

In Memoriam: Wolfgang K.H. Panofsky

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[Spurgeon M. Keeny Jr.](#)

With the passing of Wolfgang K.H. Panofsky—“Pief” to his many friends—the world has lost not only an internationally acclaimed scientist but also a dedicated leader of the effort to reduce the threat of nuclear war through arms control. Although many members of the scientific community were outspoken in their profound concern about the consequences of nuclear war, Pief was one of the few senior scientists who devoted a significant portion of his intellectual efforts to the difficult technical issues related to achieving reliable control and reduction of nuclear weapons.

Pief grew up in Hamburg, Germany, until his family emigrated to the United States after his father, a distinguished art historian, was fired from his professorship by Hitler’s edict barring Jews from teaching. After graduating as valedictorian from Princeton University and receiving a Ph.D. from Cal Tech, Pief began work with the Manhattan Project even before he received his U.S. citizenship. One of his contributions to that effort was designing the instrumentation that determined the yield of the nuclear bomb that was dropped on Hiroshima.

In scientific circles, Pief is best known for his tireless and imaginative leadership beginning in 1961 in the construction and operation of the Stanford Linear Accelerator (SLAC). It was designed to accelerate electrons to extremely high velocities and bombard other elementary particles in order to determine the fundamental constituents of the nucleus from the resulting interactions. In completing the gigantic two-mile-long device in 1966 on time and unprecedentedly under budget, he demonstrated his remarkable managerial and problem-solving skills. When no U.S. company would meet his quality specifications of a critical component required in large quantities, he solved the problem by creating his own production line and manufacturing the components on-site. His early, successful completion of SLAC made possible three Nobel Prize winners and advanced the careers of hundreds of future physicists.

Despite his heavy responsibilities in the planning, construction, and direction of SLAC, Pief began his half-century-long engagement with issues of national security and arms control by playing a key role with President Dwight Eisenhower’s science advisers, James Killian and then George Kistiakowski. The first time I met Pief was during the negotiations for a comprehensive test ban treaty, when in 1959 he headed the U.S. delegation to an ad hoc working group on the detection of nuclear tests in outer space.

The working group was convened hurriedly because U.S. critics of the future treaty were arguing that clandestine tests could be conducted in outer space and even behind the moon, scenarios that the 1958 report of an experts group on the monitoring of nuclear weapons tests did not address. Although there was agreement as to the amounts of radiation associated with such tests, the working group deadlocked over the distances at which the tests could be detected. The leader of the Soviet delegation, Yevgeny Federov, a scientist with close Communist Party connections, opposed including any estimates on the limits of detection, apparently based on Marxist/Leninist ideological grounds that human capabilities are potentially unlimited. Pief, however, firmly opposed such an unscientific conclusion and eventually found language regarding capabilities on which everyone could agree. For nearly half a century, Pief continued to champion a comprehensive test ban as important to U.S. security and refuted on technical grounds repeated arguments against it by the weapons laboratories and their supporters.

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Pief was also at the center of the anti-ballistic missile (ABM) debate, which engaged every president from Eisenhower to George W. Bush. As a member of the Presidents Science Advisory Committee and thereafter, he raised technical issues regarding the feasibility of various versions of the system and the effect that deployment of such systems would have on the nuclear arms race. He was a strong supporter of the ABM Treaty negotiated under President Richard Nixon. He was also in the vanguard of the large body of physicists who denounced as technically absurd President Ronald Reagan's Strategic Defense Initiative (SDI), which aimed to provide an impervious shield that would make nuclear weapons "impotent and obsolete." As that grand vision of SDI gradually deflated over the following 25 years, Pief was a constant critic of the still-inflated claims surrounding the remnants of SDI.

With the fading of the collective memory of Hiroshima and the subsequent thousand-fold increase in the yield of individual nuclear weapons, Pief grew increasingly concerned that policymakers would again come to consider nuclear weapons as acceptable instruments of warfare. As a problem-solver, he saw arms control, including drastic reductions of existing stockpiles and strict nuclear nonproliferation, as the best insurance policy against resumed interest in using nuclear weapons. In 1981, I had the honor of co-authoring with Pief an article in the Winter 1981/82 issue of Foreign Affairs, "MAD versus NUTS." We argued that the often-maligned term "Mutual Assured Destruction (MAD)" accurately described reality and that nuclear weapons should only exist to deter the use of nuclear weapons by others. Hence, if this strategy succeeded, nuclear weapons would never be used. It was clearly far superior to NUTS (Nuclear Utilization Target Selection), which reflected strategies actively advocated at that time to legitimize nuclear weapons for battlefield use, an act that would almost certainly escalate to general nuclear war.

As chairman and member of the Committee on International Security and Arms Control (CISAC) of the National Academy of Sciences, Pief was the moving spirit in a series of studies that advocated formal international treaties establishing deep reductions in nuclear stockpiles with the goal of an ultimate prohibition of nuclear weapons. Recognizing that convincing verification would be necessary to obtain support for deep reductions, he also played a major role in the 2005 CISAC study "Monitoring Nuclear Weapons and Nuclear Explosive Materials," which explored techniques that could be used to verify a deep reductions regime. Shortly before his death, Pief wrote an important article published in the September/October 2007 issue of Foreign Affairs entitled "Nuclear Insecurity." The piece challenged recent increased political support for legitimizing pre-emptive war, increased talk of using nuclear weapons, and assertions by some analysts that the United States would soon be in a position to conduct a pre-emptive, disarming nuclear strike against Russia without fear of nuclear retaliation. Looking forward, Pief again called for drastic verified reductions in nuclear stockpiles leading to the eventual prohibition of nuclear weapons.

Pief sought throughout his career to engage the international scientific community in efforts to control nuclear weapons. Through CISAC and his other activities, he had extensive contacts with senior scientists in the Soviet Union, then Russia, and China; through the Amaldi conferences, he sought to energize the European scientific community to become more engaged in the security and arms control policies of their governments. Evidence that his achievements and policy efforts were widely recognized and appreciated was his election as a foreign member of the Academies of Sciences of China, France, Italy, and Russia. In China, his integrity and wisdom were so highly regarded that he was designated by formal agreement as the reviewer of the Chinese high-energy physics program. In the last few years, he also worked with a small group of U.S. scientists to initiate a dialogue with Iranian scientists on the Iranian nuclear program.

In all his long, busy life, Pief never lost the common touch and a delightful sense of humor, often directed at himself and never at the expense of others. He treated subordinates with the same genuine respect and interest that he showed distinguished peers. He took a special delight in his family, proudly showing a picture of his wife Adele, five children, and numerous grandchildren and great-grandchildren, which he described as the "Panofsky Fast-breeder." Somehow in the midst of all this activity, Pief and Adele, who celebrated their 65th anniversary earlier this year, found time and energy for yearly private, week-long expeditions to Death Valley and Baja California.

Pief was a truly wise, talented, and caring individual whose life was filled with major accomplishments and an abiding passion to help ensure that the world would survive so that others

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could enjoy it too.

Spurgeon M. Keeny Jr. first worked in the Office of the President in 1956 when he served on the staff of the Gaither Committee. Subsequently, he served as a technical assistant to the president's science adviser under Presidents Eisenhower, Kennedy, and Johnson and concurrently as a senior member of the National Security Council staff under Kennedy and Johnson. Under Presidents Nixon and Carter, he served as assistant director and then deputy director of the Arms Control and Disarmament Agency. He was executive director and president of the Arms Control Association from 1985 to 2001.

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