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Harold M. Agnew, 1921-2013.

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Tribute to the life and accomplishments of Harold Agnew, to be published in the “NAE Memorial Tributes,” 2016.

Harold Agnew

Harold Agnew, a scientist who worked on the Manhattan Project that gave the United States its first atomic bomb and who later became the third director of Los Alamos National Laboratory, died September 29, 2013, at his home in Solana Beach, California. He was 92.

Agnew was born March 28, 1921, in Denver, Colorado, the only child of a stonecutter father and homemaker mother. He attended South Denver High School and the University of Denver, where he majored in chemistry.

After the Japanese bombing of Pearl Harbor brought the United States into World War II, Agnew and his girlfriend, Beverly Jackson, attempted to join the United States Army Air Corps together. But Joyce Stearns, the head of the Physics Department at the University of Denver, persuaded them to instead join him at the University of Chicago, where Stearns became the deputy head of the Metallurgical Laboratory. In Chicago, Harold worked with Enrico Fermi and others on the construction of Chicago Pile-1, the first graphite-moderated nuclear reactor. Initially, Agnew worked on instrumentation, calibrating Geiger counters, and then on stacking the graphite bricks that formed the reactor’s neutron moderator. On December 2, 1942, he witnessed the first self-sustained nuclear chain reaction, when Pile-1 went critical.

After these successful tests, Agnew and Beverly, now married, followed Fermi and others to Los Alamos, New Mexico, to participate in the Manhattan Project for the development of a nuclear bomb. Towards the completion of the project, scientists were faced with the problem of measuring the yield of the device they had just built. With Luis Alvarez and Lawrence Johnson, Agnew devised a remarkable method for measuring the yield of the nuclear blast by dropping pressure gauges on parachutes from airplanes just before the explosion and telemetering the readings back to the plane. During the

bombing of Hiroshima on August 6, 1945, Agnew, Alvarez, and Johnson flew as scientific observers on a second plane and measured the yield of the explosion. Agnew also took, on his own initiative, a hand-held 16-millimeter movie camera and filmed the only existing movies of the Hiroshima event, as seen from the air.

After the war ended, Agnew officially entered the University of Chicago, where he completed his graduate studies under Fermi, earning a doctor of philosophy (PhD) in 1949. He then returned to Los Alamos as a National Research Foundation fellow. In the following years, Agnew led several weapons-related projects, and in 1964 he became head of the Weapons Engineering Division at Los Alamos.

While working at Los Alamos, Agnew held a number of military advisory positions, including being scientific advisor to the NATO Supreme Allied Commanders (1961-1964), member of the Defense Science Board (1966-1970), member of the Army's Scientific Advisory Panel (1966-1974), and member of the Army Science Board (1978-1984). He also chaired the General Advisory Committee of the Arms Control and Disarmament Agency (1974-1978) and served on NASA's Aerospace Advisory Panel (1968-1974).

In 1970, Agnew became the third director of Los Alamos National Laboratory (then called Los Alamos Scientific Laboratory). He did so at times of great change and left his imprint on Los Alamos in many areas. Under his leadership, the Laboratory developed an underground test containment program, completed the Meson Physics Facility, acquired its first Cray supercomputer, and trained the first class of International Atomic Energy Agency weapons inspectors. Los Alamos was commissioned with developing the W76 device, used by Trident I and Trident II submarine-launched ballistic missiles, and the W78 device, used by Minuteman II intercontinental ballistic missiles. Agnew was particularly proud of advances made at the Laboratory in the configuration of these devices and in developing new insensitive high explosives that enhance safety in the handling and storage of nuclear weapons.

Agnew served as director of Los Alamos for nearly a decade and supervised the development of optimum weaponry to support the international deterrent posture assumed in the 1960s. He also recognized the importance of introducing technical

diversity into the Laboratory. Until Agnew became director, virtually every program was tied, directly or indirectly, to weapons work. The multidisciplinary Laboratory of today, as initiated by Agnew in the 1970s, devotes a large percentage of its budget to non-weapons scientific research, including topics in basic sciences and biomedicine.

After retiring from Los Alamos in 1979, Agnew became president and CEO of General Atomics in California. In that position, which he held until 1985, he pushed for the development of safe reactor technologies and was a vocal advocate of the civilian use of nuclear power.

Agnew received many recognitions and awards. From 1982 to 1989, he served as a White House science councilor, advising President Reagan. He was the recipient of two prestigious Department of Energy awards: the E. O. Lawrence Award (1966) and the Enrico Fermi Award (1978). Along with Nobel Laureate Hans Bethe, Agnew was the first to receive the Los Alamos National Laboratory Medal (2001). He was a member of the National Academy of Engineering (elected in 1976) and the National Academy of Sciences (elected in 1979).

In 1991, he participated in the first post-Cold War meeting between American bomb makers and their Russian counterparts, seeking ways to reduce nuclear arsenals. One year later, he urged the United States to buy bomb-grade uranium from scrapped Soviet nuclear warheads, which would bolster the Russian economy and reduce the risk of an accident or the theft of nuclear materials. In August of that year, the White House announced a plan to buy at least 500 metric tons of the material in a deal worth several billion dollars. The Russian bomb-grade uranium was diluted into fuel for domestic nuclear reactors that generate electricity, transforming a huge potential danger into a peaceful bonanza.

Harold Agnew was a plain-spoken person, never afraid to share his opinions about controversial issues. In a 1992 interview with Theresa Strottman (Los Alamos Historical Society), Agnew was asked whether he would do it all again. He replied, “I have no regrets. [Los Alamos National Laboratory] was a great place, still is a great place. I just hope they don’t get bureaucratized by the Washington environment. People there seem to forget what the real objective of a national lab is and want to control things more and

more. Want more accounting so to speak. I don't think that's very good in the long run. Maybe it will turn around." In a 2005 BBC interview, Agnew stated, "About three-quarters of the US nuclear arsenal was designed under my tutelage at Los Alamos. That is my legacy."

Harold Agnew had an impressive life that paralleled the development of nuclear energy: He participated in the first controlled nuclear chain reaction; assisted in the development of the first atomic bomb; witnessed the first (and only) use of that weapon in war; and was instrumental in enhancing the safety and reliability of the nuclear arsenal. Ironically, his final project, having as a goal augmenting the use of nuclear energy for electrical power generation in the United States, did not flourish as he desired because of society's concerns about the safety of nuclear energy.

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