



*Harold M. Osgood*

# HAROLD M. AGNEW

1921–2013

Elected in 1976

*“Pioneering contributions in weapons engineering and combining science and engineering into effective technology.”*

BY RICARDO B. SCHWARZ

**H**AROLD MELVIN 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.

He was born March 28, 1921, in Denver, the only child of a stonemason 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 US Army Air Corps together. But Joyce Stearns, head of the Physics Department at the University of Denver, persuaded them to instead join him at the University of Chicago, where Stearns became 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, he 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, he and Beverly, now married, followed Fermi and others to Los Alamos to participate in the Manhattan Project for the development of a nuclear bomb. Toward 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 to measure 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 handheld 16-millimeter movie camera and filmed the only existing movies of the Hiroshima event as seen from the air.

When the war ended, Agnew received a National Research Council Fellowship that allowed him to attend the University of Chicago and complete his graduate studies under Fermi. After earning his PhD in 1949, he returned to Los Alamos, where he led several weapons-related projects and in 1964 became head of the Weapons Engineering Division.

While working at Los Alamos, Agnew held a number of military advisory positions: scientific advisor to the NATO Supreme Allied Commanders (1961–1964) and member of the Defense Science Board (1966–1970), the Army's Scientific Advisory Panel (1966–1974), and 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 he became the third director of Los Alamos National Laboratory (then called Los Alamos Scientific Laboratory), which he headed for nearly a decade during times of great change. He left his imprint 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. He 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.

In addition, he 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 he became director, virtually every program was tied, directly or indirectly, to weapons work. The multidisciplinary laboratory of today, initiated by Agnew in the 1970s, devotes a large percentage of its budget to nonweapons scientific research, including topics in basic sciences and biomedicine.

After retiring in 1979 Agnew became president and CEO of General Atomics in San Diego. 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.

In recognition of his work he received two prestigious Department of Energy awards: the E.O. Lawrence Award (1966) and the Enrico Fermi Award (1978). Along with Nobel Laureate Hans Bethe, he was the first to receive the Los Alamos National Laboratory Medal (2001). In addition to the NAE, he was elected to the National Academy of Sciences (1979). And in 1982–1989 he served as a White House science councillor, advising President Reagan.

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.

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), he 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.... I don't think that's very good in the long run. Maybe it will turn around." In a 2005 BBC interview he said, "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, with the goal of 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.

