

and have him, the best qualified person, run the scientific effort.

Oppenheimer's brilliance was demonstrated by his completion of undergraduate work in three years at Harvard University and his doctorate in an additional two at the University of Göttingen (Germany). His study of quantum mechanics brought him many academic offers, and he accepted a joint appointment at the University of California, Berkeley, and the California Institute of Technology. At Berkeley, in 1942, Oppenheimer established a theoretical program on fast neutrons (necessary to create an atomic bomb) and then worked with other physicists on what it would take to develop a bomb. Late that year Groves met Oppenheimer and came to appreciate what he had to offer the Manhattan Project, and they had their first conversations about the program. Groves was not the only one who recognized Oppenheimer's potential; he also had an invitation, which he declined, from the Soviet Union to give them information about his work. After visiting Los Alamos with Groves, an area near where Oppenheimer had lived



Leslie R. Groves. Photo via Wikimedia Commons. [Public domain.]



James B. Conant. Photo via Wikimedia Commons. [Public domain.]

for a year between high school and college, things seemed to be set. This letter, from February 1943, was the crucial step in formalizing the offer and confirming Oppenheimer as the Scientific Director of the project. Two years and four months after this formal "contract" was made with Oppenheimer, the test of an atomic device resulted in the desired explosion at the Trinity test site, southeast of Los Alamos. The Manhattan Project had achieved its goal.

### Author Biography

James B. Conant (1893-1978) earned a BS from Harvard University and a PhD in chemistry also from Harvard. He was involved in poisonous gas research during World War I and prior to World War II was a strong advocate for developing atomic weapons. In the World War II era, he was appointed by President Roosevelt to be a scientific liaison with the United Kingdom and was a member, then chair, of the National Defense Research Committee, which became

sevelt's death in the spring of 1945 left his vice president, Harry S. Truman, at the helm of the nation's military. On July 16, 1945, at a New Mexico air base, scientists conducted the first successful nuclear bomb explosion.

Shortly after the test confirmed the functionality of the atomic bomb, Truman joined Great Britain's outgoing prime minister Winston Churchill and Soviet premier Joseph Stalin at Potsdam, Germany. The victorious Allied leaders spent much of the conference planning for postwar peace in Europe, but they also discussed how to conclude the war against Japan in the Pacific. Historians generally agree that Truman's confidence in the atomic bomb as a destructive force informed his strong negotiating stance at the conference; certainly, he hinted to Stalin, whom he recognized as a future competitor for global influence, that the United States had the weapon. Although never specifically mentioned, the atomic bomb was the underlying threat issued against Japan in the Potsdam Declaration by the United States, Great Britain, and China on July 26, 1945. This declaration announced the terms on which the Allies would accept a Japanese surrender and warned that "the alternative for Japan is prompt and utter destruction." These terms included the unconditional surrender and complete disarmament of Japan's military and its leaders, followed by a period of Allied occupation and rebuilding.

The Japanese refused to accept these terms, and Truman was then faced with the choice of whether to use the atomic bomb to force an unconditional surrender or to begin a traditional land and sea attack that was estimated to take months and cost tens of thousands of US lives. Truman chose the former, and on the morning of August 6, the US bomber *Enola Gay* dropped an atomic bomb on the city of Hiroshima.

### Author Biography

A native of Missouri, Harry S. Truman served in World War I and operated a men's clothing store before beginning a political career as an elected county judge in 1922. He made the jump to the US Congress with election as Missouri's junior Democratic senator in 1934 at the height of the New Deal. Truman built

509TH COMPOSITE GROUP  
Office of the Operations Officer  
APO 247, c/o Postmaster  
San Francisco, California

5 August 1945

OPERATIONS ORDER )  
NUMBER 35 )

Date of Mission: 6 August 1945  
Briefings: : See below  
Take-off: Weather Ships at 0200 (Approx)  
Strike Ships at 0300 (Approx)

Out of Sacks: Weather at 2230  
Strike at 2330  
Mess : 2315 to 0115  
Lunches : 39 at 2330  
52 at 0030  
Trucks : 3 at 0015  
4 at 0115

A/C NO.	VICTOR NO.	APOO	CREW SUBS	PASSENGERS (to follow)
<b>Weather Mission:</b>				
298	83	Taylor		
303	71	Wilson		
301	85	Katherly		
302	72	Alternate A/C		
<b>Combat Strike:</b>				
292	82	Tibbets	as Briefed	
333	89	Sweeney		
201	91	Marquardt		
304	90	McKnight		
304	88	Alternate for Marquardt		

GAS: #82 - 7000 gals.  
all others - 7400 gals.

AMMUNITION: 1000 rds/gun in all A/C.

BOMBS: Special.

CANNERS: K18 in #82 and #90. Other installations per verbal orders.

RELIGIOUS SERVICES: Catholic at 2200  
Protestant at 2230

BRIEFINGS:

**Weather Ships**  
General Briefing in Combat Crew Lounge at 2300.  
Special Briefings at 2330 as follows:  
AC and Pilots in Combat Crew Lounge  
Nav - Radar Operators in Library  
Radio Operators in Communications  
Flight Engineers in Operations  
Mess at 2330  
Trucks at 0015

**Strike Mission:**  
General Briefing in Combat Crew Lounge at 2400  
Special Briefings at 0030 as follows:  
AC and Pilots in Combat Crew Lounge  
Nav and Radar Operators in Library  
Radio Operators at Communications  
Flight Engineers at Operations  
Mess at 0030  
Trucks at 0115

NOTE: Lt McKnight's crew need not attend briefings.

*James I. Hepflus, Jr.*  
JAMES I. HEPLUS, JR.,  
Major, Air Corps,  
Operations Officer.

Strike order for the Hiroshima bombing, as posted on Tinian Island. Photo by Harold Agnew (as US Gov't employee), 1945, via Wikimedia Commons. [Public domain.]

on his reputation for honesty and fair dealing, and in 1944 he was tapped as the running mate for President Franklin D. Roosevelt in his effort to win an unprecedented fourth term. Roosevelt and Truman had little personal or professional relationship, however, and Roosevelt's administration had shared little to no detail about pressing defense or diplomatic concerns when Truman unexpectedly became president upon Roosevelt's death in April of 1945. As president, Truman suddenly faced the challenges of concluding World War II, managing increasingly tense relations with the Soviet Union, and preparing the nation to begin to return to a peacetime footing.

To help us move toward that goal we must guard not only against military threats to world security but economic threats to world well-being.

Political peace and economic warfare cannot long exist together. If we are going to have peace in this world, we must learn to live together and work together. We must be able to do business together.

Nations that will not do business with one another or try to exclude one another from doing business with other countries are not likely in the long run to be good neighbors.

Trade blackouts, just as much as other types of blackouts, breed distrust and disunity. Business relations bring nations and their peoples closer together and, perhaps more than anything else, promote good will and determination for peace.

Many of the existing restrictions on world trade result from present day conditions and practices, largely growing out of the war.

Many countries, and not least Great Britain, had to sacrifice their foreign earning power to win the war. They have sold most of their foreign stocks and bonds, borrowed heavily abroad, let their foreign commerce go, and lost ships and factories to enemy attack.

Their needs for foreign goods are great and pressing but they lack foreign exchange, that is, purchasing power to buy abroad. Without aid they cannot see their way to buy as they used to abroad, not to speak of the additional things they need from abroad to rehabilitate their shattered and devastated economies.

In a situation of this kind what can a country do? It can seek to borrow currencies it needs, which will enable it to apply the liberal principles of trade which must be the basis of any permanent prosperity.

Or it can draw in its belt. It can reduce the standard of living of its people, conserve in every way the foreign currencies that it finds hard to get, and transfer its foreign trade by Government decree to countries whose currencies are easier to obtain.

In the latter way lies increased discrimination and the division of the commerce of the world into exclusive blocs. We cannot oppose exclusive blocs if we do not help remove the conditions which impel other nations, often against their will, to create them.

States, the Army, the Navy, the Air Force, and the Marine Corps are all capable of putting this weapon to military use.

But the dread secret, and the fearful engines of atomic might, are not ours alone.

In the first place, the secret is possessed by our friends and allies, Great Britain and Canada, whose scientific genius made a tremendous contribution to our original discoveries, and the designs of atomic bombs.

The secret is also known by the Soviet Union.

The Soviet Union has informed us that, over recent years, it has devoted extensive resources to atomic weapons. During this period, the Soviet Union has exploded a series of atomic devices, including at least one involving thermo-nuclear reactions.

If at one time the United States possessed what might have been called a monopoly of atomic power, that monopoly ceased to exist several years ago. Therefore, although our earlier start has permitted us to accumulate what is today a great quantitative advantage, the atomic realities of today comprehend two facts of even greater significance.

First, the knowledge now possessed by several nations will eventually be shared by others—possibly all others.

Second, even a vast superiority in numbers of weapons, and a consequent capability of devastating retaliation, is no preventive, of itself, against the fearful material damage and toll of human lives that would be inflicted by surprise aggression.

The free world, at least dimly aware of these facts, has naturally embarked on a large program of warning and defense systems. That program will be accelerated and expanded.

But let no one think that the expenditure of vast sums for weapons and systems of defense can guarantee absolute safety for the cities and citizens of any nation. The awful arithmetic of the atomic bomb does not permit of any such easy solution. Even against the most powerful defense, an aggressor in possession of the effective minimum number of atomic bombs for a surprise attack could probably place a sufficient number of his bombs on the chosen targets to cause hideous damage.

Should such an atomic attack be launched against the United States, our reactions would be swift and resolute. But for me to say that the defense capabilities of the United States are such that they could inflict terrible losses

ert Oppenheimer. Teller belonged to the Theoretical Division, working on implosion-type nuclear weapons that led to the development of the atomic bomb.

After the war Teller taught at the University of Chicago and became a leading figure in the development of the second-generation of nuclear weapon known as the hydrogen bomb, or “super,” with a destructive power many magnitudes greater than the bombs used against Japan in 1945. Testing of the H-bomb took place in the 1950s, beginning with “Ivy Mike,” a 10.4 megaton bomb, in the South Pacific in 1952. As successful as Teller was in this, he was also known to be difficult to work with and as someone with an out-sized ego. In 1954, during the second Red Scare, he testified against his former colleague Robert Oppenheimer, contributing to Oppenheimer’s loss of his security clearance.

After the Oppenheimer controversy, Teller was kept at a distance by many of his scientific colleagues, even as he involved himself in more government projects. In 1958 he became director of the Lawrence Livermore National Laboratory, housed at the University of California-Berkeley. It was from this position that he also assumed leadership of Project Chariot, a test program under the AEC’s Plowshares Program designed to demonstrate the peaceful uses of nuclear technology. Although Chariot and the other Plowshares projects ultimately failed (or barely got off the ground), Teller remained an ardent supporter of government innovation in the nuclear field. After his retirement in 1975, he became a prominent advocate of President Ronald Reagan’s Strategic Defense Initiative, or “Star Wars” program, which sought to develop a vast system of space-based lasers ready to shoot



*The plan was championed by Edward Teller, who traveled throughout the state touting the harbor as an important economic development for America’s newest state. Photo by Greg L., via Wikimedia Commons.*

down enemy missiles. He proposed a joint Russian-US project designed to employ large-scale nuclear explosives to protect the earth from incoming asteroids, but it did gain sufficient support. Teller died, aged 95, in 2003.

by representatives of eighteen nations and subsequently approved by a majority of others. Notably absent as signatories, however, were India, Pakistan, and Israel, all of whom either had or hoped soon to have nuclear arsenals. The treaty came into force in 1970. Other relevant treaties from this time (during the Nixon administration) include the Nuclear Accidents Treaty (1970), governing procedures for managing nuclear accidents; and the Antiballistic Missile Treaty (1972), which limited US and Soviet *antimissile* defenses to two sites each: the capital of each nation plus one other site. (The latter option was dropped by agreement in 1974.)

Nixon and the USSR's Leonid Brezhnev also negotiated the Strategic Arms Limitation Talks (SALT). The first SALT agreement (SALT I, 1972) limited the two superpowers' testing and deployment of nu-

clear-weapons *delivery systems* (missiles, long-range aircraft, etc.). Meant as an interim measure, it was followed by SALT II, which cut back on offensive nuclear weapons. The latter was signed, after lengthy negotiations and delays, by Brezhnev and Nixon's successor Jimmy Carter in 1979. That same year, however, the Soviet Union invaded Afghanistan, which caused the US Senate not to ratify SALT II.

Also that same year came the Three Mile Island nuclear power plant accident near Harrisburg, Pennsylvania. Although only small amounts of radiation were released—due to both mechanical failures and human error—the political consequences were significant. Both the nuclear power industry and the Nuclear Regulatory Commission suffered blows, and the American public became more skeptical of the future of nuclear power.

## ■ JFK: “We Choose to Go to the Moon”

**Date:** September 12, 1962

**Author:** John F. Kennedy

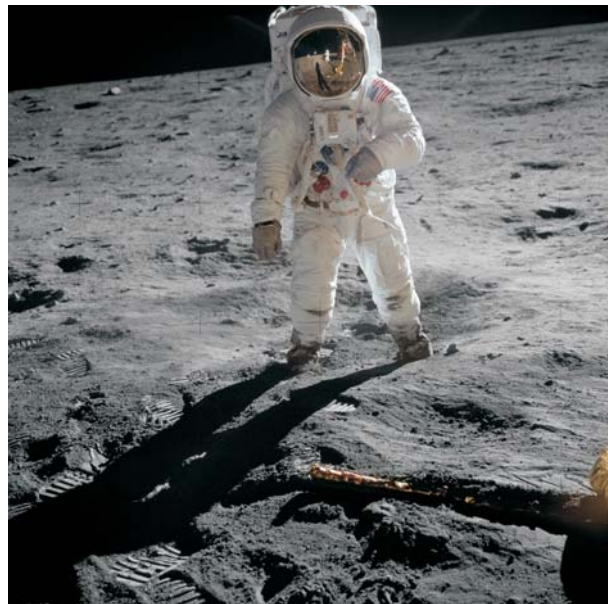
**Genre:** speech

### Summary Overview

*Although the National Aeronautics and Space Administration (NASA) was created under the Eisenhower administration (in response to the launching of the Soviets’ Sputnik satellite), it gained its greatest public notice in its early years under the administration of President John F. Kennedy. Kennedy gave this speech in support of the newly created Apollo program on September 12, 1962, at Rice University in Houston, Texas. As part of the campaign, Kennedy also visited Houston’s Manned Spacecraft Center (later renamed the Johnson Space Center), the Launch Operations Center in Florida (later known as the Kennedy Space Center), and the Marshall Space Flight Center in Alabama—all sites that were crucial to the Apollo program’s success. This speech, made during the height of the Cold War, explained why he believed that NASA should be fully funded and urged Americans to embrace a new era of space exploration and technological innovation that would return the United States to its primary place in the “space race” with the Soviet Union, which had been first to achieve major milestones in space those first years. The moon had become the ultimate prize, and Americans were increasingly concerned that the Soviets would get there first, delivering a serious blow to US prestige. The race to the moon was not only a contest for supremacy in space, but a display of military technology and the victory of a social and political worldview. In that respect it paralleled the arms race.*

### Defining Moment

The “space race” between the Soviet Union and the United States can be traced to the end of World War II. In 1944, near the end of the war, Germany launched successful attacks on England and Belgium with long-range ballistic missiles. Their V-2 rocket was also the first artificial object to pass the Kármán line, the boundary between Earth’s atmosphere and outer space, 100 kilometers (62 miles) above sea level. The V-2 was captured by the United States at the end of World War II, and many of the scientists who had worked on it were brought back to the United States and ultimately employed at NASA. The Soviet Union also captured key V-2 manufacturing bases and personnel. These rockets were developed less as a way to explore space than as a means of delivering a nuclear weapon to an enemy, but the launch of the Soviet satellite *Sputnik 1* and the space race that followed would not have been possible without this rocket technology.



*Kennedy’s vision was realized in 1969, when Apollo 11 became the first American spaceflight to put humans on the Moon. Pictured during the mission is astronaut Buzz Aldrin. Photo courtesy of NASA, via Wikimedia Commons. [Public domain.]*