

Harold Melvin Agnew

(1921–2013)

Physicist and Manhattan Project veteran.

Harold Melvin Agnew, one of the last surviving members of the team that began the nuclear age, died on 29 September. Equipped with only an undergraduate degree, Agnew helped to set in motion the first controlled, self-sustaining nuclear chain reaction, worked on the atomic bomb, and witnessed the bombing of Hiroshima in Japan from inside an aircraft that was part of the strike operation.

A native of Colorado, Agnew studied chemistry at the University of Denver. There, he pitched on a championship softball team and earned a scholarship to pursue graduate studies at Yale University in New Haven, Connecticut. Early in 1942, Agnew accepted a position as a research assistant at the Metallurgical Laboratory at the University of Chicago in Illinois, where the world's first nuclear reactor was taking shape under the stands of an athletic field. On 2 December 1942, he witnessed the first controlled nuclear reaction.

Agnew's next assignment, beginning in early 1943, was to work with a small team to disassemble a particle accelerator at the University of Illinois and to arrange for its transportation to a facility in Los Alamos, New Mexico, the new home of the Manhattan Project to build the first atomic bomb. The team included his wife, Beverly, whom he had met at high school; while Agnew worked on the accelerator, Beverly signed on as a secretary and assistant involved in the management of the new facility.

As work on the atomic bomb neared completion, the physicist Luis Alvarez (who joined Los Alamos in 1944) assembled a team that would accompany the weapon into combat. Agnew, who stated in a later interview that he had "wanted to get in the war", was among the first volunteers.

Starting in late 1944, the team spent six months developing and testing the instrumentation and procedures that would enable them to determine from an aeroplane the power of a nuclear explosion. Rather than trying to measure the level of radiation released after the bomb had exploded, the Alvarez group decided to use a microphone fitted with circuitry that would translate the shock wave of the blast into electrical signals that could be recorded on an aircraft's gun camera.

Agnew and the rest of the team began their journey to war at Wendover Air Force Base in Utah. Outfitted with uniforms and taught how to salute, the scientists were



flown to Tinian in the Northern Mariana Islands, the base from which B-29 aircraft were being sent to burn Japanese cities to the ground.

A B-29 called *Enola Gay* lifted off the Tinian runway for Hiroshima at 2.45 a.m. on 6 August 1945, with the uranium bomb aboard. A second B-29, *The Great Artiste*, took off two minutes later. As well as a crew of ten men, the second aeroplane carried three scientific observers: Alvarez, Lawrence Johnson and Agnew. At 8.15 a.m., bombardier Kermit Beahan opened the bay doors and dropped three parachute-equipped blast gauges designed to transmit the magnitude and duration of the bomb's blast wave to a receiver on the plane. Each of the three scientists manned a receiver tuned to the frequency of one of the detecting probes. When the bomb was dropped, Alvarez could not locate his frequency, and Agnew and Johnson provided all the data on the shock waves reverberating from the explosion.

With his primary task accomplished, Agnew pulled out his personal 16-millimetre motion-picture camera and filmed the mushroom cloud. A plane trailing five kilometres behind *The Great Artiste* was equipped with a high-speed still camera, but Agnew's 'unofficial' film was the only motion-picture footage of the Hiroshima explosion. Three days later, Agnew equipped the tail gunners of the aeroplanes on the Nagasaki mission with film cameras, thereby

ensuring a motion-picture record of the second atomic strike.

Agnew ended up giving his footage to the Hoover Institution on War, Revolution and Peace at Stanford University in California. "I should have held them until today," he remarked later, "sold them on eBay and become a millionaire".

With the war over, Agnew earned a PhD in 1949 working under nuclear physicist Enrico Fermi at the University of Chicago. Returning to Los Alamos, he then joined a project to develop hydrogen and thermonuclear weapons, served as project manager for a bomb test on Bikini Atoll in 1954 and became director of the Los Alamos National Laboratory in 1970.

Retiring from the post in 1979, Agnew was president and chief executive of General Atomics, a firm developing innovative nuclear reactors, headquartered in San Diego, California, until 1985. He served as scientific adviser to the Supreme Allied Commander Europe (one of NATO's two highest-ranking military commanders) in the early 1960s and as a White House science councillor for much of the 1980s. He also chaired and served on several military advisory boards, was a member of the US National Academy of Sciences and the National Academy of Engineering, and received various awards.

A scientific 'cold warrior', Agnew never expressed regret about his involvement in the Manhattan Project. "My feeling towards Hiroshima and the Japanese was, they bloody well deserved it," he remarked in 1984. He favoured the use of tactical nuclear weapons in Vietnam, and argued successfully against a comprehensive nuclear-test-ban treaty, although he did once say that he would require every world leader to witness an atomic blast while standing in his underwear, "so he feels the heat and understands just what he's screwing around with".

Towards the end of his life, Agnew summed up the achievements of his generation with pride. "We brought a quick end to a devastating war and maintained the peace and eventually saw democracy prevail. That's something you can hang your hat on." ■

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