= Myrtle Bachelder =

Myrtle Claire Bachelder (March 13 , 1908 ? May 22 , 1997) was an American chemist and Women 's Army Corps officer , who is noted for her secret work on the Manhattan Project atomic bomb program , and for the development of techniques in the chemistry of metals .

= = Early life and career = =

Myrtle C. Bachelder was born on March 13 , 1908 in Orange , Massachusetts . She earned a bachelor of science degree from Middlebury College in 1930 , and became a high school science teacher and athletics coach in South Hadley Falls , Massachusetts . She received her master of education degree from Boston University .

= = World War II : the atomic bomb = =

During World War II , Bachelder enlisted in the Women 's Army Corps (WAC) in November 1942 , at the Springfield , Massachusetts headquarters . After spending time in training at military bases in several U.S. states , she received orders assigning her to the Company ' D ' WAC Detachment of the Manhattan District , United States Army Corps of Engineers . Her secret assignment was to lead a group of 15 to 20 women from the WAC , stationed in Des Moines , Iowa , to Fort Sill , Oklahoma , and from there to Santa Fe , New Mexico . She and the women under her command arrived at Los Alamos , New Mexico on October 21 , 1943 .

" Manhattan " was the code name for the special military division dedicated to developing an atomic weapon . In the clandestine laboratory at the remote Los Alamos desert site , Bachelder was responsible for the analysis of the spectroscopy of uranium isotopes . Since the uranium @-@ 235 isotope is fissile , whereas the uranium @-@ 238 isotope is not , Bachelder 's role in the project was a crucial task : to ensure the purity of the sub @-@ critical material , and therefore the nuclear explosion , of the world 's first atomic bombs .

These methods were used during the preparation of plutonium @-@ 239 , the fissile material used in the construction of the atomic bomb for the Trinity nuclear test , on July 16 , 1945 . Analogous methods were used for the uranium weapon , code @-@ named " Little Boy " , which destroyed Hiroshima , Japan on August 6 , 1945 , and for the plutonium bomb which destroyed Nagasaki , Japan on August 9 , 1945 , leading to the Japanese surrender . The secret program was under the general direction of J. Robert Oppenheimer , whom Bachelder described as :

A " pencil and paper man " , immersed in physics theory , who was more than a little amazed by the Los Alamos lab machinery . Bachelder recalled Oppenheimer standing in front of her lab 's most important and expensive instrument punching buttons at random ... He asked " What does this do ? " Then he 'd punch another button ... He might have wrecked the machine if he hadn 't finally been persuaded to leave it alone .

= = Contribution to post @-@ war developments in nuclear energy = =

The conclusion of the Second World War was also the dawning of a new " Atomic Age " , in which the peacetime potential of nuclear energy began to be explored . Bachelder was among the scientists who opposed the May @-@ Johnson Bill of October 1945 , a Congressional bill proposed by the Interim Committee , which would have maintained military control over nuclear research . The bill was defeated in Congress and superseded by the McMahon Atomic Energy Act . In January 1947 , the newly formed Atomic Energy Commission approved the declassification of 270 previously secret documents . These included discoveries related to X @-@ radiation and purification of uranium ores , which had been made by Bachelder during the course of the war effort . At this time , the rarity and importance of Bachelder 's achievements as a woman in science were also acknowledged .

= = Scientific research and later career = =

After leaving the Army , Bachelder became a research chemist at the University of Chicago , where the first self @-@ sustaining nuclear reaction had been achieved in 1942 . Nobel Laureate James Franck had been Director of the Chemistry Division of the Metallurgical Laboratory during the earlier phases of the Manhattan Project . Bachelder joined the University 's Institute for the Study of Metals (renamed as the James Franck Institute in 1967) , and she conducted further research in metallochemistry .

Among other achievements , Bachelder developed methods for the purification of the rare elements tellurium and indium . Other aspects of her broad scientific expertise found application in the field of marine archaeology , when she determined the chemical composition of brass cannons found in the Aegean Sea on sunken ships . She also made contributions to astrochemistry , when NASA asked her to analyze the chemistry of Moon rocks which had been collected from the Moon 's surface during the Apollo missions from 1969 to 1972 .

Bachelder retired from the Franck Institute in 1973 , and was subsequently active as an official of the American Association of Retired Persons (AARP) . She died in Chicago on May 22 , 1997 .

= = Reflections = =

Bachelder believed that her role in the development of the atomic bomb , and the subsequent use of atomic weapons against Japan , had been justified , in order to end the Second World War , and to avoid greater loss of life that would have been entailed , in a U.S. land invasion and extended conflict with Japan . Later in life , during the period of the Strategic Arms Limitation Talks , Bachelder stated that , although she supported nuclear arms control :

Opponents of nuclear weapons should resist the urge to take the 1940s bomb @-@ building effort out of its proper historical context ? " One cannot pull that activity out of that time , set it down in the 1980s , and pass judgement . "