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STS.011 American Science: Ethical Conflicts and Political Choices
Fall 2007

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World War II: A Technological and Psychological Turning Point?

- Total war: production on the home front, population centers as targets, the ‘special’
- Air power: critical new component of warfare
- Big projects: Rad Lab, B-29 bomber, Manhattan Project

Postwar: Federal government in science and technology

Military-Industrial-Academic complex

Pearl Harbor – U.S. Naval base and Army airfield



Source: US Naval Historical Society.

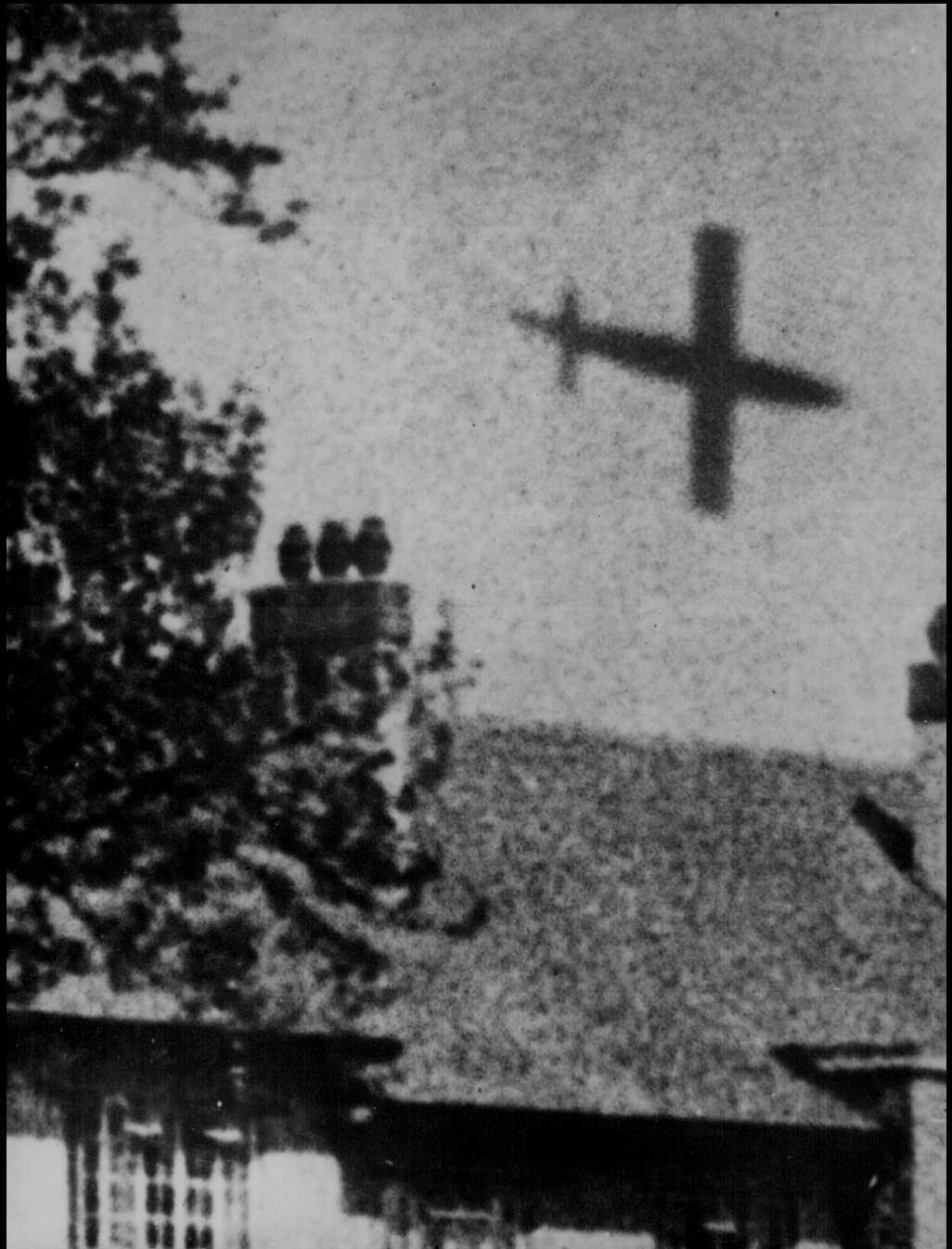
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Source: US Naval Historical Society.

Battle of Britain:
Civilian areas
legitimized as targets
for aerial bombing
Attacks.

Terror weapons:
V-1 and V-2 rockets



Source: U.S. National Archives. V1 rocket in flight, London ca. 1944. 306-NT-3157V.

London during 'the Blitz'



Source: US National Archives. Almshouse bombed Feb. 10, Newbury, Berks., England. 111-SC-178801.



Source: U.S. National Archives. Children of an eastern suburb of London...306-NT-3163V.

Rotterdam: leveled by Nazis



6-3134-1

B-17 over Europe



Source: US Air Force, over Germany ca. 1943.

Allied Strategic Bombing against Germany



Contrails of combat aircraft over Europe



The Air War in against Japan

Boeing B-29 bomber – a modern aircraft

Pressurized cabin
Top speed = 365 mph
Range = 5,830 miles
Ceiling = 31,850 feet
20,000-pound bomb load



Boeing built 2,766 B-29s at plants in Wichita, Kansas, and in Renton, Washington. Bell Aircraft Co. built 668 in Georgia, and the Glenn L. Martin Co. built 536 in Nebraska. Total = 3,970



Source: US Air Force.

B-29 traffic jam at Tinian airfield, 1945
(incendiary strikes against Japanese cities)



How to win airfields for B-29s



Photo: Naval Historical Center



Photo: Naval Historical Center



Photo: Naval Historical Center

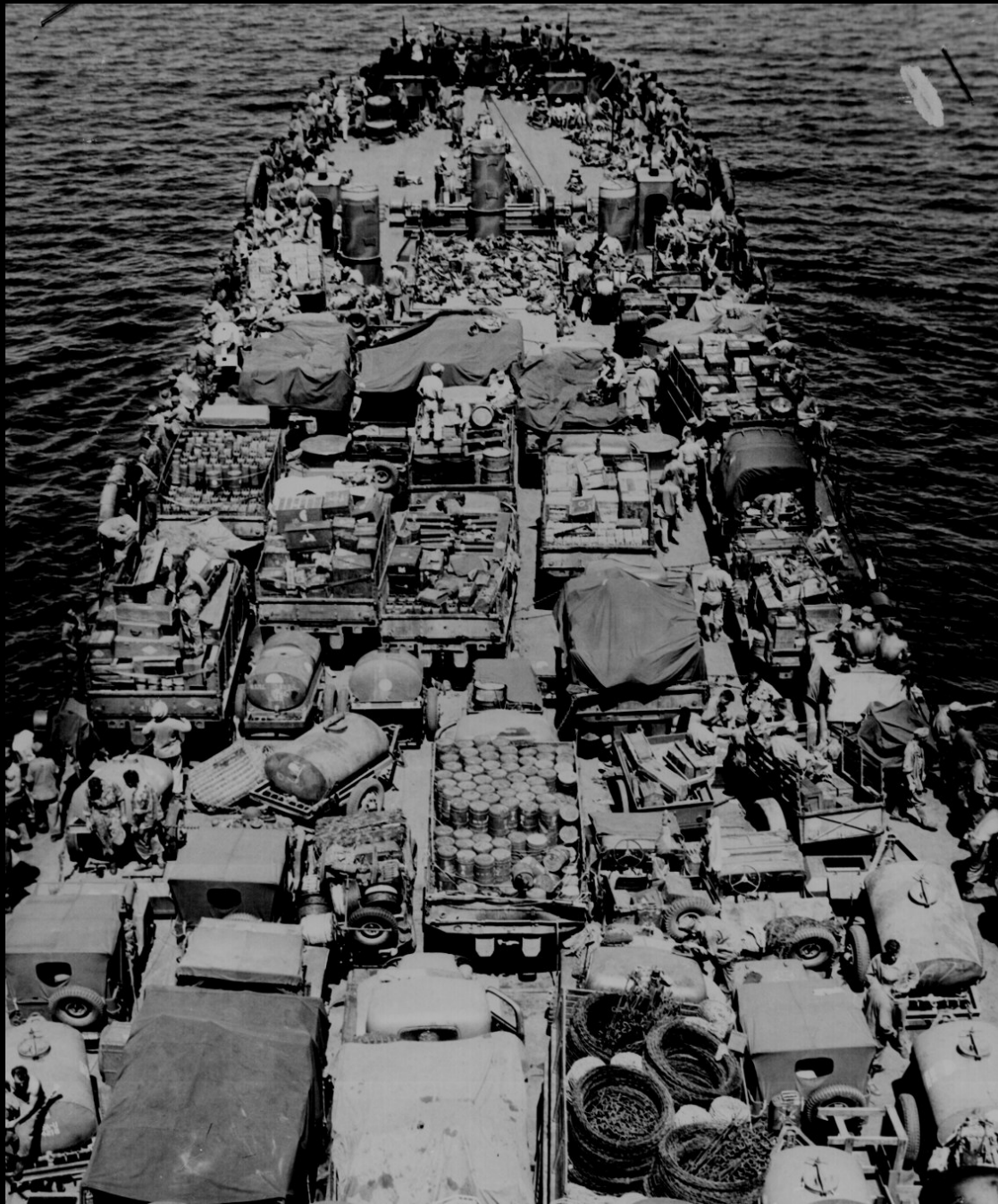


Photo: Naval Historical Center

The cost: Tarawa



Source: US National Archives. Photo by WO Obie Newcomb, Jr., November 1943. 127-N-63458

The cost: Iwo Jima



Source: IIS National Archives. Photo by PhoM3c. Robert M. Warren. ca. February/March 1945. 26-G-4474.



Photo: US National Archives



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declassification
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[Signature]
H.D.C.C.*

CONFIDENTIAL
WAR DEPARTMENT
OFFICE OF THE CHIEF OF STAFF
WASHINGTON 25, D. C.



25 July 1945

SECRET
1. DEC 1945

TO: General Carl Spaatz
Commanding General
United States Army Strategic Air Forces

1. The 509 Composite Group, 20th Air Force will deliver its first special bomb as soon as weather will permit visual bombing after about 3 August 1945 on one of the targets: Hiroshima, Kokura, Niigata and Nagasaki. To carry military and civilian scientific personnel from the War Department to observe and record the effects of the explosion of the bomb, additional aircraft will accompany the airplane carrying the bomb. The observing planes will stay several miles distant from the point of impact of the bomb.
2. Additional bombs will be delivered on the above targets as soon as made ready by the project staff. Further instructions will be issued concerning targets other than those listed above.
3. Dissemination of any and all information concerning the use of the weapon against Japan is reserved to the Secretary of War and the President of the United States. No communiques on the subject or releases of information will be issued by Commanders in the field without specific prior authority. Any news stories will be sent to the War Department for special clearance.
4. The foregoing directive is issued to you by direction and with the approval of the Secretary of War and of the Chief of Staff, USA. It is desired that you personally deliver one copy of this directive to General MacArthur and one copy to Admiral Nimitz for their information.

This Handy

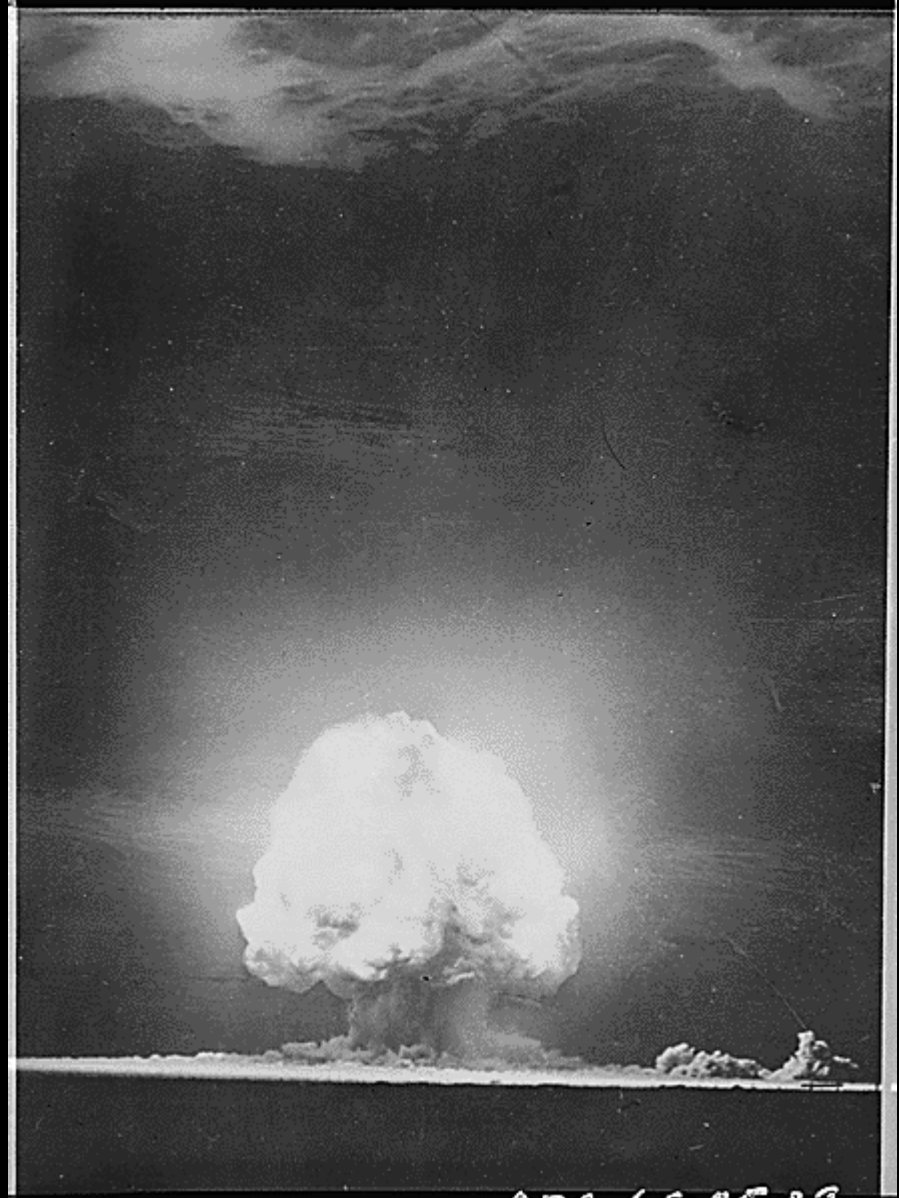
THOS. T. HANDY
General, G.S.C.
Acting Chief of Staff

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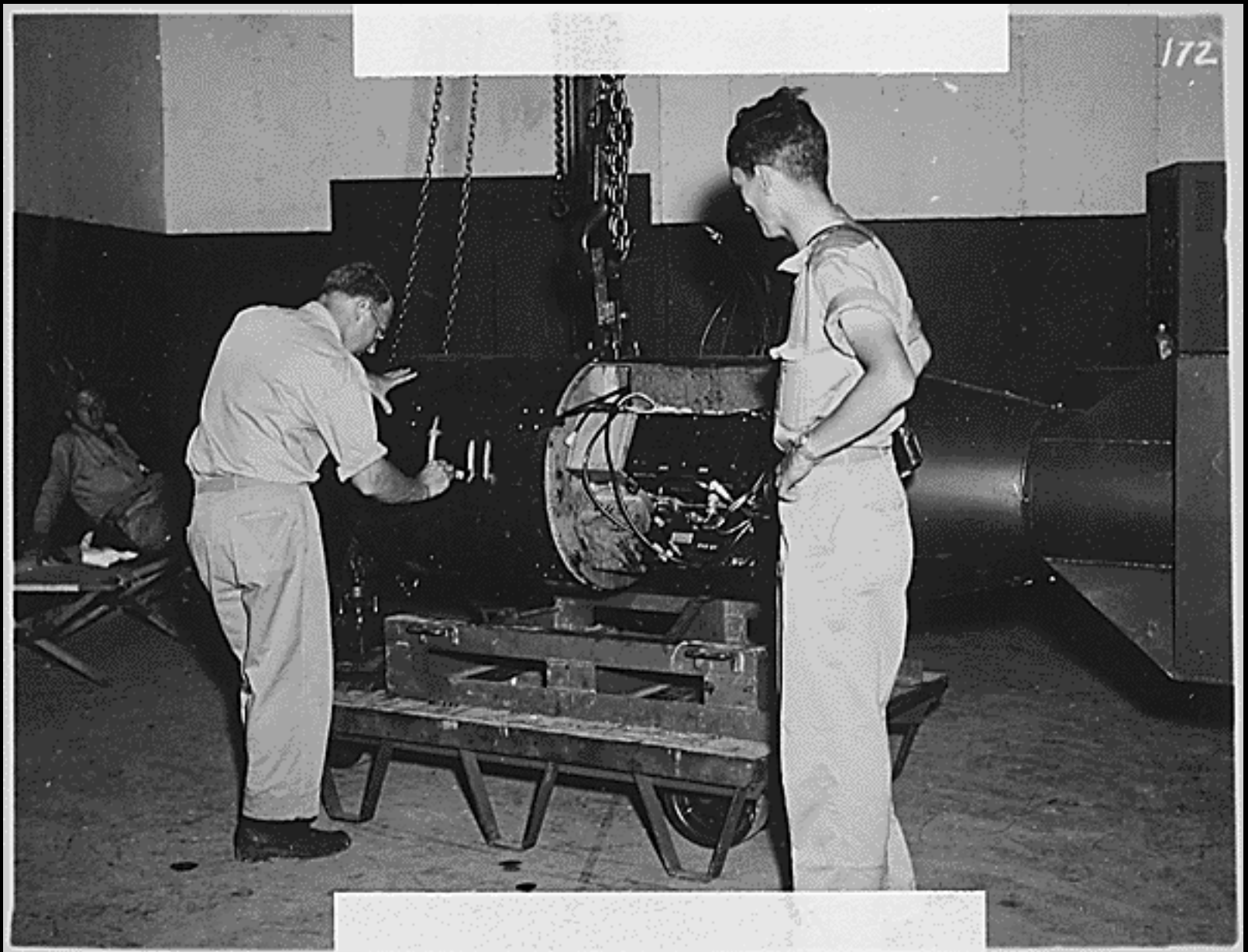
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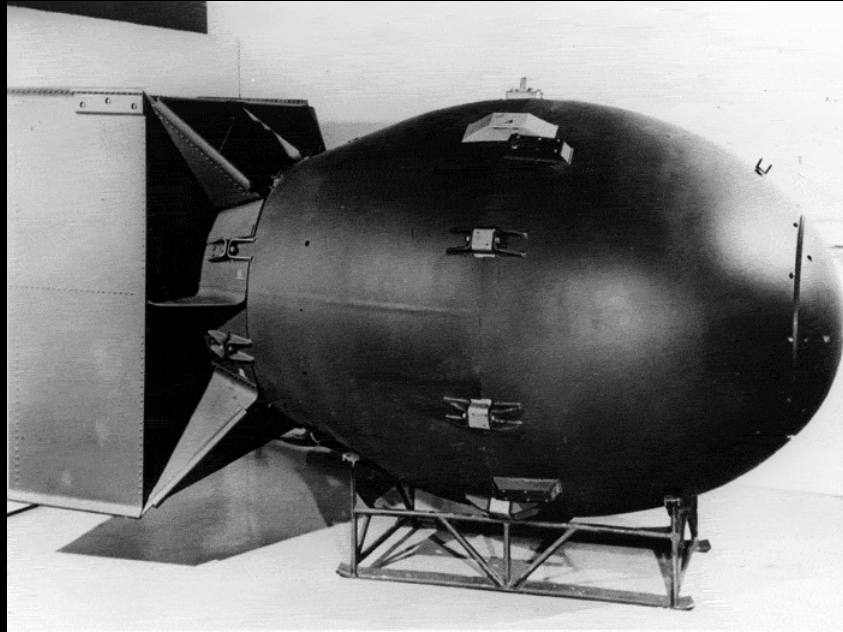
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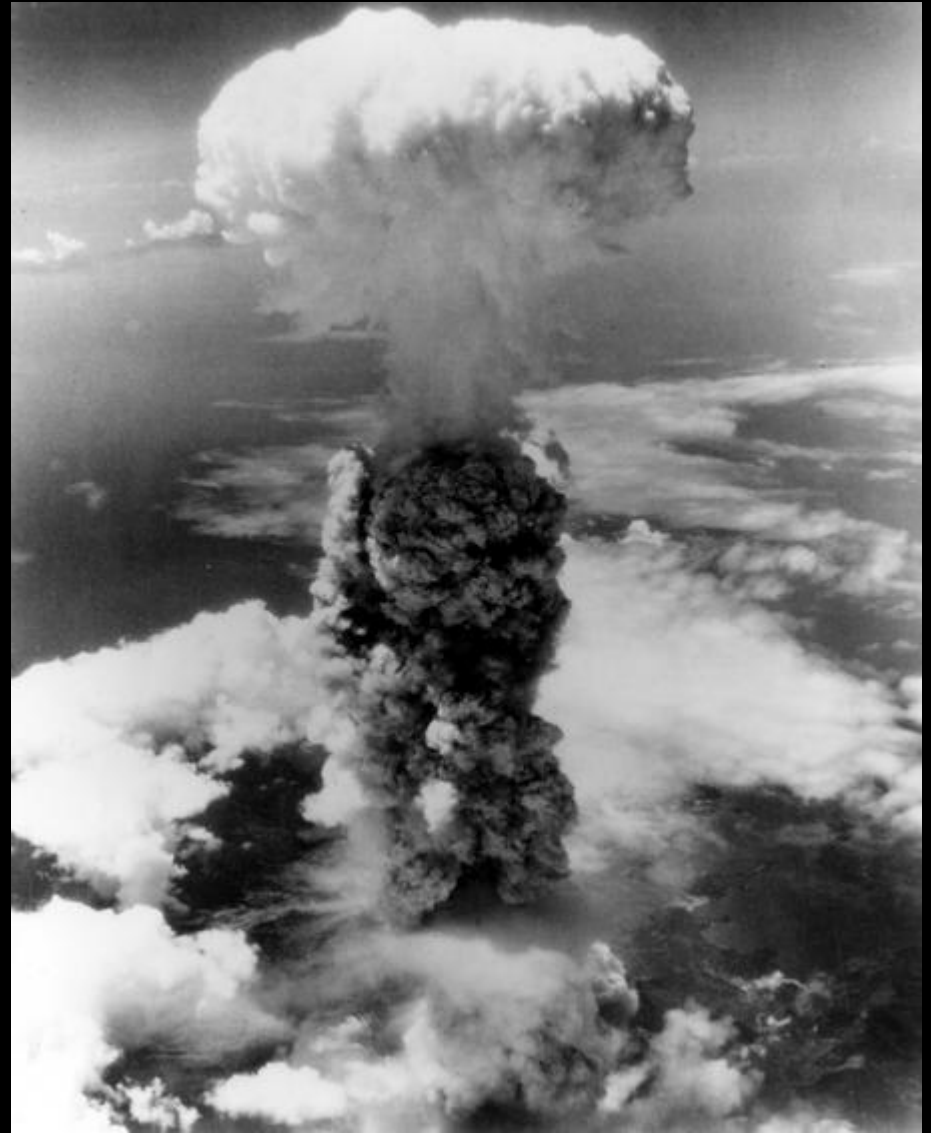


“Little Boy” atomic bomb





“Fat Man” atomic bomb,
Hiroshima



Nagasaki detonation

Science: The Endless Frontier

[N]owhere in the Governmental structure receiving its funds from Congress is there an agency adapted to supplementing the support of basic research in the universities, both in medicine and the natural sciences; adapted to supporting research on new weapons for both Services; or adapted to administering a program of science scholarships and fellowships.

A new agency should be established, therefore, by the Congress for the purpose. Such an agency, moreover, should be an independent agency devoted to the support of scientific research and advanced scientific education alone.

Vannevar Bush, 1945
Director, OSRD

General Dwight D. Eisenhower, Supreme Allied Commander



Photo: U.S. National Archives

President Dwight D. Eisenhower, 1961

“In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist.

Akin to, and largely responsible for the sweeping changes in our industrial-military posture, has been the technological revolution during recent decades. In this revolution, research has become central; it also becomes more formalized, complex, and costly.

The prospect of domination of the nation's scholars by Federal employment, project allocations, and the power of money is ever present and is gravely to be regarded.

Yet, in holding scientific research and discovery in respect, as we should, we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite.”