Historical American

Kyle Miller
Chinchilla

DECEMBER 2005
PRICELESS

"You lose"
—Calvin Coolidge

Contents

Top Twenty Events

This is a timeline of what I believe to be the top twenty events of the period from 1890 to 1945.

Politics

TRANSCONTINENTAL HIGHWAY
The year of 1913

The first transcontinental automobile highway was the Lincoln Highway, an idea of Carl G. Fisher. It ran from New York City to San Francisco, California.

Science

THE JET PLANE
The year of 1939

The Turbine-equipped jet plane, the Heinkel He 178 (Germany), was piloted by Erich Warsitz.

Science

PENICILLIN
The year of 1928

The first antibiotic agents to be used successfully in the treatment of bacterial infections in humans. Its effect was noticed by Scottish biologist Sir Alexander Fleming.

Politics

THE UNITED NATIONS
October 24, 1945

An international organization composed of most of the countries of the world. It was founded to promote peace, security, and economic development. When it was founded there were 51 members. Now there are 191.

WAR!

SPANISH AMERICAN WAR
April 25, 1989 to August 12, 1898

brief conflict between Spain and the United States arising out of Spanish policies in Cuba. It was, to a large degree, brought about by the efforts of U.S. expansionists. Marked beginning of U.S. imperialism.

WAR!

WORLD WAR I
July 28, 1914 to June 28, 1919

A war fought from 1914 to 1918, in which Great Britain, France, Russia, Belgium, Italy, Japan, the United States, and other allies defeated Germany, Austria-Hungary, Turkey, and Bulgaria. Very bloody.

WAR!

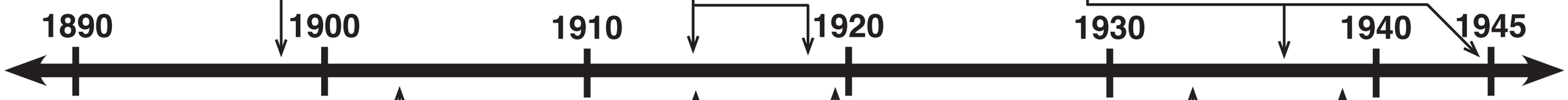
WORLD WAR II
July 7, 1937 (or Sep 1, 1939) to August 15, 1945

A war fought from 1939 to 1945, in which Great Britain, France, the Soviet Union, the United States, China, and other allies defeated Germany, Italy, and Japan. A war of totalitarianism Even Bloodier. Ended with a bang.

WAR!

PEARL HARBOR
December 7, 1941

On the island of Oahu, Hawaii. Brought the United States into war, yet again. Japanese planes attacked the Hawaiian naval base, and the United States entered World War II the following day.



Science

FIRST POWERED FLIGHT
December 17, 1903

Brothers Orville and Wilbur Wright built and flew the first airplane. Their creation was a manned, motor-powered, heavier-than-air craft. The first flight took place at Kitty Hawk, North Carolina.

Economics

PANAMA CANAL
Opened August 15, 1914

A ship canal, about 50 miles long, crossing the Isthmus of Panama in the Canal Zone and connecting the Caribbean Sea with the Pacific Ocean. Greatly shortened shipping distance.

Politics

PROHIBITION
January 16, 1919 to February 17, 1933

A national ban on alcoholic beverages via an Amendment. It was enforced by the Volstead act until it was repealed by another amendment. It brought increadible social change.

Business

MCDONALD'S
May 15, 1940

World renowned fast food business. Name synonymous with hamburger. Founded by Dick and Mac McDonald. This is the first restaurant to employ an assembly line to hamburgers.

Science

QUANTUM THEORY
The year of 1900 and 1905

Giant leaps were made in science by realizing that matter is made of tiny packets of energy, or quanta. With Einstein's photoelectric effect in 1905, it became a working theory.

Science

TV BROADCAST
The year of 1939

The first TV broadcast was conducted by RCA from the Empire State Building to the World's Fair in 1939, starting the era of television.

Science

TRINITY TEST AND NAGASAKI
July 16 and August 6, 1945

The nuclear bomb was tested and dropped. The technology could wipe out the entire world it it was used wrongly. Ended WWII.

Economics

GREAT DEPRESSION
October 29, 1929 to early 1940s

Started with a stock market crash, "black tuesday." Led to massive bank failures, high unemployment, as well as dramatic drops in GDP, industrial production, stock market share prices and virtually every other measure of economic growth.

Science

RADIO
The year of 1893

Invented by Nikola Tesla, radio was a system to transmit messages through the air. The first broadcast was to be in 1909. Now, we have many wireless technologies.

Science

RELATIVITY
The year of 1905

A physical theory, introduced by Albert Einstein, that discards the concept of absolute motion and instead treats only relative motion between two frames of reference. Space and time are no longer viewed as separate, independent entities

Politics

SCOPES "MONKEY" TRIAL
March 13, 1925

Tennessee legal case involving the teaching of evolution in public schools. John T. Scopes, a biology teacher, was tried for teaching Darwinism in schools. About violation of academic freedom.

Politics

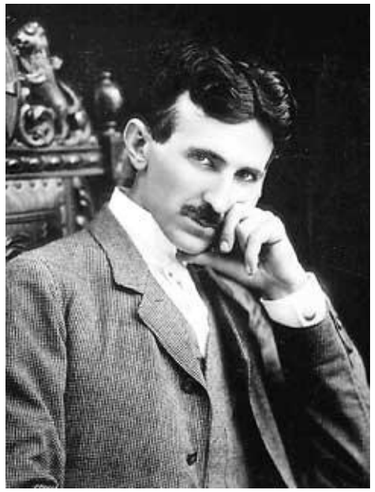
NEW DEAL
One hundred days of 1933

Programs and policies that were designed to promote economic recovery and social reform introduced by President Franklin D. Roosevelt. The projects of the New Deal included the Social Security System.

Obituary

Tesla, 86

Nikola Tesla was found dead the night of January 7, 1943 in his suite at the Hotel New Yorker. He was an electrical inventor, physicist, mechanical engineer, and electrical engineer and is credited for the application of alternating current. Tesla invented the induction motor, advanced dynamos, transformers, and other electrical equipment such as high frequency, high voltage coils. The Niagra Falls hydroelectric generators were designed by him. He was found alone in his hotel room bed at 10:45 PM by a hotel maid that called for a physician who pronounced him dead of heart failure. The hotel staff said that the 86 year old Tesla had been ailing in health for the past two years and had emphatic ideas for health which included keeping a three foot distance from all people and eating a strictly vegetarian diet. Tesla was born at midnight in Smiljan, Austro-Hungary (modern day Croatia) and was baptized on June 28, 1856. His father was a priest of the Serbian Orthodox Church, and his mother a daughter of a Serbian Orthodox priest. He went to school in Karlovac and then studied electrical engineering at the Austria Politechnic school in Graz, Austria. He earned a degree in physics at the University of Prague and received many honorary doctoral degrees from numerous universities. He worked for the American Telephone company in Budapest and then the Continental Edison Company in Paris. In 1884, he moved to the United States and worked under Edison. He was promised $50,000 by Edison to redesign all of the company's dynamos, and when he finished, he never got the promised amount. Throughout the rest of his life, he created fantastic inventions such as the radio, alternating current generation and transmission, wireless lighting, and even a "death ray" that could destroy armies at hundreds of miles away. He lived his life in poverty to maintain his freedom to follow his ideas. He was a bachelor his entire life, but had a nephew in New York. The service will be held January 12, 1943 at the Cathedral of St. John the Divine, New York.



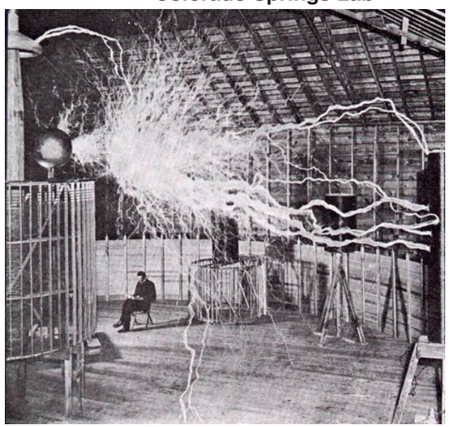
A PORTRAIT OF Tesla in Paris

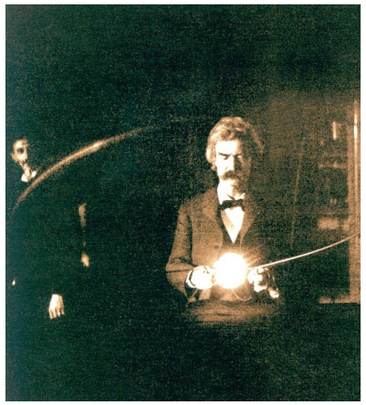
TESLA IN his early adolescents

Eulogy

Nikola Tesla was a distinguished scientist, poet, and great humanist. He was an inventor, a physicist, engineer. He was a scientist, magician, and visionary behind high-frequency lighting, radio, robotics, and remote control. As he said himself, "I do not think there is any thrill that can go through the human heart like that felt by the inventor as he sees some creation of the brain unfolding to success...Such emotions make a man forget food, sleep, friends, love, everything." I met him around 1900 in Colorado Springs. I remember when he'd create such electrical storms in his lab that you could smell the ozone in the air and actually see blue streaks of electricity jump along the ground. On the door, it said "abandon hope all ye that enter here." One time he made a device that created 135 foot lightning, and it took so much power that it overloaded a dynamo at the Colorado Springs Electric Company and put Colorado Springs in darkness. But, to continue his experiments, he offered to repair the dynamo for them. Once he told me of this story from his lab in New York. It was during a demonstration of his inventions to his good friend Mark Twain and the English journalist Chauncy McGovern. He would create fireballs at the flick of his fingers, play with them, extinguish them, and they wouldn't leave the slightest trace. Suddenly, he filled the room with a beautiful light, but there was no apparent source for it. Then, he connected himself up to a device that filled him with electricity. The voltmeter rose from two to at last two-million volts which made the inventor glow and shimmer in thousands of unburning flames. Then he turned that off and showed his guests a device that could revolutionize hospitals. He turned it on and it vibrated silently. Mark Twain then asked if he could get on, and he had a little fun bouncing around, but wouldn't get off when Tesla asked. Then, the expression on Twain's face suddenly changed, and he asked where he could find the bathroom. Tesla smiled – he knew about the laxative effect of the device. We all need to remember the amazing things Tesla did throughout his life, and how modern times would be completely different if it weren't for his breakthroughs in electricity. He can not be forgotten. I will miss this man who was ahead of his time. ■

A PUBLICITY PHOTO of Tesla in his Colorado Springs Lab





TWAIN IN Teslas lab, 1984

Interview

Wernher von Braun

Wernher von Braun was one of the leaders for the development of rocket technology in Germany and the United States during World War II. During an exclusive interview with him in 1970, we learned more about his life and inventions. It took place at his NASA office in Washington, DC. He was about 58 at the time, bearded, and very charismatic. Behind him were the models of the rockets he designed. This interview was conducted to learn a little bit more about von Braun. We will be designated by "M" and Wernher von Braun by "B."

M: What have you been doing recently with NASA?

B: Well, I have just been relocated from Huntsville, Alabama to Washington, DC. Now, I am the Deputy Associate Administrator for Planning. I've been fighting the truncation of the Apollo program. I want to see manned space flight continue like it has. I'm not really sure what my job position does, exactly, but I've been working really hard.

M: What did you think of being the first director of NASA's Marshall Space Flight Center?

B: It was amazing. It was there that my dream to have man set foot on the moon was fulfilled. I got to lead the development of the Saturn V rocket which carried the manned Apollo missions out of the earth's atmosphere, and towards the moon. I wanted to keep the Saturn V rocket development going, so that we would get to Mars in the 1980s. But, I was relocated this year, and the Apollo programs appear as if they are about to be cut. I liked being able to do what I loved, rocketry.

M: How did you become interested in rocketry?

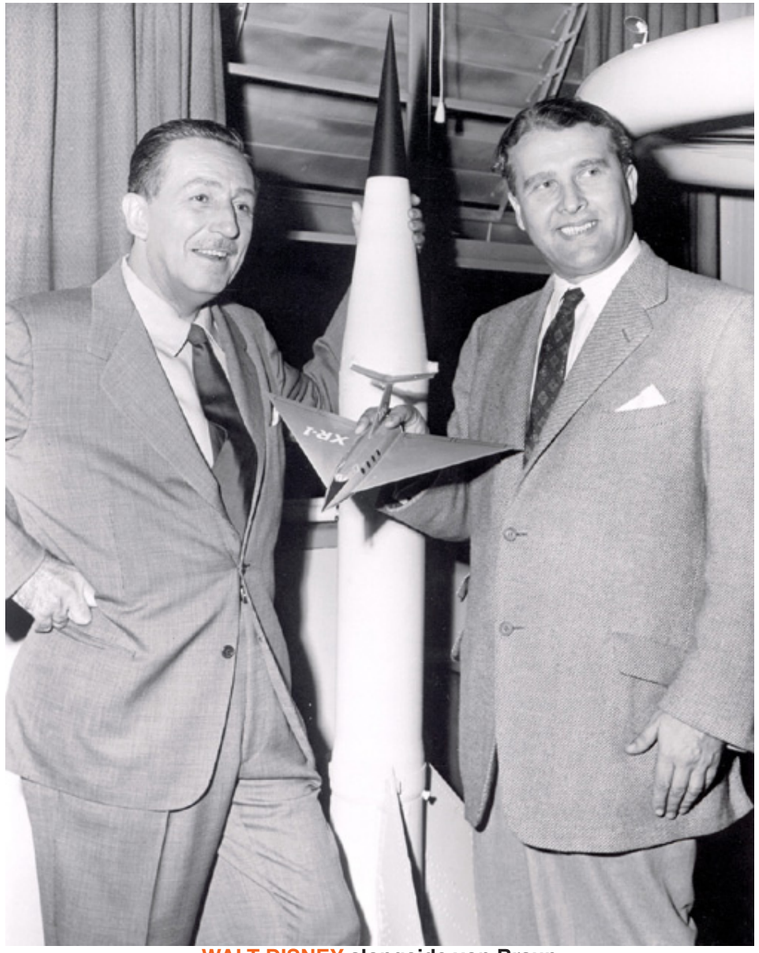
B: Well, when I was confirmed, my mother gave me a telescope. I then discovered a passion for astronomy and space. Space! It was amazing to me. I wondered what was out there, probably like most other boys my age. I would look out at the cosmos for hours on end, wanting to know more, astonished by the vastness of the universe. I initially didn't do

WERNHER VON Braun at his desk at the time of interview

that well physics and mathematics. But, when I received the book *Die Rakete zu den Planetenräumen* [*The Rocket into Interplanetary Space*], I sought to do my best so that I could learn more about things outside the earth, and build a rocket of my own. I attended the Berlin Institute of Technology in 1930 where I joined the Spaceflight Society. Later, in 1934, I earned a Ph.D in aerospace engineering at Berlin University. I remember this one time when I was 16. I took a toy wagon and attached many firecrackers to it, and I then fired it off. What a noise it made! And its speed! Well, the police didn't find it as great as I did, and they took me into custody until my father came to get me.

M: How did you become involved with the German military?
B: Because of my activities with the rocket society, I got the attention of a military scientist. After graduating with a bachelors degree in mechanical engineering at the Berlin Institute of Technology, I was offered a position in the German army to work on a ballistic missile project to develop new rocket engines. It was very interesting work.

M: Why did you decide to join the Nazi party?
B: I had no choice. Civilian rocket testing had been forbidden by the new Nazi regime. Only the military was allowed to develop rockets. I was working with Walter Dornberger on a research grant to build solid-fuel rockets. I was officially demanded to join the party in 1937. I was already the technical director of the Army Rocket Center at Peenemünde. If I were to refuse to join the party, I would have abandoned



WALT DISNEY alongside von Braun

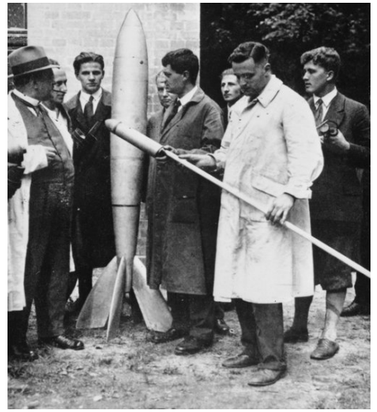
the work of my life. Therefore, I decided to join. I never did do anything political in the party. Then, in 1940, SS Colonel Müller came to my office and told me that Heinrich Himmler had sent him with the order to urge me to join the SS. I was told that if I wanted to continue my work, I had no alternative but to join.

M: What was your view of the German uses of the V-2 rocket?
B: When we started designing our rockets in 1932, we thought that the idea of war was absurd. We just wanted to explore outer space; we weren't worrying about what the technology could be used for in the future. The problem with developing for the Nazi government was that we never new what was really going on because Hitler had tight press censorship, and nobody could see what an outsider could with international media. I did not believe that launching the V-2 rockets at England was good. I wanted to explore space, not create some kind of weapon.

M: How did you become involved with the US Army?
B: After I said that I didn't believe

that Germany had a good chance of winning, and that I would rather explore space than design weapons, and after Himmler said that I was a Communist sympathizer and had attempted to sabotage the V-2 program, I was imprisoned at a Gestapo cell in Poland. I was close to being executed, if it weren't that some good people in Munitions and War Production convinced Hitler that I was required for the V-2 program. Then, in the spring of 1945, the Soviet army was getting close to Peenemünde. I got my staff together, and we decided that we should try to surrender to the Americans on the other side of the country. We surrendered to an American private. Then, the Americans saw the importance in having engineers. Through "Project Paperclip," we were secretly brought to America where we were employed to work on guided and ballistic missile technology through the US Army.

M: What did you do with Walt Disney?



WERNHER VON Braun, far right, in the 1930s

B: Walt Disney and I created three educational films about space. Those television films really sold the American public on space exploration. Disney had noticed that other scientists and I had written a series of articles about space for Collier's magazine. We made three films: "Man in Space," "Man and the Moon," and "Mars and Beyond." I was the technical director for these. I had to make it seem feasible that space flight was possible. I needed to sell the idea to Americans to ensure that there would be funding for the space program. Disney was very helpful; I don't know what would have happened to the space program if he hadn't stepped in and helped make these films.

DIRECTOR WERNHER von Braun walking with President Kennedy

M: What ideas did you have for space exploration?
B: Oh, I had so many ideas! I wanted space to be a place of peaceful exploration, with space stations, and going to the moon! I thought of the concept of the space station, and I published it in Collier's magazine under a series of articles entitled *Man Will Conquer Space Soon* along with fellow scientists. My space station would have been 250 feet wide, over a thousand miles above the earth, and spin to produce an artificial gravity. I believed that a space station would be the perfect place to start from for lunar exploration. Everybody would be able to go into space. Space transports would be standard.

M: What are your most important things you have worked on?
B: It was my rockets! Being part of NASA and sending people into space, and the moon! The Saturn V rocket was integral for all of this. My dreams had come true. The V-2 rocket might have been the most important, politically. It shaped borders between countries and helped determine the outcome of the Second World War. I think the most important thing I worked on, though, was NASA. Being a director, I had the chance to shape the administration in its infancy. It set precedence for the future of space travel for the world.

M: How do you wish to be remembered?
B: I want to be remembered as a scientist. I did everything I did for the sake of learning. People have given me a hard time for helping the Nazi party, then coming to the United States to help here. When we designed our rockets, it was because we wanted to get to space! Everything we did was for the love of learning, to understand the unknown.

M: Thank you so much, Mr. von Braun, for letting us have this interview with you. It was a real pleasure, and we learned so much.
B: You are very welcome, and thank you for the interview. ■

Film Analysis

The Pianist

Imagine losing all of your rights, one bit at a time, or being torn from your family due to the government. This is what happened to Wladyslaw Szpilman in Poland during the second world war in the movie *The Pianist*. Szpilman was a famous Jewish pianist who lived in Warsaw. The movie follows the life of Szpilman over a four year period from a piano recital at a radio station to the end of the war, with him back to his piano playing.

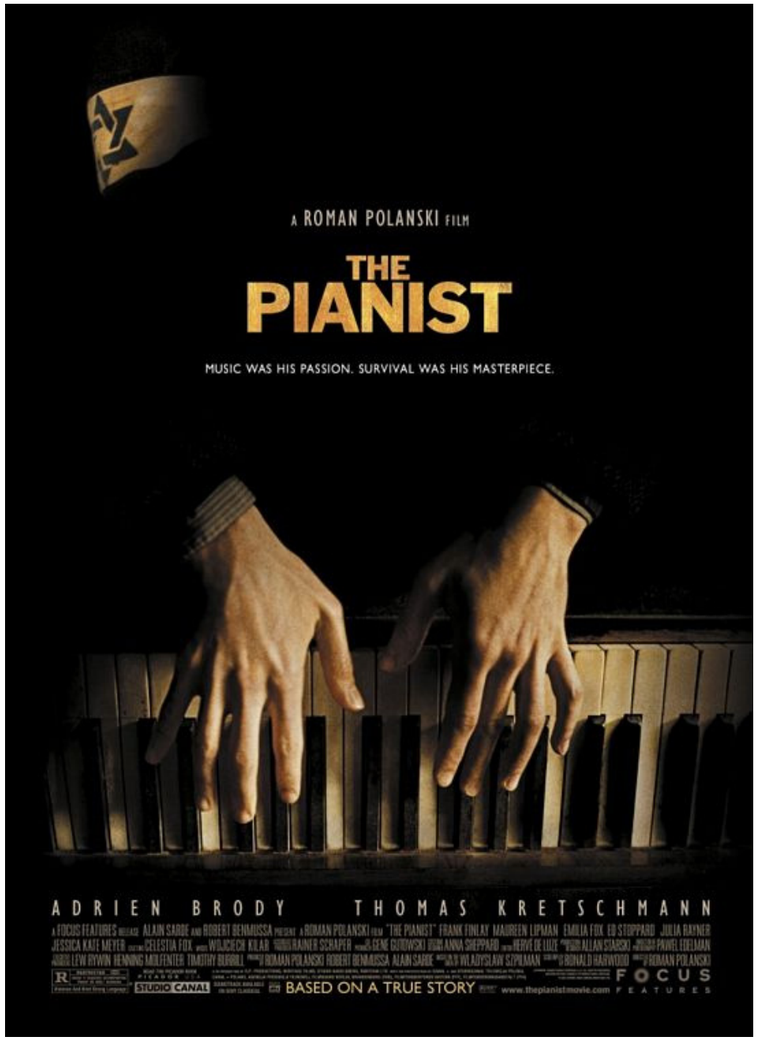
The piano was a very integral part of Szpilman. He was considered by his friends to play Chopin better than anyone else in the world. In the beginning of the movie, he is playing a song while being recorded at a radio station, and shells come flying through the roof as Warsaw was being bombed. But, Szpilman continues playing as if nothing has happened, and the people in the sound booth are all trying to get him to stop, but he keeps on going. He even gets a small injury, but it doesn't matter to him, because the piano is more important. Throughout the movie, you can see his fingers slightly moving when he is sitting down as if he's playing a piano. You could tell that he always had a song running through his head. This seemed to be a way he could keep his sanity. He had something to look forward to when the war was over. This reminds me of the book *Man's Search for Meaning* with Frankl's logotherapy. The reason people didn't just commit suicide when in the concentration camps by "touching the wire" was because there was hope in them. The same goes for Szpilman, because he had hope that he'd be able to play piano professionally again, so he practiced in his mind. It must have been incredibly painful to be confined in a room with a nice upright piano knowing that if he made the slightest sound that he'd probably lose his life like most of the other Jews in Warsaw. Whenever I enter a room with a piano, I always have to go over to it and play something. The piano was Szpilman; he was a pianist.

A few scenes about Szpilman's piano that really stand in my mind are those about him silently "playing" the piano. The first one was in the first flat with the upright piano. He went up to it, opened the lid, sat down, raised his hands, and started playing. He didn't really start playing, but instead pretended to, hovering an inch above the keys. This scene really made me anxious and distressed, because Polanski made it look like sound was emanating from the piano, which would completely blow his cover! But, with a slight movement of the camera, we find that he was just pretending. Another scene was with Szpilman sitting in a chair in the middle of the room. He had a beard and looked very weak and thin. He pretends there is a piano in front of him and goes through his music. I liked how Polanski made it seem like music was coming from his hand gestures, like that one act Bean had where a concert pianist was in the pit while Bean was on stage, doing funny things while it looked like he was playing piano in the air, with sound. Polanski made the sound because we were in his thoughts. This, again, illustrates the importance of piano to Szpilman. Also, since he had nothing else to do when sitting in his room by himself except look out the window, it shows that it was a good source of entertainment for him. This was probably the only thing that could keep him sane.

The movie is both in first and third person, in a way. Since it is a camera, it is always technically third person. But, you can feel Szpilman's emotions and thought process so well (even without narration of his thinking) that you just think that you are Szpilman.

Polanski, the director of the movie, used some very masterful techniques in the making of this film. The little things really add to the movie, such as the moving fingers mentioned above, or the motions of all the people in a crowded area. Most importantly, when the Nazis came to murder the Jews that were being "relocated," he didn't make it biased in any way. He showed it as what it was, people were being killed. If another director were to make this movie, you'd probably see the Nazis as being angry rabid gorillas and you'd see a shaky camera with hundreds of shots as people are being killed for prolonged periods of time. The Nazis were very awful, but it does more justice to show what really happened, but just enough to show the audience a picture of what happened. Those scenes were really terrible to watch. I couldn't bear to see the old man being thrown out of the balcony because he wouldn't stand up to greet the soldier, or when the man had to wait for the soldier to reload his gun before he was to be shot in the head. These things were horrible, and were shown long enough to prove the point that what happened was horrible. Another great thing was how there were long expanses of time where there was no dialog. There is no need to have witty dialog at all times in a movie, especially in one so powerful and emotional as this one. Speech would ruin the continuity, in a way. When he is confined, the only dialog is short, and quickly gets to the point. The middle of the movie reminds me of a silent movie. The camera work was amazing. The view was always where you thought you were there with Szpilman and a part of what he was experiencing. I especially liked the view through the window, a window to Szpilman's world.

SZPILMAN RECORDING at a Polish radio station in the 1940s



THE MOVIE poster for The Pianist

Usually in a story, the author makes every person, place, and thing a symbol. But, when this is a story directly from a person's memoirs where the person just wrote about what happened, without glorifying anything, and trying to remain as unbiased as possible, and just writing what the person believed happened, there is no intended symbolism. For people, we can only try to find symbolism that might not even be there. For example, The Wizard of Oz was loaded in symbolism, but the author denied it to his death. So, even though there may have been no intended symbolism by Szpilman, there may have been some by the director, so we'll keep going.

When Szpilman was confined in his "flats" throughout the movie, there was always a window. As I said before, it was a window to his world. It was here where we saw all of the things that were going on, and a very clever method of showing the progression of time in the story. Also, you could see the state of the Jewish ghetto, from having people, to being seemingly deserted, then having people fight back against the Nazis, and finally the Nazis exterminating the last people from the ghetto, to complete the promised "resettlement." The way the windows were positioned, it gave a sense of not knowing which side of the wall you were on, as Szpilman once said. The window symbolized everywhere Szpilman wanted to be. It could be the ghetto, because he always felt guilty for leaving his fellow people inside when he escaped,

or it could be the city, because he could see people walking around having a normal life.

A very simple symbolism was lighting. In the beginning of the movie, everything had a warm, yellow tone. Szpilman was happy at his radio station, performing. Then, everything started to get a grayer tone as all of the things progressed through the movie. And, at the very end, when he was playing his concerto, everything was back to its old colors, and happy.

Again, there really can't be that much symbolism because Polanski tried to stay as close as he could to Szpilman's memoirs. Symbolism is something arty from something fictional. This would require deviation from truth, which didn't happen.

The acting in the movie was very good on Brody's part. There is no question about why he won Best Actor. He looked like he was malnourished and in pain with everything he did when he was in the ghetto. I felt pain when I watched him. When he tried to lift himself over the fence near the end, he looked physically weak; that is a very hard thing to act out. Everything about his character seemed real; there was no overacting or faking.

ADRIEN BRODY as Szpilman

I thought the movie was relatively complete, but there were some scenes that I thought were missing. At the end, the only scene depicting him back in his life was him playing the Grand Polonaise by Chopin with an orchestra. There was no mention of his family except for a brief sentence superimposed that said something about his family. A mention of him trying to find his family was omitted as well. There could have been more, but I see why Polanski would make a nice, clean ending to make the movie a little happier, because his entire family was presumably dead. Another scene that I thought was missing would be during the time when the Nazis were limiting freedoms. It was brushed over in the scene when Szpilman said that he wasn't allowed to walk in the park anymore, but I thought there could have been more instances to make the transition even slower to really illustrate the fact that the Jews had their rights taken away so slowly that they didn't even know what was happening. But, the movie had to be limited temporally, or people wouldn't have gone to see it at the theater.

There are two scenes that stand out concerning Nazi brutality. This was a theme through the movie. The Nazis were the evil that couldn't be stopped. These scenes were shocking, yet there weren't too many, as mentioned before. The first scene was viewed through a window on a second floor apartment in the ghetto and started with a family sitting down to a dinner. Then, the screech of tires is heard on pavement, Nazis get out, pacing is heard of stairs, and they appear in the dining room of the family. They mutter something in German, and all of them stand up, except for the old man in the wheel chair. Suddenly, an officer takes the wheel chair, rolls it up to the balcony, and tosses the old man over. The officers run the people out of the apartment, and shoot them all as they sprint down the street. It gave everything a darker atmosphere, and made it so that there was a direct threat present, and to make the viewer go into a state of suspense.

The second scene took place in an alleyway. A group of workers were lined up by the officers. Those that were "unfit for work" were told to lie down on the pavement. Then, one officer proceeded to shoot them. But, as he got to the last person, the officer ran out of bullets and reloaded. The person had to stay there, knowing that he would be killed. The officer continued to fumble with the cartridge, loaded it, and fired. It was so shocking, I couldn't watch it happen. It would have been unbearable to be the person. Again, this scene showed the horrors of the Nazis. In both of these scenes, the lighting was done in such a way that the people's faces were illuminated to show their horror, and the coldness of the Nazi officers. It made the movie darker.

The music in the movie was excellent. Not great only because it was Chopin, but because of the mood and how it tied into the movie. Actually, most of the movie went without music. In a way, the music was silence, like *Four Minutes, Thirty-Three Seconds* by John Cage – the music was in the sounds of the scene. It is a very interesting effect. Other music would not have fit. Imagine, rock music as he is sifting through houses for food? Sometimes the best music is no music at all.

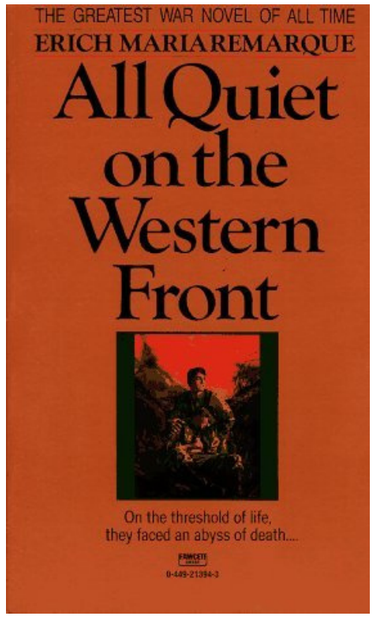
I think the most important theme in the movie is that even though there can be incredible evil, there can still be incredible good. In the ranks of the Nazis, there were people who would help out the Jews because they realized that what the Nazis were doing was morally wrong. For example, one German officer gave Szpilman his food and a coat to save him when they set up offices in the building he was staying near the end of the war. Other examples are all of the non-Jewish Polish who saved Jews from the Nazis and hid them, despite the risk of losing their lives, like when the people hid Szpilman in those flats. Despite the evil, good can still exist.

I would recommend this movie for anyone that qualifies to watch an R rated movie. It would be incorrect to say that I loved this movie. The movie was done very well, and really showed the horrors of WWII and the Holocaust. But, it is sick, in a way, to love a movie that is about death and hardship. Instead, I'll say that this movie is very good and should be seen by all so that the Holocaust is not forgotten. We do not want something so horrible to be repeated. Some might think that this movie is boring, or long and tedious. But, this is because the people aren't "thinking up here." So, I recommend it out of necessity to remember the past, as terrible as it was, but also as a beautifully made movie about a story of hope, compassion, survival, inspiration, friendship, charity, and good being victorious over evil. ■

Book Synthesis

Three Book Essay

The three books, *The Jungle*, *All Quiet on the Western Front*, and *Man's Search for Meaning* had the same basic themes. Each book talked about having people being controlled by a larger entity, people losing feeling and becoming apathetic, a motivation for living, and compassion with deep friendships. Usually, any two books share a few themes, but it is interesting that three distinct books from three time periods, the turn of the century, WWI, and WWII, respectively, will have the same elements. It is likely because these themes are timeless.



THE BOOK cover for All Quiet on the Western Front

Each of the stories had people being controlled by a large entity such as the nation's corporations, private interests, or the nation's government. "People" can mean the working class or those that aren't wealthy. In *The Jungle*, the working class of Chicago had no choice but to work for the large meatpacking or steel industries. They were the "cogs in the great machine." There were no other jobs in Chicago. It was basically a monopoly on jobs in the area. There were so many people in the city, with so few job openings, that the industries could be sure that there would be someone that would work for cheaper, for longer hours, or for more dangerous jobs. No matter how the companies treated the employees, there would always be those people who were more desperate and who were afraid for their family. Strikes did nothing because the industries would just hire people who were poorer in the city or in the south and bring them up. They had the workers around their finger, able to make them do whatever they wanted. In *All Quiet on the Western Front*, it was the wealthy private interests who played a part in controlling the people. The wealthy business owners knew that if they could get a war going there would be a boon for industry. During a lecture, this was called Militarism (from the MAIN causes of WWI). There was new technology, and they wanted to try it out, and make more money. So, the governments of "the world" were brought into war at the taxpayers expense. The working class was again brought into doing something against their will, in this case it was war, all for the enrichment (not intellectual) of the upper class, like in *The Jungle*. In the book *Man's Search for Meaning*, the same thing

basically happens. But, in this case, it is the government that is at work. Since the German government decided that Jews were the root of all problems, they created "concentration camps" where the Jews could be sent against their will. The people in the camps had to follow all orders or risk torture or death. There was no aspect of not being controlled in the camps unless you were a Capo, who were were Jews scientifically selected based on their ability to be cruel and dominate those who were "under" them. In each of these stories, people were being controlled by someone else.

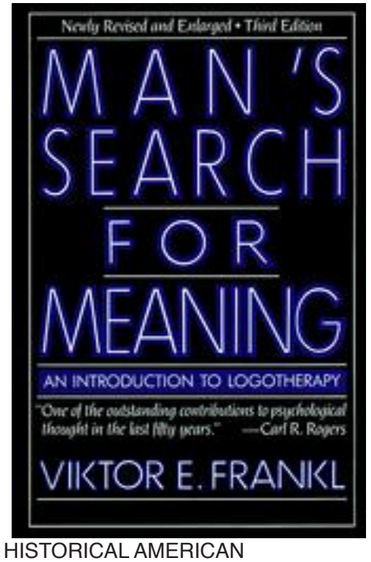
Also, each story had people develop a complete loss of feeling, becoming apathetic to everything around them. This is because in each story the characters were subjected to horrors and tragedy, and the only way that they could survive was to ignore it in their minds. *Man's Search for Meaning* talked about people going through stages when they went to the concentration camps. Initially there was shock which progressed until the people became apathetic to their environment. Death was a common sight to the prisoners in the camps, so it elicited no emotional response from them. The prisoners also couldn't feel anything beyond primal feelings such as being mad at someone who took something from him or being in pain. The most intense loss of feeling was during admission, and it lessened a little, but altogether, the people stopped caring about anything but keeping themselves alive. When the war was over, and the people were freed from the camps, they had a difficult time realizing that they were free. This is a common reaction for someone who has

THE COVER for The Jungle

been desensitized for such a long period of time. Then, over a gradual process, they could really see that they weren't in the camp anymore. In some ways, this is like today with extremely violent movies and video games. My generation doesn't see the horror in killing. When I talk to my friends, they say how much fun it is to play a "first person shooter" and kill nonsensically. They don't realize what they're doing. People argue that it isn't the games that are causing behavior such as school shootings, but I argue that these games desensitize the players. People were once allowed to bring guns to school for show and tell, and no one got hurt. The theme of loss of feeling was also found somewhat in *The Jungle*. The characters abandoned all of their values and morals as they went through the story. Their pain was so intense with their anger they had towards the meatpackers and what the industries had done to them, the loss of relatives, all of the times they got tricked by the unscrupulous, and the things they saw in the plants that they stopped caring and just tried to keep living. *All Quiet on the Western Front* clearly had this theme. With all of the death and destruction and the characters not knowing why they were at war, they all lost hope and lost feeling. When the main character went back home, he realized that he wouldn't be able to keep on living the way he used to. The war completely changed him, and he couldn't stand the way people talked about the war. The same things happened to the soldiers that happened to the Jews in *Man's Search for Meaning*. Except, in *All Quiet on the Western Front*, the main character lost hope and died. After seeing shells coming out of the sky, killing their friends, and never knowing if they would live to the next day, they stopped caring. Interestingly, each book had the apathy lifted. In *Man's Search for Meaning*, Frankl regained his old thoughts and feelings gradually after the end of a war. While in *The Jungle*, Jurgis's eyes were opened when he was introduced to the Socialist party. Metaphorically, in *All Quiet on the Western Front*, Paul Bäumer started to live again by losing his life, but that can be argued.

Each story showed people's motivation to live. The will to survive was strong in all of the books through the majority of the story. In *All Quiet on the Western Front*, the characters did their best to get food and get the good jobs where they could be free of the whistling shells of the front. They did everything they could to keep going. But, unlike the other books, at some point the main characters lost their motivation. For some, it was when they realized that the war might go on forever, so there was no point in fighting. But, since there was nothing for them to do because they had no choice but to fight, they chose to give up hope and die. Others, like Paul, when they went back home on leave, saw that there was nothing to look forward to. After all of the things they had seen, they didn't want to go back to a place where everybody thought the war effort was noble and wanted to talk about it. He died at the end, and for him, he was "glad the end had come." Another person in the story that lost his motivation was the one in the hospital. He knew that there was no chance to get out alive, so he just let himself die. But, through most of the story, the characters had the drive to keep going, again, finding food, keeping out of the line of fire, hiding in shell holes, and everything that is necessary to stay alive in a battlefield type situation. In *The Jungle*, all of the workers in the book tried to get work, no matter the wage, so they could feed themselves and their family. This was a very

THE COVER of Man's Search for Meaning



difficult thing for them to do especially with the competition of other workers and the demoralizing and unhealthy working conditions. It is amazing that even when everything is at odds against someone, they still strive to keep going. In some ways this is like the people in New Orleans from Hurricane Katrina. Even though they have lost their house to a few feet of water and there are no jobs and no money, people still struggle to keep living. In *Man's Search for Meaning*, Frankl kept going forward, hoping to get back home and reunite with his wife. It was this hope that made him want to live. In each of these books, unless people had something to hope for or look forward to, the people would die. This theme has been seen in basically all of the books for the block. *The Grapes of Wrath* was *The Jungle* retold in California and a family's struggle against agricultural barons instead of meat barons. The family's will to survive as a family and not break up was really strong, and survived with minimal breakup throughout the book. All of these books, especially *The Jungle*, are similar to *Fast Food Nation*, which is a book that describes the meat and fast food industries, and proceeds to illustrate people's lives and their struggle with their jobs. Anybody who's read both books will understand. These themes really are timeless in that they are still happening today.

One other similarity is that each book has deep friendships with other characters. In spite of the horrors of war, concentration camps, and meat packing plants, evil people, and total despair, the common thread was the camaraderie, selflessness, and deep friendship and love that developed between the characters. In *All Quiet on the Western Front*, the group of people was very close, and helped each other, like in the other books. In *Man's Search for Meaning*, friendship was sometimes the only way to survive. Friends were the source of entertainment, humor, and someone to talk to. Finally, in *The Jungle*, friends were a source of support. The friendships in the books were strong and very important.

It is easier to compare than to contrast these three books. The most obvious difference was that they all occurred in different time periods and in different locations. Two were in Germany, and *The Jungle* was in Chicago. In *The Jungle*, the message of the story was that socialism was the answer to all of the problems of the working class. *All Quiet on the Western Front* left the reader feeling that war was hopeless and never the solution. *Man's Search for Meaning* tried to market the author's logotherapy method of psychoanalysis by using anecdotes, but Frankl's main message was that in order for people to survive, they

Book List

This is a list of books that I want to read by the end of high school. Most of the books have the theme of a dysfunctional utopia.

1. *Clockwork Orange*
   by Anthony Burgess
2. *Brave New World*
   by Aldous Huxley
3. *We*
   by Yevgeny Zamyatin
4. *Foundation*
   by Isaac Asimov
5. *Atlas Shrugged*
   by Ayn Rand

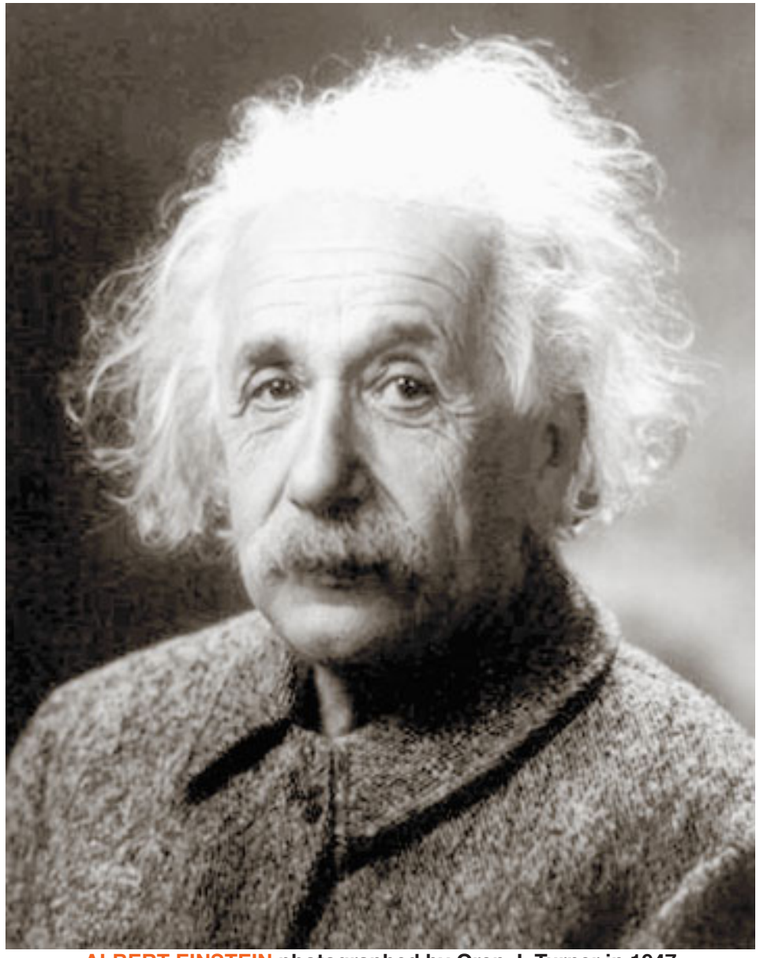
need a reason and meaning for life.

These books were remarkably similar, even thought they were in different time periods, different locations, and each had different messages. They all were concerned with people being controlled against their will, apathy, a motivation for living, and friendships. These themes are timeless. ■

Main Event

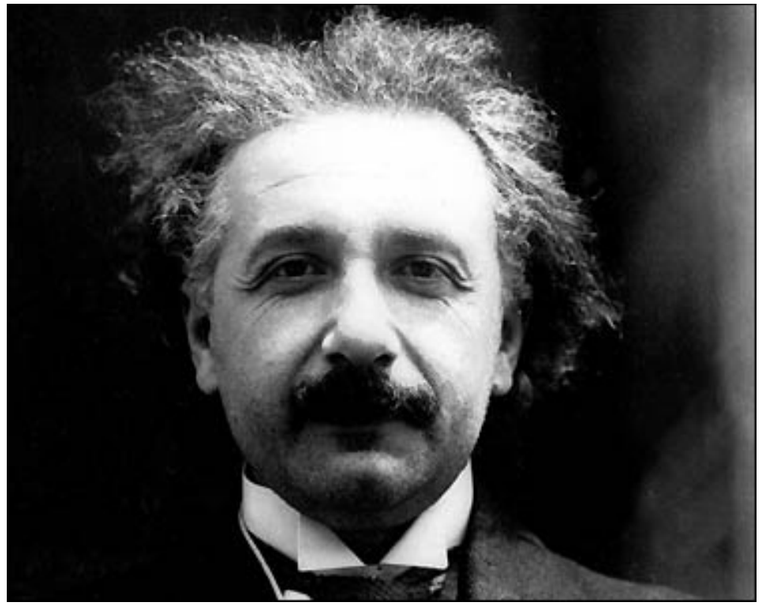
Einstein

Most famous for his general theory of relativity, Albert Einstein is regarded as the greatest scientist of the twentieth century. He made major contributions to the fields of quantum mechanics, statistical mechanics, and cosmology. In 1921 he was awarded the Nobel Prize for Physics. After he formulated his general theory of relativity in 1915, he became world famous. He would become more famous than any other scientist in history. His name has become synonymous with intelligence and genius.



ALBERT EINSTEIN photographed by Oren J. Turner in 1947

Einstein was born on March 14, 1879 at Ulm in Baden-Württemberg, Germany. His parents were Hermann Einstein, a featherbed salesman, and Pauline. Six weeks later, Hermann moved his family to Munich after several business failures. Einstein was part of a non-observant Jewish family. He was considered a slow learner, possibly due to dyslexia or simply shyness. He took time to ponder his speech and did not speak fluently until the age of ten. His teacher remarked to his father that it does not matter in which profession he would choose, because he would never succeed. Unlike most children, Einstein questioned space and time. Although he was slow, he was an intelligent child. He also showed manual dexterity. He liked mechanical toys and was curious about how they worked, jigsaw puzzles, and towers of cards. When Einstein was ill in bed one day, his father showed him a pocket compass. He decided that there must be some force in empty space that acted on the compass. His mother had him take violin lessons at the age of six. He was intrigued by the mathematical structure of Mozart's music. At around this time, he entered the Luitpold Catholic Elementary School. Then, at the age of ten, he entered the Luitpold Gymnasium. He did not like these schools. He likened the teachers at the elementary school as sergeants and those at the Gymnasium as lieutenants. He had said that "the worst thing seems to be for a school principally to work with methods of fear, force, and artificial authority. Such treatment destroys the healthy feelings, the integrity, and self confidence of the pupils. All that it produces is a servile captive." While at the Gymnasium, he adopted an attitude of not caring about accepted beliefs. He learned the virtues of



DOCTOR EINSTEIN in 1934

skepticism, questioning, and doubting, which are important tools for a scientist. Also, he learned self-discipline, single-minded determination, and a dedication to an ideal. He did not become interested in physics because of the Gymnasium, but because of Max Talmey, a young Jewish medical student who gave him books to read such as *Popular Books on Physical Science* by A. Bernstein and *Force and Matter* by L. Buchner. After his father's business failed in 1894, the family left for Pavia, Italy, near Milan, over the Alps. Einstein was left at Munich in a boardinghouse to finish school. He completed only one term before leaving the Gymnasium in the spring of 1895 to rejoin his family in Pavia. This was without telling his parents, and only a year and a half before final examinations. Unlike most dropouts, Einstein convinced the school to let him go with a medical note from a doctor saying he was having a nervous breakdown, but this meant he had no secondary-school certificate. Without the certificate, he couldn't enroll in most colleges. The only alternative was the Swiss Federal Institute of Technology in Zurich, which only required an entrance exam. He excelled on the mathematics and science portions, but failed on the liberal arts portion. His family then sent him to Aarau, Switzerland to finish secondary school, where he received his diploma in September 1896. He enrolled at the Eidgenössische Technische Hochschule in October and moved to Zurich. That year, he became stateless by renouncing his Württemberg citizezenship. In 1900, he was granted a teaching diploma from the Eidgenössische Technische Hochschule and was accepted as a Swiss citizen in 1901. He kept his Swiss passport for his whole life.

After he graduated, Einstein could not find a teaching post because he had irritated most of his professors as a young man. The father of a classmate had helped him obtain employment as a technical assistant examiner at the Swiss Patent Office in 1902. He judged the worth of inventors' patents that required a knowledge of physics to understand. Mostly, he had to evaluate patents concerning electromagnetic devices. He had to learn to understand poor descriptions, and he occasionally fixed design errors while evaluating the practicality of their designs.

On January 6, 1903, Einstein married Mileva Marić, a mathematician. They had been in the same section in the Swiss Federal Institute of Technology and she had been the only woman to earn that degree that year. In 1902, they had an illegitimate daughter, Lieserl. Einstein referred to Mileva as "a creature who is my equal and who is as strong and independent as I am." They had both a personal and intellectual partnership. On May 14, 1904, their first son, Hans Albert Einstein, was born.

In 1903, Einstein's position at the Swiss Patent Office had been made permanent. He obtained his doctorate after submitting his thesis "A new determination of molecular dimensions" in 1905.

In that year, he published four articles, known as the Annus Mirabilis Papers (Latin for "year of wonders"), which provided the foundation for modern physics. He did this without much scientific literature which he could reference or many scientific colleagues which he could discuss his theories with. He submitted the papers to the "Annalen der Physik."

His first paper, named "*On a Heuristic Viewpoint Concerning*

the Production and Transformation of Light," proposed that "energy quanta" (which we now call photons) were real, and showed how they could be used to explain such phenomena as the photoelectric effect, which was when electrons were emitted from a metal when the metal was exposed to electromagnetic radiation.

His second paper, named "*On the Motion—Required by the Molecular Kinetic Theory of Heat—of Small Particles Suspended in a Stationary Liquid*," covered his study of the randomness of Brownian motion and provided empirical evidence for the existence of atoms. Before his paper, physicists and chemists never really knew if atoms were real entities or not. His statistical discussion of atomic behavior gave experimentalists a way to count atoms by looking through an ordinary microscope.

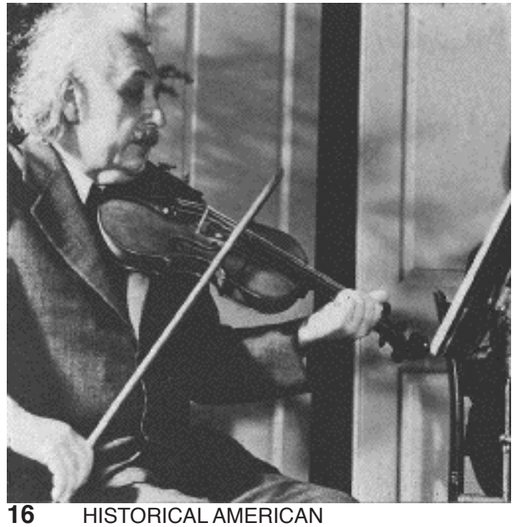
His third paper, "*On the Electrodynamics of Moving Bodies*," introduced the special theory of relativity. It was a theory of time, distance, mass, and energy which was consistent with electromagnetism, but didn't talk about gravity.

His final paper, "*Does the Inertia of a Body Depend Upon Its Energy Content?*" took an axiom from relativity and deduced that the energy of a body at rest is equal to its mass multiplied by the speed of light, squared. This is commonly referred to in his famous equation, $E = mc^2$.

Interestingly, he received the Nobel Prize in Physics only for his paper about the photoelectric effect which made quantum theory possible. This is ironic because he was better known for relativity, and he did not like the path quantum theory took. Most importantly, these papers explained what scientists were baffled by for decades.

Einstein was promoted to technical examiner second class in 1906. And then, in 1908, he was licensed in Bern, Switzerland as an unsalaried university teacher. His second son, Eduard, was born in 1910. In 1911, Einstein became first associate professor at the University of Zurich and later a full professor at the University of Prague. The next year, he became a full professor at the Swiss Federal Institute of Technology. In 1914, right before the outbreak of World War I, he became a German citizen and settled in Berlin as professor at the local university and became a member of the Prussian Academy of Sciences. From 1914 to 1933, he served as director of the Kaiser Wilhelm Institute for Physics in Berlin, and during this time he was awarded the Nobel Prize for his papers. He was also a professor at the Leiden University from 1920 to 1946.

THE VIOLIN was very important to Einstein



On February 14, 1919, Einstein divorced Mileva and married his cousin Elsa Löwenthal on June 2, 1919. She was Einstein's first cousin maternally and second cousin paternally.

General relativity was presented via a series of lectures to the Prussian Academy of Sciences on November 1915. The theory replaced Newton's law of gravity. According to the theory, all frames of reference were equivalent, not only things that moved at a uniform speed, as in the special relativity. Gravity was no longer a force but was a consequence of the curvature in space-time. With the theory of relativity, all laws of physics apply to all observers, including light. So, no matter how fast an observer is moving in relation to light, the light still seems to go the same speed. The theory provided the foundation for the study of cosmology and gave scientists the tools for understanding the universe. In 1919, predictions were what confirmed the theory. During an eclipse, scientists measured the angle at which light from a star was bent. The gravitational lensing effect showed that relativity could predict. According to the New York Times on November 10 of that year, "Lights All Askew in the Heavens: Men of Science More or Less Agog Over Results of Eclipse Observations. — Einstein Theory Triumphs — Stars Not Where They Seemed or Were Calculated to be, but Nobody Need to Worry. — A book for 12 Wise Men — No More in All the World Could Comprehend it, Said Einstein When His Daring Publishers Accepted It."

In the 1920s, the original quantum theory that he developed was replaced with a new theory of quantum mechanics. The new theory said that everything behaved based on probabilities; there was no way of knowing the exact outcome of physical behavior. Einstein did not like this explanation, though he did say that it was the best theory available at the time. He believed that the universe behaved in a deterministic way, and that even though we don't understand it, everything happens directly because of something that happened preceding the event, and not something completely random. In a letter to Max Born in 1926, Einstein had written:

> *Quantum mechanics is certainly imposing. But an inner voice tells me it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the Old One. I, at any rate, am convinced that He does not throw dice.*

He was not rejecting the probabilistic theories, but instead believed that there must be a better, deterministic, theory.

Over the next few years he helped develop a new form of statistics, predict a property of matter called the "Bose-Einstein condensate," and a new form of refrigerator with no moving parts.

When Adolf Hitler came to power in 1933, the Nazi party had accused Einstein of creating "Jewish physics" as opposed to "Aryan physics." Einstein then renounced his German citizenship and fled to the United States where he was given permanent residency. He then accepted a position at the newly founded Institute for Advanced Study in Princeton Township, New Jersey. In 1940, he became an American citizen, though he still retained Swiss citizenship.

In 1939, Einstein sent a letter to President Franklin Delano Roosevelt that urged the study of nuclear fission for military purposes under fears that the Nazi government would be the first to develop atomic weapons. In the letter, Einstein had said that:

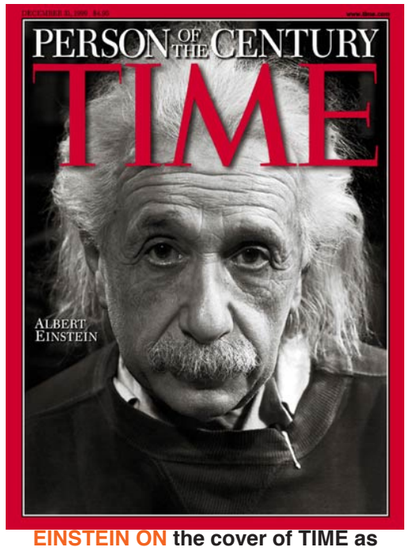
> *It may become possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power. [...] This new phenomenon would also lead to the construction of bombs, and it is conceivable [...] that extremely powerful bombs of this new type may thus be constructed. [...] I understand that Germany has acutally stopped the sale of uranium from the Czechoslovakian mines, which she has taken over.*

He then proceeded to say that the Kaiser Wilheim Institute in Berlin is copying American work on uranium. Because of this letter, Roosevelt started a small investigation which exploded into the Manhattan Project.

After the war, Einstein sought nuclear disarmament. He said, "I do not know how the Third World War will be fought, but I can tell you what they will use in the Fourth—rocks!"

In 1952, the Israeli government proposed to Einstein that he take the post of second president. He declined, and remains to this day the only citizen to be offered a position as a foreign head of state.

At 1:15 AM on April 18, 1955, in a hospital in Princeton,



EINSTEIN ON the cover of TIME as Person of the Century

New Jersey, the only person present was a hospital nurse, and she reported that he mumbled some word in German before his death, which she did not understand. He was cremated without ceremony on the same day he died at Trenton, New Jersey, in accordance with his wishes. His ashes were scattered at an undisclosed location.

Albert Einstein had created science as we know it today. He made the stereotype of the "absent-minded professor" with his crazy white hair and being completely focused on problems in physics. His quantum theory and theories of relativity paved a new way of looking at the world around us. He gave us the tools to look at the very beginning and the end of the universe. But, these theories had dramatic social consequences as well. His famous $E=mc^2$ made it possible to make the nuclear bomb, for good or evil. This arguably ended World War II. With his theories, we now have insight into the universe and its inner-workings. ■

Painting Analysis

Upwards

Artists don't paint something without a reason. It may be because they were developing a new skill with the brush, or that they were being paid to paint a portrait. Whatever the reason, an artist will also try to send a message, be it subconsciously or consciously. It could be about the artist's psyche, or society at large.

At first glance, the painting, *Upward*, by Emil Bisttram, looks like some kind of invention, with the red wire connecting parts together. But, that doesn't explain the name of the title, *Upward*. The title implies that something is growing toward the sky. With that, it now seems to be a city. The semi-transparent trapezoids in the middle look like buildings, with elevators being the darker bands. Above them, the lighter night sky seems to lead the way for the buildings, the future of the city. Behind the florescent buildings lies a strange green monolith. What could this be? Seeing that the heights of the buildings increase as they are farther back in the image, the buildings in the back have been developing for a longer period of time. And, the building in the very back is what the the city is to become.

"UPWARD" ca. 1940 Emil Bisttram, Oil on Canvas 1986.92.3A

Underneath the city its hidden secrets lie. This is the part that no one goes to see, or maybe even knows about. It is the infrastructure that makes the city run. Underneath the blue ground, there are many interesting devices. The three white rails could be the subway. The three overlapping triangles seem to be stairs going down to the subway. The red curly line looks like it could be cable. Then, there is the yellow ball with the red wire connecting it to the surface. This could either be a light or a power source. This raises the question if the artist was trying to show a dependency of the underground to the surface, or of the surface to the underground. If it is indeed a power source, the artist is showing that all that people don't want in their backyard is being hidden from view. But, if it is a light, then it shows that not everything can be hidden, and society is striving for an ideal that can't be achieved.

There is a gray disk in the sky. No doubt it is some celestial object, but which one? It is either the sun or the moon. If the disk were the sun, then the artist is showing that cities are ruining the world. Pollution from the city building is blocking out the sky, reducing it to dark blue and sunless. More likely though, is that the disk is the moon. But, is it setting or rising? Is the artist trying to say that cities are the new era and good times have come? When this painting had been made, the Great Depression had been over for about a year. So, the setting moon making way for the sun could be saying that good times are coming for cities and people in general. Now, that could also be a rising moon. This could symbolize that darkness is going to cover everyone. That does not explain why the city is producing its own light. Maybe the artist is saying that cities have lost spirituality, where the sun could be like a god, and that the cities only have themselves to turn to.

During 1940, when this was painted, New York City had just purchased all of the competing subway lines, making a monopoly. The artist may have been saying with the small yellow tower that is connected near the subway system that the city now has control over the transportation system.

It is interesting that the artist chose to paint everything with straight lines and solid-filled boxes. This gives the painting a sort of simplistic look. The author is saying that the city has a very simple goal, to expand and grow "upward." People had been moving from a rural setting into cities increasingly around the time period.

Notice how there are no stars in the night sky. This is a side effect of cities. The light emanating from them completely wash out the stars. Nature's beauty can not be seen with cities. This would mean, then, that the light above the buildings is also literally light, and not just the future of the towers. The artist probably saw this light to be a detriment to the beauty that people should be able to enjoy.

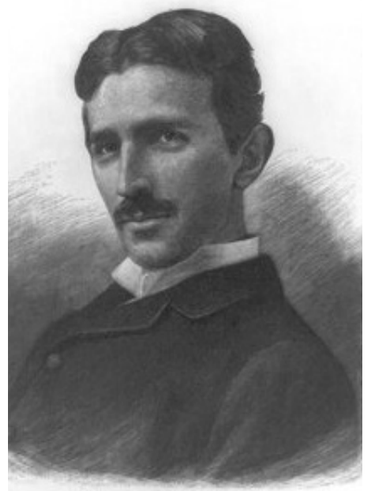
There seems to be limitless possibilities when analyzing this painting, but no matter what the artist intended for his viewer to see, there is always something that can be pulled from it. A picture is indeed worth a thousand words. ■

What if?

Tesla

Tesla was an inventor at the turn of the century who was years ahead of his time. He invented the radio, alternating current transmission systems, wireless communication, among hundreds of other things. He had an incredible will to learn and create new things to benefit society. It can be argued that he had this drive because he tried to dispel the shadow of his brother and impress his parents. His brother died when Tesla was five due to injuries from a horse, but before he died, he blamed Tesla for it. Tesla said that his achievements were dull in comparison to the promise of his dead brother. He said his own achievements "merely caused my parents to feel their loss more keenly. So I grew up with little confidence in myself. But I was far from being considered a stupid boy..." Because of his brothers death, he sought to console his parents by being supe-

NIKOLA TESLA — Inventor



rior to other boys with his methods of self discipline.

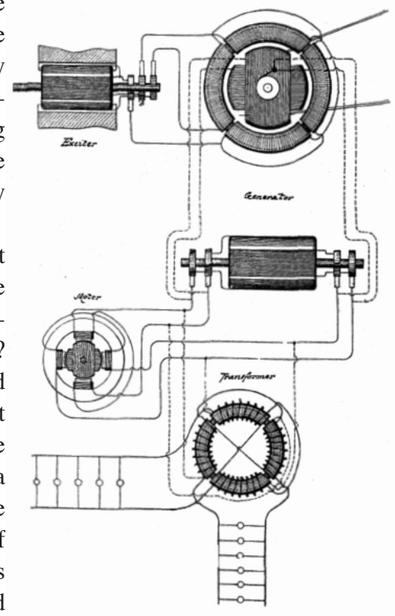
What if Tesla's brother had never died? Tesla would have never read as much as he had. Reading was his relief from the horror of his brother's death. He took refuge in his father's books and hid from the world. He learned a lot from his reading, and it sparked an interest for him about electrical engineering, physics, mathematics, and even poetry. He could recite hundreds of poems, and after he read a book, he said he could tell you about it word for word. He went to the Polytechnic college in Prague to show that he could have been as good as his brother, and that is where he invented the alternating current motor, the device that is used throughout the world in applications such as industrial automation. But, if he didn't have this need, there wouldn't have been the drive for him to succeed. He would have probably gone into the Serbian Orthodox Church and become a priest like his father, and his grandpa, and most of the people in his family. We wouldn't have gone on to invent his most important inventions which were radio and electrical transmission. Technology today wouldn't have been as far as it is now, and we may still be using steam instead of electricity.

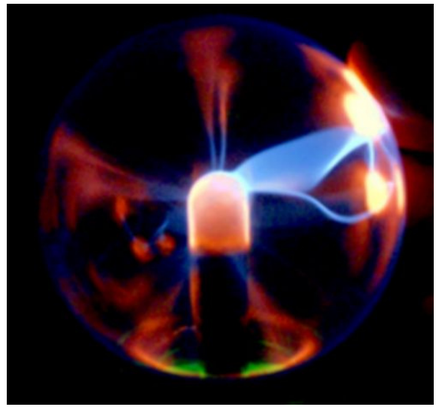
Tesla's electrical transmission system was probably his most important invention. He first invented the induction motor 1881 and proceeded to build one in 1883. After he sailed to America, he sold the patents for the motor and everything else that went into power transmission to Westinghouse. When Westinghouse saw that he wouldn't be able to pay the due of twelve-million dollars and stay in business, Tesla tore up the contract and didn't ask for the money. He never asked for royalties because he believed that it would be best for humanity. If someone else had invented this system, they would have limited the manufacture of the devices so that they could make a handsome profit even thought it would hurt technological innovation. This is like today. The person who invented the World Wide Web refused to collect royalties for his invention because he new it would hinder its use. Another thing that could have happened was that no one would come along and see how superior alternating current was to direct current. The "War of Currents" would never have happened between Edison and Westinghouse, and we would be using the more expensive and wasteful direct current. Cheap electricity has spurned many common devices. If electricity were to be more expensive because of this, people would have been more cautious with new technology that relied on electricity. Computers would never have become as widespread as they are now because the cost of electricity would have been too much. Alternating current is efficient over long distances. With direct current, we would need a power plant in every city.

Radio is another important invention by Tesla. What if he hadn't come up with the idea of using the air to transmit information? Marconi did not invent it; he used the work of Tesla and pretended it was his creation when he sent the famous message. There is even a Supreme Court ruling. Imagine what the world would be like if we couldn't send information as easily as we can. Wires would be commonplace without the radio, and those are expensive. There wouldn't be cell phones, which may or may not be a good thing, you decide. Space exploration would be non existent; it would be impractical to have a wire thousands of miles long. Also, radar is another application of radio. It is very helpful to know where things are at long distances (air control towers).

If Tesla had never found the need to invent something like the radio, modern communication systems would have never developed. The principle of air transmission is very important to us. We would never have been able to track airplanes, so commercial airlines would be very dangerous. News would never be able to be transmitted as fast as it is now. Radios and TVs are very cheap devices in terms of ease for information transmission. A land-line is an expensive thing. We wouldn't have the advanced methods of talking as we have now; we would

TESLA'S AC transmission system





THE DOMESTIC Tesla Coil

have to actually talk to people face to face. There are so many technologies that have relied on sending electromagnetic waves through the air, that they can't be listed here.

These inventions of Tesla's, if they hadn't been created, would have drastically changed the politics of the world. Now that the background is out of the way, it is time for short illustrations of what history would have been like after 1890.

The "War of Currents" would have never occurred between Tesla and Edison. This was where he and Edison fought over efficient alternating current and Edison's direct current, respectively, for what would be distributed since Tesla would have never come up with his AC distribution system. Tesla would never have paired up with Westinghouse, and the Westinghouse Electric Corporation would have never been created. General Electric would have never had this rival, and we'd all be using GE lightbulbs with direct current.

Without cheap electricity, Ford never would have found it worthwhile to create his "moving assembly line" in 1913, a system in which the parts come to the worker to save time and cut costs. Other companies would never have copied his system, because it wouldn't exist, and cars would be more expensive. Also, since his assembly line was copied so many times, manufacture around the world would be different. With consumer electronics, the method of creating circuit boards and etching chips heavily relies on having a moving assembly line, or everything has to be hand made, which can be prone to errors.

Without his famous "Tesla Coil," we would not have electric starters for cars. Everytime we would want to go somewhere, we would have to turn a crank and risk breaking a bone.

Without the radio, it would have been very difficult to send messages from out at sea to land. There would be no way to coordinate maritime battles with other ships, unless something like smoke signaling was used, which is impractical. During the sinking of the Titanic, there would have been no way to signal to passing ships to save the people aboard the ship. During WWI, radio was used extensively on both sides to coordinate armies and navies. Without it, Germany would have never been able to send diplomatic messages (their telegraph cables were cut by the British) and Woodrow Wilson wouldn't have been able to send Germany his Fourteen Points. Who knows how the war would have ended up without radio? Maybe Germany could have even won. Before WWII, Hitler wouldn't have been able to broadcast his famous speech, so he might not have had as many supporters, and he might not have come to power, stopping WWII before it started, assuming that WWI happened in the first place.

I would think that radio would be invented at some point in the mid-1900's or later if Tesla hadn't invented it. All current communication systems would be postponed until decades later, and we may only be first inventing the internet now.

The possibilities are endless for what could happen without Tesla creating all of his amazing inventions. But, we can only guess what it would be like. Actually, there is no need to worry about what would happen if something didn't happen, such as Tesla's brother never dying. We live in a deterministic universe. Things happen because everything in the universe was set up in such a way to make that thing happen. In the universe, there are certain symmetries. One is time. If you look backwards through time or forwards through time, it doesn't matter. It will look the same. So, with a "what if" question, one must also ask what must have happened to lead up to such a situation. This is known as a light cone in physics. On one side, the cone trees out into all of the things that depended on the incident occurring. On the other are all of the events that lead up to the incident. The past is as important as the future. So, now for the "what if" question in reverse. What would have been needed to make it so Tesla's brother had never died, or that made it so Tesla didn't feel the need to live up to what he thought his parents expectations were? This will not be answered here, but question will be left as an exercise for the reader. ■

Snapshot and Dedication

The Editor

This project made me think about life, and helped me to grow as a person. I now know more about the period from 1890 to 1945. This project was fun to do, and a great experience. As interesting as it was to learn about WWI, WWII, concentration camps, meat packing plants, Frankl's logotherapy, Einstein, Tesla, and everything else, I think the most important thing that I learned from this project was time management.

I chose to write about science history because it is taught very little, and there is not much in the textbooks. In fact, there is only one sentence in our history textbook concerning Tesla, Edison, and Einstein. Politics seems to be king. Industry and politics get all of the benefits of technology and are acknowledged. Where would they be without the cumulative addition of knowledge? There was a whole story about Edison getting Tesla to redesign his companies power system, promising $50,000 in return. After several months of effort, Tesla was done, and Edison said, "Tesla, you don't understand our American humor," and never gave him the money. From then on, Tesla and Edison were rivals, and went to fight the "War of Currents." All our history textbook, Liberty, Equality, Power, has to say about this is that:

> *The work of Thomas Edison, George Westinghouse, and Nikola Tesla produced the incandescent bulb that brought electric lighting into homes and offices and the alternating current (AC) that made electric transmission possible over long distances. (610)*

This is misleading. This has ambiguity that can make it seem like Edison and Tesla helped each other, that Edison supported AC, and that Westinghouse was an inventor. Westinghouse was really a businessman that bought the rights to Tesla's system. The correct meaning is only understood if you knew the history to begin with. Well, at least it got in there. More of Tesla's work is in his obituary. Einstein also has a little snippet in our textbook. All it says is that Einstein had urged Franklin Roosevelt to build a bomb based on atomic research. This is the only mention of him. I know that this is an American history textbook, but when a theory that is big enough to help make an atomic bomb is made, you would think that there would be a little more about it. Also, Einstein became a U.S. citizen, and became outspoken politically. But, he was a scientist, and the textbooks appear to focus on the politicians

I dedicate this portfolio to my mom and to all of the underrepresented scientists throughout history. For this project, my mom was very helpful by keeping me on task. It is very hard in a world where information is literally at our fingertips because it is easy to continue to research things that didn't need to be researched. At one point, on the internet, I started with Tesla and ended up at Geissler tubes. Staying focused was hard for me with so many things to read about. My mom helped me get a schedule together to finish the project by a deadline so that I'd have enough time for formatting everything into this magazine layout, and then getting it over to the printer. Her method of motivation was to say that she wouldn't get it printed if I didn't finish typing by a certain deadline. Thank you, mom.

This paper is also dedicated to the underrepresented scientists in history. We take their work for granted, every day of the year. For everything we use, be it computers, lights, radio, the internet, cars, or even running water, there was someone who invented it, or improved upon it. Leaders, the people in public view, are the ones that are written about. Without the scientists discoveries and inventions, we wouldn't be where we are today. Where would politics be today without the cotton gin? Cotton may have never been king. That would have been a valid "What if?" essay, if only it were in the correct time period. Also, I wouldn't have access to this fancy computer or all of the amazing computer programs that I have if it weren't for computer scientists and engineers. Thank you, all of the scientists throughout history. ■

KYLE MILLER