Date of publication: March 10, 2022
DOI: 10.52270/26585561_2022_13_15_78

Historical Sciences

THE ATOMIC RACE DURING THE SECOND WORLD WAR

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Abstract

The article examines the race for the possession of atomic weapons, which unfolded between Nazi Germany and the United States during the Second World War. The chronology of events shows that Nazi Germany was in the lead in the atomic race in 1940 and 1941. After the defeat of the Fascist troops near Moscow in December 1941, Hitler ordered to mobilize all resources for current military needs. At a time when the fighting on the Eastern Front was pulling more and more financial and human resources out of the Reich, the Nazi leadership came to the conclusion that the creation (and even more so the use) of nuclear weapons during the Second World War are no longer possible. If the United States (a huge rich country without military operations on its territory) intensified work on the nuclear project every month, then the Third Reich, on the contrary, conducted it according to the residual principle. The authors conclude that the main force that prevented the Nazis from unleashing atomic death on the world was the Soviet Union, which made a decisive contribution to the defeat of fascism.

Keywords: World War II, USSR, Nazi Germany, USA, atomic bomb. "Uranium Project", "Manhattan Project", nuclear scientists.

I. INTRODUCTION

The nuclear age is a concept that is not just a continuation of the previous series of concepts: the age of steam, the age of electricity. They were symbols of the new driving forces of social production. The energy of the atomic nucleus presented itself primarily as a destructive force. The United States is the first country to carry out a nuclear explosion and the only one to date to use nuclear weapons in a combat situation. The article will examine the race for the possession of atomic weapons, which unfolded between Nazi Germany and the United States during the Second World War, and revealed the reasons why the United States was the first in this race.

II. METHODOLOGY

When writing the article, the materials of the Nuremberg Trials were used, in particular, the answers to the interrogation of the Reich Minister of Armaments and War Production A. Speer about his work in the field of the military use of atomic energy, the memoirs of the American General L. Groves, who initiated the Alsos mission, created with the aim of preserving both as long as possible, the American monopoly on nuclear weapons and to prevent the falling into the hands of the Soviet secret services of German technology and personnel. It was L. Groves who came up with the idea to bomb the plant of the Auergesellschaft concern in the zone that was intended for occupation by the Armed Forces of the USSR, since the plant could be used for nuclear production.

Interest in this area is represented by the works of the Austrian journalist R. Jung on the creation of the atomic bomb in the United States and the British writer D. Irving on atomic development in Nazi Germany, as well as the work of the honored lawyer of the Russian Federation A.I. Ioyrysha, who since 1982 for a long time headed the sector of legal problems of the use of atomic energy at the Institute of State and Law of the Russian Academy of Sciences.

III. DISCUSSION AND RESULTS

At the Nuremberg Trials, which began on November 20, 1945 and ended on October 1, 1946, during interrogation, Albert Speer was questioned by the Soviet prosecutor M.Yu. Raginsky confirmed that all his activities as Minister of Armaments were subordinated to the conduct of an aggressive war. The development of rocket weapons was the subject of special concern of the Hitlerite minister. Speer often visited Peenemünde [8]. It was on the basis of Speer's information that Hitler announced that the war would soon be over, for Germany would use a super-powerful secret weapon. Chief American Prosecutor R. Jackson asked Speer about his work in the field of military use of atomic energy. According to Speer, the Nazis lagged behind in this area, since all the best forces that were engaged in the study of atomic energy went to America. It would take the Nazis another one or two years to split the atom [3, p. 162]. At these words, those sitting in the hall of the Nuremberg court shuddered. One can only imagine how the fate of mankind would have developed if Hitler had received an atomic bomb at his disposal.

Speer stated: “... Hitler used technology not only for the purpose of domination over the German people. Thanks to his technical superiority, he almost succeeded in subjugating Europe ... The more technology is developed in the world, the more it is fraught with danger, the more weight the technical means of warfare have” [3, p. 163].

Speer described the horrors of a future war: “Military equipment in five to ten years will make it possible to bombard one continent from another with rockets with absolute precision. Such a rocket, which will operate with the force of the fission of an atom and be serviced by maybe only ten persons, can destroy millions of people in New York in a few seconds, reaching the target invisibly, without the possibility of prior knowledge of it, faster than sound, at night and during the day” [3, p. 163].

On August 6, 1945, during a conversation with German physicists interned in Great Britain, a legend arose that the threat of atomic death was withdrawn from the world by the hands of the German physicists themselves, who were tasked with creating nuclear weapons. This legend was taken up and supplemented by Western researchers. Thus, the Austrian journalist and writer Robert Jung wrote in a documentary book about the creation of an atomic bomb in the United States «Brighter than a Thousand Suns»: “Four factors contributed to disrupting the creation of the German atomic bomb. The first factor is the lack of sufficiently qualified physicists who were expelled by Hitler. The second is the poor organization by the Nazis of research in the interests of waging war and the lack of understanding of its significance by the Nazi government.

The third is the poor equipment of laboratories with appropriate equipment for such complex research. And, finally, the fourth is the attitude of German specialists engaged in atomic research, who do not strive for success" [7, p. 80]. The same arguments are put forward by David Irving in the book about atomic development in Nazi Germany "Virus Wing" [6, p. 343, 104].

The history of the creation of the German atomic bomb must be viewed in comparison with the course of atomic research in the United States, which led to the creation of the atomic bomb, and with the main events of that period.

On December 17, 1938, a scientific discovery was made that began a new era in the history of mankind. As a result of the experiment, a couple of chemical scientists found that when the uranium nucleus is bombarded with slow neutrons, it "bursts", decaying into lighter elements. Moreover, this process, called "nuclear fission", was accompanied by the release of energy. The prospect of a sensational find, peaceful and military, was obvious to scientists from the very beginning. The authors of the discovery were named Otto Hahn and Fritz Strassmann, they worked at the Kaiser Wilhelm Chemical Institute in Berlin. By the late 1930s, scientists from around the world, including Niels Bohr, Enrico Fermi, Irene Curie and her husband Frederic Joliot, were on the cusp of a landmark achievement, but the Germans were still the first. In the first third of the XX century, Germany was at the forefront of science, its physicists and chemists, Max Planck, Albert Einstein, Gustav Hertz, Werner Heisenberg, regularly received Nobel Prizes. With very little time left before the outbreak of World War II, the Nazis were unexpectedly at the forefront of the race for nuclear weapons. As a result of the experiment at the very end of 1938, they found that when uranium was irradiated with slow neutrons, barium was formed with a core about 2 times less than the original. Subsequent studies led scientists to the idea of the possibility of a nuclear chain reaction, accompanied by the release of a large amount of energy. The controlled chain reaction, in turn, formed the basis of nuclear energy, and the uncontrolled one - the basis of nuclear weapons.

In January 1939, Hahn and Strassmann found that the number of neurons in uranium fission was sufficient to trigger a chain reaction. In February 1939, American scientists Fermi and Szilard discovered the same thing. In March 1939, an American physicist of Italian origin Enrico Fermi told Admiral Hooper that he could create atomic weapons, but the meeting between Fermi and Cooper had no practical consequences.

In April 1939, the Austrian physicist and chemist Paul Harteck informed the German military leadership about the possibility of creating atomic weapons.

In September 1939, the German military department approved the classified "Uranium Project" - a research program aimed at creating atomic weapons. For its implementation, the cooperation of more than 20 scientific organizations of the Reich was organized, about a hundred of the largest German physicists began to work on the topic, and the young 37-year-old scientist Werner Heisenberg, by that time already a Nobel Prize winner, became the theoretical leader of the program.

The probable opponents of the Third Reich also understood the prospects for nuclear weapons and the advantages that they provide on a geopolitical scale. In August 1939, Albert Einstein, forced to leave Germany for the United States in 1933 after the Nazis came to power, sent a letter to Franklin Roosevelt in which he informed the President of the country about the existence of the German nuclear program and indirectly warned about the prospect of creating a uranium atomic bomb in the Reich. In October 1939, US President Roosevelt, having received a letter from Einstein, gave instructions on state support for atomic research.

In the early 1940s, the Third Reich was ahead of any other country in its nuclear program. Nazi Germany already had an organizational structure dealing with problems, had the necessary intellectual resources to work on it, and provided sufficient funding for the corresponding work. The problem could be the lack of the required amount of raw materials for the atomic project on the territory of the country, but this issue was also resolved as a result of the expansion of the Reich. After the annexation of the Sudetenland region of Czechoslovakia in 1938, the uranium mines of the city of Jachymov were at the disposal of the Germans. More than a thousand tons of uranium oxide from African colonial mines (half of the world's uranium reserves) were captured during the occupation of Belgium in March 1940. In April 1940, in Norway, the Nazis seized the world's only heavy water plant, which was supposed to be used to slow down the chain reaction. All these activities allowed Werner

Heisenberg to begin practical work on the creation of the first nuclear reactor, or "uranium machine" as it was called at the time.

In June 1940, the National Defense Research Committee was created in the United States to direct atomic research.

In July 1940, the German physicist Karl Weizsacker, who, together with W. Heisenberg and other German scientists, worked on the creation of nuclear technology for Nazi Germany, informs the military leadership of the possibility of converting uranium-238 into plutonium and creating plutonium explosives. In December of the same year, the industrial production of metallic uranium began. Werner Heisenberg assembled the first nuclear research reactor. In the United States, at the same time, the National Defense Research Committee concludes the first contract for the creation of a nuclear research reactor.

In July 1941, the German physicist and chemist Wilhelm Groth developed a method for separating uranium-235 by centrifugation. The American nuclear scientist and Nobel Prize laureate in physics in 1939 for the invention of the cyclotron (1930) Ernest Lawrence informed the National Defense Research Committee of the possibility of creating a plutonium bomb.

In September 1941, German scientists produced a ton of uranium metal in a month. Heisenberg conducted successful experiments in the atomic rector that opened the way to the implementation of a nuclear chain reaction. But after the defeat of Nazi troops near Moscow in December 1941, Hitler ordered the mobilization of all German resources for current military needs and banned long-term programs.

Until about the beginning of 1942, the nuclear projects of Germany and the United States developed in parallel and with equal success, but by the middle of this year, a fundamental change took place in the nuclear race. After the Japanese attack on the largest American naval base Pearl Harbor in December 1941, when the United States finally entered World War II, Roosevelt decided to transform the work on the study of atomic energy into an atomic weapons program within 3-4 years. American physicists E. Lawrence and G. Urey developed a method for separating urn-235 by centrifugation and a gas-diffusion method. An internal analysis in the Uranium Committee led its leadership to the conclusion that the country has sufficient resources, both theoretical and practical, to create nuclear weapons during the current conflict and their potential use. A huge rich country without hostilities on its territory was practically unlimited in the choice of means to achieve this goal.

Germany was in completely different conditions. Although the intellectual potential of German scientists roughly matched the American one, other resources were incomparable. The failure at the end of 1941 of the "blitzkrieg" concept, which had repeatedly proved its effectiveness, led to the understanding that the war could drag on, and its result was not at all guaranteed. In conditions when the hostilities on the Eastern Front were drawing more and more financial and human resources from the Reich, the Nazi leadership came to the conclusion that the creation (and even more so the use) of nuclear weapons during the Second World War was no longer possible.

In April 1942, the commissioner for the 4-year plan, G. Goering, banned all research that did not promise a result within 6 weeks.

In June 1942, the Minister of Armaments and Ammunition of the Third Reich, Speer, heard a report on the atomic research carried out and, convinced that it was impossible to create atomic weapons in less than a few years, in the next report to Hitler he put the question in 16th place.

In July 1942, a key meeting of Reich Minister Albert Speer with participants in the Uranium Project took place in Berlin. It made a decision in principle to return nuclear work from the Ministry of Arms and Munitions to the responsibility of the Imperial Research Council. The Nazis made, perhaps, a fatal choice for themselves: they abandoned the military atom in favor of the peaceful atom. Henceforth, Heisenberg and his team had to work on the peaceful use of the "uranium machine", and not on the atomic bomb, the appearance of which was considered unrealistic before the end of hostilities.

From that moment on, the development of nuclear projects in the United States and Germany followed diametrically opposite vectors.

If the United States intensified work on the topic every month, then the Third Reich, on the contrary, the further, the more it was carried out on a leftover principle.

Roosevelt at this time heard a report on the atomic research carried out and decided to start creating an atomic bomb.

In August 1942, the Manhattan Project was approved, a military organization tasked with creating an atomic industry and setting up the production of atomic bombs. Uranium metal production commenced. In December of the same year, Fermi carries out the world's first nuclear chain reaction. Construction begins at Hanford and Oak Ridge for which $ 400 million is allocated. By the summer of 1942, the information accumulated by Allied intelligence was sufficient to determine the bottleneck of the Nazis. It turned out to be the same plant for the production of heavy water, built in 1934 by the Norwegian company Norsk Hydro near the hydroelectric power station in the village of Vemork.

Heavy water (deuterium oxide) was an essential ingredient that Heisenberg planned to use to slow down a chain reaction in a nuclear reactor. It was obtained after the decomposition of fresh water using electrolysis. For the successful implementation of their program, the Germans needed about five tons of this liquid, and this process was quite laborious.

The first attempt to send saboteurs into Norway, called Operation Stranger, was made in November 1942 and ended in failure. The landing of sappers with the help of gliders led to the death of 18 out of 32 people, and the remaining 14 volunteers were captured by the Germans and shot.

The second attempt was more successful. Operation Gunnerside was more organized. During January - February 1943, several groups of saboteurs were thrown into Norway at once, who on the night of February 27-28, 1943, in the most difficult conditions, were able to enter the territory of the Norsk Hydro enterprise, install explosive devices and detonate them. As a result of sabotage, the plant was forced to stop production for several months. In November 1943, the British carried out two massive bombing raids on the object. As a result, the Germans decided to evacuate his equipment and the remaining reserves of heavy water to the Reich, but here, too, the Norwegian resistance showed itself in the most dignified way. On February 20, 1944, the ferry SF Hydro, carrying containers of water, was blown up and sank. Thus, the Nazis finally lost a key component for their nuclear program, which put an end to it.

In January-February 1943, the fascist army was defeated at Stalingrad, and a radical change took place during the Second World War.

In March 1943, the German War Office resigned from the leadership of atomic research. For the 1943/1944 financial year, 2 million marks (0.5 million dollars) were allocated for atomic research. In the United States at this time, Robert Oppenheimer began designing the first atomic bomb. In November 1943, the first stage of the uranium-235 production plant was launched at Oak Ridge.

In 1944, the fascist troops are retreating on all fronts. The production of uranium metal is curtailed - less than a ton was produced in a year. All this time in Berlin, Heisenberg continued his experiments on obtaining a chain reaction. At the same time, a special bunker for the "uranium machine" was being built in the city, but the dire situation for the Reich on the fronts, the lack of finances and materials significantly hampered the work of scientists. In January 1945, the Heisenberg group and the reactor already almost completed by it were evacuated from the German capital inland, to the village of Haigerloch near the Swiss border. The work did not stop even in the conditions of the already lost war. The last attempt to start a chain reaction the Germans made on March 23, 1945, it again ended in failure due to an insufficient amount of uranium and heavy water. In May - June 1945, Heisenberg and 9 associates were arrested by the Americans and taken to Great Britain during Operation Epsilon. On May 8, 1945, Nazi Germany surrendered.

New isotope separation facilities and industrial nuclear reactors are commissioned in the United States. The accumulation of uranium-235 and plutonium is in full swing. Various versions of atomic bombs are being designed.

On August 6 and 9, 1945, American aircraft carried out the atomic bombing of the Japanese cities of Hiroshima and Nagasaki. Heisenberg and his colleagues were literally shocked by the bombing of Hiroshima and Nagasaki. They were sure that they were ahead of the competition, and could not even imagine how much ahead in the United States actually went ahead.

The explosions destroyed most of these cities, and the exact death toll is unknown: on average, it is believed that there are at least 200 thousand of them. Even more people were injured. The role of the atomic bombings in Japan's surrender and their ethical justification are still highly controversial [4].

From the chronology of events, it can be seen that Nazi Germany:

- the first start of research with the aim of creating atomic weapons;

- the first has achieved real results on the way to a nuclear chain reaction;

- the first to establish the production of metallic uranium. In 1940 and 1941. she was in the lead in the atomic race.

The main force that prevented the Nazis from unleashing atomic death on the world was the Soviet Union, which made a decisive contribution to the defeat of fascism [1].

Towards the end of the war, US military circles began to fear that the USSR would receive information regarding the manufacture of atomic weapons as a result of the seizure of atomic enterprises in the eastern part of Germany by the Soviet Army. True, most of these enterprises were located on the territory intended for the occupation by France - mainly in the Strasbourg region. In this regard, American troops made efforts to be the first to enter Strasbourg. Together with the advance units, a group of the so-called Alsos mission arrived here under the leadership of American intelligence colonel, former security officer of the Manhattan Project, Boris Pasha. The scientific leader of the group was the Dutch physicist Samuel Goudsmit. Translated from Greek "Alsos" means "grove". The name of the operation used a kind of play on words: the surname Groves (Groves) in translation from English means grove (more precisely, groves, in the plural).

Major General Leslie Groves was the engineering team leader for the Manhattan Project and worked hard to develop the atomic bomb. He became practically the main initiator of the Alsos mission, on the one hand, in order to make sure that German technologies and personnel did not fall into the hands of the Soviet special services, on the other, to preserve the alleged American monopoly on nuclear weapons for as long as possible.

The tasks of the special purpose scientific intelligence mission "Alsos" included the collection of information on the state of research and development in preparation for the production of the atomic bomb in Germany, the identification of German atomic physicists. The Alsos mission was also supposed to take measures to prevent leakage of scientific information on the atomic problem to other countries.

Alsos specialists discovered a laboratory of German physicists in Strasbourg. There were no leading German physicists among the captured scientists. In one of the offices, Goudsmit found a folder with notes, after examining which he reported to Colonel Pasha that Nazi Germany did not have an atomic bomb and would not have it until the end of the war. The plant of the "Auergesellschaft" concern, which was of the greatest importance for nuclear production, was located in Oranienburg (a suburb of Berlin) - in the zone that was intended for occupation by the Armed Forces of the USSR. Since the Alsos group did not have the opportunity to penetrate the area of this plant, General Groves suggested that General Marshall bomb it. With Marshall's consent, Groves dispatched his officer to General Spaats, the commander of strategic aviation in Europe, instructing him to convey this request to the general. On the afternoon of March 15, 1945, 612 flying fortresses dropped 1,506 tons of high-explosive bombs and 178 tons of incendiary bombs on the plant. All ground structures of the plant were destroyed to the ground. As General Groves wrote in his book “Now we can talk about it”, “to camouflage the purpose of the flight in front of the Russians and the Germans, at the same time the same massive blow was launched on the town of Zossen, where the headquarters of the“ Wehrmacht ”was located [2, p. 198].

The decision to bomb the plant was prompted by the desire to ensure that it could not be used by the Soviet Union for nuclear production. This decision was quite natural for the strategic course of the reactionary circles in the United States.

IV. CONCLUSION

In conclusion, it should be noted that the nuclear age has crossed out all the postulates of the previous times that peace is just a pause between wars. The nuclear age in the international lexicon designates the period of danger hanging over mankind. He brought methods such as incineration of civilians and nuclear blackmail into international politics.

Some American politicians, speaking of a preemptive nuclear strike, forget that the International Tribunal in Nuremberg over the main Nazi criminals most definitely showed the falsity of the attempts of the Hitlerite militarists to portray their aggressive wars as preemptive. The chief prosecutor from the United States at the Nuremberg trials, R. Jackson, said: “We must not forget for a moment that according to the protocols of the trial by which we judge these people today, history will judge ourselves” [7, p. 56]. The ruling circles in the United States need to keep this in mind.

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АТОМНАЯ ГОНКА В ГОДЫ ВТОРОЙ МИРОВОЙ ВОЙНЫ

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Аннотация

В статье рассматривается гонка за обладание атомным оружием, которая развернулась между нацистской Германией и США в годы Второй мировой войны. Из хронологии событий видно, что нацистская Германия в 1940 и 1941 гг. лидировала в атомной гонке. После разгрома фашистских войск под Москвой в декабре 1941 года, Гитлер приказал мобилизовать все ресурсы на текущие военные нужды. В условиях, когда боевые действия на Восточном фронте вытягивали из рейха все большие финансовые и человеческие ресурсы, нацистское руководство пришло к выводу, что создание (и тем более использование) ядерного оружия в ходе Второй мировой уже невозможно. Если США (огромная богатая страна без боевых действий на своей территории) с каждым месяцем работу над ядерным проектом интенсифицировали, то Третий рейх, наоборот, вел ее по остаточному принципу. Авторы приходят к выводу, что главной силой, которая помешала гитлеровцам обрушить на мир атомную смерть, был Советский Союз, внесший решающий вклад в разгром фашизма.

Ключевые слова: Вторая мировая война, СССР, нацистская Германия, США, атомная бомба. "Урановый проект", "Манхэттенский проект", ученые-атомщики.

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