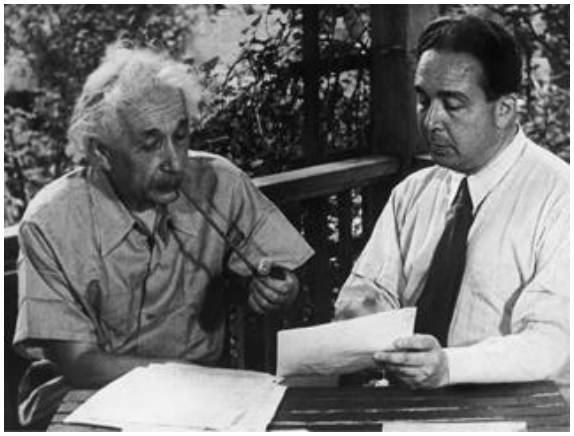
THE HISTORY CHANNEL® PRESENTS:

10 DAYS THAT UNEXPECTEDLY CHANGED AMERICA™



Einstein's Letter
(JULY 16, 1939)

"Yes, we have to divide up our time like that, between our politics and our equations. But to me our equations are far more important, for politics are only a matter of present concern. A mathematical equation stands forever."

- Albert Einstein

"There is a mysterious cycle in human events. To some generations, much is given, of other generations, much is expected. This generation of Americans has a rendezvous with destiny."

- President Franklin D. Roosevelt

In a long series of events that changed the course of the world forever, the evolution of the atom bomb began one hot summer day in Long Island, New York. The day is July 16th, 1939, the setting is the beautiful summer home of Albert Einstein and the key players are Germany's Albert Einstein and Hungary's Leo Szilard. If it were not for these two men, who decided to change the world that day, the Manhattan Project would not have spawned and the outcome of WWII could have been dramatically different. It was on that day when Szilard met with Einstein to tell him that the German war machine, with Hitler's full support, was developing an atom bomb to use against innocent people. Szilard was regarded as one of the best physicists in the world, but outside the science community, he was unknown, which is why he told Einstein this and tried to enlist his help. Einstein was a devoted pacifist, so he faced a huge dilemma – does he write a letter to President Roosevelt urging additional research of the nuclear chain reaction that will potentially kill millions of people or does he stand back, riddled with constant fear, and permit the Germans to develop the bomb uninhibited? Eventually, he decided to write

the letter to the President, which changed the way the American President would enact foreign, domestic and military policy forever.

10 Days that Saved America: Einstein's Letter documents the remarkable evolution of the atom bomb from its perceived idea, to the physics behind a self-sustained nuclear chain reaction to its development in the Manhattan project. The development of the bomb, by Leo Szilard, Enrico Fermi and indirectly Albert Einstein, is arguably the most decisive scientific development of the 20th century and maybe single most important scientific undertaking the United States has ever accomplished. The aggressive project, developed by foreigners on American soil, was enacted under supreme secrecy, but The History Channel® brings a new and innovative chronological analysis to light. Utilizing reenactments, primary sources, expert historians, Einstein's actual letters, recordings from FDR, and authentic video clips from the earlier half of the 20th century, the program thoroughly explains Einstein and Szilard's dilemma as well as the bureaucratic hurdles that the two faced in their quest to defend America and free the world from widespread fear of the Nazi regime.

Curriculum Links

10 Days that Unexpectedly Changed America: Einstein's Letter would be an excellent addition to any class on American History, Science and Technology, the Cold War, and 19th Century History. **Due to some graphic images and sensitive material, we recommend that teachers view this program prior to showing it to the class. It is recommended for high school students only.** It fulfills the following standards as outlined by the National Council for History Education: (1) Civilization, cultural diffusion and innovation, (3) Values, beliefs, political ideas, and institutions, (3) Conflict and cooperation, (4) Comparative history of major events and (5) Patterns of social and political interaction.

Footnotes to History

WERE YOU AWARE that Einstein could not speak fluently at the age of nine, so many people thought he was mentally retarded?

Vocabulary

Using the dictionary at www.merriamwebster.com, an internet resource such as www.history.com, or an encyclopedia, students should define or explain the significance of the following terms:

Cogent
Efficacy
Euphemism
Fascism
German War Machine
Intolerant
Intrepid
Malaise
Mundane
Mutually Assured Destruction (MAD)
Nobel Peace Prize
Pontificate
Posit
Salutary

Comprehension Questions

1. Who is Leo Szilard and what was his most famous idea? How did his idea spur the need for Einstein's letter?
2. In layman's terms, what does $E=mc^2$ mean? Who came up with it? Why was this formula so important?
3. Why was Szilard conflicted about testing out the nuclear chain reaction? What did he think was going to happen? Did he think that his potential discovery would be used for military purposes?
4. Why did Einstein renounce his German citizenship? What did he believe about the use of military force? How did he use his power to pontificate his personal beliefs?
5. Initially, did Szilard agree with Einstein on the moral issues of the project? Where did Szilard's initial beliefs come from? How did he get Einstein to write the letter to President Roosevelt?
6. What was the Uranium Club? What did it mean for the Americans? Who was the most widely acclaimed German scientist? What were some of his accomplishments?
7. What was the fate of Einstein's initial letter to President Roosevelt? What type of bureaucratic red tape did Szilard face after his meeting with the president?
8. What was the Manhattan Project? What did it mean for the United States and the world? Who was Enrico Fermi?
9. Why did Szilard call the day he tested the nuclear chain reaction, "a black day in the history of mankind?" What happened on July 16th, 1945?
10. After the bombings of Japan, what did the Americans learn from the German scientists at Farm Hall in England? Why was this information so surprising?
11. After the bombing of Hiroshima, was Szilard satisfied with his efforts in helping devise the physics behind the weapon? What did Einstein think of the Japanese bombings?

Extended Activities

1. The Life of Albert Einstein

Albert Einstein was one of the world's most influential scientists during his lifetime and his legacy has traveled to present day. From his theories of relativity to his career as a pacifist, Einstein shaped the way of the world worked and thought in the 20th century. On your own, research Einstein's life, utilizing resources like the internet or the library, and write a 3-page paper on 2 of his major contributions to society. Also, include a detailed timeline of his life in an appendix to your paper in order to give context to your argument. In class, give a quick, 5 minute presentation on your selected contributions.

2. An Invention Convention

Einstein, Newton, and Bell are not the only ones who have the ability to invent, although all three have made more major contributions to our daily lives than most people. Students are America's bright future and they have the ability to invent just like the world's most famous scientists. On your own, think of something you would

like to invent, and write a preliminary 3 page paper on how you are going to design it, develop it and how it functions. Afterwards, make a detailed computer presentation or make one by hand that explains exactly how your invention works. If possible, try to make either a life-size or miniature model of your invention and present in a convention style setting in your classroom along side all of your classmates. Be sure to explain to the class why your invention is important, feasible, and even likely.

3. The Nobel Prize – An Amazing Feat

The Nobel Prize is perhaps the greatest international award a civilian can win. Einstein, President Jimmy Carter and Elie Wiesel – these people are from different backgrounds and have different goals in life, but all share the achievement of winning a Nobel Prize. In a well written 3-5 page paper, pick one winner in any field and from any time period and write about the significance of their life. How would the world have been different without their accomplishments? On what scale did their personal achievements affect humankind? Be sure to include their reason for winning, a detailed timeline and their continuing contributions after winning the award.

Primary Source Exploration

Albert Einstein's letters to President Roosevelt were the catalyst for the establishment of the Manhattan Project and the eventual development of the atom bomb. The gravity of the German Empire's power and irrationality is seen through these letters, as Einstein, an unwavering pacifist, advocates for the development of potentially the most powerful bomb in the world. These letters, written in the name of liberty, had detrimental consequences in the end for some and for others, they were reason to celebrate. No one will ever be able to make a decisive decision as to whether they were beneficial or detrimental, but they should still be analyzed as historical artifacts. Read the excerpts below from Einstein's first letter to President Roosevelt and answer the following questions:

> *…In the course of the last four months it has been made probable - through the work of Joliot in France as well as Fermi and Szilard in America - that it may become possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power and large quantities of new radium-like elements would be generated. Now it appears almost certain that this could be achieved in the immediate future…*
>
> *This new phenomenon would also lead to the construction of bombs, and it is conceivable - though much less certain - that extremely powerful bombs of a new type may thus be constructed. A single bomb of this type, carried by boat and exploded in a port, might very well destroy the whole port together with some of the surrounding territory…*
>
> *I understand that Germany has actually stopped the sale of uranium from the Czechoslovakian mines which she has taken over. That*

she should have taken such early action might perhaps be understood on the ground that the son of the German Under-Secretary of State, von Weizsäcker, is attached to the Kaiser-Wilhelm-Institute in Berlin where some of the American work on uranium is now being repeated.

Yours very truly,
Albert Einstein
August 2nd, 1939

1. Judging from the tone of the excerpt, what were Einstein's goals for the letter?
2. What tactics does Einstein use to draw attention to the need for a nuclear program?
3. How would you have written this letter differently if you had the opportunity to address President Roosevelt about nuclear chain reactions?
4. If you were Roosevelt, how would you have assessed the validity of this letter? What would you have done after reading and formulating your opinions?
5. Do you think Roosevelt considered Germany a nuclear threat at the time of this letter, which is before American involvement? What did he think after this letter?
6. What is the most important part of the excerpt above?
7. How do you think President Truman would have reacted to this letter had he received it? Speculate as class.

Resources

Websites

The Center for The History of Physics' official website on Einstein – http://www.aip.org/history/einstein/

The official website of the Nobel Prize – www.nobelprize.org

The National Atomic Museum's official website – http://www.atomicmuseum.com/tour/manhattanproject.cfm

Books

Fermi, Laura. *Atoms in the Family: My Life with Enrico Fermi.* University of Chicago Press, 1995.

Groueff, Stephane. *Manhattan Project: The Untold Story of Making the Atomic Bomb*. Backinprint.com, 2000.

Lanouette, William. *Genius in the Shadows: A Biography of Leo Szilard, the Man Behind the Bomb*. University of Chicago Press, 1994.

Penrose, Roger, et. al. *Einstein's Miraculous Year: Five Papers that Changed the Face of Physics.* Princeton University Press, 2005.

A portrait of Einstein c. 1935