

= Alsos Mission =

The Alsos Mission was an organized effort by a team of United States military , scientific , and intelligence personnel to discover enemy scientific developments during World War II . Its chief focus was on the German nuclear energy project , but it also investigated both chemical and biological weapons and the means to deliver them .

The Alsos Mission was created following the September 1943 Allied invasion of Italy with a twofold assignment : search for personnel , records , material , and sites to evaluate the above programs and prevent their capture by the Soviet Union . It was established as part of the Manhattan Project 's mission to coordinate foreign intelligence related to enemy nuclear activity . Alsos personnel followed close behind the front lines in Italy , France , and Germany , occasionally crossing into enemy @-@ held territory to secure valuable resources before they could be destroyed or scientists escape or fall into rival hands .

The Alsos Mission was commanded by Colonel Boris Pash , a former Manhattan Project security officer , with Samuel Goudsmit as chief scientific advisor . It was jointly staffed by the Office of Naval Intelligence (ONI) , the Office of Scientific Research and Development (OSRD) , the Manhattan Project , and Army Intelligence (G @-@ 2) , with field assistance from combat engineers assigned to specific task forces .

Alsos teams were successful in locating and removing a substantial portion of the German research effort 's surviving records and equipment . They also took most of the senior German research personnel into custody , including Otto Hahn , Max von Laue , Werner Heisenberg and Carl Friedrich von Weizsäcker .

= = Origin = =

The Manhattan Project was a research @-@ and @-@ development program , operated during and immediately after World War II . Led by the United States with contributions principally from the United Kingdom and Canada , it aimed to produce an atomic bomb . Brigadier General Leslie Groves of the U.S. Army Corps of Engineers became its director in September 1942 . The project operated under a tight blanket of security lest its discovery induce Axis powers , particularly Germany , to accelerate their own nuclear projects or to undertake covert operations against the project .

The Manhattan Project intelligence staff believed that the Japanese atomic program was not far advanced because Japan had little access to uranium ore , the industrial effort required exceeded Japan 's capacity , and , according to American physicists at the University of California , Berkeley , who knew the leading Japanese physicists personally , there were too few Japanese qualified to work in the area . Oppositely , German scientists had reputations as leaders in the field , and the fear of Germany developing nuclear weapons first was one of the reasons for the establishment of the Manhattan Project . The Chancellor of Germany , Adolf Hitler , frequently claimed that Germany was developing secret weapons , and it was feared that these might include nuclear weapons . Reports of German nuclear activity were taken very seriously . At the instigation of the Manhattan Project , Norwegian saboteurs and Allied bombers attacked heavy @-@ water infrastructure in German @-@ occupied Norway in late 1942 and early 1943 .

Following the September 1943 Allied invasion of Italy , Brigadier General Wilhelm D. Styer , Chief of Staff of Army Service Forces , was concerned intelligence activities related to foreign nuclear energy programs were not being properly coordinated . He feared that important items might be overlooked unless those responsible were properly briefed , yet at the same time wished to minimize the number of personnel with access to such secret information . Having the Manhattan Project itself take over responsibility for coordinating these efforts would address both these concerns . Accordingly , he approached Groves on behalf of General George Marshall , the Chief of Staff of the Army , with that recommendation .

In response , Groves created the Alsos Mission , a small team jointly staffed by the Office of Naval Intelligence (ONI) , the Office of Scientific Research and Development (OSRD) , the Manhattan

Project , and Army Intelligence (G @-@ 2) . Its assignment was to investigate enemy scientific developments , including nuclear weapons research . Groves was not pleased with the codename , the Greek word for " grove " , but decided that changing it would only draw unwanted attention .

The Chief of Army Intelligence , Major General George V. Strong , appointed Lieutenant Colonel Boris Pash to command the unit . Pash had served as the head of the Counter Intelligence Branch of the Western Defense Command , where he had investigated suspected Soviet espionage at the Radiation Laboratory at Berkeley . Pash 's command comprised his executive officer Captain Wayne B. Stanard , four Counter Intelligence Corps (CIC) agents , four interpreters , and four scientists : Dr. James B. Fisk from the Bell Telephone Company , Dr. John R. Johnson from Cornell University , Commander Bruce Olds from the Office of Naval Intelligence (ONI) and the Massachusetts Institute of Technology (MIT) , and Major William Allis , originally from MIT although then serving on the War Department scientific staff .

= = Italy = =

In December 1943 , the Alsos Mission reached Algiers , where Pash reported to the Chief of Staff at Allied Force Headquarters (AFHQ) , Major General Walter B. Smith , and his British Chief of Intelligence , Brigadier Kenneth Strong . This was awkward as Pash 's instructions were not to give the British information about the Alsos Mission , but it turned out that Strong was already fully aware of it . It was arranged that Pash would deal with Strong 's American deputy , Colonel Thomas E. Roderick . The Alsos Mission then moved on to Italy , where it was assigned to Major General Kenyon A. Joyce 's Allied Control Commission . Pash met with Marshal of Italy Pietro Badoglio , the man who had negotiated Italy 's surrender to the Allies , and was now head of the Italian Provisional Military Government , who gave him a letter of introduction addressed to Italian civil and military authorities .

Alsos interviewed the Italian Minister for Communications , the Chief of Naval Ordnance , the staff of the Italian Naval Academy , and Italian scientists at the University of Naples , and examined what captured technical documents could be found . There was little information about developments in northern Italy and Germany . The Alsos Mission was attached to Colonel George Smith 's S @-@ Force . Built around a Royal Air Force ground reconnaissance squadron equipped with armored cars , this unit contained American , British , French , and Italian technical specialists of various kinds who would enter Rome on the heels of the advancing Allied forces . The expectation that Rome would soon be captured proved premature , and by March 1944 most of the Alsos Mission had returned to the United States . The Alsos Mission had gathered little of value about nuclear matters , but submitted detailed reports about German rockets and guided missiles .

Rome fell on 4 June 1944 . When the news came that its fall was imminent , Pash was ordered from London to Italy . He flew back to Italy and entered the city with S @-@ Force on 5 June . Pash took key scientists into custody and arranged for sites targeted by Alsos , including the University of Rome and the Consiglio Nazionale delle Ricerche , to be secured . The Alsos Mission to Italy was reconstituted under the command of Pash 's deputy , Major Richard C. Ham , and Johnson and Major Robert R. Furman were sent from the United States to join him . They reached Rome on 19 June , and over the next weeks interviewed scientists including Edoardo Amaldi , Gian @-@ Carlo Wick , and Francesco Giordani . The picture that the Alsos Mission built up indicated that the German effort was not far advanced .

= = Western Europe = =

= = = Britain = = =

In December 1943 , Groves sent Furman to Britain to discuss the establishment of a London Liaison Office for the Manhattan Project with the British government , and to confer over coordinating the intelligence effort . Lieutenant Commander Eric Welsh , the head of the Norwegian

Section of MI6 , was unimpressed with Furman 's grasp of the subject matter . Groves selected the head of the Manhattan District 's security activities , Captain Horace K. Calvert , as head of the London Liaison Office , with the title of Assistant Military Attaché . Working in cooperation with Eric Welsh and Michael Perrin from Tube Alloys , the London Liaison Office consisted of Calvert , Captain George C. Davis , two Women 's Army Corps clerks and three CIC agents .

The Liaison Office interviewed European refugee scientists and studied German physics journals . It compiled lists of German scientists of interest and possible locations of nuclear research and industrial facilities , and the mining and stockpiling of uranium and thorium ores . Little thorium was available in Germany or German @-@ occupied Europe , and attention soon centered on the mines at Joachimsthal in Czechoslovakia . Aerial reconnaissance was carried out periodically , and production was measured by assessing the size of the piles of tailings .

Groves warned General Dwight D. Eisenhower of the possibility that the Germans might disrupt the Normandy landings with radioactive poisons , and sent Major Arthur V. Peterson to brief his chief of staff , Lieutenant General Walter B. Smith . Under the codename Operation Peppermint , special equipment was prepared and Chemical Warfare Service teams were trained in its use . The British forces made similar preparations for their beaches . The precautions were unnecessary .

Meanwhile , the new head of G @-@ 2 , Major General Clayton L. Bissell , at the urging of Groves and Furman , decided to create a new , even larger Alsos Mission for western Europe in March 1944 . Pash assumed command of the new unit upon its official creation by the Secretary of War , Henry L. Stimson , on 4 April . The military staff for the new mission were selected by Bissell on Pash 's advice . Lieutenant Colonel George R. Eckman became the deputy commander . Captain Henry A. Schade was appointed as the head of the naval contingent . Groves and Vannevar Bush , the head of OSRD , selected the scientific staff , and appointed Samuel Goudsmit , a University of Michigan physicist with a good command of several western European languages , as its head . Goudsmit had not been working on the Manhattan Project , and therefore could not reveal any of its secrets if captured . The British considered creating their own rival mission , but in the end agreed to participate as a junior partner . Three Dutch and one Norwegian officer also served with the Alsos Mission . By the end of August it had seven officers and 33 scientists .

= = = France = = =

On 5 August , Pash received a secret message from Washington , D.C. , reporting that the French physicist Frédéric Joliot @-@ Curie had been sighted at his holiday home at L 'Arcoquest in Brittany . Joliot @-@ Curie was at the top of Alsos 's wanted list , so Pash and CIC Special Agent Gerry Beatson set out to investigate in the wake of the advancing U.S. Third Army . They searched the University of Rennes and found some documents there on 9 August . On 11 August they reached the homes of Joliot @-@ Curie , Francis Perrin , and Pierre Auger in the L 'Arcoquest area . Joliot @-@ Curie was not home , but German snipers fired on them , and they had to wait until 12 August before they could search the house .

The rest of the advance party of the Alsos Mission moved to Normandy in August 1944 , where it joined T @-@ Force , a similar formation to S @-@ Force , at Rambouillet , where it was preparing for the liberation of Paris . An Alsos Mission team including Pash and Calvert reached Joliot @-@ Curie 's house in the Paris suburbs on 24 August to find that he was not there , but at his laboratory at the Collège de France . The next day they reached the Porte d 'Orléans where they encountered troops of the French 2e Division Blindée , who were engaged in liberating the city , and came under small arms fire from the German defenders . The Alsos Mission replied with their M1 carbine and Tommy guns as they made their way through the back streets to the college , where they found Joliot @-@ Curie in his office .

Goudsmit interviewed Joliot @-@ Curie in Paris on 27 August . Accompanied by Calvert , Joliot @-@ Curie was flown to London where Perrin and Goudsmit interviewed him about the activities of German scientists . Joliot @-@ Curie recalled visits to the College , which had a cyclotron , by German scientists including Erich Schumann , who had initiated the German nuclear project , and controlled it until it had been handed over to the Reichsforschungsrat (National Research Council)

in 1942 ; by Abraham Esau , who had been in charge of nuclear physics under the Reichsforschungsrat ; and by Walter Gerlach , who had replaced him in January 1944 . Other German physicists who had used the facilities included Kurt Diebner , Walther Bothe , and Erich Bagge , all of whom were known to be associated with the German nuclear project .

Meanwhile , T @-@ Force had moved into the Petit Palais . The main body of the Alsos Mission soon followed , and the Mission opened an office at the Place de l 'Opéra . On 5 September , word was received that the British 21st Army Group was about to enter Brussels . There were two important Alsos Mission objectives in Belgium : the corporate headquarters of Union Minière du Haut Katanga , the world 's largest supplier of uranium ore , in Antwerp , and its uranium processing plant in Olen . A six @-@ man Alsos Mission team set out to secure them , led by Pash and the Assistant Chief of Staff , G @-@ 2 , at ETOUSA , Colonel G. Bryan Conrad .

On reaching Brussels , they made contact with Lieutenant Colonel David Strangeways , the commander of R Force , who provided them with an escort of Royal Air Force armored vehicles . They entered Antwerp on 7 September and found the office of Union Minière . They discovered that over 1 @,@ 000 tons of refined uranium had been sent to Germany , but about 150 tons still remained at Olen . They set out for Olen , where they located 68 tons , but another 80 tons were missing , having been shipped to France in 1940 ahead of the German invasion of Belgium . The capture of Eindhoven by the U.S. 101st Airborne Division allowed early access to another high priority target , the Philips plant there . Brigadier Edgar Williams , the 21st Army Group 's Chief of Intelligence , facilitated the Alsos Mission 's detour to Eindhoven , where it was able to interview Dutch scientists . Williams also furnished a detachment of Royal Engineers to transport and move the uranium from Olen . Groves had it shipped to England , and , ultimately , to the United States .

The Alsos Mission now attempted to recover the shipment that had been sent to France . Documentation was discovered that said that part of it had been sent to Toulouse . An Alsos Mission team under Pash 's command reached Toulouse on 1 October and inspected a French Army arsenal . They used a Geiger counter to find barrels containing 31 tons of the uranium from Belgium . Conrad persuaded Major General Frank S. Ross to release the U.S. 3342nd Quartermaster Truck Company from the Red Ball Express to retrieve the shipment . The barrels were collected and transported to Marseille , where they were loaded on a ship bound for the United States . During the loading process a barrel fell into the water and had to be retrieved by a Navy diver . In Marseilles , the Alsos Mission detachment also met up with the detachment that had been sent to Italy , which now rejoined them . The remaining 49 tons of the original shipment to France were never found .

Information gathered in Rennes , Paris , and Eindhoven pointed to Strasbourg as a place of particular interest . Physicists Rudolf Fleischmann and Carl Friedrich von Weizsäcker were known to be working at the University of Strasbourg , as was Eugen von Haagen , an expert on viruses whose work was of great concern to the Alsos Mission 's Biological Warfare section . The Naval section was interested in the torpedo research being carried out there , and jet engine development was being undertaken at Strasbourg 's Junkers plant .

On 22 November , the U.S. Sixth Army Group notified the Alsos Mission that the capture of Strasbourg was imminent , and it should join T @-@ Force in Saarburg , where it was preparing to enter the city . The Alsos Mission joined T @-@ Force in Strasbourg on 25 November . The German nuclear laboratory was discovered on the grounds of the Strasbourg Hospital , where the physicists attempted to pass themselves off as medics . Fleischmann was taken into custody , but Weizsäcker and von Haagen had fled the city .

Documents discovered in Weizsäcker 's office , Fleischmann 's laboratory and the Strasbourg Hospital pointed to nuclear activities taking place at Stadtilm , Haigerloch , Hechingen , and Tailfingen . After establishing its headquarters in von Haagen 's office Alsos staff uncovered documents concerning secret medical experiments at Natzweiler concentration camp . These indicated the Germans had been unable to develop a practical process for uranium enrichment . For the first time the Alsos Mission was able to categorically report that the Germans did not have nuclear weapons , and would not have them for some time .

= = = Germany = = =

When the German Operation Nordwind offensive threatened Strasbourg , Pash ordered all captured documents to be removed . Papers indicating the nature of the Alsos Mission were removed or destroyed . Although Strasbourg was not abandoned by the Allies , and ultimately did not fall , the Alsos Mission departed the city on 8 January 1945 . Pash even ordered an evacuation plan to be prepared for the Alsos Mission 's main headquarters in Paris . The embarrassing series of intelligence failures that had led up to the Battle of the Bulge cast doubts on the Alsos Mission 's own findings . A four @-@ man team under Eckman was sent to investigate a suspiciously devastating V @-@ 2 explosion near Antwerp , and Fred Wardenburg had to confirm that it was not a small nuclear explosion . Rumors that Germany had an atomic bomb persisted as late as March 1945 .

A new forward headquarters , Alsos Forward North (AFwdN) , was opened at Aachen , and on 8 February the Alsos Mission reopened its forward headquarters in Strasbourg as Alsos Forward South (AFwdS) . In March , the U.S. Twelfth Army Group launched Operation Lumberjack , an offensive to clear the Germans west of the Rhine . Pash , who was promoted to colonel on 6 March , led an Alsos Mission detachment into Cologne on 7 March , but little additional information was found .

The interrogation of German prisoners indicated that uranium and thorium were being processed in Germany , mostly at the Auergesellschaft plant at Oranienburg , so Groves arranged for the plant to be bombed on 15 March 1945 . Some 612 B @-@ 17 Flying Fortresses of the U.S. Eighth Air Force dropped 1 @,@ 500 tons of high explosive and 178 tons of incendiary bombs on the plant .

On 30 March , the Alsos Mission reached Heidelberg , where important scientists were captured including Walther Bothe , Richard Kuhn , Philipp Lenard , and Wolfgang Gertner . Their interrogation revealed that Otto Hahn was at his laboratory in Tailfingen , while Werner Heisenberg and Max von Laue were at Heisenberg 's laboratory in Hechingen , and the experimental natural uranium reactor that Heisenberg 's team had built in Berlin had been moved to Haigerloch . Henceforth , the main focus of the Alsos Mission was on these nuclear facilities in the Württemberg area .

As the Allied armies advanced into Germany in April 1945 , Alsos Mission teams searched Stadtilm , where they found documentation concerning the German nuclear program , components of a nuclear reactor , and eight tons of uranium oxide . Scientists captured at Göttingen and Katlenburg @-@ Lindau included Werner Osenberg , the chief of the planning board of the Reichsforschungsrat , and Fritz Houtermans , who provided information about the Soviet atomic bomb project . At Celle , the Alsos Mission uncovered an experimental centrifuge for separating uranium isotopes , the result of work undertaken at the University of Hamburg by a team under Paul Harteck .

The problem with the targets in the Württemberg area was that they not only lay in the path of the French First Army 's advance , but were also in the occupation zone allocated to France . Groves attempted to get the occupation boundaries changed , but the State Department wanted to know why first , and Groves refused to provide this information . Groves , Marshall , and Stimson then decided that the area would have to be secured by American troops that would carry off what they could and destroy everything else . Pash was sent to ask General Jacob Devers , the commander of the U.S. Sixth Army Group , if the zones of the French First Army and the U.S. Seventh Army could be swapped around . He was informed that the matter would have to be taken up with Eisenhower .

Groves dispatched Lieutenant Colonel John Lansdale , Jr . , to Europe , where he participated in a meeting with Lieutenant General Bedell Smith and Major General Harold Bull of SHAEF ; Major General Eldridge G. Chapman , the commander of the U.S. 13th Airborne Division ; Pash , Furman , and Goudsmit of Alsos ; and Brigadier General Reuben E. Jenkins from the Sixth Army Group . The plan , codenamed Operation Effective , called for the 13th Airborne Division to occupy the area to prevent its capture by the French , and seize an airfield that could be used to fly in an Alsos Mission team , and later to fly it out , along with captured German scientists . Operation Effective was scheduled for 22 April . Meanwhile , Devers took steps to delay the French advance .

The Alsos Mission had learned that the uranium ores that had been taken from Belgium in 1944 had been shipped to the Wirtschaftliche Forschungsgesellschaft (WiFO) plant in Staßfurt . The 83rd Infantry Division captured this on 15 April . As it was in the occupation zone allocated to the

Soviet Union at the Yalta Conference , the Alsos Mission , led by Pash and accompanied by Lansdale , Perrin and Air Commodore Sir Charles Hambro , arrived on 17 April to remove anything of interest . Over the following ten days , 260 truckloads of uranium ore , sodium uranate and ferouranium weighing about 1 @, @ 000 tons , were taken away by an African @-@ American truck company . The uranium was taken to Hildesheim and most of it was flown to the United Kingdom by the Royal Air Force ; the rest had to be moved to Antwerp by train and loaded onto a ship to England .

On 20 April , the French First Army captured an intact bridge over the Neckar River at Horb and established a bridgehead . It was decided to send in a force on the ground instead of Operation Effective , which was cancelled on 19 April . This time , instead of following or accompanying the front @-@ line troops , the Alsos Mission would operate behind enemy lines . The Alsos Mission had taken delivery of two armored cars , four jeeps with machine gun mounts , and two .50 caliber machine guns . The other two jeeps would carry captured German machine guns . They would be accompanied by three unarmed jeeps . For the operation , codenamed Operation Big , Pash would command a special force called Task Force A , built around his Alsos Mission team and Lieutenant Colonel Wilbur White 's U.S. 1269th Engineer Combat Battalion , less its Company B. Sir Charles Hambro decided to accompany the Alsos Mission with a British group that included Michael Perrin , David Gattiker , Eric Welsh , and Rupert Cecil . Lansdale accompanied Task Force A as Groves ' representative , and Brigadier General Eugene L. Harrison , the G @-@ 2 from the Sixth Army Group , as Devers ' representative .

The Alsos Mission set out on 20 April and rendezvoused with the 1269th Engineer Combat Battalion at Freudenstadt . The intact bridge over the Neckar River at Horb was crossed and Haigerloch was occupied without opposition on 22 April . The main body of Task Force A arrived on 23 April . In a laboratory in a cellar they found a German experimental nuclear reactor shaped like a cylinder and made of graphite blocks , but the uranium and heavy water were missing . The scientists immediately began dismantling it . Pash left Hambro in charge , while he led troops of Task Force A to Bisingen , and then on to Hechingen , where 25 scientists were captured , including von Weizsäcker , von Laue , Karl Wirtz , Horst Korsching and Erich Bagge . At Tailfingen they took Otto Hahn and nine members of his staff into custody . At Haigerloch , a sealed drum of documents was retrieved from a cesspool , and three drums of heavy water and 1 @. @ 5 tons of uranium ingots were found buried in a field . The uranium and heavy water were loaded onto trucks . The apertures in the cellar were blown up with minor explosions to prevent their capture by the French .

Werner Heisenberg remained at large , having left Hechingen on 19 April . On 1 May , Pash set out in pursuit of Heisenberg with ten men in the two armored cars and two jeeps . They teamed up with the 36th Reconnaissance Troop of the U.S. 36th Infantry Division and entered Urfeld on 2 May , where Pash found Heisenberg at his home . The Americans became involved in firefights with German troops attempting to enter the town , and the 36th Reconnaissance Troop had to head off on another mission , leaving Pash with just seven men . Fortunately , the German force , which numbered about 700 , offered to surrender . Pash returned on 3 May with the 3rd Battalion , 142nd Infantry , which took them prisoner , while Pash and his Alsos Mission team took Heisenberg into custody .

By VE day , the Alsos Mission had a strength of 114 men and women . It was officially disbanded on 15 October 1945 .

= = Japan = =

Plans for the invasion of Japan incorporated an Alsos Mission . Japanese fire balloon attacks on the United States had aroused fears that the technique might be used in combination with biological agents , which the Japanese Unit 731 was known to be experimenting with . In March 1945 , the physicist and seismologist L. Don Leet was appointed as head of the scientific section of the Alsos Mission to Japan . Leet had previously worked with the Manhattan Project on the Trinity nuclear test . Plans were drawn up to prepare and equip a T @-@ Force along the lines of the one in Europe , but made up of personnel already in the Pacific . The mission differed from its European counterpart

in that it was solely American and consisted of only one intelligence agency . Responsibility for nuclear matters was subsequently handled by a separate Manhattan Project Intelligence Group organized by Groves .

Leet 's group reached Manila in July 1945 , where they met with the intelligence staff of General of the Army Douglas MacArthur 's Army Forces , Pacific . Following the surrender of Japan the mission traveled to Japan and visited various research establishments including Tokyo Imperial University , Waseda University , Tokyo Institute of Technology , the Institute of Physical and Chemical Research , the Institute for Materials Research , Tokyo Shibaura Denki (Toshiba) , the Japan Society for the Promotion of Science , the National Research Council , and the Board of Technology . The mission , which included Karl Compton , interviewed over 300 Japanese scientists and produced reports on Japanese research into radar , rockets , and other developments , including chemical and biological warfare . The Manhattan Project Intelligence Group , under the command of Philip Morrison , arrived in Japan in September 1945 and examined Japan 's wartime nuclear weapons program . The group concluded that lack of uranium ore and low priority had doomed the Japanese effort . They reported that , contrary to American belief , Japan 's nuclear physicists were competent .

= = Legacy = =

After seeing the German project at Haigerloch , Goudsmit wrote that :

It was so obvious the whole German uranium set up was on a ludicrously small scale . Here was the central group of laboratories , and all it amounted to was a little underground cave , a wing of a small textile factory , a few rooms in an old brewery . To be sure , the laboratories were well equipped , but compared to what we were doing in the United States it was still small @-@ time stuff . Sometimes we wondered if our government had not spent more money on our intelligence mission than the Germans had spent on their whole project .

In the end , the Alsos Mission contributed little to the Allied defeat of Nazi Germany , because the German nuclear and biological weapons programs that it had been formed to investigate turned out to be smaller and less threatening than had been feared . In the field of nuclear weapons development at least , the underfunded and disorganized German program lagged far behind the Allies ' own efforts . In its appropriation of the accomplishments of European science , the Alsos Mission played a small part in the wartime and subsequent scientific and technological developments that characterized and transformed the postwar world .