= Harold Agnew =

Harold Melvin Agnew (March 28 , 1921 ? September 29 , 2013) was an American physicist , best known for having flown as a scientific observer on the Hiroshima bombing mission and , later , as the third director of the Los Alamos National Laboratory .

Agnew joined the Metallurgical Laboratory at the University of Chicago in 1942 , and helped build the Chicago Pile @-@ 1 , the world 's first nuclear reactor . In 1943 , he joined the Los Alamos Laboratory , where he worked with the Cockcroft ? Walton generator . After the war ended , he returned to the University of Chicago , where he completed his graduate work under Enrico Fermi .

Agnew returned to Los Alamos in 1949 , and worked on the Castle Bravo nuclear test at Bikini Atoll in 1954 . He became head of the Weapon Nuclear Engineering Division in 1964 . He also served as a Democratic New Mexico State Senator from 1955 to 1961 , and was the Scientific Adviser to the NATO Supreme Allied Commander Europe (SACEUR) from 1961 to 1964 . He was director of the Los Alamos National Laboratory from 1970 to 1979 , when he resigned to become President and Chief Executive Officer of General Atomics . He died at his home in Solana Beach , California , on September 29 , 2013 .

= = Early life and education = =

Harold Melvin Agnew was born in Denver , Colorado on March 28 , 1921 , the only child of a pair of stonecutters . He attended South Denver High School and entered the University of Denver , where he majored in chemistry . He was a strong athlete who pitched for the university softball that won a championship . He left the University of Denver in January 1942 , but had enough credits to graduate Phi Beta Kappa with his Bachelor of Arts degree in June , and he received a scholarship to Yale University .

After the Japanese bombing of Pearl Harbor brought the United States into the Pacific War , Agnew and his girlfriend Beverly , a fellow graduate of South Denver High School and the University of Denver , attempted to join the United States Army Air Corps together . They were persuaded not to sign the enlistment papers . Instead , Joyce C. Stearns , the head of the physics department at the University of Denver , persuaded Agnew to come with him to the University of Chicago , where Stearns became the deputy head of the Metallurgical Laboratory . Although Agnew had enough credits to graduate , Beverly did not and had to remain behind . They were married in Denver on May 2 , 1942 . They then went to Chicago , where Beverly became a secretary to Richard L. Doan , then head of the Metallurgical Laboratory . Agnew and Beverly had two children , a daughter Nancy , and a son , John .

At the Metallurgical Laboratory , Agnew worked with Enrico Fermi , Walter Zinn and Herbert L. Anderson . There , he was involved in the construction of Chicago Pile @-@ 1 . Initially , Agnew worked with the instrumentation . The Geiger counters were calibrated using a radon @-@ beryllium source , and Agnew received too high a dose of radiation . He was then put to work stacking the graphite bricks that were the reactor 's neutron moderator . He witnessed the first controlled nuclear chain reaction when the reactor went critical on December 2 , 1942 .

Agnew and Beverly moved to the Los Alamos Laboratory in March 1943 . Agnew , Beverly and Bernard Waldman first went to the University of Illinois , where the men disassembled the Cockcroft ? Walton generator and particle accelerator while Beverly catalogued all the parts . The parts were shipped to New Mexico , where Agnew and Beverly met up with them , and rode the trucks hauling them to the Los Alamos Laboratory . There , Beverly worked a secretary , initially with Robert Oppenheimer and his secretary Priscilla Green . She then became secretary to Robert Bacher , the head of Physics (P) Division , and later the Gadget (G) Division , for the rest of the war . Agnew 's job was to reassemble the accelerator , which was then used for experiments by John Manley 's group .

When experimental work wound down , Agnew was transferred to Project Alberta , working as part of Luis W. Alvarez 's group , whose role was to monitor the yield of nuclear explosions . With Alvarez and Lawrence H. Johnson , Agnew had devised a method for measuring the yield of the

nuclear blast by dropping pressure gauges on parachutes and telemetering the readings back to the plane . In June 1945 , he was issued with an Army uniform and dog tags at Wendover Army Air Field , Utah , and was flown to Tinian in the Western Pacific in a C @-@ 54 of the 509th Composite Group . Agnew 's first task was to install his yield measurement instrumentation in the Boeing B @-@ 29 Superfortress aircraft The Great Artiste .

During the atomic bombing of Hiroshima , on August 6 , 1945 , Agnew , along with Alvarez and Johnson , flew as a scientific observer in the The Great Artiste , piloted by Charles Sweeney , which tailed the Enola Gay as the instrumentation aircraft . Agnew later recalled , " After we dropped our gauges I remember we made a sharp turn to the right so that we would not get caught in the blast ? but we still got badly shaken up by it . " He brought along a movie camera and took the only existing movies of the Hiroshima event as seen from the air .

After the war ended , Agnew entered the University of Chicago , where he completed his graduate work under Fermi . Agnew and Beverly stayed with Fermi and his family , due to the post @-@ war housing shortage . He received his Master of Science (MS) degree in 1948 and his Doctor of Philosophy (PhD) degree in 1949 , writing his thesis on " The beta @-@ spectra of Cs137 , Y91 , Pm147 , Ru106 , Sm151 , P32 , Tm170 " . Fellow postgraduate students at Chicago at the time included Tsung @-@ Dao Lee , Chen Ning Yang , Owen Chamberlain and Jack Steinberger .

= = Los Alamos years = =

With his doctorate in hand , Agnew returned to Los Alamos as a National Research Foundation Fellow , and worked on weapons development in the Physics Division . In 1950 , he was assigned to the thermonuclear weapons project , and was project engineer for the Castle Bravo nuclear test at Bikini Atoll in 1954 . He became head of the Weapon Nuclear Engineering Division in 1964 .

Agnew served as a Democratic New Mexico State Senator from 1955 to 1961 . He was the first state senator to be elected from Los Alamos County . Senators served unpaid , receiving only a per diem allowance of five dollars . Since the New Mexico legislature convened for only 30 days in even numbered years and 60 days in odd numbered years , he was able to continue working at Los Alamos , taking leave without pay to attend . He attempted to reform New Mexico 's liquor laws , which specified a minimum mark @-@ up . He was unsuccessful in 1957 , but the law was reformed in 1963 .

From 1961 to 1964 , he was Scientific Adviser to the NATO Supreme Allied Commander Europe (SACEUR) . He also held a number of part @-@ time advisory position with the military over the years . He was a member of the United States Air Force Scientific Advisory Board from 1957 to 1968 , and was chairman of the Science Advisory Group of the United States Army 's Combat Development Command from 1966 to 1970 . He was a member of the Defense Science Board from 1966 to 1970 , the Army 's Scientific Advisory Panel from 1966 to 1974 , and the Army Science Board from 1978 to 1984 .

Agnew became director of the Los Alamos National Laboratory in 1970 , when it had 7 @,@ 000 employees . He took over at a time of great change . His predecessor , Norris Bradbury , had rebuilt the laboratory from scratch after the war , and many of the people he had brought in were approaching retirement . Under his directorship , Los Alamos developed an underground test containment program , completed its Meson Physics Facility , acquired the first Cray supercomputer , and trained the first class of International Atomic Energy Agency inspectors . Agnew managed to get the Los Alamos Laboratory responsibility for the development of the W76 , used by the Trident I and Trident II Submarine Launched Ballistic Missiles , and the W78 used by the Minuteman III intercontinental ballistic missiles . He was proud of the work with insensitive high explosive that made nuclear weapons safer to handle . Support from the Atomic Energy Commission for reactor development dried up , but during the 1970s energy crisis , the laboratory explored other types of alternative fuels .

= = Later life = =

In 1979 , Agnew resigned from Los Alamos and became President and Chief Executive Officer of General Atomics , a position he held until 1985 . In his letter of resignation to David S. Saxon , the President of the University of California , Agnew wrote that his decision was influenced by " dissatisfaction with University administration policies and a lack of advocacy for the total LASL [Los Alamos Scientific Laboratory] program " and " frustration with what I consider to be a continuing inequitable distribution of defense program funding by the Department of Energy between the LASL and LLL [Lawrence Livermore Laboratory] . "

Agnew chaired the General Advisory Committee of the Arms Control and Disarmament Agency from 1974 to 1978 , and served as a White House science councillor from 1982 to 1989 . He was a member of NASA 's Aerospace Safety Advisory Panel from 1968 to 1974 , and from 1978 to 1987 . He became an adjunct professor at the University of California , San Diego in 1988 . He was the recipient of the E.O. Lawrence Award in 1966 , and of the Department of Energy 's Enrico Fermi Award in 1978 . Along with Hans Bethe , Agnew was the first to receive the Los Alamos National Laboratory Medal . He was a member of the National Academy of Sciences and the National Academy of Engineering .

A proponent of tactical nuclear weapons , Agnew pointed out in 1970 that the Thanh Hoa Bridge in Vietnam required hundreds of sorties to destroy with conventional weapons when a nuclear weapon could have done the job with just one . In a 1977 article for the Bulletin of the Atomic Scientists , Agnew argued that the fusion reactions of neutron bombs could provide " tactical " advantages over conventional fission weapons , especially in countering the " massive armor component possessed by the Eastern bloc . " Citing conclusions reached by the Rand Corporation , Agnew argued that without affecting the armor of a tank , the neutrons produced by a fusion blast would penetrate the vehicle and " in a matter of a few tens of minutes to hours kill or make the crew completely ineffective . " Because the neutron bomb reduced collateral damage , it could be used in a much more selective fashion than a fission weapon , thereby providing a clear " advantage for the military defender as well as for the nearby non @-@ combatant . "

Agnew maintained that no new U.S. nuclear weapon design could be certified without nuclear testing , and that stockpile reliability stewardship without such testing may be problematic . In a 1999 letter to the Wall Street Journal , he commented on the significance of allegations of Chinese nuclear espionage . " As long as any nation has a demonstrated nuclear capability and a means of delivering its bombs and warheads , it doesn 't really matter whether the warheads are a little smaller or painted a color other than red , white , and blue , " he wrote . " I suspect information published in the open by the National [sic .] Resources Defense Council has been as useful to other nations as any computer codes they may have received by illegal means . "

Beverly died on October 11 , 2011 . Agnew was diagnosed of chronic lymphocytic leukemia , and died at his home in Solana Beach , California , on September 29 , 2013 , while watching football on television . He was survived by his daughter Nancy and son John . He had arranged to be cremated and his ashes interred with Beverly 's at the Guaje Pines Cemetery in Los Alamos .

In a 2005 BBC interview , Agnew stated , " About three @-@ quarters of the U.S. nuclear arsenal was designed under my tutelage at Los Alamos . That is my legacy . "