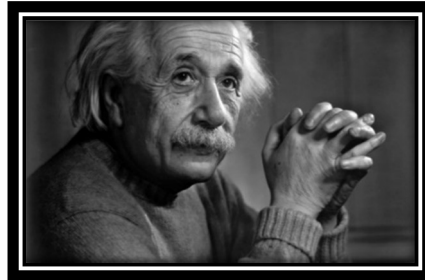


ALBERT EINSTEIN AND THE ATOMIC BOMB
HERE HE EXPLAINS THE BIGGEST MISTAKE OF HIS LIFE

173



THE BEGINNING

LTR WRITTEN BY ALBERT EINSTEIN TO PRESIDENT ROOSEVELT EXPLAINS THE POSSIBLE USE OF ATOMIC BOMB

Old Grove Rd. Nassau Point, Peconic, Long Island

August 2nd, 1939

F.D. Roosevelt, President of the United States, White House, Washington, D.C.

Sir,

Some recent work by E. Fermi and L. Szilard, which has been communicated to me in a manuscript, leads me to expect that the element uranium may be turned into a new and important source of energy in the immediate future. Certain aspects of the situation that have arisen seem to call for watchfulness and, if necessary, quick action on the part of the administration. I believe therefore that I must bring to your attention the following facts and recommendations:

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. However, such bombs might very well prove to be too heavy for transportation by air.

The United States has only very poor [illegible] of uranium in moderate quantities. There is some good ore in Canada and the former Czechoslovakia, while the most important source of Uranium is the Belgian Congo.

Because of this situation, you may think it desirable to have some permanent contact maintained between the Administration and the group of physicists working on chain reactions in America. One possible way of achieving this might be for you to entrust with this task a person who has your confidence and who could perhaps serve in an unofficial capacity. His task might comprise the following:

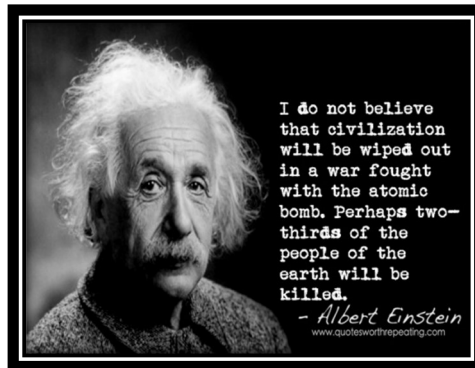
- a) To approach Government Departments, keep them informed of further development, and forward recommendations for Government action, giving particular attention to the problem of uranium ore for the United States;
- b) To speed up the experimental work, which is at present being carried on within the limits of the budgets of University laboratories, by providing funds, if such funds be required, through his contacts with private persons who are willing to contribute to this cause, and perhaps also by obtaining the co-operation of industrial laboratories which have the necessary equipment.

I understand that Germany has 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 Weishlicker [sic], 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)

Source: Argonne National Laboratory



QUESTIONS AND ANSWERS

IS IT TRUE THAT EINSTEIN HELPED INVENT THE ATOM BOMB?

No. In 1939, when he learned that scientists in Berlin had figured out how to split a uranium atom, Einstein wrote a letter to President Roosevelt urging him to do whatever it took to make sure American scientists were the first to build an atomic bomb. (He was a committed pacifist, but the prospect of nuclear weapons in the hands of the Nazis was so terrifying, he later wrote that “I did not see any [other] way out.”) However, because of his left-wing political beliefs, the U.S. Army denied Einstein the security clearances he needed to be a part of the Manhattan Project, and so his role in the development of this deadly technology was an indirect one.

NOTE: Although not a practicing Jew, Einstein called his relationship with the Jewish people, “my strongest human bond.”

IS IT TRUE THAT MANY OFFICIALS BELIEVED THAT EINSTEIN WAS A SOVIET SPY?

Yes. Because of his controversial political beliefs and support for socialism, civil rights, and nuclear disarmament, for example, anti-Communist crusaders believed that Einstein was a dangerous subversive. Some, like FBI director J. Edgar Hoover, even thought he was a spy. For 22 years, Hoover’s agents tapped Einstein’s phones, opened his mail, rifled through his trash, and even bugged his secretary’s nephew’s house, all to prove that he was more radical (as his 1,500-page FBI dossier noted) than “even Stalin himself.”

DID EINSTEIN ALMOST BECOME THE PRESIDENT OF ISRAEL?

Yes. In 1952, Israel’s first president, Chaim Weizmann, asked his friend Albert Einstein (“the greatest Jew alive,” Weizmann said) if he would be willing to lead the young nation. Though the Israelis assured him that “complete facility and freedom to pursue your great scientific work would be afforded by a government and people who are fully conscious of the supreme significance of your labors,” Einstein turned down the offer. For one thing, though he was very sympathetic to Israel, he was never an ardent Zionist—he believed in “friendly and fruitful” cooperation between Jews and Arabs—and for another, he worried that he lacked the interpersonal skills to be a world leader. Still, Einstein added, “My relationship to the Jewish people has become my strongest human bond, ever since I became fully aware of our precarious situation among the nations of the world,” and he was “deeply moved” by Weizmann’s offer.

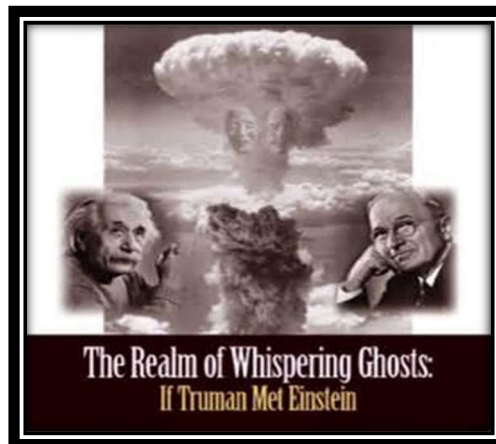
IS IT TRUE THAT EINSTEIN WAS A LOUSY STUDENT?

In some ways, yes. When he was very young, Einstein's parents worried that he had a learning disability because he was very slow to learn to talk. (He also avoided other children and had extraordinary temper tantrums.) When he started school, he did very well-he was a creative and persistent problem-solver-but he hated the rote, disciplined style of the teachers at his Munich school, and he dropped out when he was 15. Then, when he took the entrance examination for a polytechnic school in Zurich, he flunked. (He passed the math part, but failed the botany, zoology, and language sections.)

Einstein kept studying and was admitted to the Polytechnic Institute the following year, but even then he continued to struggle: His professors thought that he was smart but much too pleased with himself, and some doubted that he would graduate. He did, but not by much-which is how the young physicist found himself working in the Swiss Patent Office instead of at a school or university.

IS IT TRUE THAT EINSTEIN'S FIRST WIFE CONTRIBUTED TO THE DISCOVERIES THAT MADE HER HUSBAND FAMOUS?

Some researchers think that she did (for example, in 1905 she told a friend that "we finished some important work that will make my husband world-famous"), but most agree that, while Mileva Maric was a talented physicist in her own right and a valuable sounding-board for his most famous work. However, her scientific ambitions were certainly belittled and overlooked, especially by her husband. Einstein treated his wife quite badly: He had (and flaunted) many affairs; he was distinctly unhelpful around the house; and he made Maric obey a long list of humiliating rules ("You must answer me at once when I speak to you," for example.) The two divorced in 1919 and Einstein married his cousin Elsa. As for her husband's ideas, she did not make substantial



SUMMARY

The physicist Albert Einstein did not directly participate in the invention of the atomic bomb. But as we shall see, he was instrumental in facilitating its development.

In 1905, as part of his Special Theory of Relativity, he made the intriguing point that a large amount of energy could be released from a small amount of matter. This was expressed by the equation $E=mc^2$ (energy = mass times the speed of light squared). **The atomic bomb would clearly illustrate this principle.**

But bombs were not what Einstein had in mind when he published this equation. Indeed, he considered himself to be a pacifist. In 1929, **he publicly declared that if a war broke out he would "unconditionally refuse to do war service, direct or indirect... regardless of how the cause of the war should be judged."** (Ronald Clark, "Einstein: The Life and Times", pg. 428). His position would change in 1933, as the result of Adolf Hitler's ascent to power in Germany. While still promoting peace, Einstein no longer fit his previous self-description of being an "absolute pacifist".

Einstein's greatest role in the invention of the atomic bomb was signing a letter to President Franklin Roosevelt urging that the bomb be built. The splitting of the uranium atom in Germany in December 1938 plus continued German aggression led some physicists to fear that Germany might be working on an atomic bomb. Among those concerned were physicists Leo Szilard and Eugene Wigner. But Szilard and Wigner did not influence those in power. So in July 1939, they explained the problem to someone who did: Albert Einstein. According to Szilard, Einstein said the possibility of a chain reaction "never occurred to me", although Einstein was quick to understand the theory. After consulting with Einstein, in August 1939 Szilard wrote a letter to President Roosevelt with Einstein's signature on it. The letter was delivered to Roosevelt in October 1939 by Alexander Sachs, a friend of the President. Germany had invaded Poland the previous month; the time was ripe for action. That October the Briggs Committee was appointed to study uranium chain reactions.

But the Briggs Committee moved very slowly, prompting Einstein, Szilard, and Sachs to write to FDR in March 1940, pointing again to German progress in uranium research. In April 1940 an Einstein letter, ghost-written by Szilard, pressed Briggs Committee chairman Lyman Briggs on the need for "greater speed"

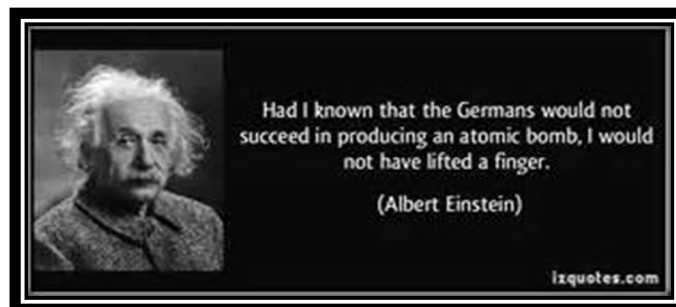
Research still proceeded slowly, because the invention of the atomic bomb seemed distant and unlikely, rather than a weapon that might be used in the current war. It was not until after the British MAUD Report was presented to FDR in October 1941 that a more accelerated pace was taken. This British document stated that an atomic bomb could be built and that it might be ready for use by late 1943, in time for use during the war.

Einstein biographer Ronald Clark observed that the atomic bomb would have been invented without Einstein's letters, but that without the early U.S. work that resulted from the letters, the a-bombs might not have been ready in time to use during the war on Japan.

The atomic bomb-related work that Einstein did was very limited and he completed it in two days during December 1941. [Vannevar Bush](#), who was coordinating the scientific work on the A-bomb at that time, asked Einstein's advice on a theoretical problem involved in separating fissionable material by gaseous diffusion. But Bush and other leaders in the atomic bomb project excluded Einstein from any other a-bomb-related work. Bush didn't trust Einstein to keep the project a secret: "I am not at all sure... [Einstein] would not discuss it in a way that it should not be discussed."

As the realization of nuclear weapons grew near, Einstein looked beyond the current war to future problems that such weapons could bring. He wrote to physicist Niels Bohr in December 1944, "When the war is over, then there will be in all countries a pursuit of secret war preparations with technological means which will lead inevitably to preventative wars and destruction even more terrible than the present destruction of life."

EINSTEIN'S THOUGHTS / COMMENTS / DISAPPROVAL OF THE USE OF THE ATOMIC BOMB



A short article on the front page of the New York Times contained his view: "Prof. Albert Einstein... said that he was sure that President Roosevelt would have forbidden the atomic bombing of Hiroshima had he been alive and that it was probably carried out to end the Pacific war before Russia could participate.

Einstein later wrote, "I have always condemned the use of the atomic bomb against Japan."

In November 1954, five months before his death, Einstein summarized his feelings about his role in the creation of the atomic bomb:

"I made one great mistake in my life... when I signed the letter to President Roosevelt recommending that atom bombs be made; but there was some justification - the danger that the Germans would make them."

Additional information about the life and the Obituary of Dr. Einstein can be found at the following link:

<http://www.nytimes.com/learning/general/onthisday/bday/0314.html>



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