

A Brief History of the Nuclear Age

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Atomic bombs began with the Nazis.

In 1939, Albert Einstein was afraid that Hitler would use the recent discoveries of nuclear fission to make a Super weapon. His fellow physicists and émigrés from fascism, Leo Szilard and Enrico Fermi, helped him write his famous letter to President Franklin Roosevelt. The world's most celebrated scientist warned FDR that it might be "possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power... would be generated."

This "new phenomenon" he said, could lead to "extremely powerful bombs of a new type." He urged FDR to match what he thought was a German effort. Not to actually use the bomb, but to deter Hitler from using it.

Einstein later called the letter the greatest mistake of his life. There was no determined German or Japanese program. But by the spring of 1945, the program Roosevelt started was close to testing the world's first atomic bomb.

Non-proliferation began with the scientists.

In June 1945, one month before the atomic test, some of the Manhattan Project scientists formed a committee lead by Nobel laureate James Franck. The group included Szilard and Eugene Rabinowich, the ultimate drafter of the committee's report (and, six months later, cofounder of the *Bulletin of the Atomic Scientists*).

The Franck report warned that the United States could not rely on its nuclear monopoly indefinitely. Presciently, they said that a numerically superior arsenal would offer only false security. In words as true today as they were 60 years ago they wrote, "quantitative advantage ... will not make us safe from sudden attack." Unless America quickly secured an international agreement, there would be a "flying start of an unlimited armaments race."ⁱ Such an international agreement, they said, could account for all uranium, and check on any conversion of natural uranium into weapon material.

They had hit upon a core truth: Preventing proliferation requires a political solution; the science of nuclear technology cannot be otherwise contained.

Their efforts were picked up soon after the war.

"The hope of civilization," President Harry S Truman said in his message to Congress in October 1945, "lies in international arrangements looking, if possible, to the renunciation of the use and development of the atomic bomb."

In November 1945, when the entire global arsenal consisted of two atomic bombs in the United States, Truman joined with the leaders of Britain and Canada to propose to the new United Nations that all atomic weapons be eliminated and that nuclear technology for peaceful purposes be shared under stringent international controls.

Independent research groups helped develop the proposals. The Carnegie Endowment for International Peace played a leading role, forming a Committee on Atomic Energy in November 1945. After a two-day conference debating proposals, a high-level panel, chaired by James T. Shotwell, released detailed recommendations for the international control of nuclear materials and bombs.

In June 1946, Bernard Baruch presented the complete U.S. plan to the new United Nations. “We are here ” he said, “to make a choice between the quick and the dead. If we fail, then we have damned every man to be the slave of fear.”

Baruch, called for a new International Atomic Development Authority that would own and control the “dangerous” elements of the nuclear fuel cycle, including all uranium mining, processing, conversion, and enrichment facilities.

Once assured that no other state was able to construct the bomb, the United States would eliminate its weapons.

The U.N. Atomic Energy Commission approved the plan in December 1946, but Cold War tensions killed it within months. Stalin saw the bomb as more than a weapon. It was symbol of industrial might, scientific accomplishment, and national prestige. Stalin told his scientists: “Hiroshima has shaken the whole world. The balance has been broken. Build the Bomb—it will remove the great danger from us.”ⁱⁱ

Both nations opted to seek security through atomic arsenals, not atomic treaties. And so the arms race began.

In 1948, after the coup in Czechoslovakia and the Berlin crisis, Truman ordered the first major increase in weapons production. By late 1949, the U.S. arsenal had grown to more

than 200 weapons.

This was the crucial fork, the road wrongly taken that effectively institutionalized a policy of nuclear one-upmanship. When the Soviets tested their first atomic bomb that year, Truman raised the stakes, accelerating a program to build the “Super,” or fusion bomb.

David Lilienthal, wrote in his diary, “More and better bombs. Where will this lead.... We keep saying, ‘We have no other course’; what we should say is, ‘We are not bright enough to see any other course.’”ⁱⁱⁱ

The scientific advisory board to the president on atomic matters strongly opposed the Super, including J. Robert Oppenheimer, the former scientific head of the Manhattan Project. They believed it a weapon of genocide.

They wrote in their unanimous opinion to President Truman, “The use of this weapon would bring about the destruction of innumerable human lives; it is not a weapon which can be used exclusively for the destruction of material installations of military or semi-military purposes. Its use therefore carries much further than the atomic bomb itself the policy of exterminating civilian populations.”^{iv} Even if the Soviets developed the H-bomb, they argued, the United States could deter its use with fission weapons.

The scientists’ views did not prevail. The United States tested the first H-bomb in November 1952, with a yield of 10.4 megatons—or almost one thousand times more power than the fission bomb that destroyed Hiroshima. Predictably, the Soviets tested their first fusion device a year later in August 1953.

Albert Einstein wrote in the *Bulletin of the Atomic Scientists*, “The idea of achieving security through national armaments is, at the present state of military technique, a disastrous illusion....The armament race between the U.S.A. and the U.S.S.R., originally supposed to be a preventive measure, assumes hysterical character.”^v

During the 1950s, the arms race made the United States more vulnerable, not less. America’s nuclear arsenal mushroomed from just under 400 weapons in 1950 to more than 20,000 by 1960, including 10,000 new “tactical” nuclear weapons for battlefield uses. Moscow’s arsenal likewise jumped from 5 warheads in 1950 to roughly 1,600 in 1960.

The United States was ahead but afraid.

Everyone of my generation remembers the duck and cover drills in school, the tests of air raid sirens and civil defense emergency broadcast systems. The growing fears of the nation were captured in popular books and movies of the 1950s such as *On the Beach*, *Fail-Safe*, and *Dr. Strangelove*. A whole new genre of science-fiction films was spawned such as *Them*, that featured giant mutant ants crawling out of the Nevada nuclear test site. An apt metaphor for proliferation.

As the atomic scientists had warned, numerical superiority did not bring security. Tensions were high, and confrontations in Berlin and Cuba in the early 1960s would put the world on edge.

Moreover, the threat no longer came from just two states. Britain joined the nuclear club in 1952, France in 1960, and China was not far off. The U.S. intelligence community concluded that as many as 16 states could have nuclear weapons by 1968.^{vi}

U.S. leaders were thus faced with the crucial question of how to protect the nation. Build more weapons or try to climb down? For John F. Kennedy, the answer was clear.

“Today every inhabitant of this planet must contemplate the day this planet may no longer be habitable,” Kennedy said, “These weapons of war must be abolished before they abolish us. The risks inherent in disarmament pale in comparison to the risks inherent in an unlimited arms race.”

Kennedy began negotiations for both a Comprehensive Nuclear Test Ban Treaty *and* a nonproliferation pact. He signed the Limited Test Ban Treaty with the Soviet Union in 1963, calling it a “first step.” Kennedy did not live to finish the job, but Lyndon Johnson picked up the baton. In 1968, he signed the diplomatic crown jewel of his presidency: the Treaty on the Non-Proliferation of Nuclear Weapons, or NPT. President Richard Nixon later won its ratification and in a March 1970 Rose Garden ceremony, he said

“Let us trust that we will look back and say that this was one of the first and major steps in that process in which the nations of the world moved from a period of confrontation to a period of negotiation and a period of lasting peace.”

In many ways it was. The NPT was a bipartisan effort that produced a measurable increase in national and international security.

The NPT and the test ban proved the substantive link between controlling existing nuclear arsenals and controlling the spread of nuclear weapons to *other* nations. A recently declassified 1958 National Intelligence Estimate had noted the linkage and may have informed presidential thinking:

“A U.S.-U.S.S.R. agreement provisionally banning or limiting nuclear tests would have a restraining effect on independent production of nuclear weapons by fourth countries. However, the inhibiting effects of a test moratorium would be transitory unless further progress in disarmament—aimed at effective controls and reduction of stockpiles—were evident.”^{vii}

Similarly a 1961 estimate judged that 15 countries *could* develop nuclear weapons but most would *not* do so, *unless* “...it became increasingly clear that progress on international disarmament was unlikely.”^{viii}

The NPT, the test ban and other disarmament efforts made a difference.

Taking the nonproliferation fork in the road made the United States and the world more secure. Intelligence estimates confirmed a steady decrease in the number of “likely” or “possible” new nuclear states, though as industrialized states dropped off the list, programs in some developing nations appeared.^{ix}

By 1970, France and China had deployed nuclear weapons, but the list had narrowed to only four or five other states of concern. Five too many, but better than twenty-five. The diplomatic dam had held.

The progress of the 1960s gave way to the nuclear ambivalence of the 1970s. Richard Nixon's agreements limiting missile and bombers coexisted with the multiplication of warheads. Success in ending some national programs was blunted by India's 1974 nuclear test, and Israel and South Africa's secret nuclear programs. Both America and the Soviet Union reverted to nuclear expansionism again in the 1980s. But Ronald Reagan's initial military build-up was replaced in his second term with unprecedented agreements to slash nuclear arsenals.

Reagan came very close to realizing Truman's original disarmament vision at his summit with Soviet president Mikhail Gorbachev in Iceland in 1986. His *advisors* held him back, arguing that the Star Wars anti-missile program *would* work and he should *not* restrain it, even if it meant losing the chance to eliminate all nuclear weapons.

It was terrible advice.

With anti-missile systems still not working today despite funding of 150 billion dollars and no treaty restraints, Reykjavik was one of the most heartbreaking missed opportunities of the past few decades.

For 60 years, we have followed a meandering path that has led us, once again, back to the brink of disaster. The United States and Russia still retain thousands of warheads on hair-trigger alert. Stockpiles of weapons material in dozens of countries are insecure and could fall into the hands of terrorists. Countries such as Iran invoke their right to develop peaceful nuclear power that could have decidedly non-peaceful applications.

Once again, we stand at a crucial fork in the road. But, whereas our path six decades ago was circumscribed by the looming threat of Soviet power, today's political climate allows for considerably more freedom of movement.

The global non-nuclear norm is stronger than ever. Most of the 183 non-nuclear weapon states party to the NPT believe what the treaty says: We should eliminate nuclear weapons.

Sixty-six percent of the American public feels the same way. There's more good news. The world has fewer nuclear weapons and ballistic missiles than it did 15 years ago, and fewer countries have or are considering nuclear weapon programs. More and more political and military leaders recognize the limited utility of nuclear weapons.

A broad expert consensus exists on the core elements of a comprehensive plan for nuclear security:

- Enforce Nonproliferation Commitments
- Secure All Weapons-usable Materials
- Devalue Nuclear Weapons
- Stop Illegal Transfers
- Resolve the Underlying Conflicts
- Bring Israel, India and Pakistan into the regime

As the Carnegie report, *Universal Compliance*, details, many of the programs to accomplish these steps are now in place.

All that's lacking is the political will to implement them.

We can hearken back to the spirit and content of the early Truman proposals that coupled weapons elimination with strict, verified enforcement of nonproliferation. We can, today, join dramatic reductions in nuclear forces with stronger barriers to countries leaving the NPT and a sweeping reform of the way we supply nuclear fuel.

We can learn from our history, avoid repeating past mistakes, and this time, take the right road to national security and global peace. We hope this conference, like the Carnegie conference of sixty years ago, contributes to that noble goal. Thank you.

ⁱ "Report of the Committee on Political and Social Problems," Manhattan Project Metallurgical Laboratory, University of Chicago, June 11, 1945, (the Franck Report). See also, Jane Vaynman, "Nuclear Time Capsule," Carnegie Analysis, June 2, 2005 (ProliferationNews.org).

ⁱⁱ Cited in David Holloway, *Entering the Nuclear Arms Race: The Soviet Decision to Build the Atomic Bomb 1939–1945* (Washington, D.C.: The Wilson Center, 1979), p. 41.

ⁱⁱⁱ Cited in Barton J. Bernstein, "Truman and the H-Bomb," *Bulletin of the Atomic Scientists*, March 1984, p. 13.

^{iv} Ibid.

^v Albert Einstein, "Arms Can Bring No Security," *Bulletin of the Atomic Scientists*, March 1950, p.71.

^{vi} Director of Central Intelligence, "National Intelligence Estimate 100-2-58, 1 July 1958" (approved for release July 2004). Of these sixteen, they assessed five as "likely" to do so.

^{vii} Director of Central Intelligence, "National Intelligence Estimate 100-2-58," p. 2.

^{viii} Director of Central Intelligence, "National Intelligence Estimate Number 4-3-61," September 21, 1961, p. 9.

^{ix} These NIEs are now available on the web site of the National Security Archives (www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB155/index.htm).