating the Atomic Age, despite the belief by major scientists that humans working with nuclear energy was a bad idea at least for now, and that it as a dead end for physics. Even so, the projects were pushed forward; readers today are living with the aftermath of advancements that came from Tesla's and other's works.

As nuclear energy has been brought up, it seems pertinent to point out that as we know now, the Sun is nuclear energy, and the Earth does everything with 1% of the energy from that natural source of nuclear fission and fusion which makes it to the planet's atmosphere and surface. This is nuclear energy in relation to the Earth.

Chapter 22 of the text by Margaret Cheney is titled "The Guest of Honor." During the preceding decades, an award had been established called the Edison medal. A committee deemed it fit for Tesla to be selected as a winner of this award. The hard feelings between the two men were severe; however, one of the committeemen knew that Tesla actually needed the benefits of the award. The animosity was understandable; it is also still the truth that were it not for Edison, no one knows where Tesla might have been able to get his start as an engineer. It is equally true that Edison was not sufficiently supportive of alternating current and that the two were set terribly at odds from one another for a very long time.

Chapter 23, Pigeons; Chapter 24, Transitions

Chapter 23, Pigeons; Chapter 24, Transitions Summary and Analysis

There are two chapters covered by this section of the summary. There was a strange and close association between two radically-different, new social conditions. Women finally acquired the right to vote in the United States and prohibition came into effect, i.e., alcohol had been made illegal. This was a cause for great relief and hope for some since problems with alcohol plagued many families. For those who would abide by it, the end of domestic violence and other disruptions to families and society cause by alcohol use was good news. It was hoped that many women and children would be protected by this ban against the actions of alcoholics. However, the painful truth was that Prohibition did not continue long. Fortunately, women voting has lasted nearly a century now and is going rather well.

The inventor was aging. Now in his 60s he was past his prime, still single and prone to continue the cyclic pattern of a good period with funding and productivity followed by some kind of loss. His temperament continued to be a bit grouchy; perhaps it was a lack of affectionate attention that was the root cause of this. However, some of it may have simply been the nature of his own mind. His friend, Katherine, accused him of not having such human needs, but obviously that isn't true.

Tesla continued to reside in a hotel. Most single men and women do not do this. Margaret Cheney describes him as "Victorian in manner & in style," chaste, well dressed and able to find a way to live so that matters that would otherwise fall to a wife or mother are done by the hotel servants at a supposedly cheaper rate than keeping his own staff of servants would be. However, at this stage in his life he was a poor-posh man. He was the poor man at a five-star New York Hotel, and he owed them money.

Nikola's pigeon hobby grew into a well-known eccentricity. His need to love and to be loved had grown acute. Feeding the birds and nursing them back to health fulfilled a need for basic companionship and love. These were meaningful relationships with animals. Although not a genuine healthy substitute for connections with other people, animal friends can make an excellent supplement or, if need be, a surrogate.

The author Margaret Cheney takes the trouble to provide readers with a psychological analysis of Nikola Tesla. She relies predominantly and knowledgeably upon Freudian and Jungian psychology. She claims, that when one looks at Tesla's overall condition temperamentally and behaviorally, a discernible pattern emerges. He is a man who as a boy was somehow shorted, though he was loved by his parents. This is the long term consequence is insufficient breast feeding and also a shortage of cuddling from the

mother. The author readily admits the possibility of error in this analysis showing that this seems to be what those theories would tend to conclude.

The next chapter is devoted mainly to Tesla's friendship with the Johnsons. The female half of the Johnson couple, Katherine, took ill in 1911 and died in 1924. The enduring nature of their friendship was such that she specifically asked her husband to continue to look after Tesla after she had died. Her husband met this request with an increase in responsibility for maintaining their relationship. Tesla sent Mr. Johnson some money sometimes and reliably turned up at most of Johnson's invitations as his now deceased wife had correctly ascertained.

There is one other matter. The scientist, during this phase of his life, directly addressed the matter of women and the drive for social equality. He did this through a magazine interview, which relied upon his reputation. Since women were finally about to attain voting rights, it is very rewarding that he bothered to address this subject publicly as well as privately. Perhaps he accurately saw that it was wise and more correct to recognize women's equality of ability. However, he forewarned that female pursuit of too much or too many of the same sorts of goals as men would undermine and undercut their maternal instincts and interests. It might be said that in this he saw both his own mother's brilliance but also how very valuable her expression of her caring, maternal nature was so beneficial, even though it limited her other types of achievements.

Chapter 25, The Birthday Parties; Chapter 26, Corks on Water

Chapter 25, The Birthday Parties; Chapter 26, Corks on Water Summary and Analysis

Margaret Cheney informs readers of the next phase in Tesla's life. One aspect of it involved celebrating birthdays, which he had not been known to do. Apparently, he had suffered from the confusion surrounding which date to use because it had been at or so close to midnight that no one was quite sure. This changed when he was in his seventies.

One of his much younger friends, who had befriended him in New York City, was a science writer. A predominantly quiet fellow, Ms. Cheney explains to the readers that Swezey single-handedly brought about an event for Tesla's benefit. He wanted to ensure that the scientist rediscover how much his work had been appreciated. He organized requests. How many people assisted him is uncertain. This is an ironic truth: that people accomplish goals with a great deal of help from others even when any given individual does it on his or her own. Show me the man who builds his own home and I'll show you who he went to buy bricks made by another man, and how they transported the materials using devices made by other people.

This effort resulted in Tesla receiving a flood of positive feedback. Support and appreciation through notes, letters, and presents arrived en masse thanks to the efforts of this shy, science writer.

Another interesting fact in this chapter is that Tesla began to prophecy in public. The reasons this is such a victory are simple. Obviously, he is a scientist rather than a "foofy headed sort." Another reason is that the Bible states that those who have the gift of prophecy should share this with others in their community. The other cause of why this is a joy, is that it is "fun;" it is wonderful that this creative genius of electrical engineering would have social functions while in his seventies and that he would express the drama and the truth of some of his visions, even though they are less scientific in their appearance.

Tesla suffered another serious setback. He was hit by a car, luckily at low speeds. Strangely, the inventor rejected professional medical help. It is not clear whether or not this was due to the financial costs or if there was another reason. The incident took him away from his task of feeding the pigeons. After the accident, he spent half a year virtually bedridden from three broken ribs. Some of his friends who were his age sent offers of help to him, only to die themselves the following year. Tesla made it, though admittedly, he had become permanently more frail.

Chapter 27, Cosmic Communion; Chapter 28, Death and Transfiguration

Chapter 27, Cosmic Communion; Chapter 28, Death and Transfiguration Summary and Analysis

The author continues to provide a holistic view of Nikola Tesla. Her writing style is objective, yet friendly. She is able to provide numerous quotations by Tesla himself, sometimes from speeches; in other cases through his diary writings. During her introduction she explains why it is important to create a high quality portrayal. She emphasizes this by making the comparison to someone who lived near Colorado Springs and was able to write "from more personal experience" that Nikola Tesla was probably an alien life form from the nearby planet Venus and was here to help guide humanity into the future. "Excuse her, Sir, but she's mistaken."

The circumstances have in some ways been getting increasingly difficult. Tesla, after all, is now in his 70s and have lost even more of those friends of his who are his peers. The good news is that he has developed an improved ability to befriend younger people. He has more experience having younger people, mostly men, as employees than as friends. He has at least one intergenerational friend: Agnes Holden, the Johnson's daughter, made the decision to be friends with Tesla after the death of her parents—she maintained this friendship into the inventor's old age. Surely, this must have brought him some very real comfort.

World War II began to take a significant place in Tesla's life. Tesla was a Serbian of Croatia. He was not involved in the divisions between the Serbs and the Croats. Given the present timing, readers will be apt to feel a sensitivity to this distinction that had not been felt for over 50 years. There was a tremendous amount of tension between them under the surface. This was also true of the monarchy. Here, there is a situation that really emphasizes how much the individual does matter. One King made a self-protective and passive pact with Hitler. However, he died while in office and was succeeded by a son who had an entirely different view on the same matter. The younger man, King Peter, told Hitler "No," and his nation was rapidly bombed. The King was encouraged to go to England with some other officials, even though this meant that he could not stand or fall with his own people as they faced the battle directly.

Tesla became involved with this when his nephew arrived from out of the country. Doubtless it was good for there to be a relative nearby, as the younger man truly appreciated this new acquaintance, who was not only a relative, but became a friend. Tesla's reputation was so vast, and his willingness to use royalty well cultivated that he was delighted when the actual King of his homeland, Yugoslavia, came to visit him, even though he had become an American citizen. His reputation was so well-known that a King felt fortunate to be able to meet him, and was willing to go to Tesla, who was in a frail state at the time.

The fact that Mark Twain dies is mentioned in this chapter. Tesla received a visitation from him that was not "in the flesh" but was clearly perceivable when he died. He stopped by for an hour and sat in Tesla's room. Tesla was confused by the visitation and because of his own physical weakness thought it meant that Twain was still alive when, in fact, it was the confirmation of his death. Tesla did not attempt to touch Twain, and it turns out that he wasn't there in the flesh anyway.

The author tells of the engineer's death during this chapter. He passed away, entirely alone in the physical sense, in his hotel accommodations. The coroner had to make his best guess at the time, which is coincidentally the same issue which had faced those dear to him regarding the time of his birth. Unlike at his birth, Tesla was by himself. Cheney explains that a maid found him by entering the room despite a sign on the door that said not to disturb him. Given that he lived in the hotel, and there is a good chance that the maid knew him, it makes sense that she would have checked on him. After all, they were aware of his age and other factors. The coroner listed the cause of death as coronary thrombosis and the date as 7 January 1943.

Chapter 29, The Missing Papers; Chapter 30, The Legacy

Chapter 29, The Missing Papers; Chapter 30, The Legacy Summary and Analysis

These final two chapters are dedicated to discussion of what remained after Nikola Tesla died. Tesla left numerous notes and other effects directly pertaining to his work. These have been handled in a variety of ways. The author explains:

Tesla's information was unique in that he performed so many of his experiments alone, that his notes took on an aura of the old magician's grimoire: containing notes that no one other than himself could fully understand. Some of his papers were labeled as "missing" by the author in that some of his notes were taken by the US government. They have been sequestered away in the hope that something can be gleaned from them, but also that his knowledge will be kept out of the wrong hands.

However American Tesla had become, he was still genuinely loved his native country. This is evident in that he bequeathed most of his papers and much of his equipment to his homeland. There is a museum there devoted entirely to his life and work.

There was some drama associated with Tesla's documents. One reason is that later in his life he had been working on what some journalists termed a "death ray" weapon, perhaps similar to today's laser weapon. Much of what Tesla worked on has come into the technological present. Even so, an aspect of his work's beauty is that there is more that he has left us that will become applicable in the future. This has begun to show in that interest in his work has been growing rather than fading during the past 70 years since his death. Contributions he helped to make have been reliable for decades and the insight of many other researchers, theoreticians and engineers have progressed to a stage where more of his efforts can find a relevant home in contemporary science.

With this Margaret Cheney has completed the biography. She has presented this great thinker's life from beginning to end with a few twists and turns on the timing in order to provide a superior read without detracting from the content. Her tone has been objective throughout the book with a slight flare and touch of friendliness. In this sense, readers do not quite forget that the biography has an author, but she does not disrupt the view of the subject matter. Factual and expressive of the entire man, Margaret Cheney has written a very good work on the European native.

Characters

Thomas Edison

This individual was both a strong supporter and difficult opponent of Nikola Tesla's. Edison invented numerous objects, securing funding and being a wealthy and famous inventor. His activities, due mainly to his approach, changed the face of the culture through direct and indirect effort. His effectiveness was greatly enhanced by the combination of funding and the work of assistants.

Edison emerges early on in the book because his successes and some of his problems created opportunities for Nikola Tesla. Tesla was 4 or 5 years younger, and took his first job in the field of electrical engineering by working for an Edison-related company.

Tesla's wisdom regarding alternating current was destined to come between he and Edison. The two also had personality conflicts, in addition to the difference in their interests; nevertheless, Edison's efforts created fertile ground for Tesla to earn money and experience in during his twenties before Tesla secured enough funding to have his own company. Likewise, without Edison's efforts, Tesla's genius regarding alternating current would have been far less profound in their implications. Edison was popularizing electricity and making it available to the masses; Tesla improves on that with alternating current.

Maraget Cheney

This is the book's author. She had this book published through Touchstone in 2001. Biography is her specialty. This work on Nikola Tesla is not her first biography. She has taken especial care to produce a high quality work that is holistic in its approach.

In order to help readers understand the biography, there are introductory materials and notes at the end of the book. There has been some high quality work done on him and by him. It is also true that a few people have written horribly inaccurate books about him. As such, readers are fortunate to have a rather experienced professional who has taken the trouble to write a reliable portrait of the famous scientist.

Nikola Tesla

This is the man who is at the center of the book. He is from Croatia, a country which became part of the Republic of Yugoslavia, but is once again an independent country. Tesla was born on July 10, 1856 supposedly at midnight, but since he was born at home, the midwife/doctor may have just written that time down.

He was one of 7 children, but only 6 of them lived to adulthood. The majority of them were girls.

He was tall and slender, although the right kind of diet may have been able to "make him bulk out."

The time of his death had to be approximated. He was found dead at the age of 86 on the 8th of January in 1943. He was alone, partly due to having remained a single man with no children.

Mark Twain

This man is credited by Nikola Tesla as having saved his life. How this occurred is quite strange. Nikola was sickly as a boy. He was desperate for ways to feel better and get healthy again. He discovered the works of Mark Twain.

Later, the inventor met Mark Twain. The American novelist is mentioned in chapters one and two. In the first chapter, Twain visits the younger man's electricity laboratory. In the second, Twain's writings are mentioned as playing a vital role of the young Nikola's recovery from sickness.

M. Bauzin

Bauzin was a German Mayor when Nikola Tesla met him. He is mentioned in chapter 3 at the beginning of Tesla's career in electrical engineering.

This Mayor was one of the first socially prominent people that Tesla ever met. The inventor was able to obtain the man's assistance in securing funding among other local wealthy people. Sadly, the inventor did not secure a great deal of funding this way. However, it was still a first significant effort. In addition, Tesla was personally responsible for helping the mayor to overcome a serious problem. This Mayor was one of the people who benefited from Tesla's willingness to use his technical expertise.

Charles Batchelor

Batchelor became a strong advocate for Nikola Tesla. He was an Englishman and secured work for Thomas Edison. He was actually highly effective as part of Edison's big team. It was because of his working for Edison and his own flexibility that Batchelor ended up working as a manager in Europe. It was there that he met Nikola Tesla, one of the younger men who had obtained a job on Edison's work team.

It did not take much exposure for Batchelor to realize that Tesla was absolutely brilliant. This was so much the case, and the nature of the genius so specific in its quality, that Batchelor advised Tesla to go to America. He felt Tesla's chances of winning decent funding would be superior in the USA.

This is the man who wrote a devout recommendation of Tesla to Thomas Edison. To paraphrase he explained to Edison that Tesla was "the other great man" - as in inventor, scientist, that he, Charles Batchelor knew.

A. K. Brown

This wealthy man turned out to be an important business contact for Nikola Tesla. In fact, he was so wealthy and/or socially connected that he sponsors Nikola's second company and provide it with $500,000.00 dollars, which would be comparable to a few million today.

What made this truly spectacular is that this man, unlike his predecessors was actually interested in Tesla's real baby: alternating current.

He is mentioned in the fourth chapter of the book, which began Tesla's next up phase of success in an "up down" cycle of happiness and progress followed by sorrow and defeat.

George Westinghouse

This man was alive and very important during Tesla's lifetime. He is well known for having been a genuinely benevolent businessman rather than a "robber-baron."

At the end of the 1880s, both Tesla and Westinghouse owned electric companies. Unlike so many others, they also shared a common dream-goal. Both envisioned power generators using Niagara Falls in New York State.

They made a few deals with each other. Westinghouse bought 40 of Tesla's patents, and offered Tesla a combination of cash pay offs and promises of stock. There was even some kind of offer by Westinghouse for a deal that was supposed to give Tesla $2.50/horsepower on generated electricity that sold from the Niagra generators.

Katherine Johnson

A married woman with wealth and high social status. Her friendship with Tesla is a sign that Tesla has arrived at a new level of the social strata. Though Tesla gets into the New York 400 of most important people, he still feels small.

Katherine was most likely representing herself and her husband to the inventor. Katherine often cared for Tesla as if he were her child or spouse, bringing him meals and offering other ways of nurturing and caring for Tesla, in order to help Tesla stay focused on his projects.

Marguerite

Marguerite is one of Nikola's friends. When he does something social, he likes it if she is also around. She is wealthy and connected and he relies upon her for help in his role in high society.

Scherff

This man was Nikola Tesla's first secretary. The inventor was in luck as this fellow turned out to be both loyal and permanent.

Objects/Places

Colorado Springs

This location is mentioned in the introduction and a number of times in the text, often with reference to various aspects of the same set of important experiments.

At Colorado Springs, some of Tesla's most significant electrical experimentation was conducted. One of the productions at this place was the artificial lightning storm and the relevant powers of it.

Forked lightning

The laboratory-produced, electrical phenomenon known to the world as lightning, which Tesla produced.

This is first mentioned in the introduction of the book for two reasons. It is incredibly impressive to everyone in the world who perceives it, and it indicates Tesla's influence in the realm of science.

This item may be better understood by contemporary readers than it was to people of Tesla's day. Nowadays, humans have developed, among other things, the ability to synthetically-produce, naturally-occurring chemicals in areas as diverse as gems and herbal remedies. Tesla's lightning is best understood as having been of this nature.

Missing Papers

A number of papers and research notes that Nikola produced along with his scientific efforts that were left after his death and which went missing.

These may have been imbued with some mystery. They would probably be obscure to anyone not well versed in the subject matter.

There are occasions when this two word phrase refers to Tesla's papers held by the US Department of Defense because they pertain to national security.

Tesla Society

This is a society founded by the author of the Introduction, whose name is Leland Anderson. Anderson founded the society around the centennial anniversary of Tesla's major works. Although the Tesla Society did not last, it survived well enough to effect its purpose, which was to remind the scientific community and the public in general to take this man and his work very seriously.

Waldorf Astoria Hotel

It is mentioned because Nikola Tesla often went to dinner there. At the time of the story's opening, he was already a well known figure.

Burnless Mini Fireball

According to the author, it is still not entirely clear what this was. Tesla was somehow able to produce what appeared to be a small amount of fire. However, it functioned more like wireless light, in that it never burned anyone, and did not require any flame. It is described in relation to what would now be recognized as a red laser beam light pouring through a flame stencil or some trick such as that.

The mini fireball impresses a professional journalist named McGovern, who is among a few men visiting Tesla's NYC laboratory.

Tesla's Laboratory Parlor Tricks

The reason Tesla's experiments are called "parlor tricks" is not because they were fake but because they had no practical application at that time.

Their greatest uses at that time would be in theaters and modern-day special-effects departments of film studios. In these special venues, some of Tesla's experiments and models that served no industrial purpose could still be used. Typically, he used these to demonstrate principles of electricity in ways that pleased and impressed guests. This theatrical quality naturally helped Tesla to secure funding and to be written about with an air of drama.

Prague

This is where Nikola Tesla obtained some higher education. He received a fellowship for one year. His life was humble but fine when he had funding. When this financial resource dried up, he sought out another one. His only real "crime" here was that he did not take a conventional course of action. Prague's universities and police department were apparently glad when he made the decision to leave town.

Dynamo

These come up repeatedly during the book from early on in Nikola's adult working life. They are a necessary portion of all systems that carry electrical energy. There is more than one kind.

These can be devised to work with direct and alternating current. Tesla made a great deal of scientific progress by working on these.

These devices transform mechanical energy into electrical energy. The interplay of materials and twisting is intriguing: wrapping metal coils, often copper wire, around other metals greatly influences how the energy is handled.

Screw

These devices are laughingly familiar to us now. However, the author informs readers that screws were once invented. The originator of the screw is said to have been Archimedes.

What really distinguishes a screw from a nail is that screws have a way of getting into woodworks or other difficult surfaces thanks to the twists of their metal. This makes them able to dig their way into otherwise impossible surfaces. Unlike nails, however, the twisting is a form of consistency. Screws can be nailed into place but it isn't making the most of their holding ability to do so. Properly used, screws are simply twisted into place using the screwdriver rather than nailed in with the hammer.

Themes

Genius

A main feature of the inventor's life is that he was a genius. Margaret Cheney shares with readers Tesla's assurance that he inherited this from his mother, who was also an inventor. In her case, she devised handy devices for use around their home. All her activity of that sort was limited to the family budget and never grew into any kind of public demonstration.

The youth of Nikola Tesla was relatively normal for his cultural context. He was one of several children. When one of the children died, it left an emotional mark upon the entire family. The young Tesla was allowed to play in such a way as to develop some familiarity with experimentation.

The culture was very conducive to the healthy development of excellent memory. Nikola made the most of this opportunity. This may sound odd, but it is quite true that he realized the value of his own mind. He discovered that he could do a lot with it, even while a boy at no cost to himself or to the family. One of the traits that he worked on, along with building up his memory was the active and intentional cultivation of his ability to visualize in precise detail.

Creation through visualization was a talent that the inventor developed. In fact, this led to one of his eccentricities even while still a child. He did not rely upon blue prints, which caused him a little trouble in school. Later in his life, this powerful ability made it harder for him to work with others.

Nikola managed to secure over twenty patents during his lifetime. He left a great deal more in the development phases that he was not able to follow up on. Fortunately he was able to share at least some of these ideas and to leave notes behind indicating more of these.

Electrical Technology

There is no question about the timing of Nikola Tesla's life. He arrived during the emergence of an electrical era. The telegraph and other telecommunication systems were just coming into being. Electricity had been harnessed well enough that people had heard of it, but it was still only rarely used in homes. Those who did have electricity installed in their homes were considered very daring.

Edison was one of the giants of invention, who combined invention with business and changed the world with electrical technology. There is no doubt about the significance of those investors who stood behind him as the industrial age moved forward. It may even be, in retrospect, that the emergence of mechanical and electrical technologies

combined made an even greater leap forward than such technology as mining and smithing.

While Edison is most well known by the general public for the light bulb, it was far from his only practical invention. It is also true that if Edison had not had the ability to manager teams and run a business that much of his work would not have come to much. The effect upon the population was intentional.

Tesla's efforts managed to grow in this same category. His work with alternating current and radio have both blossomed. He was aware during his own time that some of his work could not progress any further without advancements in other areas of science. This is still true; however, much of his efforts with remote control devices and oscillators have progressed past his work on them. Work with laser beams and particle beams has also progressed. The wireless transmission of both radio waves and other power has advanced. These are all areas which directly touch upon the inventive work of Nikola Tesla.

Paranormal Mysteries

For some strange reason, these found their way into Nikola Tesla's life. From a young age he experienced what some might call "visions." The author mentions these quite early in the book when describing his childhood. Occasionally headaches were among the odd psychological effects that he noted. These headaches at times occurred with visualizations of some kind.

Tesla did not attempt to explain the images that emerged to him in this strange fashion. These paranormal visions were different from the visualizations he consciously and actively formed in his research work. If he had had our technology available there is a good chance that he would have described them as spontaneous and complete holographic images.

Tesla also possessed the double-edged sword of prophecy. This is the power to make accurate and effective predictions based upon events. He predominantly ignored this power until he was in his 70s. When he was an old man, he finally began to focus upon his social life as much or more so than upon his work. When he did, he shared the visions and insights more openly at parties.

Finally, the other paranormal experiences that Nikola had were two "visitations" and dreams that directly related to deaths. The first was the death of his mother, which was fortunately not premature. He had dreams about her more and more as the time of her death approached. He heeded these well enough along with more ordinary means of long distance communications to ensure that he was able to be with her near to the time of her death. His other experience occurred decades later when his friend Mark Twain stopped by one night for about an hour. It turned out that this was not his friend Mark in the flesh but his "spirit" or "ghost." After an hour of conversation, Tesla's friend of many

years left. Whatever the reason of the vision or visitation, it turned out that the following day Mark Twain died.

Style

Perspective

Margaret Cheney is an experienced professional biographer. On the book's jacket it reveals that the scientist Nikola Tesla is one of her favorite subjects. She is evidently well into middle age, estimating from the photograph of her that goes with the book.

The author has made it clear from where she draws her sources of information. In this sense she is showing that she is a responsible biographer. She educates the readers of the difference by referring to an outlandish case wherein a biographer made the patently false comment that the human inventor was rather an alien from the nearby planet Venus than an Earthling. Unlike that person, the author has used her research skills. She has used Tesla's diary writings. She has also included his own research notes, which are neatly included in the bibliography. In addition to this, Madam Cheney has used published information that has been kept on the public record. She has referred to reputable sources such as "Time" but not to equivalents of the infamous and dubious "National Enquirer." Finally, she has taken the trouble to meet with people who knew the man personally and to have some interviews with them in order to gain insights that are quite elusive when one has not had personal contact. The author engages her writing powers by putting together the information from all of the above sources. Her perspective is that of a mostly silent narrator.

Tone

The book's tone is rather personal. It is not the author's ego that has center stage, however. As befits the type of book that it is, the author tells readers all about someone else. The work is nonfiction.

There is a subtlety to the tone that is an exceptionally good fit to the material. The whole point is for readers to grow closer to this man. Cheney is somehow able to convey a feeling of closeness even though she is writing objectively.

Structure

The book is clearly organized. There is introductory material and bibliographical notes at the end. In between there are 30 chapters. The last two of these cover material about Tesla's posthumous influence.

This method of organization is quite normal. The book summary contents have been subdivided into three books, but this is for the convenience of the summary readers. The original biography has no such separations.

The author of the biography does not begin the true story at the beginning of the scientist's life. This turns out to be quite clever as it leads directly to a similar sense of meeting someone and then, after getting to know him a bit, finding out about his childhood.

This biography has a standard structure for a work of its kind. The author's choice for structure is based in part on the idea of being sequential. It is also a decision based upon the length of the manuscript.

Quotes

"...one of your splendid mathematicians." p. 80

"'useful fact'" p. 80

"Envious journalists and critical scientists were not to be the only sources of Tesla's travail. Occultists seemed attracted to him." p.112

"Sensitivity was not one of the hallmarks of the Gilded Age." p. 114

"He only succeeded in being cruel." p. 144

"By actual testing, said the report, he 'has really accomplished wireless communication over reasonably large distances...'" p. 144 [see footnote #7]

"Conceiving of robots as having many uses besides war, he believed their greatest role would lie in service to humanity." p.168

"Yet Tesla has only recently been so much as recognized for having pioneered the field." p. 169

"Why fasten the disturbances of Mr. Tesla's instrument on Mars? Are there no comets that will serve the purpose?" p. 191

"Thrilled and awestruck, he could only sit and listen." p. 190

"The most probable explanation of what he had heard was radio waves from the stars." p. 190

"Tesla replied that night in Jovian style by going to the tower and setting off such a fireworks display as no one had seen before. His tests went on through the night and for several thereafter." p. 206

"So at last he wrote to Morgan and bared his true goal-not just the sending of radio waves but the wireless transmission of power." p. 207

"...funds were dangerously low. Creditors were impatient." p. 206

Topics for Discussion

Name your favorite invention of Tesla's. Explain your answer.

Describe the role of Edison in relation to Tesla in the book.

What is alternating current?

What is the three phase motor system?

Why did glass jars figure so largely in Tesla's life during his radio research?

To use the vernacular: do you think Tesla was "looney"?... Defend your answer.

Nikola Tesla had some behaviors that can certainly be viewed as symptoms of insanity. Do you think the inventor suffered from mental illness? If so, do you feel he should have had it treated, why or why not?

Agree or disagree with Tesla's hypothesis that he could use machinery to "split apart the Earth like an apple" using resonance that he was able to produce in his laboratory.

Do you think Tesla was a little scary? Defend your answer.