

# **Little Boys and Blue Skies**

## ***Drones through Post-Atomic Eyes***

**Derek Gregory**

*Trevor Paglen*  
*Untitled (Predator, Indian Springs, Nevada)*

## Delivery systems: geographical range

B2 bomber	B52 Bomber	Minuteman ICBM	Trident SLBM	<i>MQ-1 Predator</i>	<i>MQ-9 Predator</i>
12,000 km	18,500 km	13,000 km	11,000 km	740 km	1,850 km

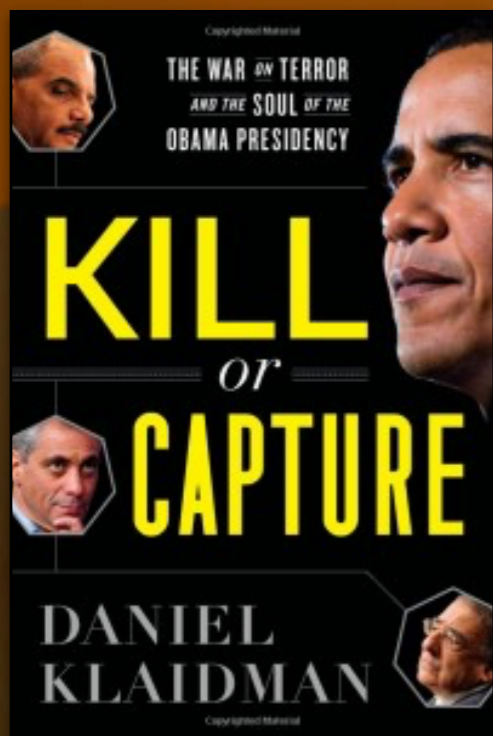
## Munitions

<b>CEP</b> circular error probable		120-200 m		<i>'5 m or less'</i> <i>(Hellfire II AGM)</i>
<b>blast radius</b>	3.5 km ( <i>'Little Boy'</i> )			<i>15-20 m</i>

## Effects

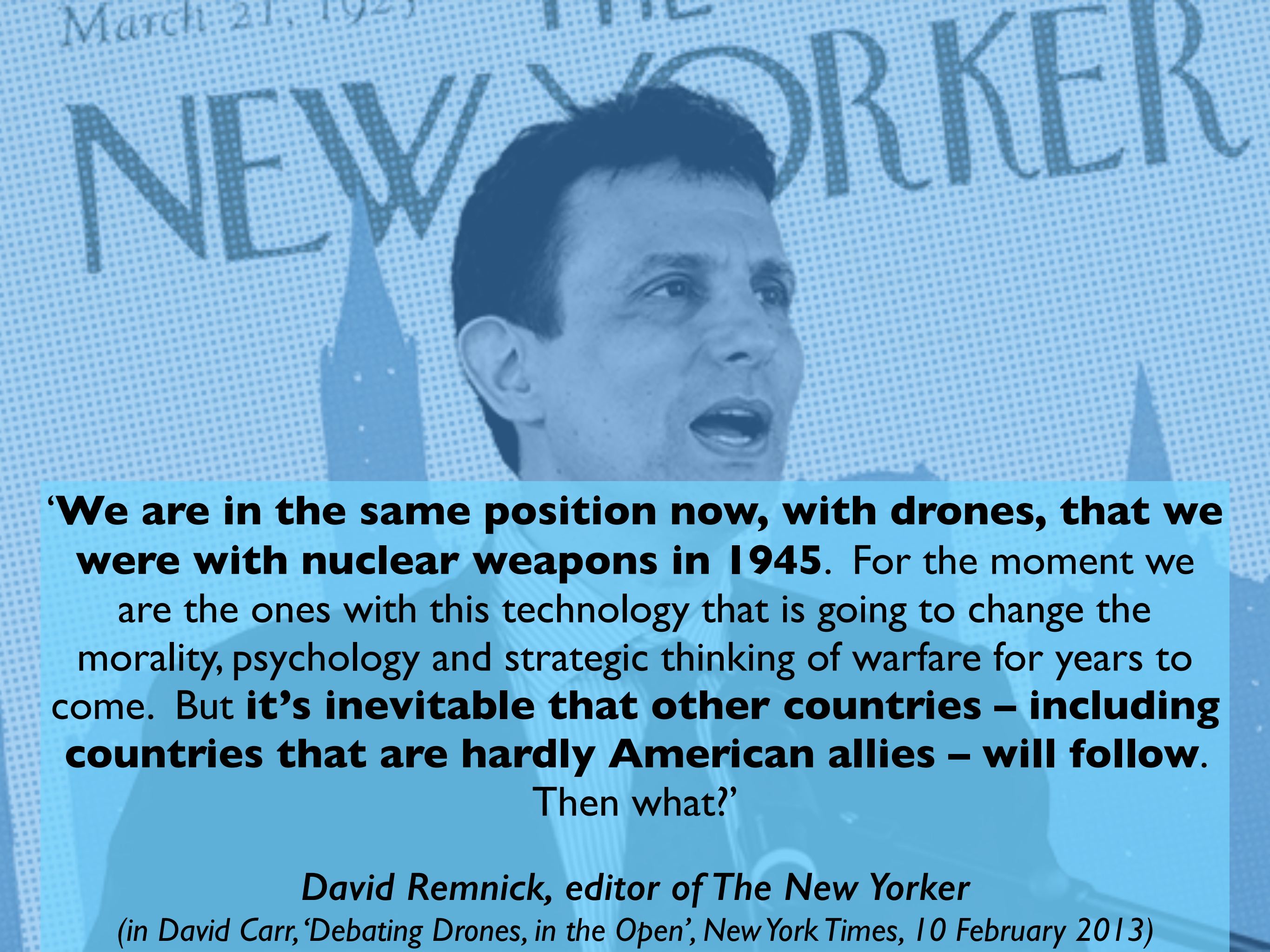
large-scale loss of life  
long-term environmental toxicity

contained in time and space  
(*'warheads on foreheads'*)



**“I would have preferred targeted killings to Hiroshima,”** [Harold Koh, Legal Adviser to the State Department] would often say when debating his friends in the human rights community.’

Daniel Klaidman, *Kill or capture: the War on Terror and the soul of the Obama Presidency*



**‘We are in the same position now, with drones, that we were with nuclear weapons in 1945. For the moment we are the ones with this technology that is going to change the morality, psychology and strategic thinking of warfare for years to come. But it’s inevitable that other countries – including countries that are hardly American allies – will follow. Then what?’**

*David Remnick, editor of The New Yorker*

*(in David Carr, ‘Debating Drones, in the Open’, New York Times, 10 February 2013)*

# DRONES AND TARGETED KILLING

LEGAL, MORAL, AND GEOPOLITICAL ISSUES

EDITED BY MARJORIE COHN  
WITH A FOREWORD BY ARCHBISHOP DESMOND TUTU

It is against this background that the counter-intuitive argument is put forward seriously to the effect that drone warfare is, and is likely to become, **more** destructive of international law and world order than is nuclear warfare. Such a contention is not meant to suggest that reliance on **nuclear weapons** would somehow be better for the human future than the acceptance of the logic of drone use. It is only to say that so far, at any rate, international law and world order have been able to figure out some regimes of constraint for **nuclear weapons** that have kept the peace, but have not been able to do so for **drones**, and will be unlikely to do so as long as the logic of dirty wars is allowed to control the shaping of national security policy in the United States.



WHY DRONES ARE  
MORE DANGEROUS THAN NUCLEAR  
WEAPONS

**Richard Falk**



**i can**

**international** campaign  
to abolish nuclear weapons



# PROTEST DRONE ATTACKS



noam  
chomsky

and andre  
vlitchek

on western  
terrorism

from hiroshima  
to drone warfare



## President Strangelove

Or:  
How  
I Learned  
to  
Stop  
Worrying  
and  
Love  
Secret  
Drone  
Attacks



MATSON ST. LOUIS POST-DISPATCH  
caglecartoons.com

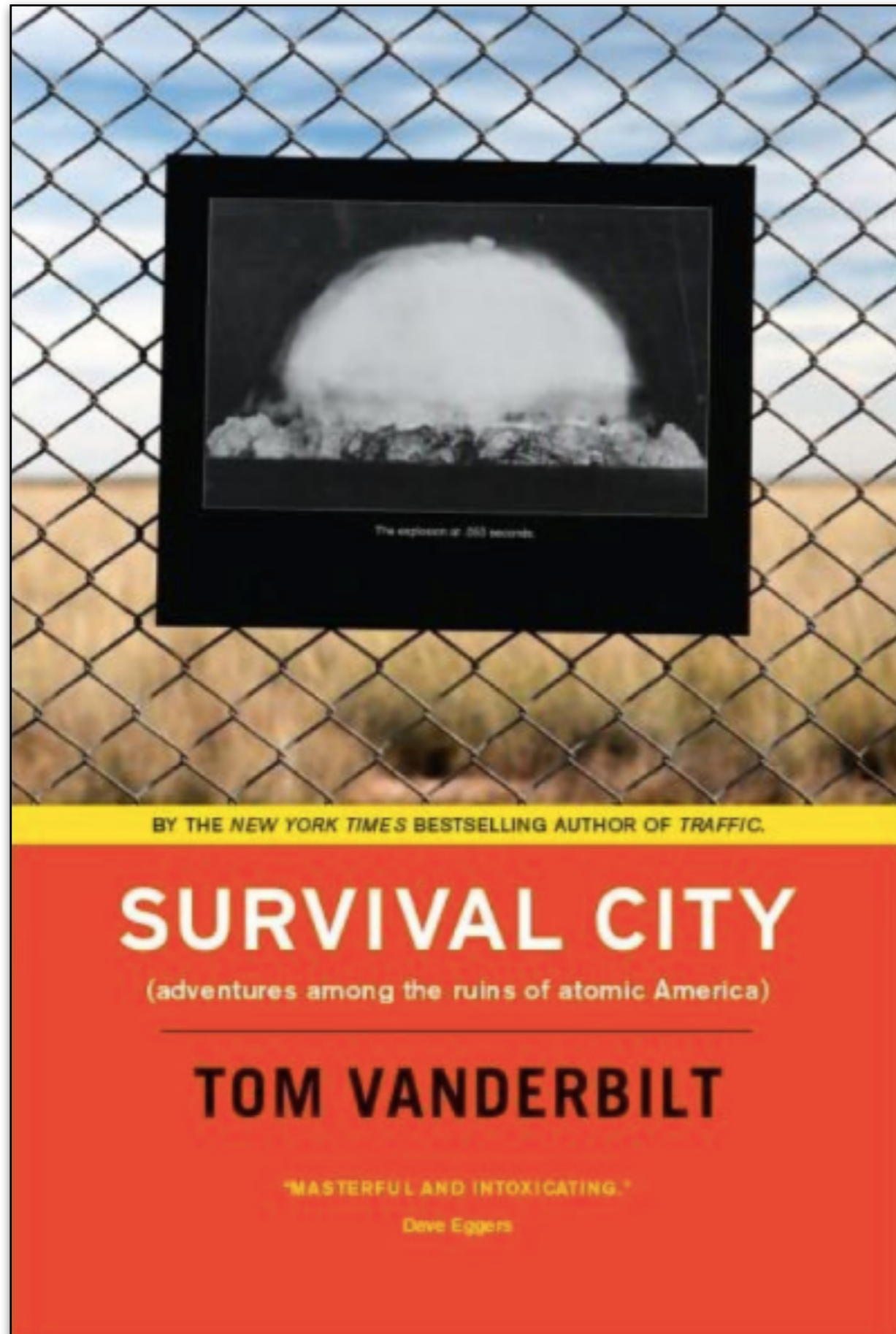
# **I: Distance, dispersal and the global battle space**

# The vanishing battlefield

‘[T]he development of nuclear weapons has, to a considerable degree, helped **blur the notion of the battlefield**.... This shift was evident at Hiroshima and Nagasaki, where **the attacks concretely and metaphorically annihilated the battlefield by sending the message that no place was safe from war**, and that **the new weapons could, in one great big flash, abolish any distinction between combatants and non-combatants**. Nuclear weapons are in that respect not just quantitatively but qualitatively different from all other weapons because their use is, by definition, premised on **the total breakdown of the battlefield**.’

*Frédéric Megret, ‘War and the vanishing battlefield’*





‘a war with no clear boundaries, no clear battlefields ... a war waged in such secrecy that both records and physical locations are often utterly obscured...’

FEATURED STORY

# The World as Free-Fire Zone

How drones made it easy for Americans to kill a particular person anywhere on the planet.

By Fred Kaplan on June 7, 2013

72 COMMENTS



*Geopolitics*, 00:1–24, 2013

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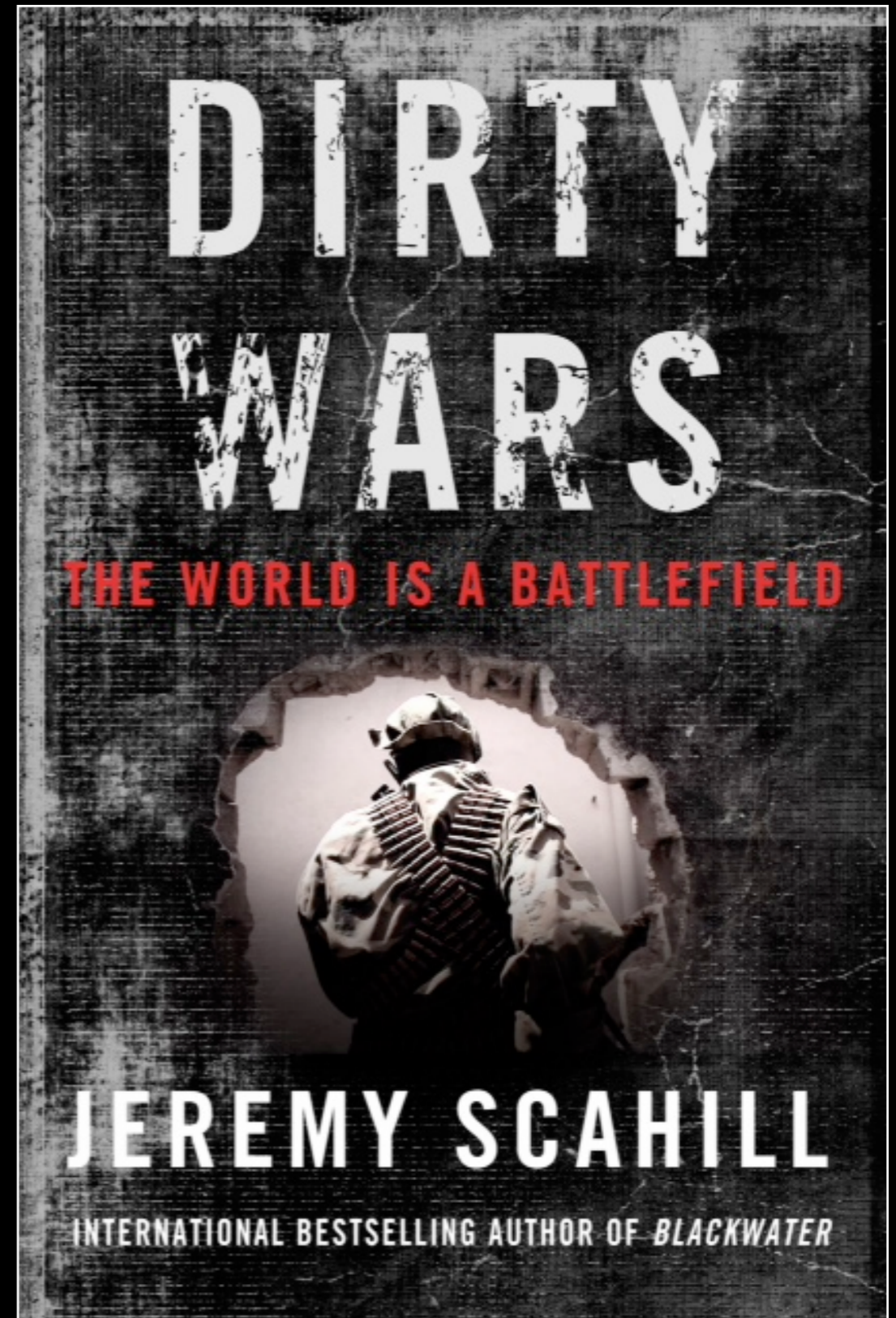
DOI: 10.1080/14650045.2012.749241

 **Routledge**  
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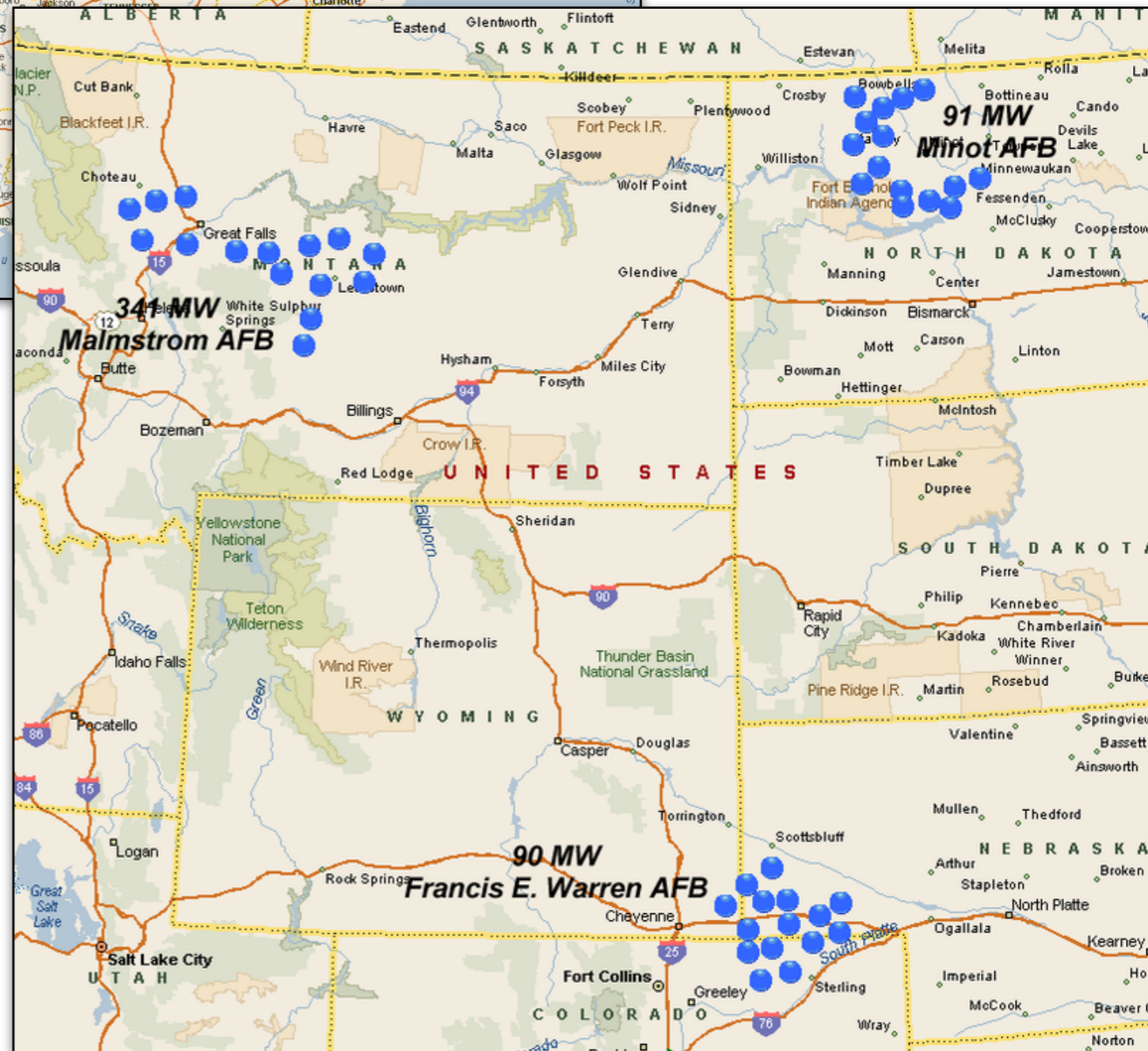
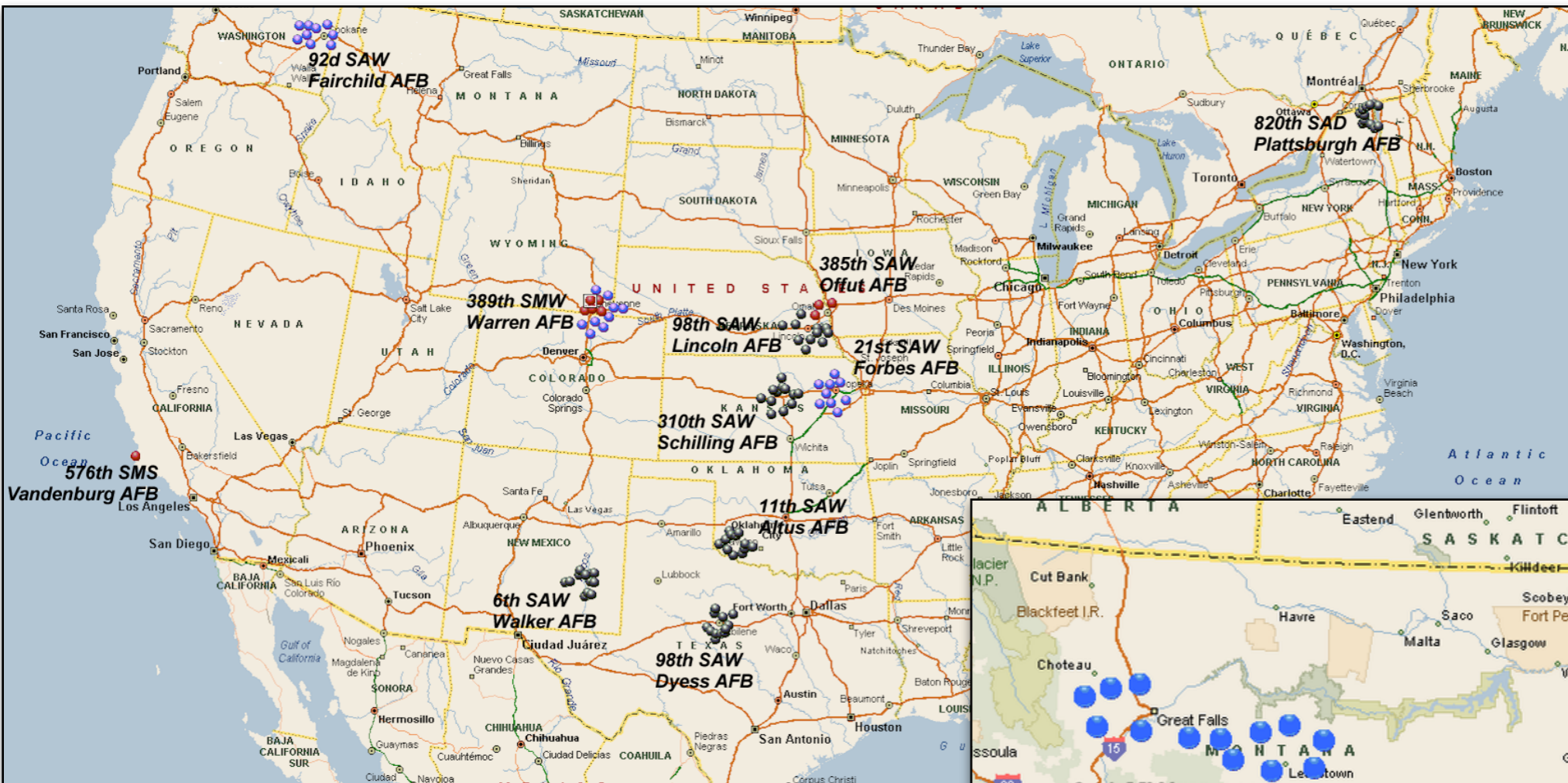
## Predator Empire: The Geopolitics of US Drone Warfare

IAN G. R. SHAW

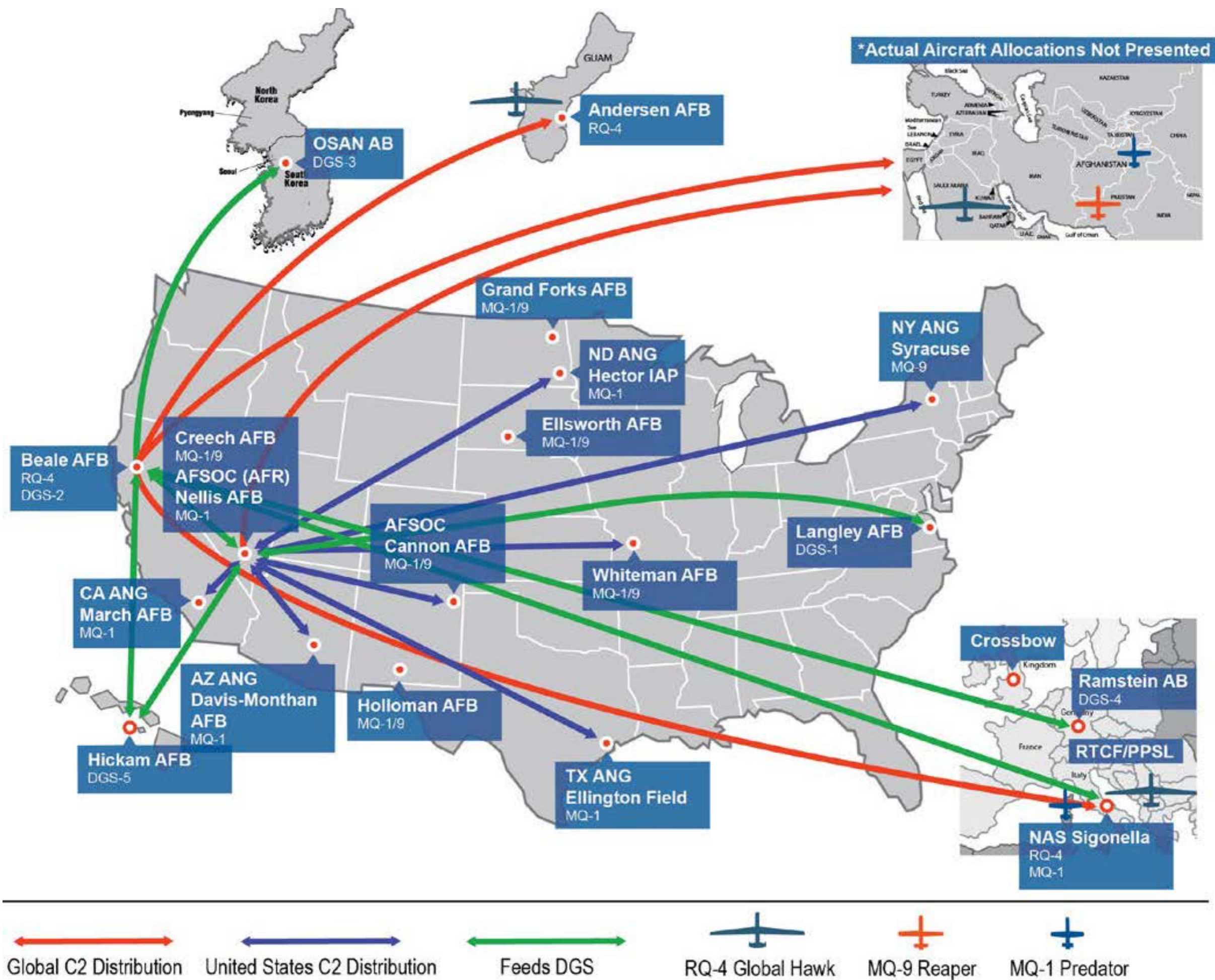
*School of Geographical and Earth Sciences, The University of Glasgow, Scotland*



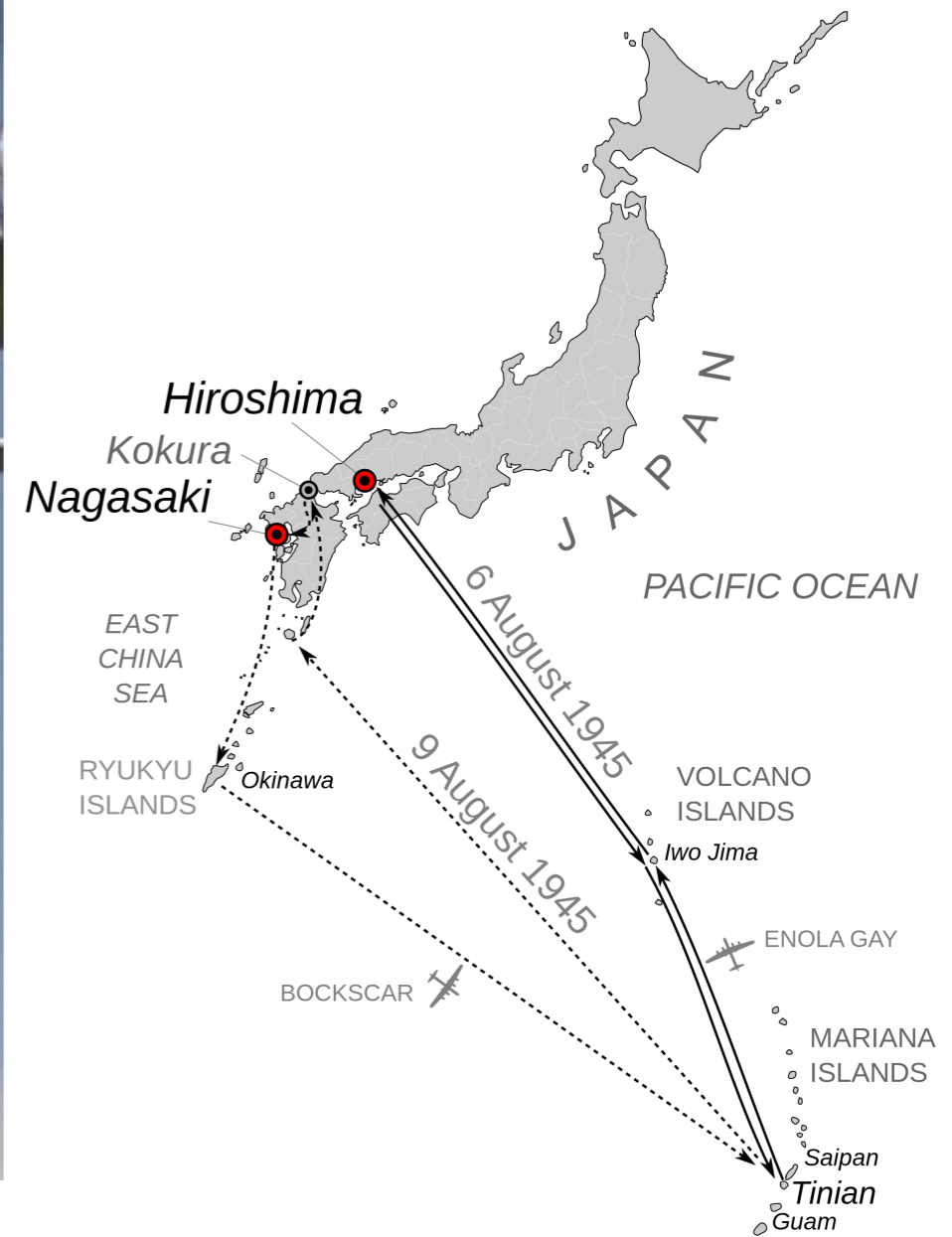
# SM-65 Atlas missile sites



# LGM-30 Minuteman missile sites

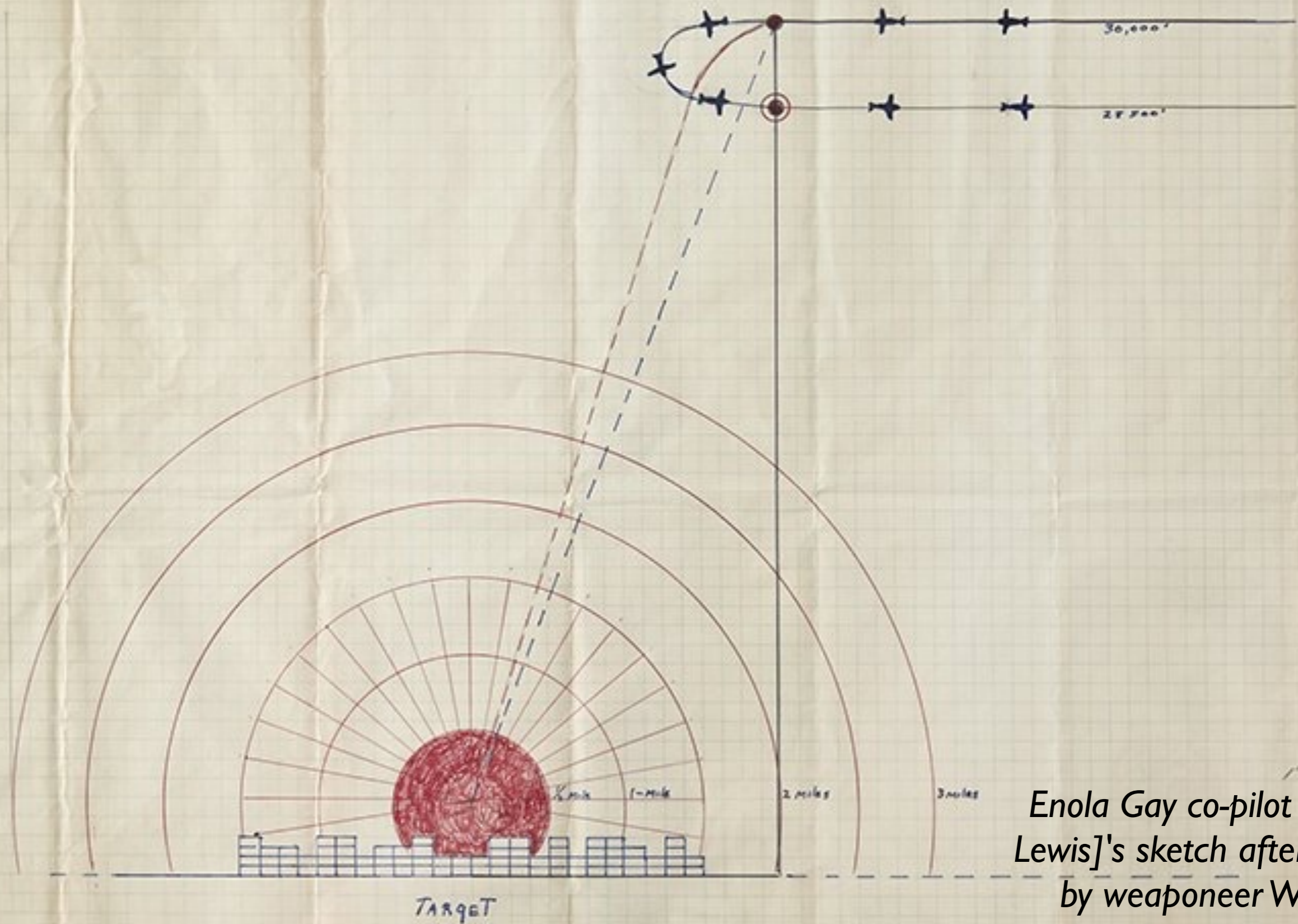


## **2: Atomic safety: securing American lives**



# **‘Little Boy’ and Hiroshima 6 August 1945**

# The 155 degree turn



*Enola Gay co-pilot [Robert Lewis]'s sketch after briefing by weaponeer William Parsons, 4 August 1945*

# THE ATOM BOMB AND FUTURE WAR

There may be devastating "push-button" battles

by HANSON W. BALDWIN

*To military men the atom bomb threatened a complete revolution in the methods of making war. It could become an offensive weapon so effective that ground, sea and air forces might be relegated to secondary roles. Here a sober military analyst, Hanson W. Baldwin, tells what the coming wars could be like and how the U.S. must prepare for them.*

In a fraction of a second on Aug. 5, 1945 American scientists not only destroyed Hiroshima, Japan, but with it many human concepts—chief among them our ideas of how to wage war. We are opening today a fresh page in military history and our first scribbblings on it will be cramped and difficult, for what is to come far transcends all man's experience of what has gone before.

It would be completely impossible and futile, therefore, to try at this time to digest the meaning of man's harnessing of atomic energy to war or to predict its consequences. It is far too early and our knowledge is yet too small. Only tentative conclusions and incomplete speculations can serve as some yardstick to what must become a new brand of military thinking—thinking geared fundamentally to the laboratory and the factory rather than to terrain contours and grid maps.

Major General J. F. C. Fuller, the British military historian, has written of the First World War, "God now marched with the biggest industries rather than with the biggest battalions." This remark is even more fundamentally true of the Second World War than of the First. Our victories have been based on material superiority, upon mass production. Tomorrow the big factories, but with the big laboratories beside them, will dominate war and will make it—in its most virulent form, at least—the business of the big and wealthy nations, not of the small and the weak. The two A1 priorities in our postwar national defense program must be: superiority in research and development (something we have not always enjoyed by any means in this war, despite our "first" with the atomic bomb) and continued superiority in mass production—in other words a coupling of quality with quantity—never an easy mating.

Where does any such "push-button" war as this leave the military man? Is there need in this fantastic world of tomorrow for piloted planes, ground armies, surface navies?

General of the Army H. H. Arnold has predicted that this is the last war of the pilots. The inference is obvious. Robot planes, rockets, television and radar bombing and atomic bombs will do the work today done by fleets of thousands of piloted bombers.

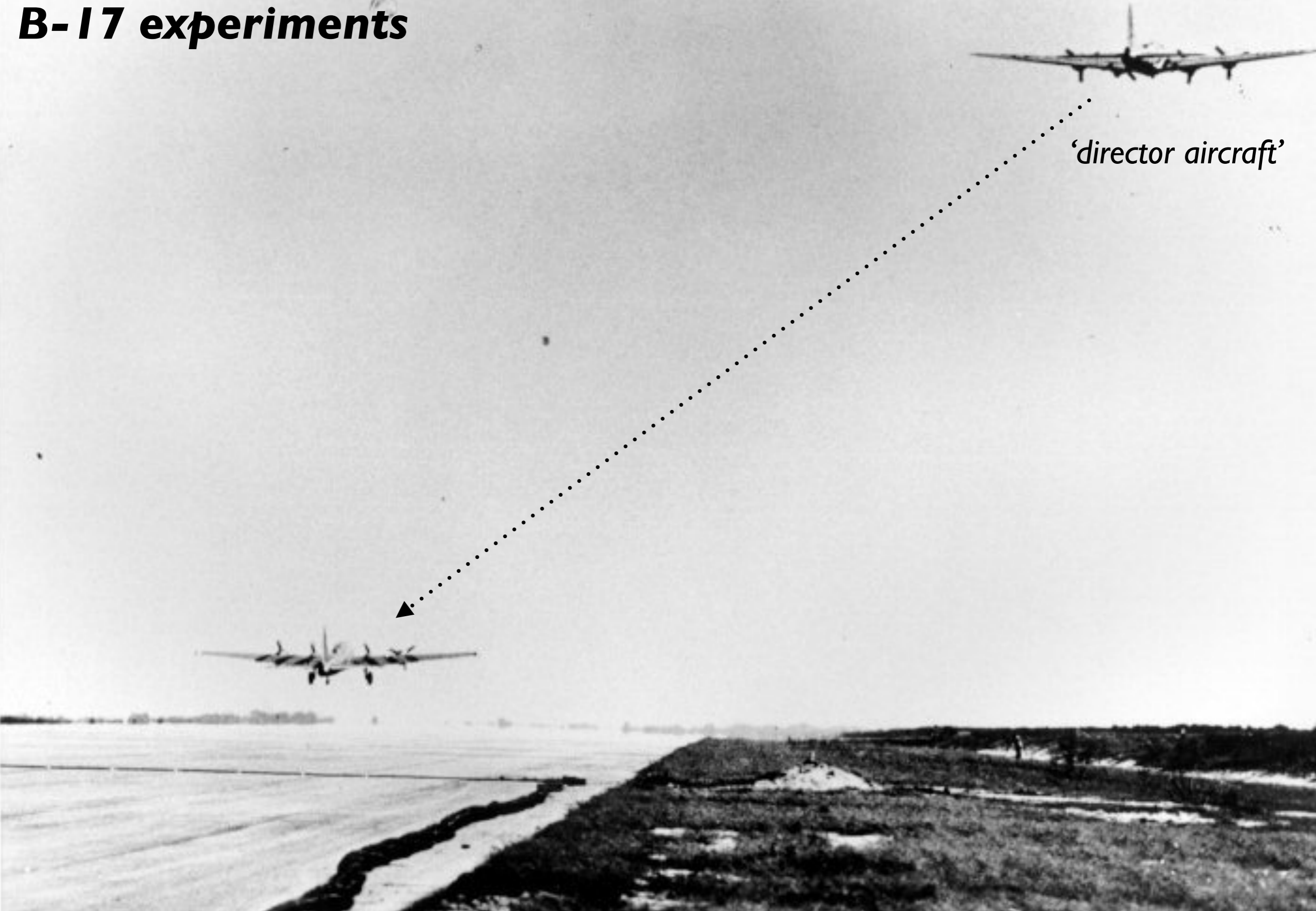
This may well be. Indeed it seems likely that the bulk of area bombing may be done in the future by robots controlled or directed from the ground. But this will not replace the piloted plane for specialized tasks—pin-point visual bombing of rocket-launching sites, photo and visual reconnaissance, airborne operations. The pilot will still have a place in the world of tomorrow for the very simple reason that man has not yet invented a machine endowed with all the brains of man.

Partly for the same reason, partly because of the inherent limitations of bombardment in any form—even in this terrific combination of rocket and atomic warfare—there will be, as far as we can see now, use for ground armies. This use will probably be more limited and specialized than exists today. The plane, the robot, the rocket, long-range artillery and the atomic bomb can destroy and devastate, kill and maim, but cannot occupy, hold and organize the earth on which men live and from which they have their being. Men on the ground must do this; hence, even if those men are transported by air as airborne armies, some sort of an occupying and organizing ground force will be needed. Perhaps it will have to be an army of moles, specially trained in underground fighting, for man may well burrow into the earth, as the Japs have done in this war, to escape insofar as it is possible the terrible effects of the atomic bomb. Certainly it will have to be an army trained in wide dispersion rather than in close concentration and possessing tremendous mobility, an army whose principal transport may be aircraft.

*Life, 20 August 1945*

# **USAF Pilotless Aircraft Branch**

## ***B-17 experiments***



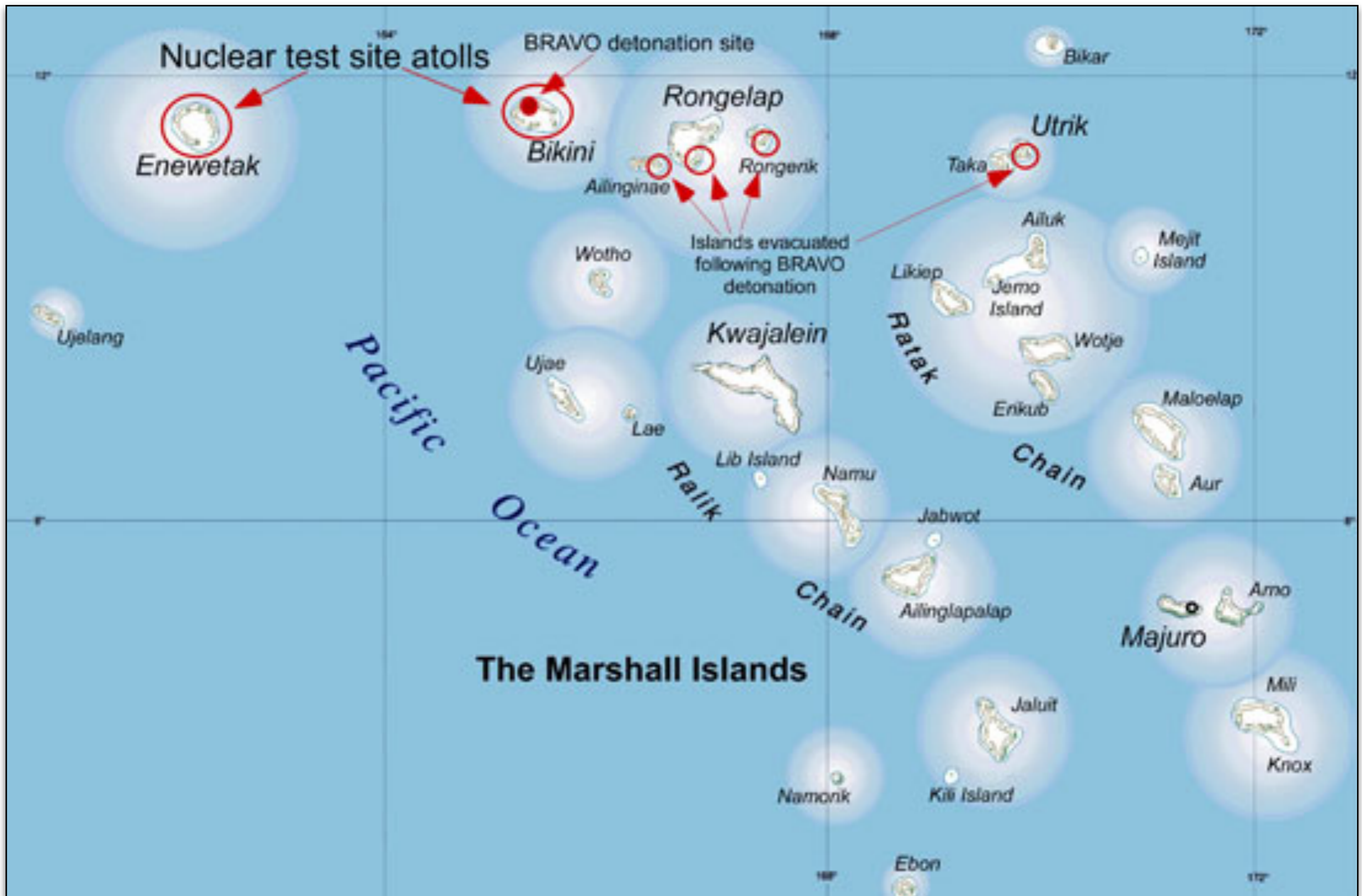
*'director aircraft'*

# Ground Control Station





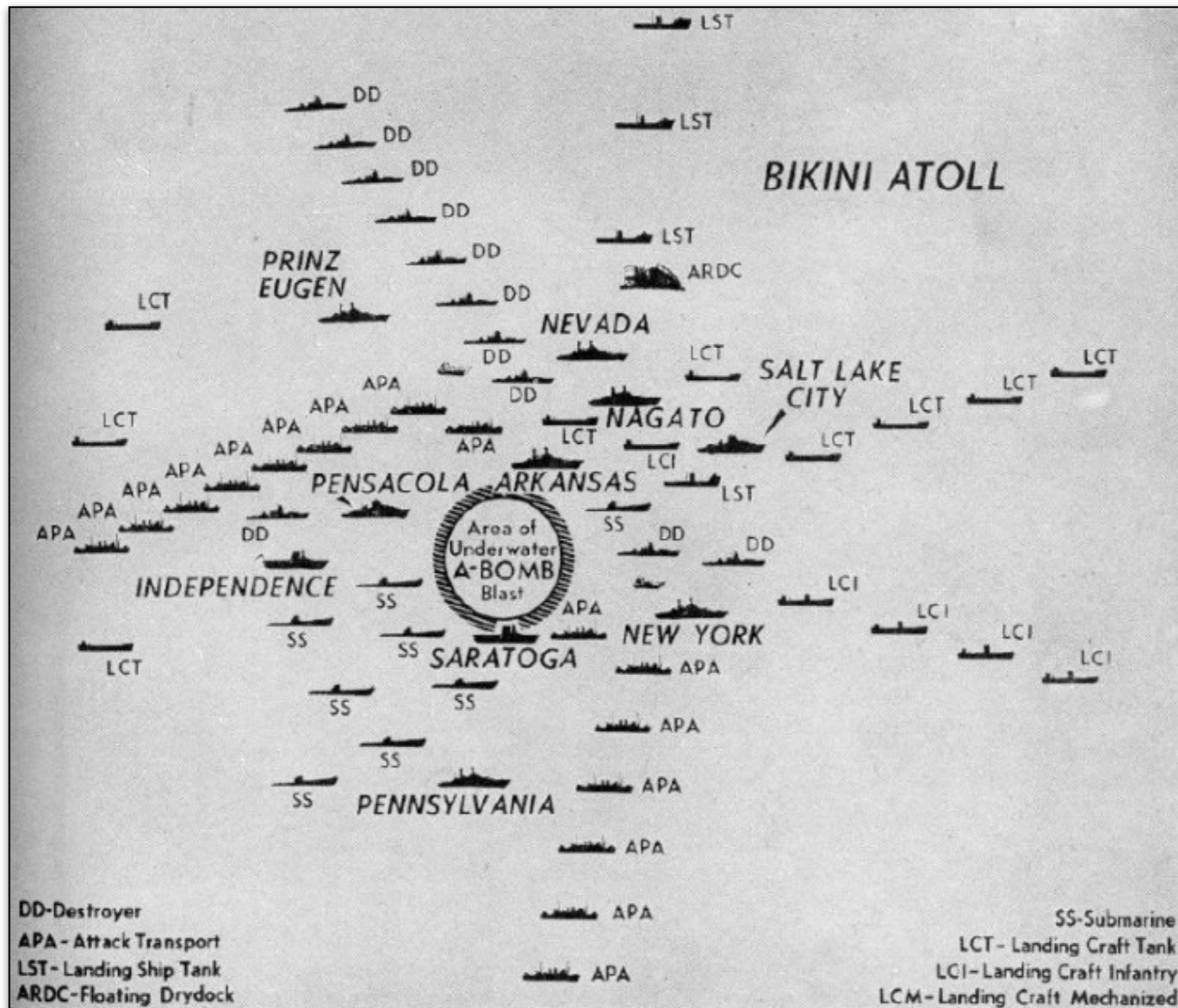
A B-17 drone in 1946 on a fourteen-hour flight from Hawaii to California under radio control from its mother ship. It was being evaluated for use in sampling atomic clouds during nuclear tests.




**National Cancer Institute** Between 1946 and 1958, the United States tested 66 nuclear weapons on or near Bikini and Enewetak atolls, which had previously been evacuated. Populations living elsewhere in the Marshall Islands archipelago were exposed to measurable levels of radioactive fallout from 20 of these tests.

# Drones in the Marshall Islands I

## Operation Crossroads, July 1946



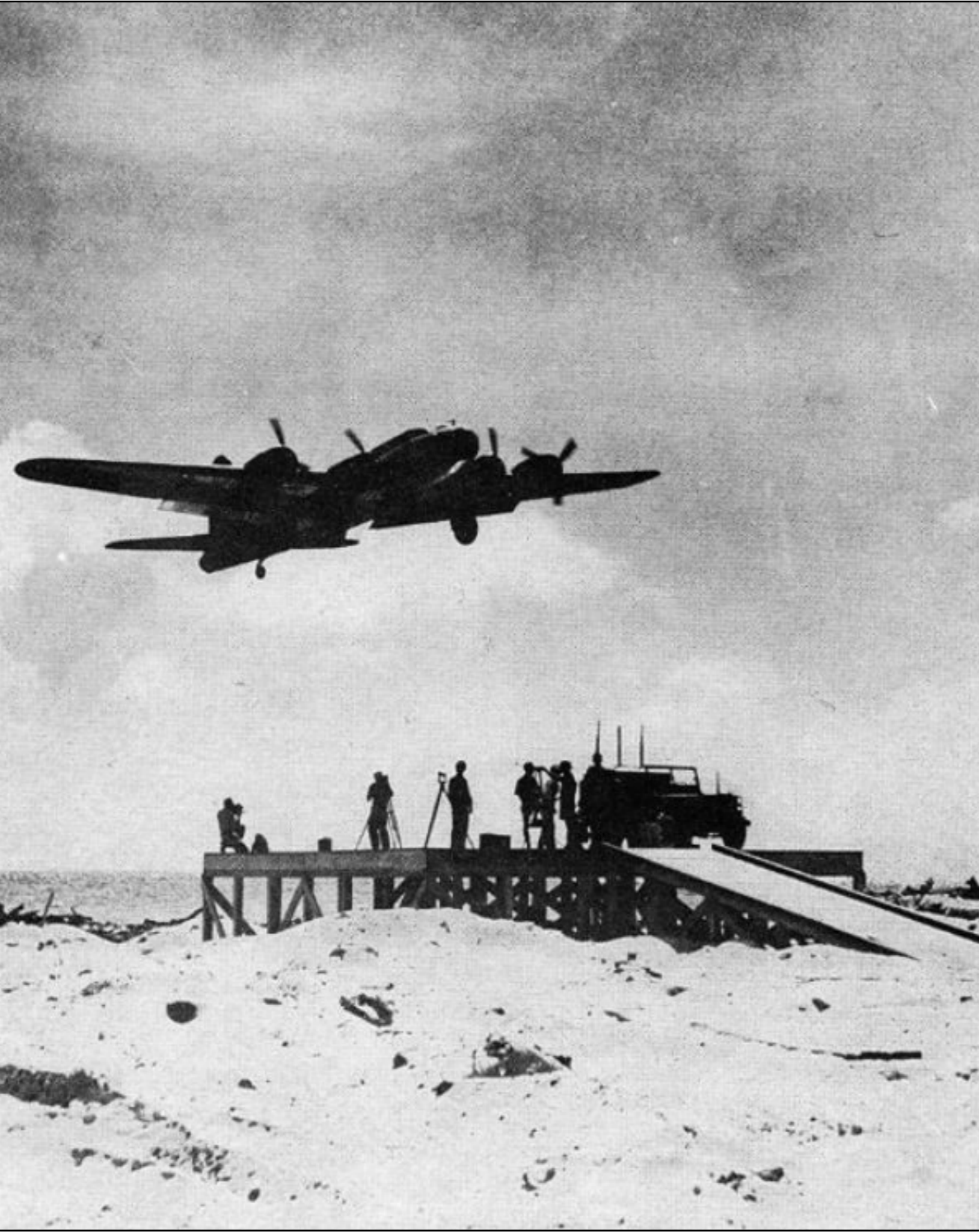


B-17 "drones," operating by remote control from "mother" planes, will photo the test.

*Crossroads at Bikini*

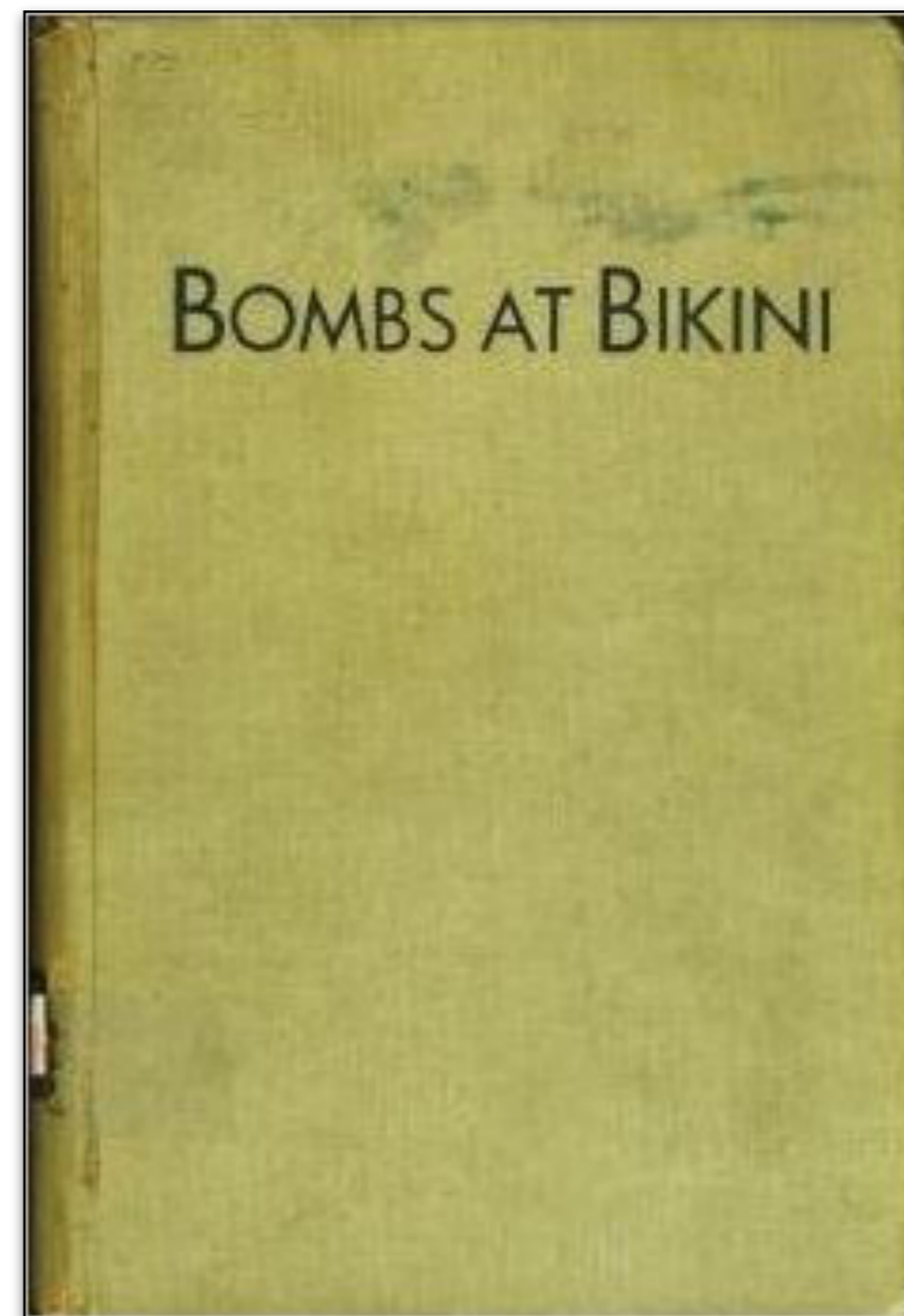


*Yellow-tail B-17G drones and silver drone directors lined up on Eniwetok for the Able and Baker atomic tests in 1946.*



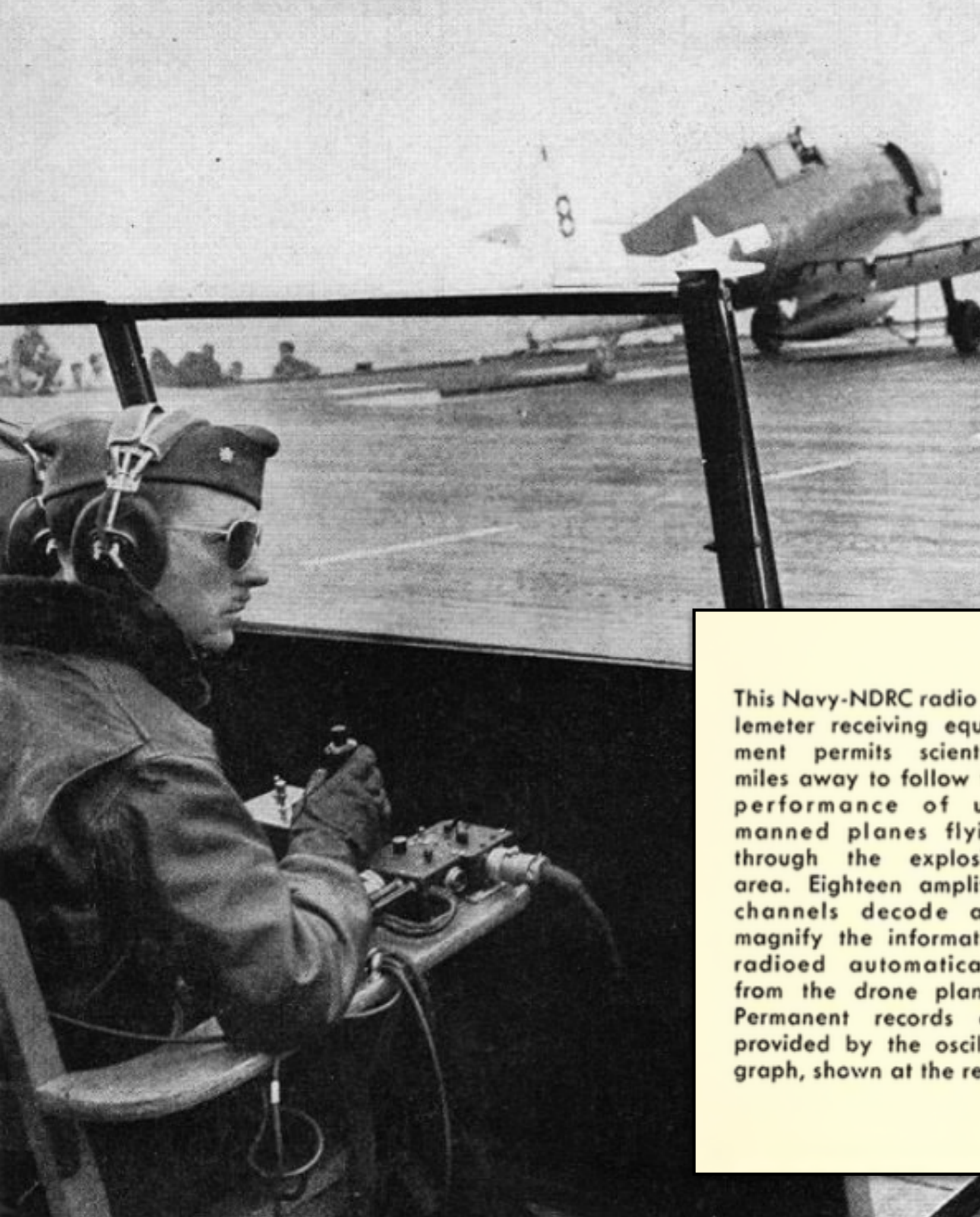
A B-17 drone,  
controlled by  
transmitters on the  
ground, lands at  
Eniwetok during  
Operation  
Crossroads.  
(*Manhattan Project  
Heritage Preservation  
Association*)

‘A number of Army Air Forces officials believe that the drone-plane program undertaken for Crossroads advanced the science of drone-plane operations by a year or more. To be sure, a few war-weary B-17’s had been flown without crews during the latter part of the recent war [Operation Aphrodite], but they and their cargoes of explosives were deliberately crash-landed. Also, a few B-17’s had been landed by remote control; but pilots were aboard, ready to take over control in case of trouble. **Operation Crossroads was the first operation in which take-off, flight, and landing were accomplished with no one aboard.** The feat was an impressive one; many experts had thought it could never be accomplished with planes of this size.’





US Navy Grumman **F6F-5K Hellcat drones**, with their tails painted different colors to indicate different radio guidance frequencies, await the call on Roi Island during Operation Crossroads.  
(Library of Congress)



On the deck of the carrier *Shangri-La* pilot W. G. Maurer controls a Navy F6F Hellcat drone plane before takeoff. (Manhattan Project Heritage Preservation Association)

This Navy-NDRC radio telemeter receiving equipment permits scientists miles away to follow the performance of unmanned planes flying through the explosion area. Eighteen amplifier channels decode and magnify the information radioed automatically from the drone planes. Permanent records are provided by the oscillograph, shown at the rear.





This photograph was taken by an automatic camera mounted in a drone plane flying directly above the Zero-point at the instant of detonation, a remarkable achievement in drone control. The cauliflower is funnel-shaped at this stage; within its jagged rim is a condensation cloud nearly a mile in diameter, which evaporated a few seconds later.



‘Drone planes penetrated where no man could have ventured, flew through the mushroom cloud on photographic missions, sampled its poisonous content, televised to remote onlookers their instrument panel readings for flight analysis.’

## **Project Brass Ring (1949-1951)**

‘It appeared that the Air Force would need some method to deliver a 10,000-pound package over a distance of 4,000 nautical miles with an accuracy of at least two miles from the center of the target. It was expected the package would produce a lethal area so great that, were it released in a normal manner, the carrier would not survive the explosion effects. Although not mentioned by name, the “package” was a thermonuclear device – the hydrogen or H-bomb...’

*Delmer Trester, ‘Thermonuclear weapon delivery by unmanned  
B-47: Project Brass Ring’*



*‘The ultimate objective was to fashion a B-47 carrier with completely automatic operation from take-off to bomb drop...The immediate plan included the director B-47A aircraft as a vital part of the mission. Under direction from the mother aircraft, the missile would take off, climb to altitude and establish cruise speed conditions. While still in friendly territory, the crew aboard the director checked out the missile and committed its instruments to automatically accomplish the remainder of the mission. This was all that was required of the director. The missile, once committed, had no provision for returning to its base... either the B-47 became a true missile and dived toward the target ... or a mechanism triggered the bomb free, as in a normal bombing run.’*

# First test flight

*'The automatic take-off, climb and cruise sequence was initiated remotely from a ground control station. The aircraft azimuth, during take-off, was controlled by an auxiliary control station at the end of the runway. Subsequent maneuvers, descent and landing (including remote release of a drag parachute and application of brakes) were accomplished from the ground control station. The test was generally satisfactory; however, there were several aspects – certain level flight conditions, turn characteristics and the suitability of the aircraft as a “bombing platform” – which required further investigation.'*

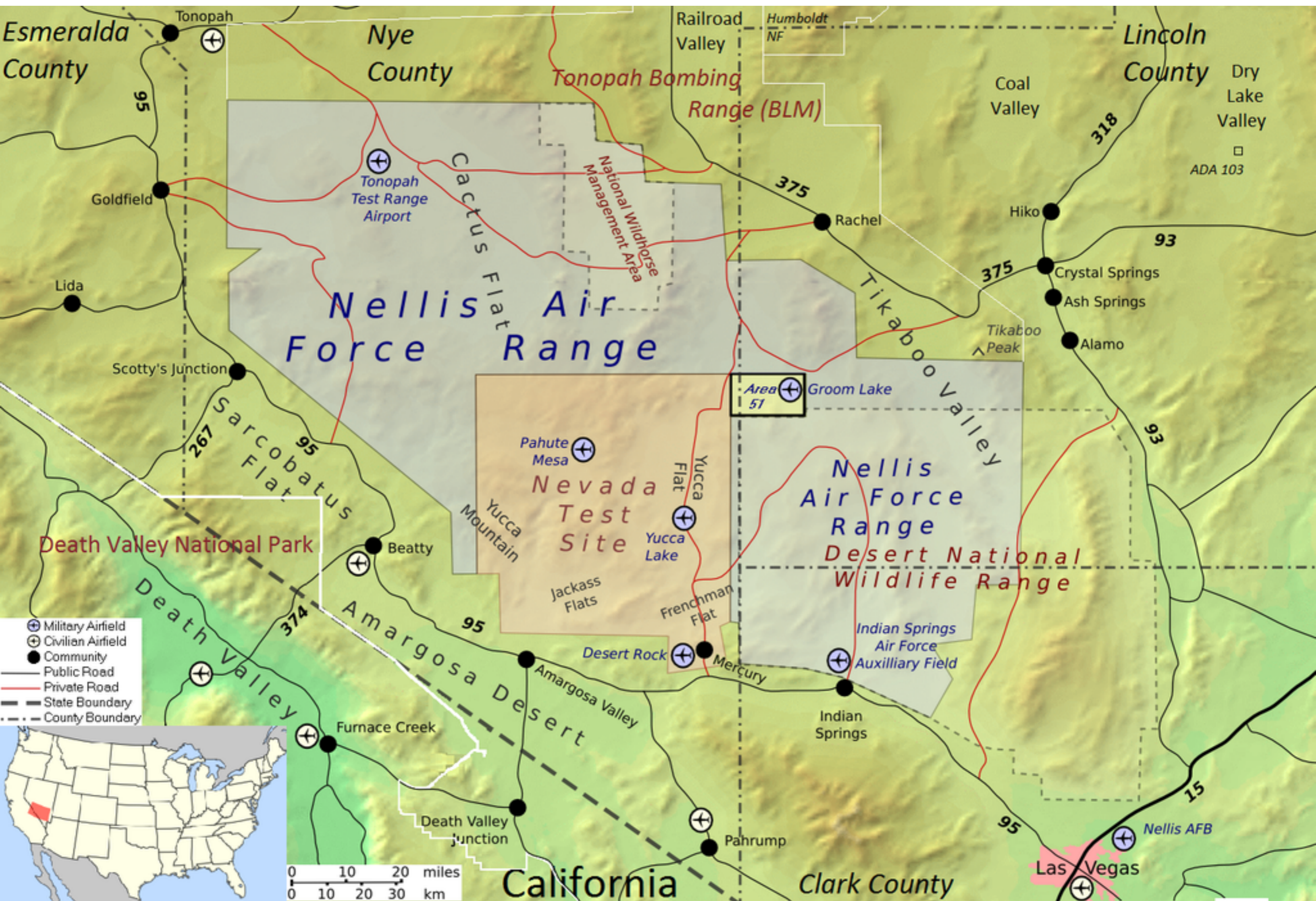


*Project Brass Ring was abandoned on **13 March 1951** when the Air Force determined that a manned aircraft could execute the delivery safely (at least for those on board)*

# **Drones in the Marshall Islands II**

## ***Operation Sandstone, April-May 1948***





# Drones at Indian Springs

Air Force mechanics at Indian Springs Air Force Base are shown calibrating radio-control equipment in a Lockheed QF-80 drone (pilotless aircraft) which was used in penetrating a radioactive cloud resulting from an atomic detonation during a recent nuclear test at the Nevada Proving Ground



*US Air Force, 1953*

T-33 director aircraft

Q-80 drone



‘The QF-80 drones, a pilotless version of the standard Lockheed F-80 jet fighter, will collect **data of vital interest to the United States Air Force regarding radiological hazard in an atomic cloud.**

A robot system of the Sperry Gyroscope Company completely controls via remote means the QF-80. The system enables **"NULLO" flight (no live operator aboard)** by the QF-80 under direction by radio and radar from the beep-box control signals from two ground stations worked by specially trained "beep pilots," or from a nearby jet "director" aircraft.’

# **Desert Rock**

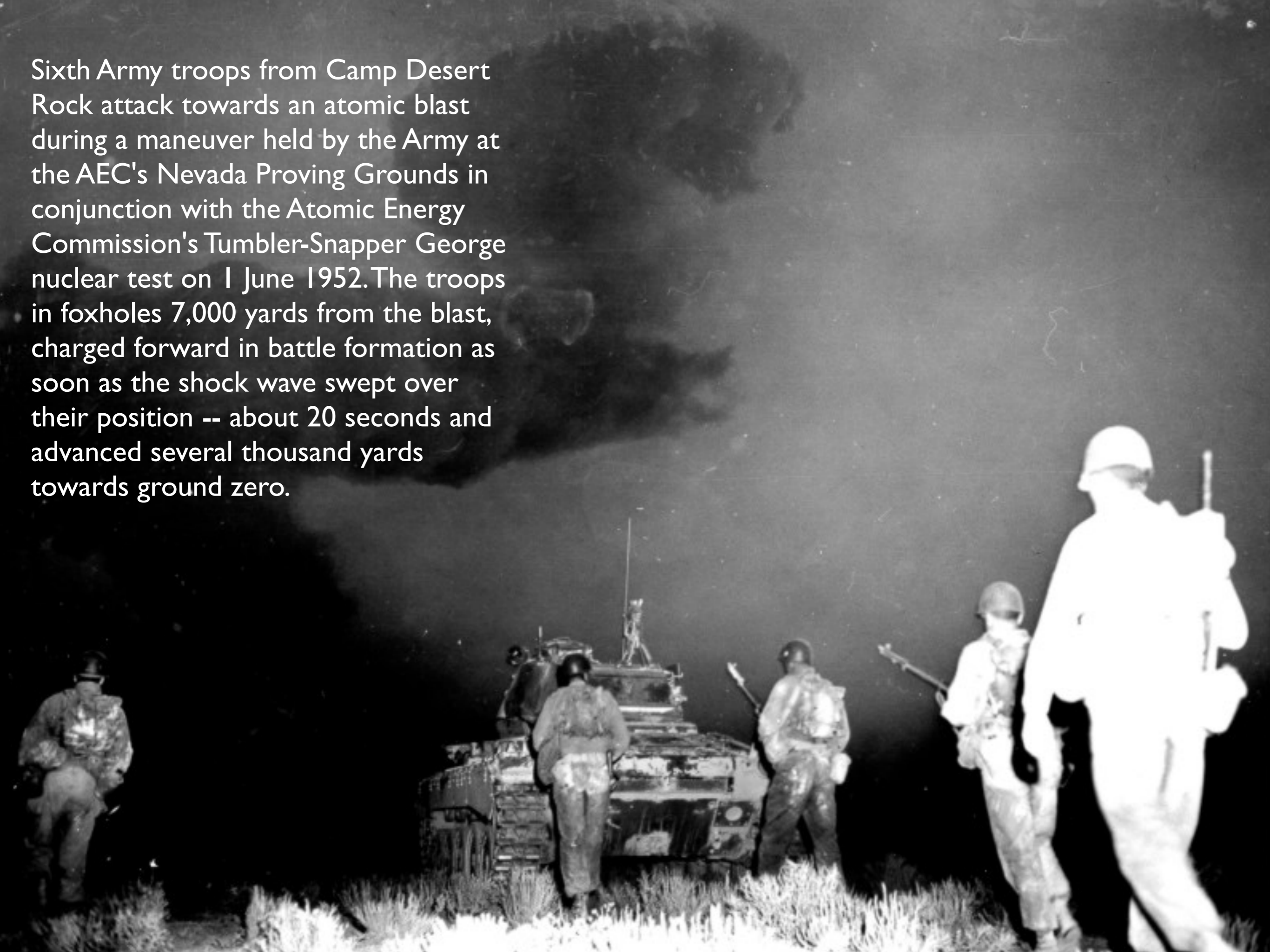
## **Nevada Proving Grounds**

### **1951-1957**





Sixth Army troops from Camp Desert Rock attack towards an atomic blast during a maneuver held by the Army at the AEC's Nevada Proving Grounds in conjunction with the Atomic Energy Commission's Tumbler-Snapper George nuclear test on 1 June 1952. The troops in foxholes 7,000 yards from the blast, charged forward in battle formation as soon as the shock wave swept over their position -- about 20 seconds and advanced several thousand yards towards ground zero.



# ***American lives: Strategic Air Command (1955)***



**VISTAVISION**  
MOTION PICTURE HIGH-FIDELITY

...SWEEPS YOU FROM HORIZON TO HORIZON  
...FROM EARTH TO SKY



**JAMES STEWART** and **JUNE ALLYSON** in

# ***STRATEGIC AIR COMMAND***



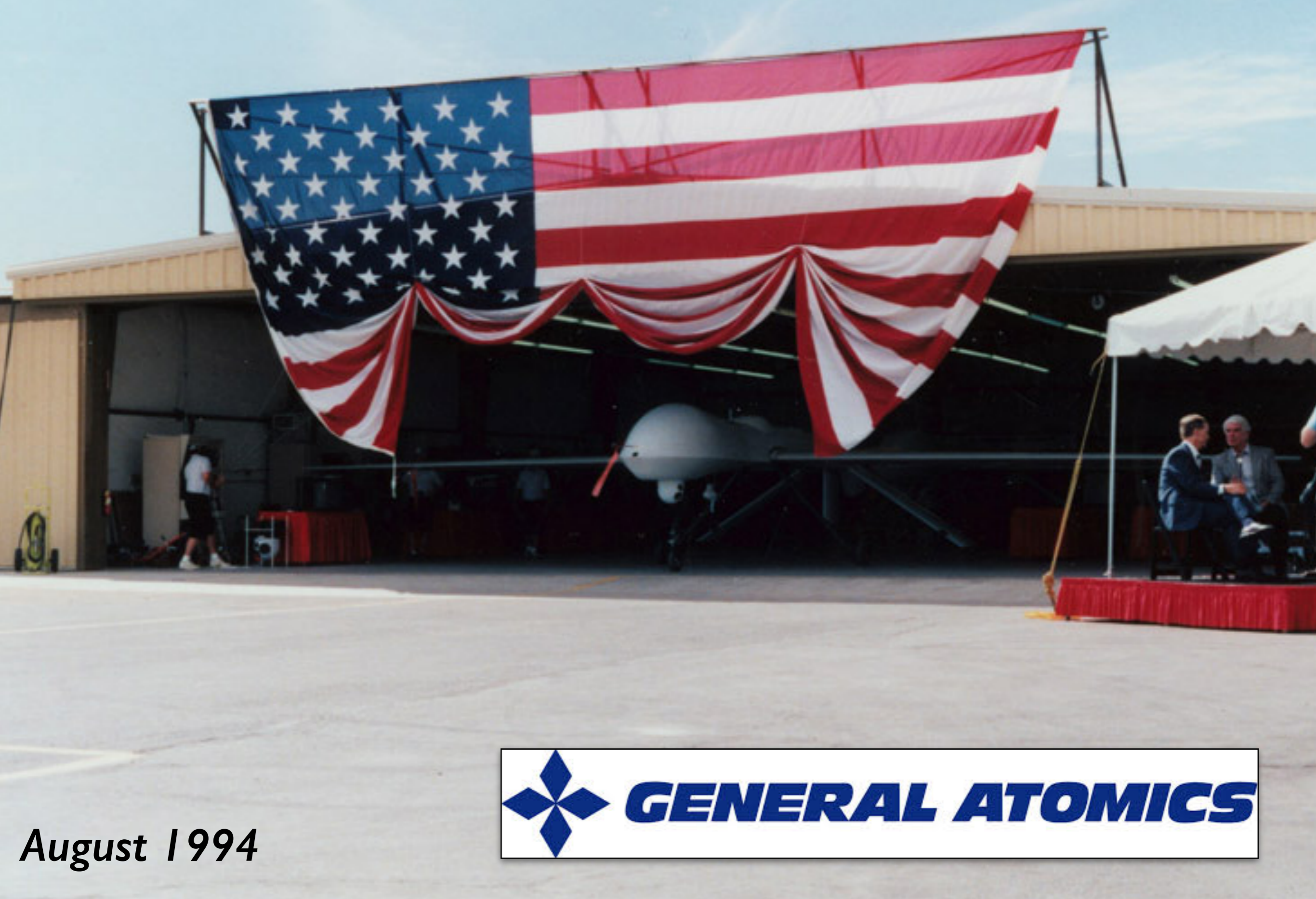
***YOU WILL SHARE THE LOVE,  
THE LIVES, THE GREATEST  
ROMANCE OF "THOSE SWEETHEARTS"  
JAMES STEWART AND JUNE ALLYSON***

Story by Beirne Lay Jr.

A PARAMOUNT PICTURE



### **3: The atomic sublime: vulnerable bodies**



**August 1994**



*The first Predator unmanned aerial vehicle is flown at General Atomic's flight test facility at El Mirage, CA*



## 21<sup>st</sup> Century Challenges: AF ISR Distributed Operations

Deployed  
ISR



Entire AF ISR  
Enterprise

Approximately 1100 ISR Airmen deployed—however,  
more than 5,000 Airmen executing ISR operations for  
the COCOMs every day

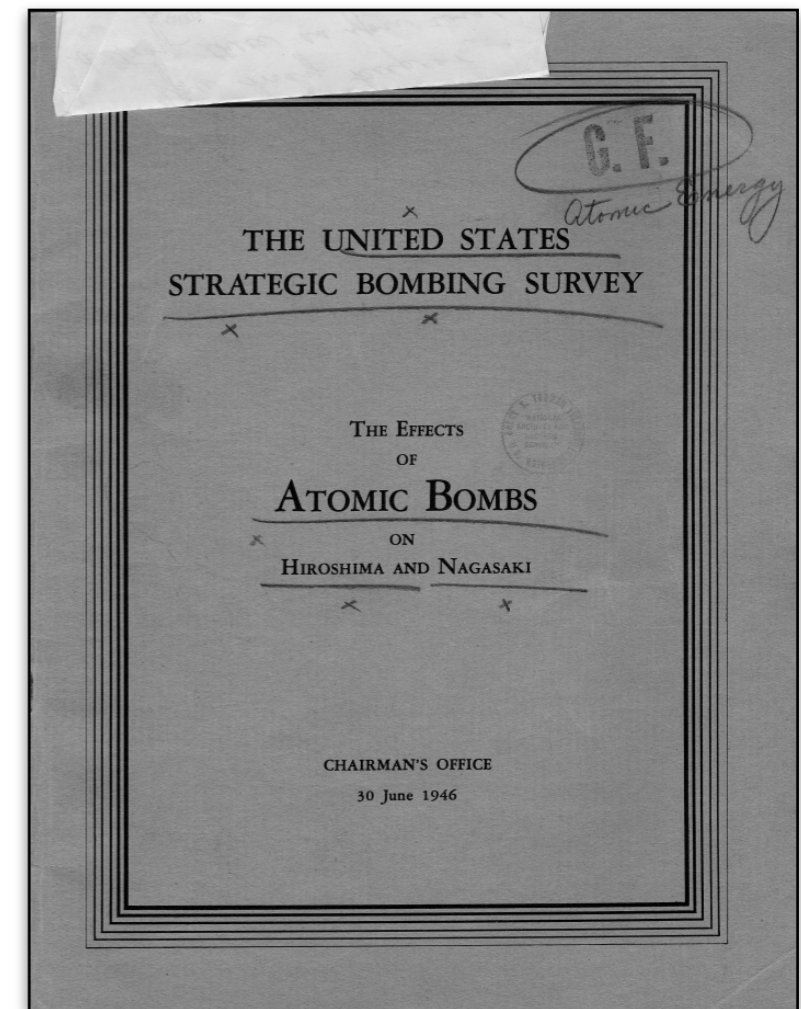
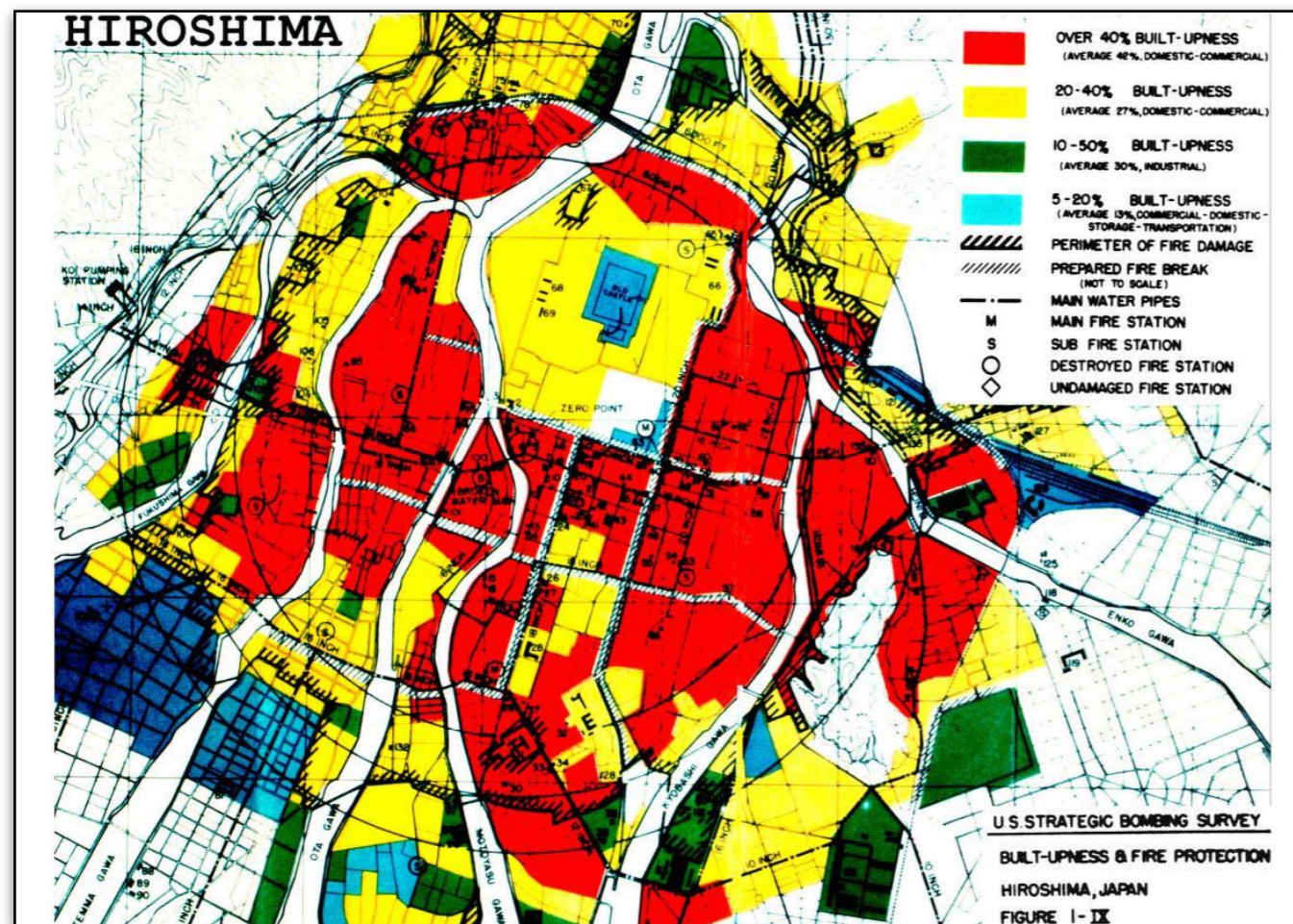
**Minimizing forces deployed forward allows  
us to project power without projecting vulnerability...**

*Integrity - Service - Excellence*

33

**“The technology allows us to project power without vulnerability,”** said a senior Defense official. “You don’t have to deploy as many people. And in the modern age you want as little stuff forward as long as you can achieve the effects as if you had lots of people forward.”

Julian Barnes, ‘Military refines a ‘constant stare against our enemy’,  
*Los Angeles Times*, 2 November 2009



The Survey's investigators, as they proceeded about their study, found an insistent question framing itself in their minds: "What if the target for the bomb had been an American city?" True, the primary mission of the Survey was to ascertain the facts just summarized. But conclusions as to the meaning of those facts, for citizens of the United States, forced themselves almost inescapably on the men who examined thoughtfully the remains of Hiroshima and Nagasaki. These conclusions have a different sort of validity from the measurable and ponderable facts of preceding sections, and therefore they are presented separately. They are not the least important part of this report, however, and they are stated with no less conviction.

*Briefing from the Atomic Energy Commission to the Joint Committee on Atomic Energy in February 1953 about Operation Ivy [the detonation of the first hydrogen bomb prototype].*

**Brigadier Gen. Fields:** Now, briefly, just to put perspective on the effects of the weapons that we have had and do have, the growth in the yield, the maximum yield obtainable. Here are three charts that show the effects of different weapons. The Hiroshima or Nagasaki (sic), approximate yield of this weapon. One of our very prominent members of our present stockpile of fission weapons, the 83,000-ton TNT equivalent. And we have just selected 5 million tons as a possibility in the thermonuclear field. You can see the differences in the areas covered.

**Rep. Cole:** Is that a map of Washington?

**Gen. Fields:** Yes. The zero point is over the White House.

**Rep. Van Zandt:** Not the Capitol?

**Gen. Fields:** Not the Capitol.

**Rep. Van Zandt:** Well, all right. (Laughter.)

**SECRET**

TYPE OF DAMAGE	SIZE BOMB		
	IN THOUSANDS TONS OF TNT	FEET	INCHES
TOTAL DESTRUCTION	1,000	8.12	8.11
TOTAL COLLAPSE OF RESIDENCES	5,000	6.6	8.14
RESIDENCES UNUSABLE WITHOUT MAJOR REPAIRS	8,000	1.10	1.10

Residences Unusable without Major Repair

Total Collapse of Residential Structures  
Repairable Damage to modern Office Bldg

Area of Total Destruction

**20 THOUSAND  
TONS OF TNT**

**Target Washington (1953)**

**SECRET**

UNCLASSIFIED

3300

**SECRET**

SECURITY INFORMATION

TYPE OF DAMAGE	SIXE POMS		
	15 THOUSAND	30 THOUSAND	45 THOUSAND
TOTAL DESTRUCTION	1,400	5.30	5.30
TOTAL COLLAPSE OF RESIDENCES	8,000	1.40	5.30
RESIDENCES UNUSABLE WITHOUT MAJOR REPAIR	15,000	5.40	10.4

Residences Unusable without Major Repair

Total Collapse of Residential Structures  
Repairable Damage to modern Office Bldg

Area of Total Destruction

**83 THOUSAND  
TONS OF TNT**



**SECRET**

SECURITY INFORMATION

3300

**SECRET**

4-74  
518 9086

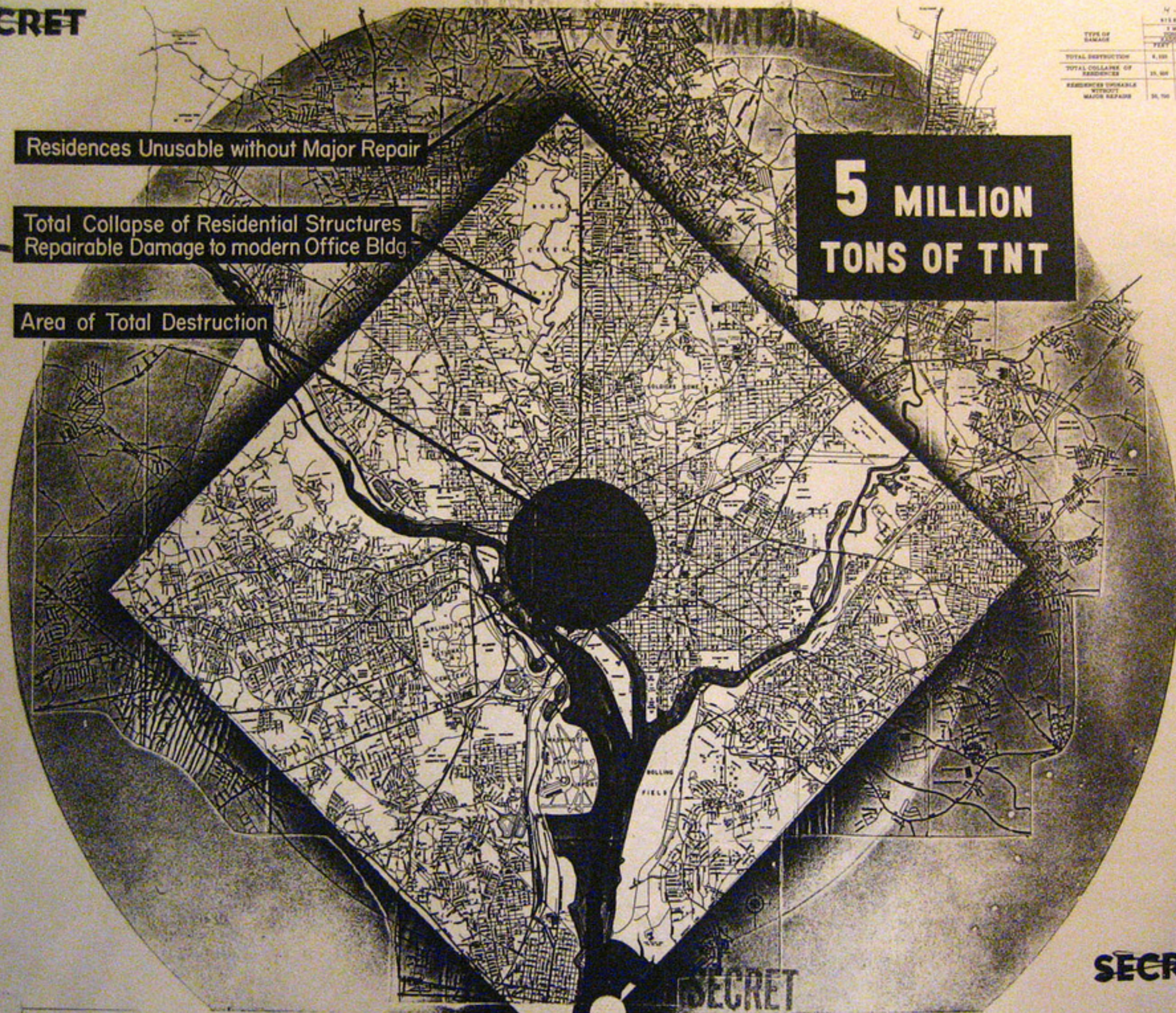
TYPE OF DAMAGE	5 MILLION TONS OF TNT		
	FEET	FEET	FEET
TOTAL DESTRUCTION	8,000	1.00	4.50
TOTAL COLLAPSE OF RESIDENCES	15,000	6.00	100.0
RESIDENCES UNUSABLE WITHOUT MAJOR REPAIRS	10,000	4.00	100.0

Residences Unusable without Major Repair

Total Collapse of Residential Structures  
Repairable Damage to modern Office Bldg

Area of Total Destruction

**5 MILLION  
TONS OF TNT**



**SECRET**

**SECRET**

3300 - 347

‘Here stands a new, bizarre, and yet pervasive species of Lacanian mirroring. Having gone through the bomb-planning and bomb-evaluating process so many times for enemy maps of Schweinfurt, Leuna, Berlin, Hamburg, Hiroshima, Tokyo, and Nagasaki, now the familiar maps of Gary, Pittsburgh, New York City, Chicago, and Wichita began to look like them.’



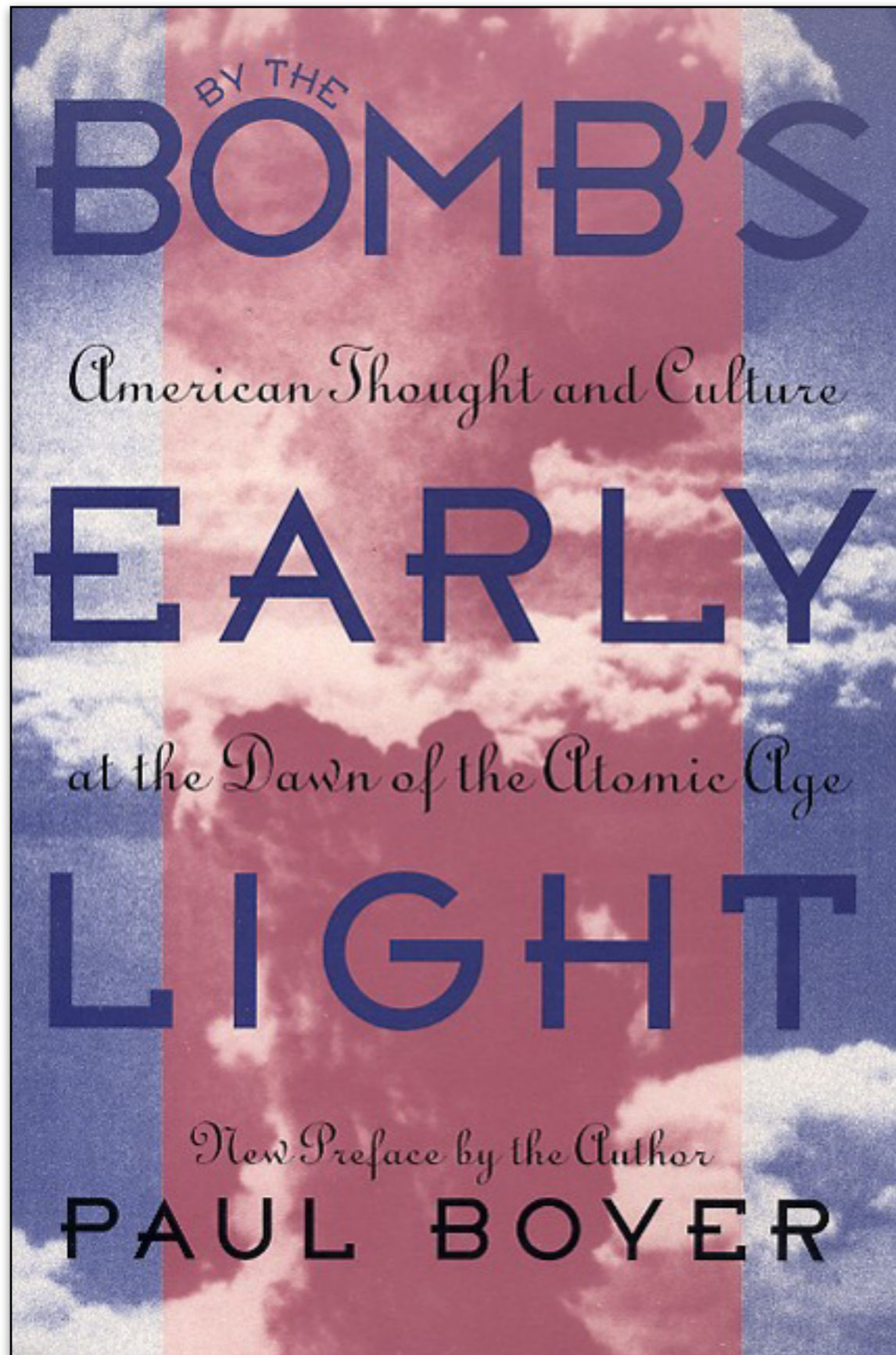
‘War Against the Center’,  
*Grey Room*, 4 (2001) 5-33

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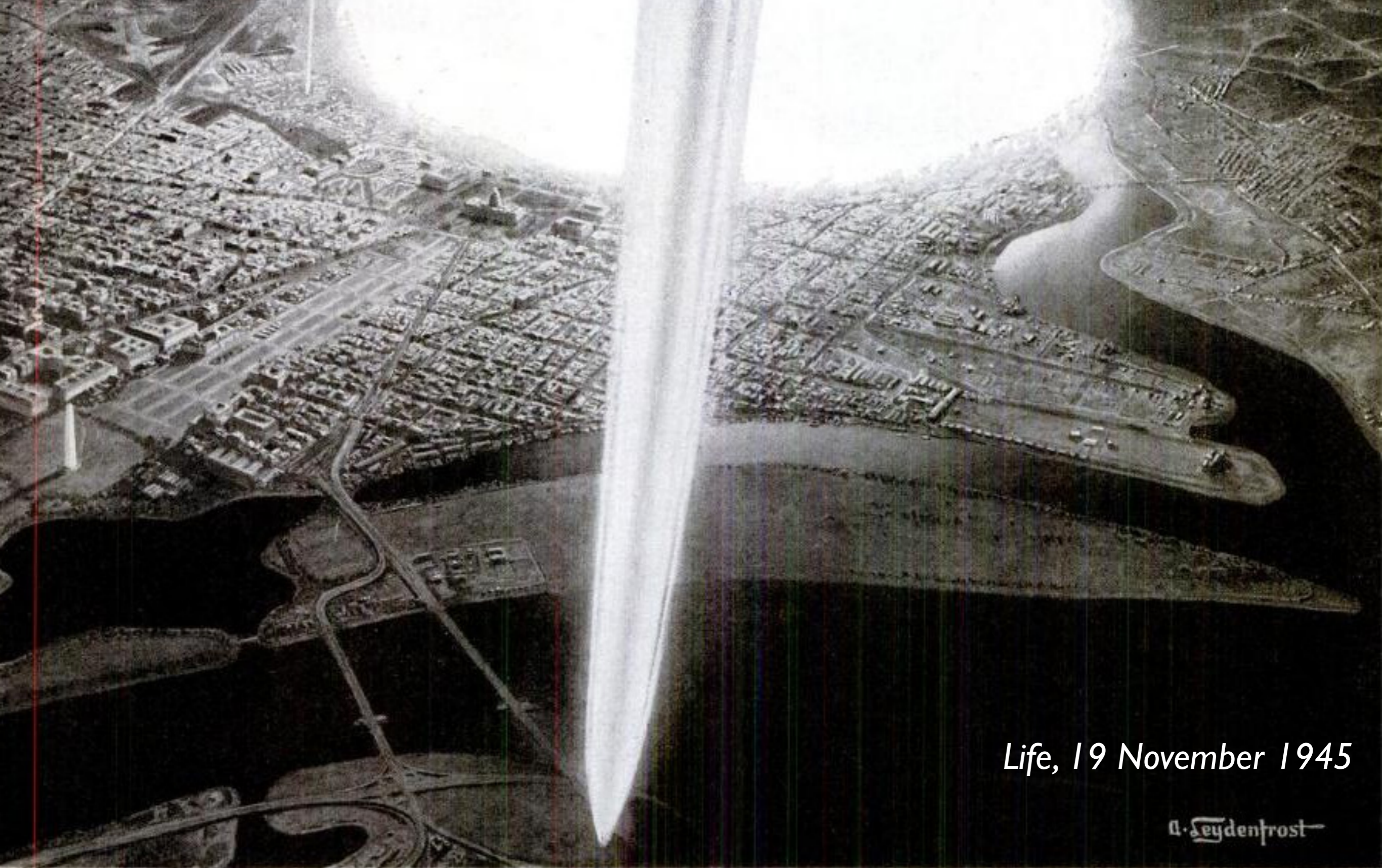
The Nuclear Secrecy Blog

**‘It superficially looks like empathy,  
but it’s really likely just fear.’**

*Alex Wellerstein, ‘Bullseye on Washington (1953)’*



‘Physically untouched by the war, **the United States at the moment of victory perceived itself as naked and vulnerable.** Sole possessors and users of a devastating instrument of mass destruction, **Americans envisioned themselves not as a potential threat to other peoples, but as potential victims.**’



*Life, 19 November 1945*

A. Seydenfrost

THE 36-HOUR WAR BEGINS WITH THE ATOMIC BOMBARDMENT OF KEY U.S. CITIES. HERE A SHOWER OF WHITE-HOT ENEMY ROCKETS FALLS ON WASHINGTON, D.C.

# THE 36-HOUR WAR

# THE ATOM BOMBS DESCEND ON U.S.

The start of another war, said General Arnold, might come with shattering speed: "With present equipment an enemy air power can, without warning, pass over all formerly visualized barriers and can deliver devastating blows at our population centers and our industrial, economic or governmental heart even before surface forces can be deployed."

In the panorama above, looking eastward from 3,000 miles above the Pacific, LIFE's artist has shown the U.S. as it might appear a very few years from now, with a great shower of enemy rockets falling on 13 key U.S. centers. Within a few seconds atomic bombs have exploded over New York, Chicago, San Francisco, Los Angeles, Philadelphia,

Boulder Dam, New Orleans, Denver, Washington, Salt Lake City, Seattle, Kansas City and Knoxville. One bomb (second from left) has been exploded high above the earth by a U.S. defensive rocket (see illustration on page 31). In the cities more than 10,000,000 people have been instantly killed by the bombs. The enemy's purpose is not to destroy

industry, which is an objective only in long old-fashioned wars like the last one, but to paralyze the U.S. by destroying its people.

The rockets above, white-hot from traveling part of their journey through the atmosphere at three miles a second, have in a little more than an hour soared 1,800 miles up and some 8,000 miles around

the earth from equatorial Africa. Then the U.S. has built its rocket-launching and secretly in the jungle to escape the UNO Security Council. In their flights coast most of the way through where the stars are out at noon. The band on the horizon is the earth's

A. Seydentr

# *Collier's*

15c

August 5, 1950



## HIROSHIMA, U.S.A.

*Can Anything Be Done About It?*

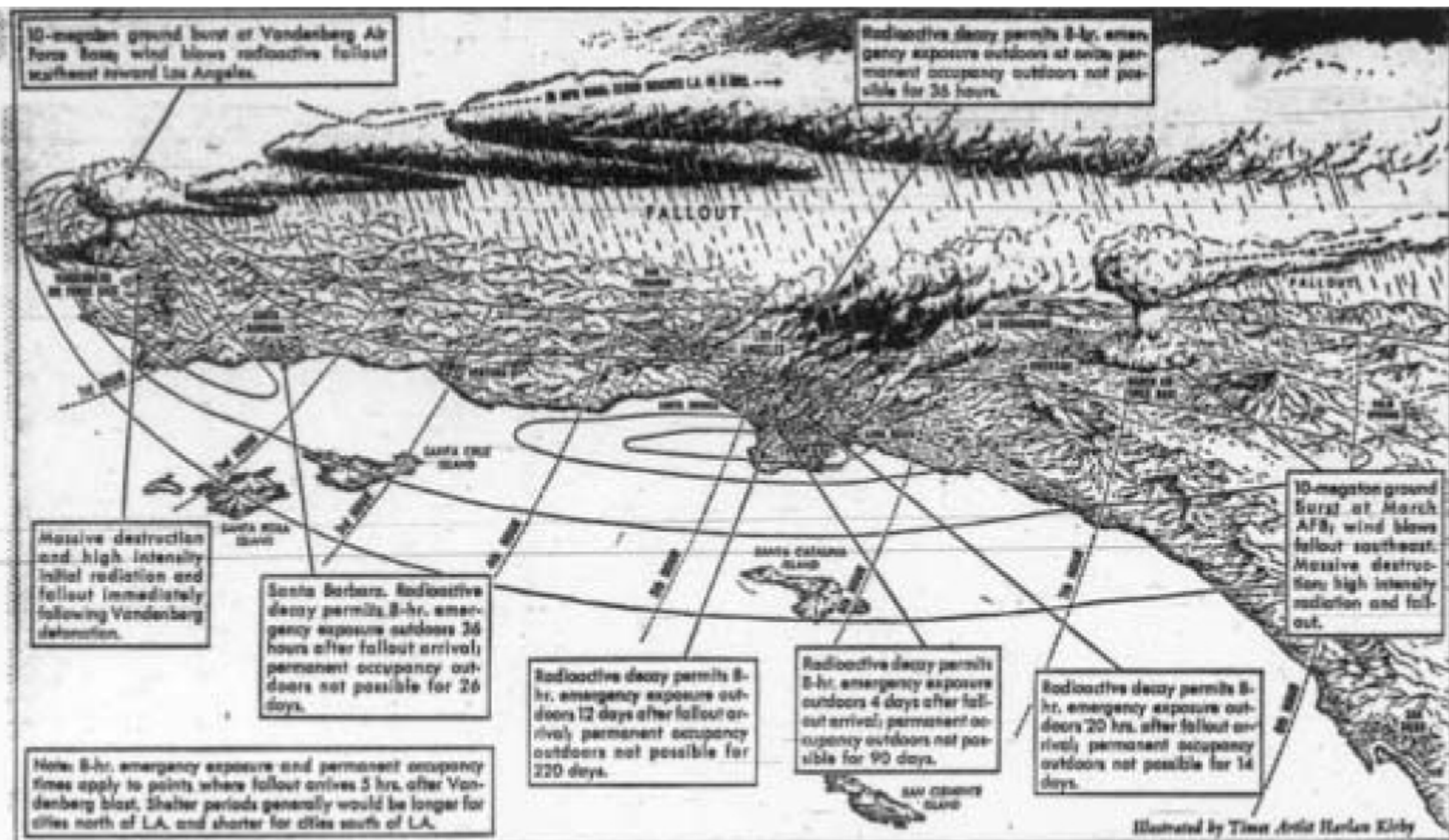


**Chicago 1950**



**Houston 1955**



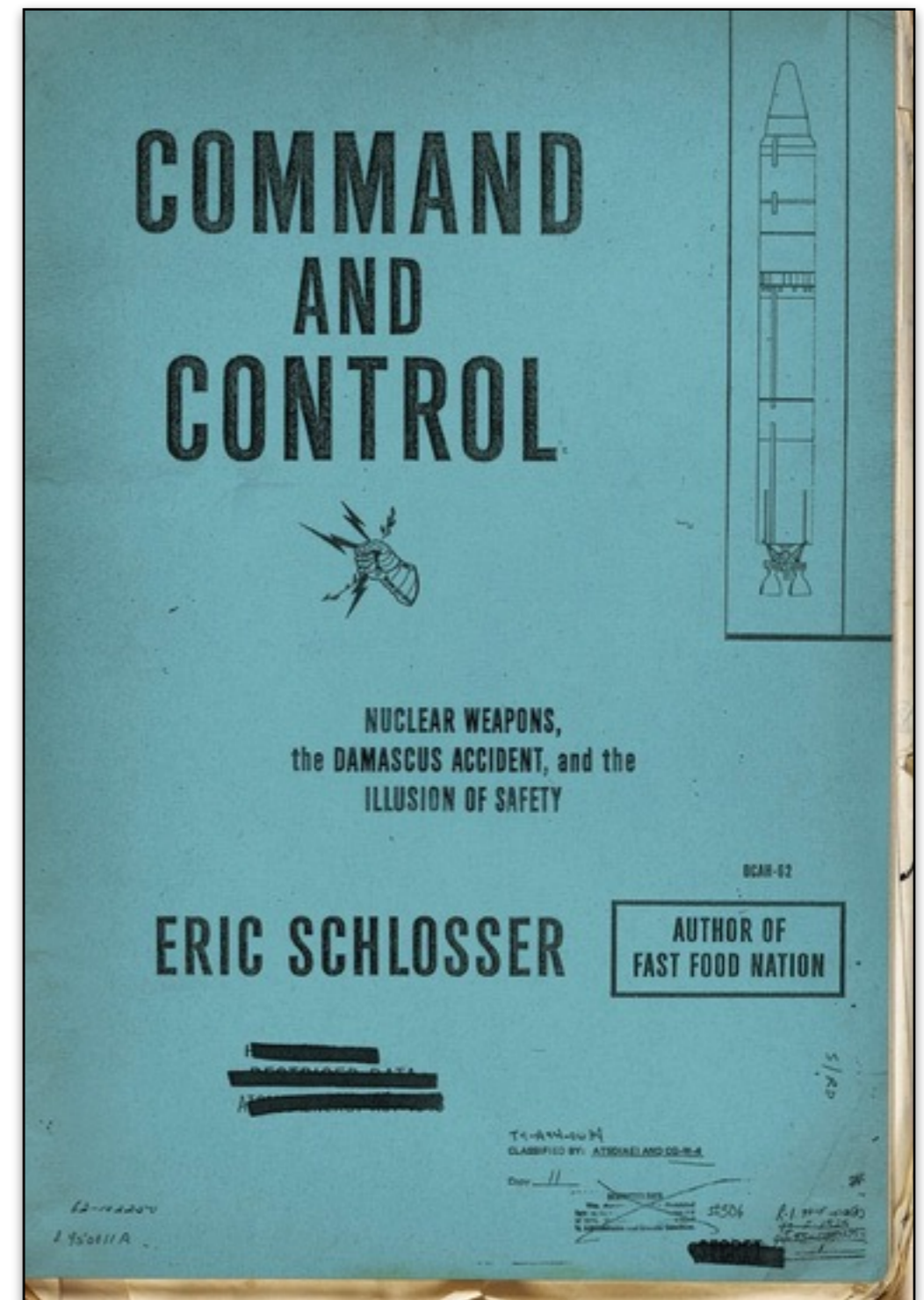


**FALLOUT PATTERN**—Path of radioactive fallout as it moves southeast toward Los Angeles from Vandenberg Air Force Base as calculated for the first eight hours following the blast.

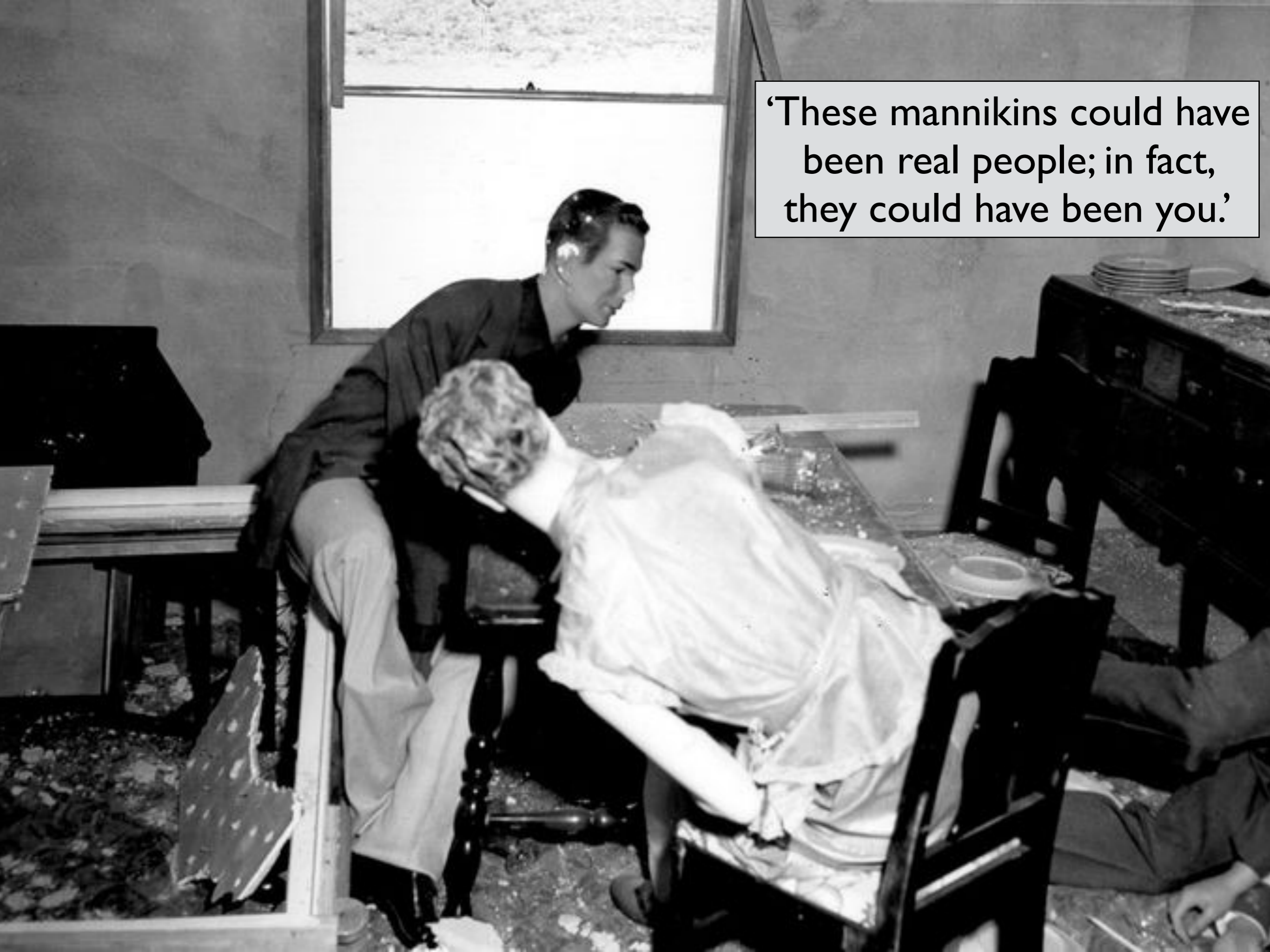
# This Is How It Will Be If H-Bomb Hits Los Angeles

As it happened, American cities did become targets – for the US Air Force. Under General Curtis Le May the goal was

*‘to build a Strategic Air Command that could strike the Soviet Union with planes based in the United States and deliver every nuclear weapon at once. SAC bomber crews constantly trained and prepared for that all-out assault. They staged mock attacks on every city in the United States with a population larger than twenty-five thousand, practicing to drop atomic bombs on urban targets in the middle of the night. San Francisco was bombed more than six hundred times within a month.’*



‘These mannikins could have been real people; in fact, they could have been you.’





# HIROSHIMA ATOM BOMB NO. 1 OBLITERATED IT

A B-29, laden with a new weapon of terrible but virtually untold destructive power, circled in the morning air over Japan's Isle of Honshu from the Inland Sea. Shortly below, its crew, headed by Colonel Paul W. Tibbets Jr., had selected Hiroshima, a major Japanese port and military center, for the first actual test. They dropped the 480-pound bomb, sped away. It was Aug. 6, 1945 and man had unleashed atomic power on man.

In the moment of its incomparable blast, air became flame, walls turned to dust. "My God," breathed the crew of the B-29 at what they saw. Hiroshima reported, "There

was a terrific flash of light, even in the daytime . . . a couple of sharp claps against the airplane." White smoke leaped on a mushroom stem to 20,000 feet when it spilled into a huge, billowy cloud (above). Then an odd thing happened. The top of this cloud structure broke off the stem and rose several thousand feet. As it did so, another cloud formed on the stem exactly as the first had done. On the ground, from a distance, a Jap saw the explosion. ". . . A lightninglike flash covered the sky," he said. "All around I found dead and wounded . . . Mashed . . . burned with a huge blast. . . . All green vegetation . . . perished."

## ‘The nuclear sublime’: the God’s eye view

‘The weapon’s devastating power had to be seen to be believed.’

*Kyo Maclear, Beclouded visions: Hiroshima-Nagasaki and the art of witness*

‘By celebrating the sublime, visual qualities of the mushroom clouds, the glossy images . . . could be seen as innocuous...’

*Scott Kirsch, ‘Watching the bombs go off’*

*A visual field in which bodies are conspicuously absent*



## HIROSHIMA BEFORE

To the atomic-bomb-laden B-29 "Bock's Jug" diving overhead, Hiroshima looked like this—a typically Oriental congestion of modern industry, rickety dwellings, shrines and quiet temples. It had a population of 244,000, which made it Japan's seventh city. It was a military center, dating from the days of the Russo-Japanese War when the mikado made its historic castle his

war-time headquarters. In World War II its army transport base, ordnance depot and food depot (lower right) made it a military target, as did the nearby docks and textile mills. In the heart of the city were oil stores, electrical works and many bridges spanning the arms of the Ota River on whose delta it stood. There were centuries-old temples and a public garden which was famous for its flowering trees.



## HIROSHIMA AFTER

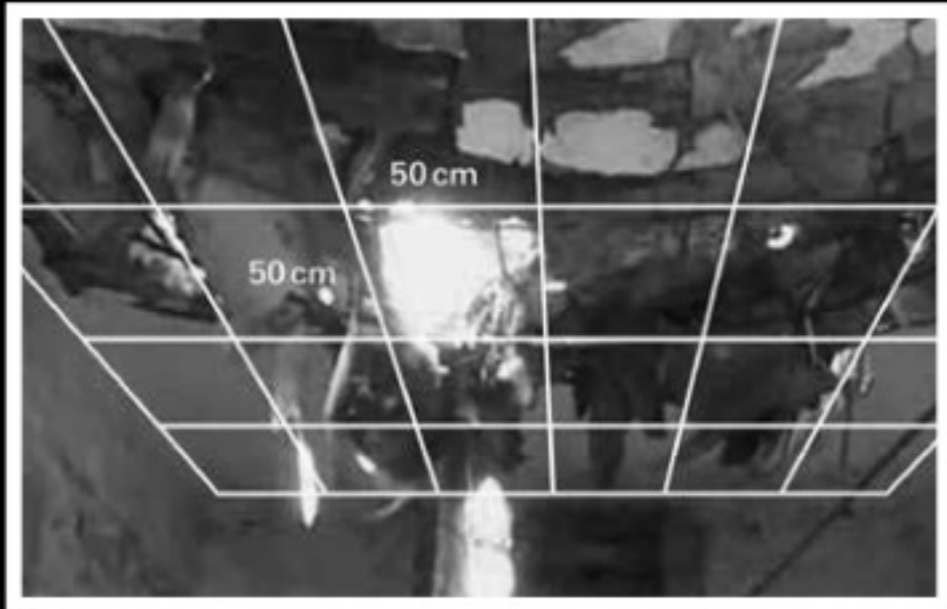
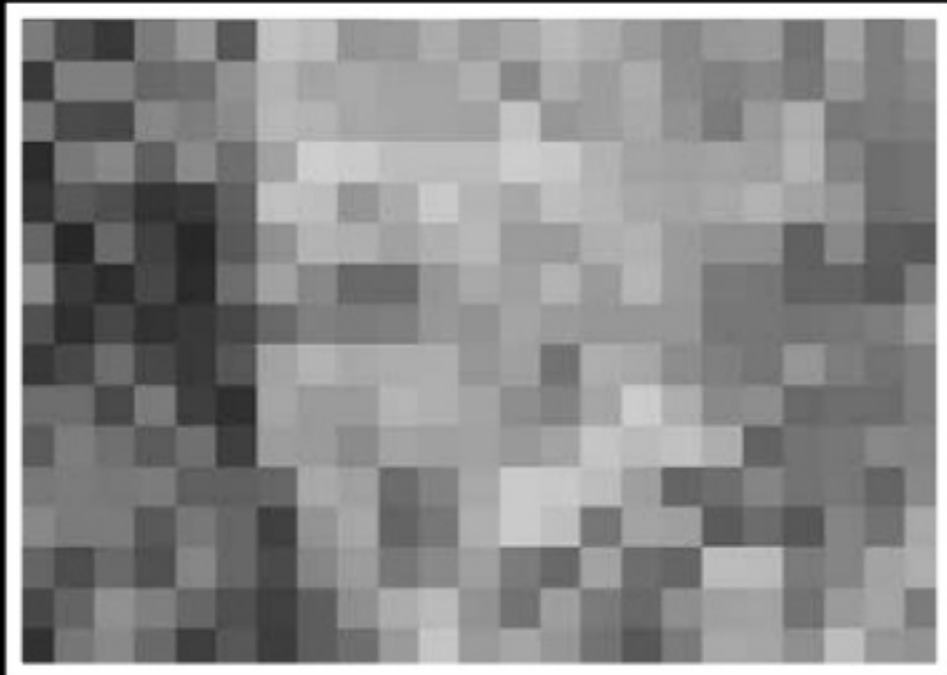
The mosaic of reconnaissance photos (above) made the day after Hiroshima was bombed shows circle of flattened ash, stretching almost four miles from foothills (upper left) well into the outlying eastern area (right). A few buildings still stood, spared by the freakish dynamics of explosion. Smoke drifted up.

Within the grim circle, in which 100,000 reportedly

died, a rail station, generator station, Hiroshima's telephone company, scores of big buildings, hundreds of small ones were rubble. Eleven bridges were destroyed or damaged. Textile mills and rail centers nearer the circle's edge were damaged or 100% destroyed. Seriously damaged, too, were the relatively distant army bases. The atomic bomb had blown three-fifths of Hiroshima off the face of the earth.

# Bodies and pixels

## THRESHOLD OF DETECTABILITY



‘... the size of the hole that a missile makes in a roof is smaller than that of a single pixel in the resolution to which publicly available satellite images are degraded....

... the human figure is the thing to which drone vision is calibrated, obviously because it is designed to deliver munitions to people and kill them. However, while the human figure is the convergent point of drone vision, it is what satellite images are designed to mask.’

*Eyal Weizman, ‘Violence at the threshold of detectability’*



*Omar Fast, 5,000 Feet Is Best (2011)*



*Tomas van Houtryve, Blue Sky Days (2014)*

## **4: Kill chains**

# ‘The bureaucratization of homicide’

Henry T. Nash,

former analyst, Air Targets Division, US Department of Defense

*Bulletin of the Atomic Scientists* 36 (4) (1980)

CTIF FORM										SECRET		TDI			
CLASSIFICATION										PROCEEDING					
I															
II															
III															
IV															
V															

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1000 SOURCES OF INFORMATION

[NOTE: TARGET IS FICTITIOUS]

SECRET

John Doe 3A2 1 DEC 58

**Bombing Encyclopaedia of the World**

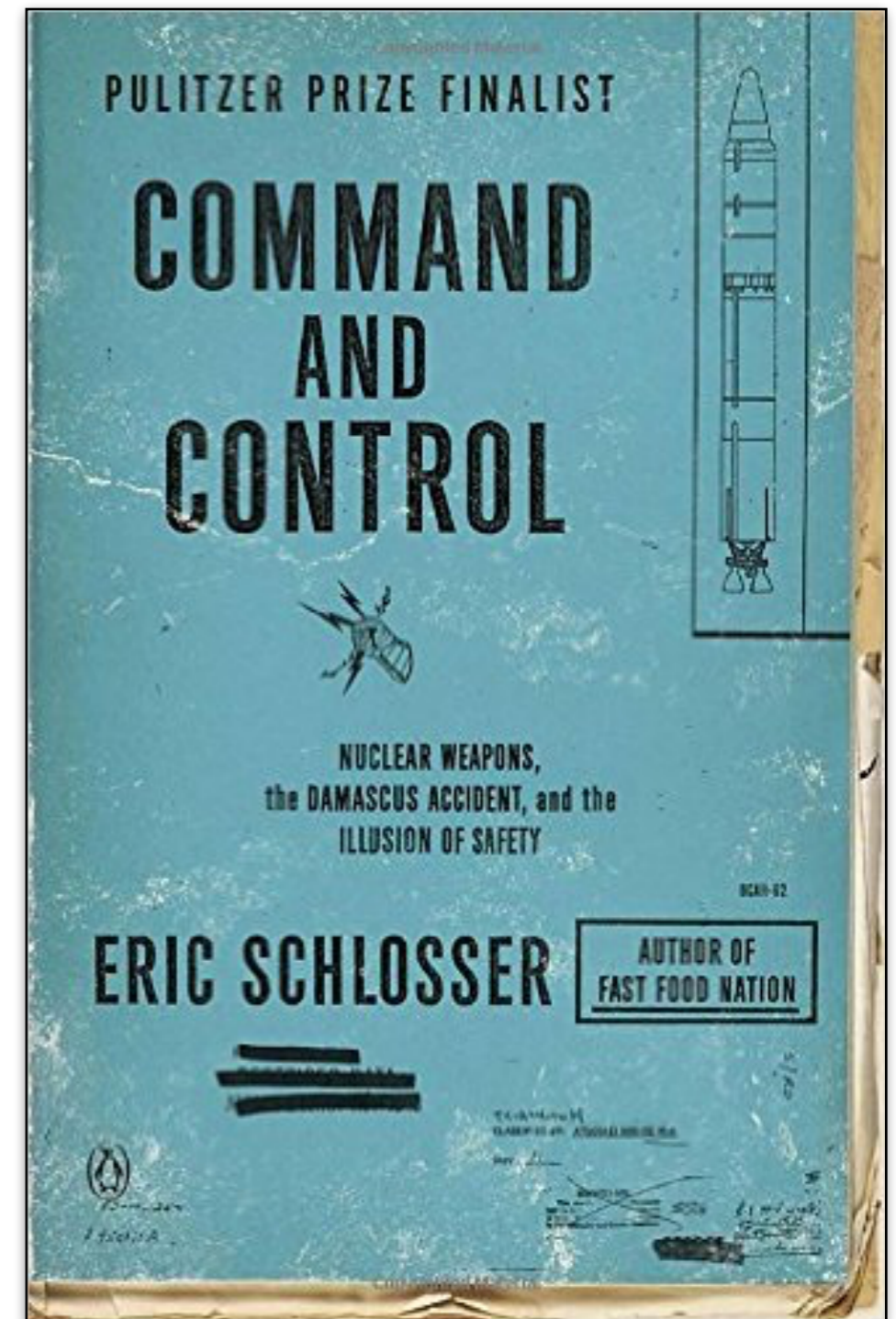


*‘The nuclear football’*

# Nuclear Command and Control

‘Only the President of the United States can authorize the employment of US nuclear weapons... The President may direct the use of nuclear weapons through an execute order via the Chairman of the Joint Chiefs of Staff to the combatant commanders and, ultimately, to the forces in the field exercising direct control of the weapons.’

*US Air Force, Nuclear Command, Control and Communications (May 2015)*

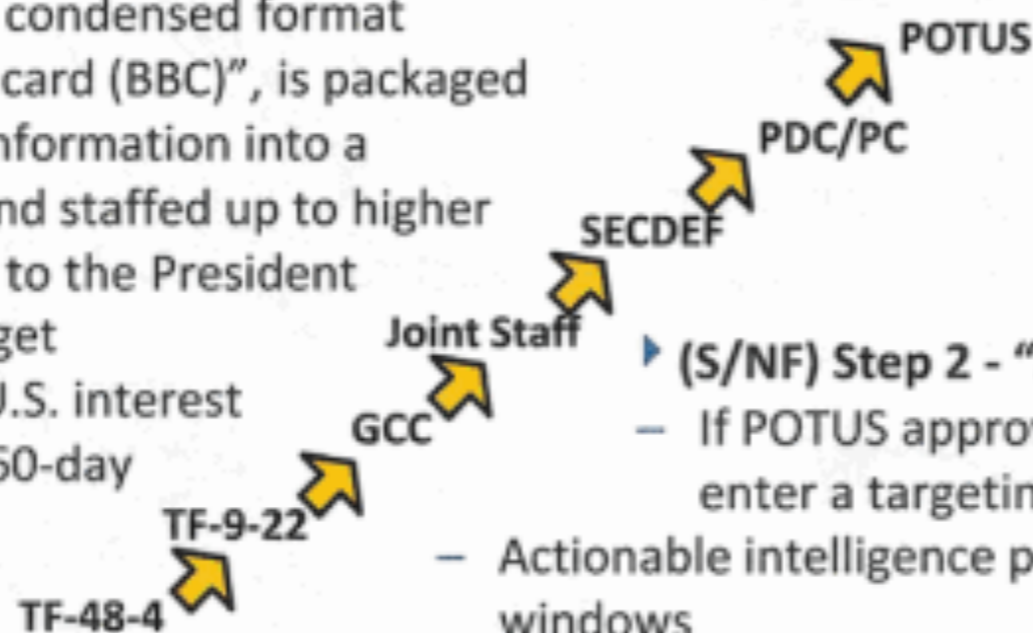
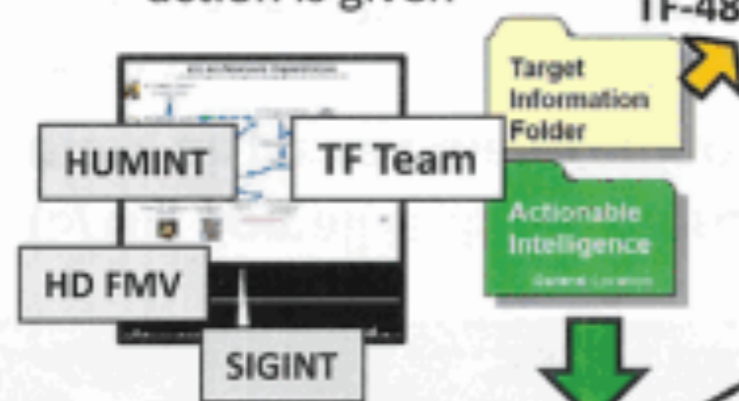




# Authorization to Use Military Force (AUMF) Operations

## ► (S/NF) Step 1 - "Developing a target" to "Authorization of a target"

- TF 48-4 direct action operations are conducted under execution orders for Operation Copper Dune (AP/Yemen) and Operation Jupiter Garret (EA/Somalia)
- These orders specify delegated authorities, authorized targets and criteria for action
- TF intelligence personnel, with support from IC partners, builds the case for action
- This information, in a condensed format known as a "baseball card (BBC)", is packaged with the operations information into a "CONOPS" package and staffed up to higher echelons—ultimately to the President
- If proven that the target presents a threat to U.S. interest or personnel, then a 60-day authorization to action is given

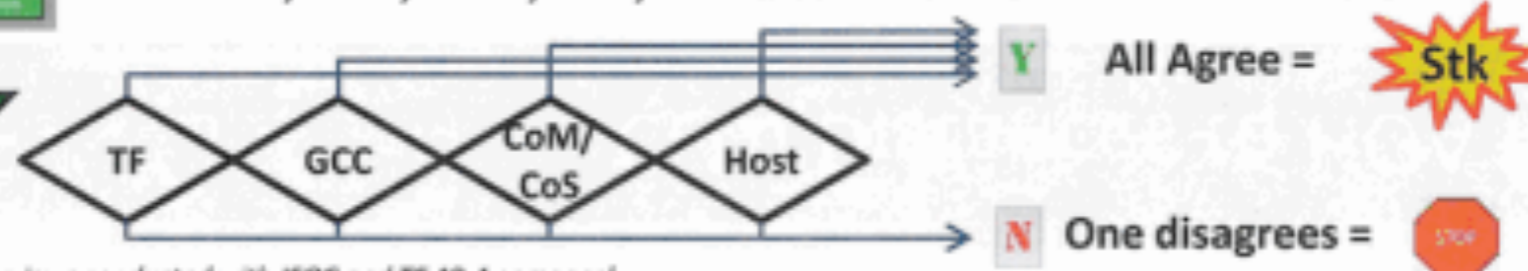


Current Authorization to Action List	
Jupiter Garret (Somalia)	4
Copper Dune (Yemen)	16

CAO: 30 Jun 2012

## ► (S/NF) Step 2 - "Authorizing" to "Actioning"

- If POTUS approves the CONOP, operations enter a targeting cycle
- Actionable intelligence provides potential targeting windows
- The targeting window suitability is determined by ROE:
  - must be Low CDE, "near certainty" of HVI presence based on two forms of intelligence, no contradictory intelligence
- TF, GCC, CoM, CoS, HN Gov all must concur or no strike occurs



SECRET//NOFORN

Source: Multiple interviews conducted with JSOC and TF 48-4 personnel

# Listing agencies

‘Most security lists ... operate by way of a “diffusion of evaluative labour” where the predictive work of actors from a plethora of different executive agencies and institutions ... is continually intersected with various algorithmic assessments to produce contingent knowledge about threats through processes of “cumulative judgement”. **Listing in this sense is much more than an exercise of executive power...**

**‘[Lists] work to constitute law and establish new modes of legal transmission...**

‘Once listing problems are made technical, they elevate relevant security expertise around questions of practical implementation, effective calibration and practical interoperability. **Technicality does not so much dissolve political questions** (for example, how suspects are targeted pre-emptively through exceptional listing mechanisms), however, **it buries such questions within registers of expertise.**’

***Marieke de Goede and Gavin Sullivan***  
***‘The politics of security lists’, Society & Space (2015)***



## **(S) New Tactical Collection System Joins the War on Terrorism (repost)**

FROM: **name redacted**

Technical Advisor, Target Reconnaissance and Survey (S316)

Run Date: 03/03/2005

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*DISTANTFOCUS pod is new system for tactical SIGINT and precision geolocation... first deployed in December (S)*

(U//FOUO) What resembles "LITTLE BOY" (one of the atomic bombs dropped on Japan during World War II) and as LITTLE BOY did, represents the dawn of a new era (at least in SIGINT and precision geolocation)?

(S) If you answered a pod mounted on an Unmanned Aerial Vehicle (UAV) that is currently flying missions in support of the Global War on Terrorism, you would be correct.

# General Atomics GNAT-750

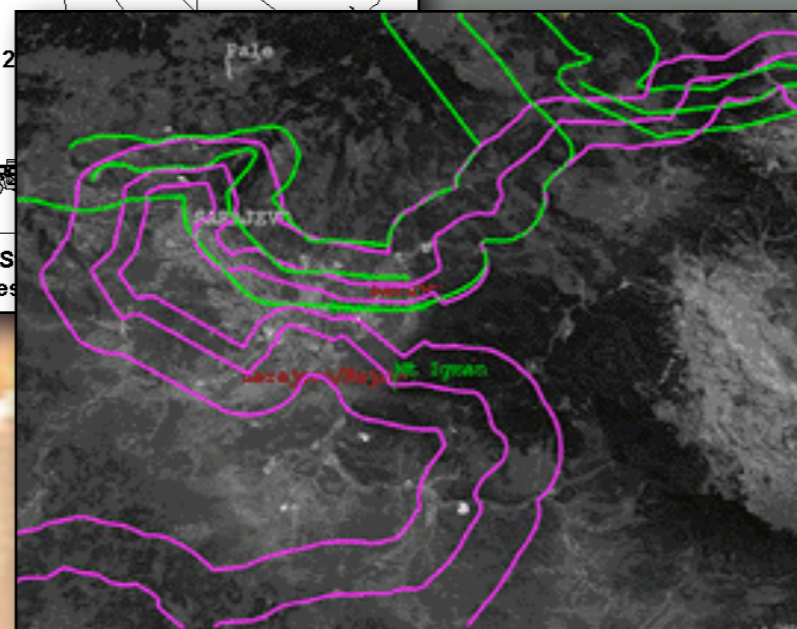
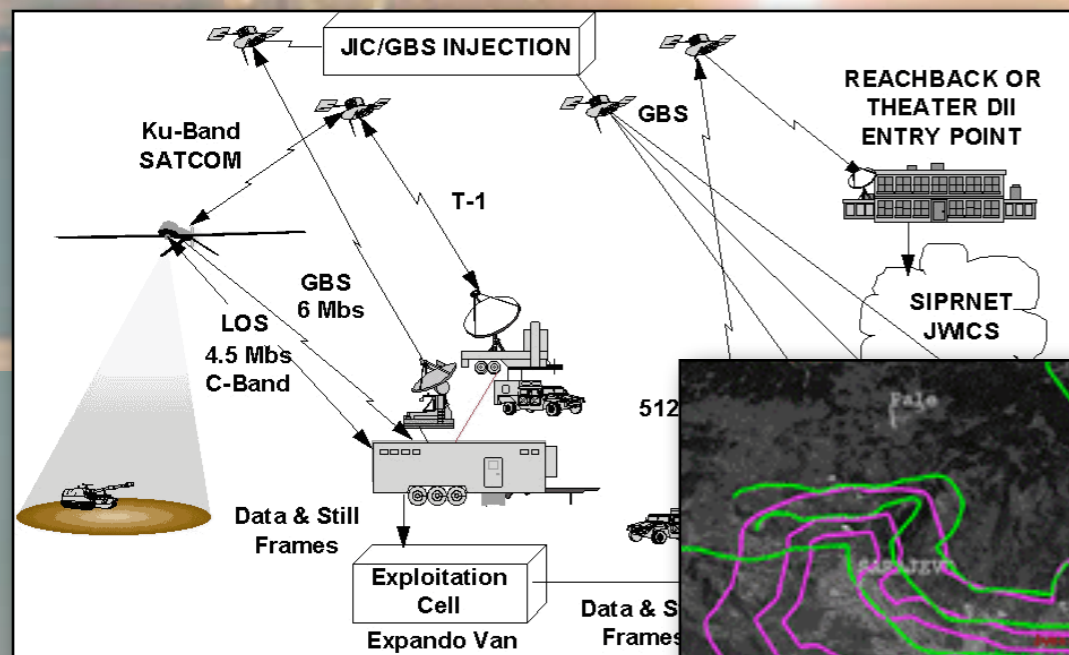
*12-24 hours endurance at 5-25,000 feet  
Maximum speed 120 m.p.h.*



Still imagery and text interpretation  
*replaced by*  
***Real-time motion video in colour***  
***(day) and infrared (night)***



C-band Line of Sight data link limited  
range to 150 miles  
*replaced by*  
*Ku-band satellite link which extended*  
*the operating range*



PowerScene identification of target  
imagery  
*replaced by*  
***Satellite-linked GPS which increased  
speed and accuracy of targeting***

# Bosnia | 1994-95



CAOC in Vicenza, Italy sent **50-300 image targets** ('collection points') to Mission Planning Cell in Taszar, Hungary.

**72-48 hours later** the video feeds from the Predator were sent via coaxial cable to the MPC where they were digitised and encrypted for onward transmission over a secure network to commanders in the field and to a group of 10-12 imagery analysts in the United States.

The analysts posted video clips and annotated stills on a classified web page, but the quality of the video feeds with which they had to work was significantly less than the raw feeds available in theatre, and the slow response time was another serious limitation on the value of their work.

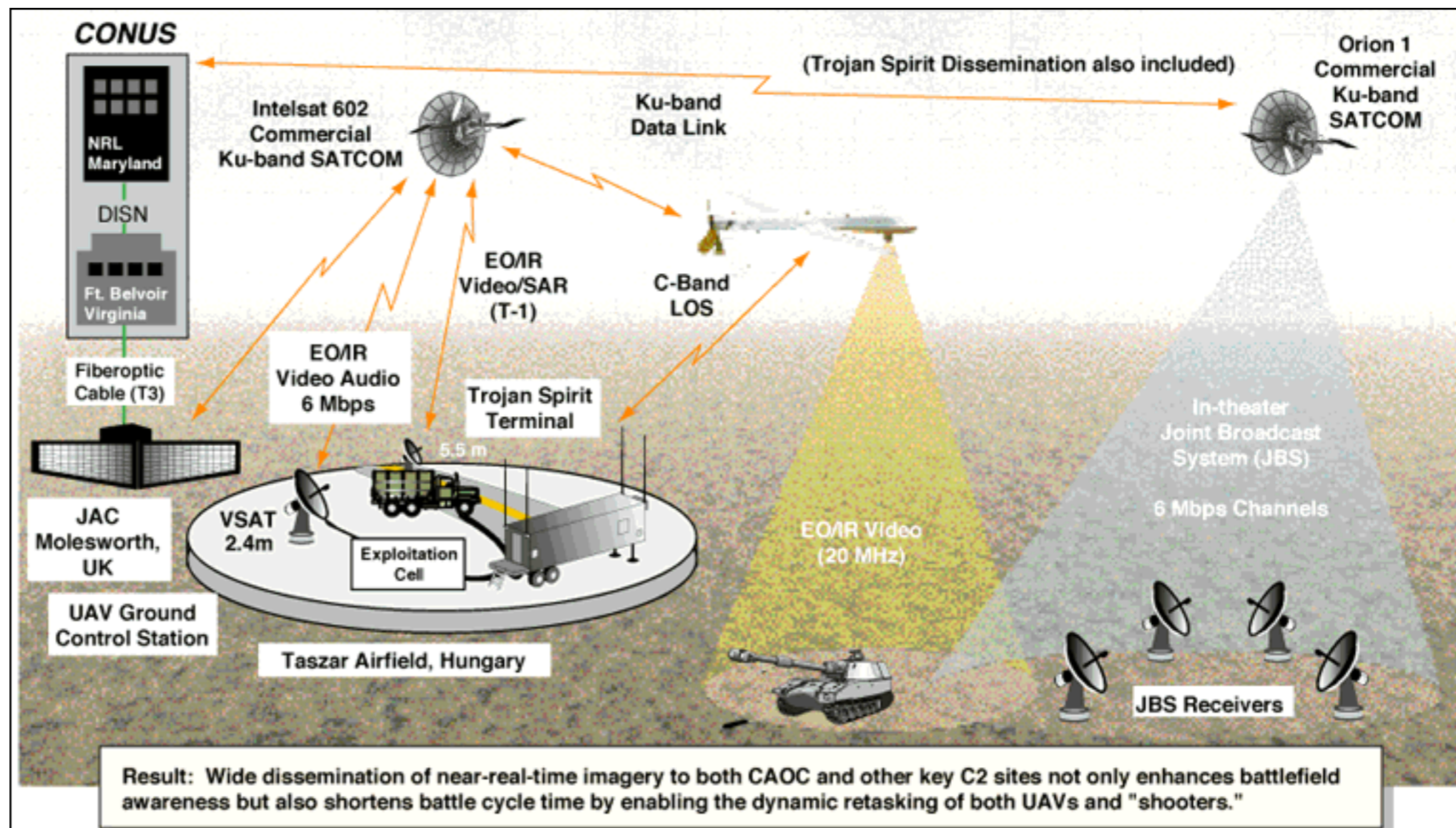


**The network was extremely limited:** imagery was widely circulated, but it was assumed that these platforms had to be **controlled (not simply based) close to the combat theatre.**

For the 'no-fly zone' established over southern Iraq reconnaissance flights were flown by Predators from Ali Al Salem Air Base in Kuwait, and for the initial campaign in Afghanistan in 2001 from Jacobabad in Pakistan.

*Ground Control Station and Mission Planning Cell, Hungary, 1996*

**It was the CIA not the USAF that initiated 'remote split' operations in 2001** with flights controlled from the continental United States, which provided assured access to secure networks, communications and databases.



**NUCLEAR NIGHTMARES**

## **What Bin Laden Sees in Hiroshima**

*By Steve Coll*

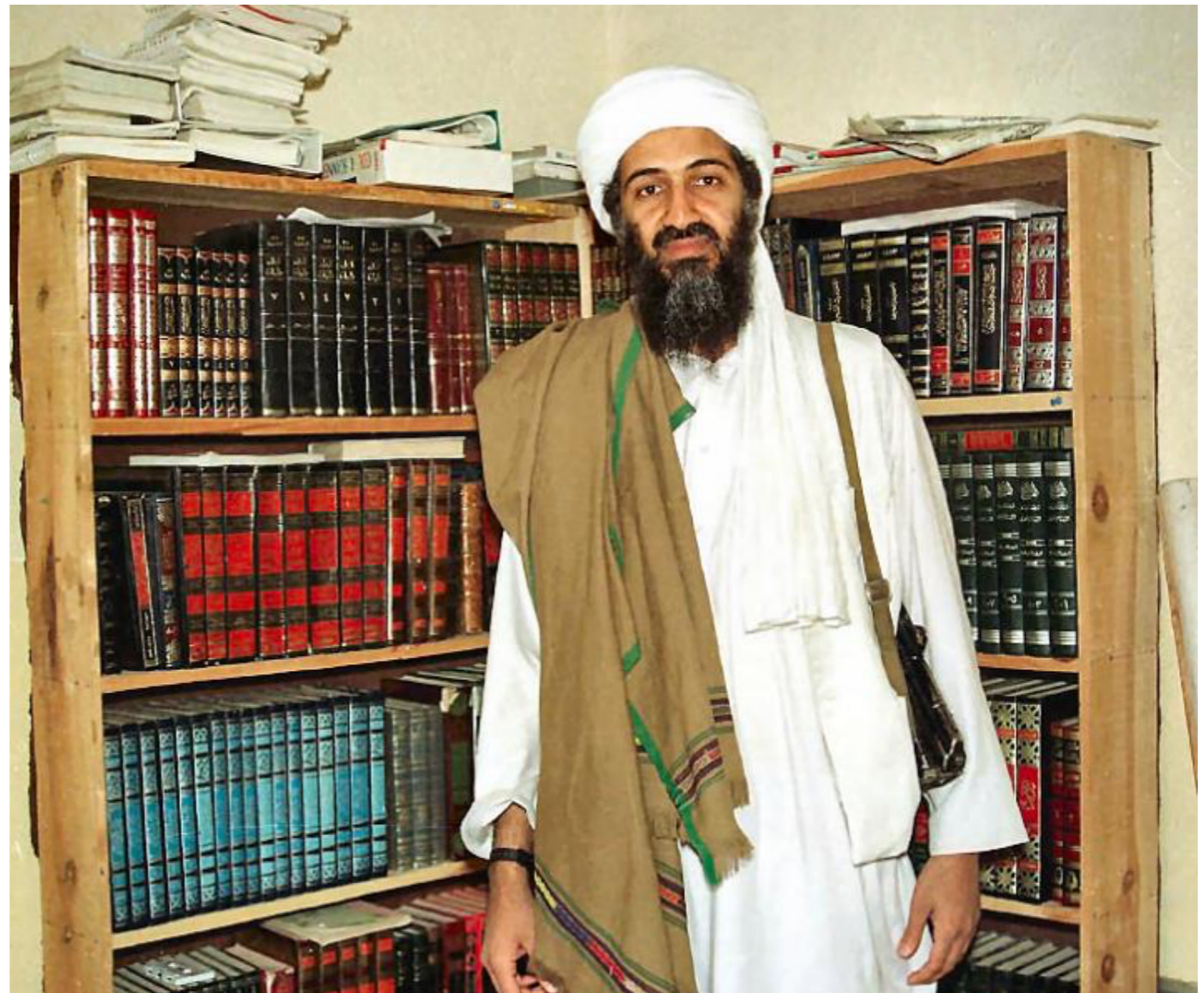
The Washington Post

Sunday, February 6, 2005; Page B01

At a conference on the future of al Qaeda sponsored by Los Alamos National Laboratory last month, I posed a dark question to 60 or so nuclear weapons scientists and specialists on terrorism and radical Islam: How many of them believed that the probability of a nuclear fission bomb attack on U.S. soil during the next several decades was negligible -- say, less than 5 percent?

At issue was the Big One -- a Hiroshima-or-larger explosion that could claim hundreds of thousands of American lives, as opposed to an easier-to-mount but less lethal radiological attack. Amid somber silence, three or four meek, iconoclastic hands went up.

His inspiration, repeatedly cited in his writings and interviews, is the American atomic bombing of Hiroshima and Nagasaki, which he says shocked Japan's fading imperial government into a surrender it might not otherwise have contemplated. Bin Laden has said several times that he is seeking to acquire and use nuclear weapons not only because it is God's will, but because he wants to do to American foreign policy what the United States did to Japanese imperial surrender policy.



THE SECRET ORIGINS OF  
THE DRONE REVOLUTION



# PREDATOR

RICHARD WHITTLE

Author of *The Dream Machine*

In order to secure satellite access over Afghanistan, Predator flights to find bin Laden had been flown from a ground control station at **Ramstein Air Base** in Germany. But using a Predator to *kill* bin Laden was less straightforward. After protracted debate, US Government lawyers agreed that **a Predator armed with a missile would not violate the 1987 Intermediate-Range Nuclear Forces Treaty**, which eliminated nuclear and conventional missiles with intermediate ranges but which defined missiles as ‘*unmanned, self-propelled weapon-delivery vehicles*’; the lawyers determined that the Predator was merely a platform and, unlike a cruise missile, had no warhead so that it remained outside the Treaty. But they also insisted that the Status of Forces Agreement with Germany would require **Berlin’s consent for the activation of an armed Predator**.

## U.S. Air Force Base Ramstein

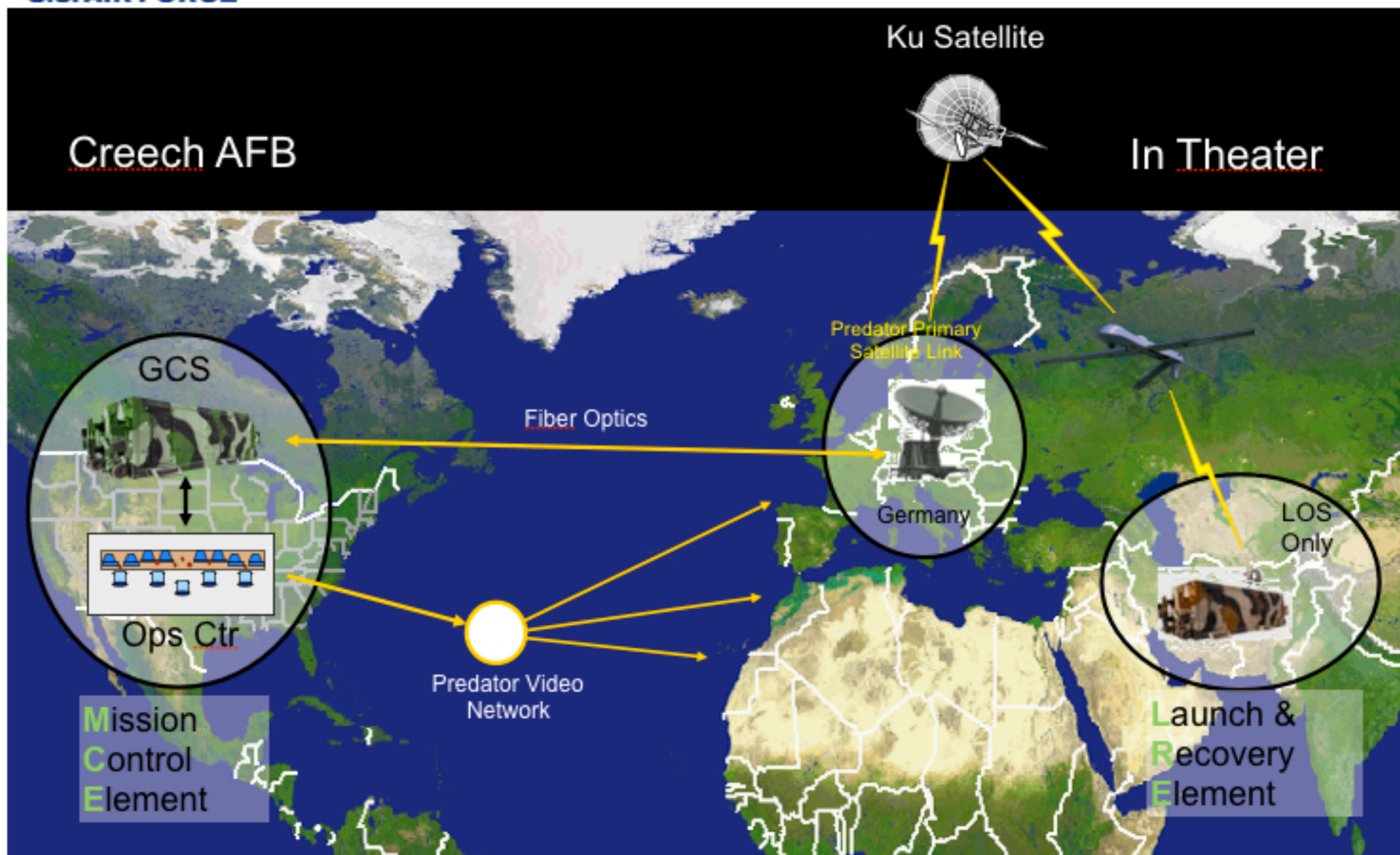


The need to bring Berlin onside (and so potentially compromise the secrecy of the project) was one of the main reasons why **the ground control station was relocated to the continental United States**, connected to the satellite link at Ramstein through a fibre-optic cable under the Atlantic.



U.S. AIR FORCE

# Remote-Split Operations



*Integrity - Service - Excellence*



## **5: Little boys and blue skies**

‘The world will note that the first atomic bomb was dropped on Hiroshima, a military base. That was because **we wished in this first attack to avoid, insofar as possible, the killing of civilians.**’



Today

‘There hasn’t been a single collateral death because of the exceptional proficiency, precision of the capabilities we’ve been able to develop...’

*John Brennan, June 2011*

OBAMA ADMIN. COUNTERTERRORISM STRATEGY

**JOHN BRENNAN**

White House Homeland Security &  
Counterterrorism Adviser

**C-SPAN**  
c-span.org



**‘Like nuclear weapons,  
drones turn the  
prospect of death from  
above into a condition  
of everyday life.’**

*Paul K. Saint-Amour, ‘Waiting for  
the bomb to drop’*

*New York Times, 3 August 2015*

Daddy squats down, and digs with his hands  
Suddenly, his voice weak with exhaustion, he points  
I throw the hoe aside  
And dig at the spot with my hands  
The tiles have grown warm in the sun  
And we dig  
With a grim and quiet intent  
Oh...  
Mommy's bone  
Oh...  
When I squeezed it  
White powder danced in the wind Mommy's bone  
When I put it in my mouth  
Tasted lonely  
The unbearable sorrow  
Began to rise in my father and I  
Left alone  
Screaming, and picking up bones  
And putting them into the candy box  
Where they made a rustle  
My little brother was right beside my mommy  
Little more than a skeleton  
His insides, not burnt out completely  
Lay exposed...



**Sky of Hiroshima**  
**‘Yukiko Hayashi’/Sachiko Kawamura**

# 'Mamana' Bibi

## 24 October 2012

On 24 October 2012, a U.S. drone strike killed Mamana Bibi (first strike) while she was picking okra. The map shows the location of her family when she was killed.

RESIDENCE OF MAMANA  
BIBI RELATIVES

● Nabeela  
● Zubair

✕ Second Strike  
✕ First Strike

Kaleem (inside)

● 3 livestock  
killed

● Rehman  
Saeed and  
Shahidullah

● Asma and  
Naeema

● Samad (inside)

● Safdar (on roof)

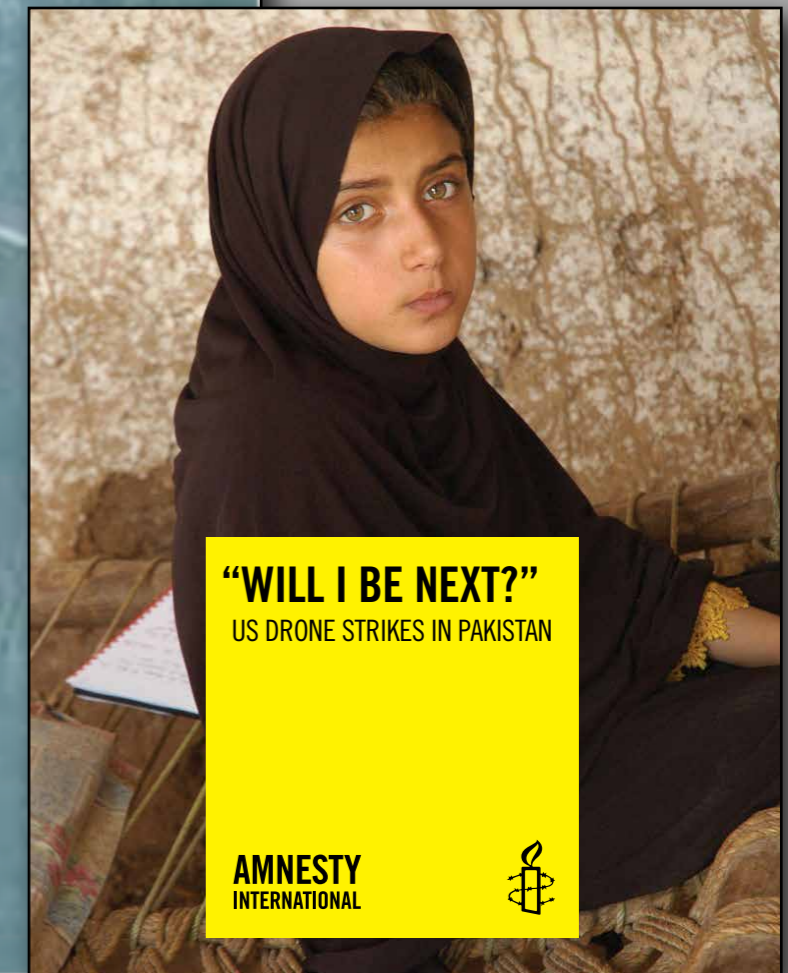
RESIDENCE OF  
MAMANA BIBI AND  
FAMILY

## Ghundi Kala

North Waziristan, Pakistan  
ASTRIUM Imagery: 25 March 2013  
Data: Amnesty International

0.02 mi

Includes material © Astrium Services 2013, all rights reserved



**"WILL I BE NEXT?"**

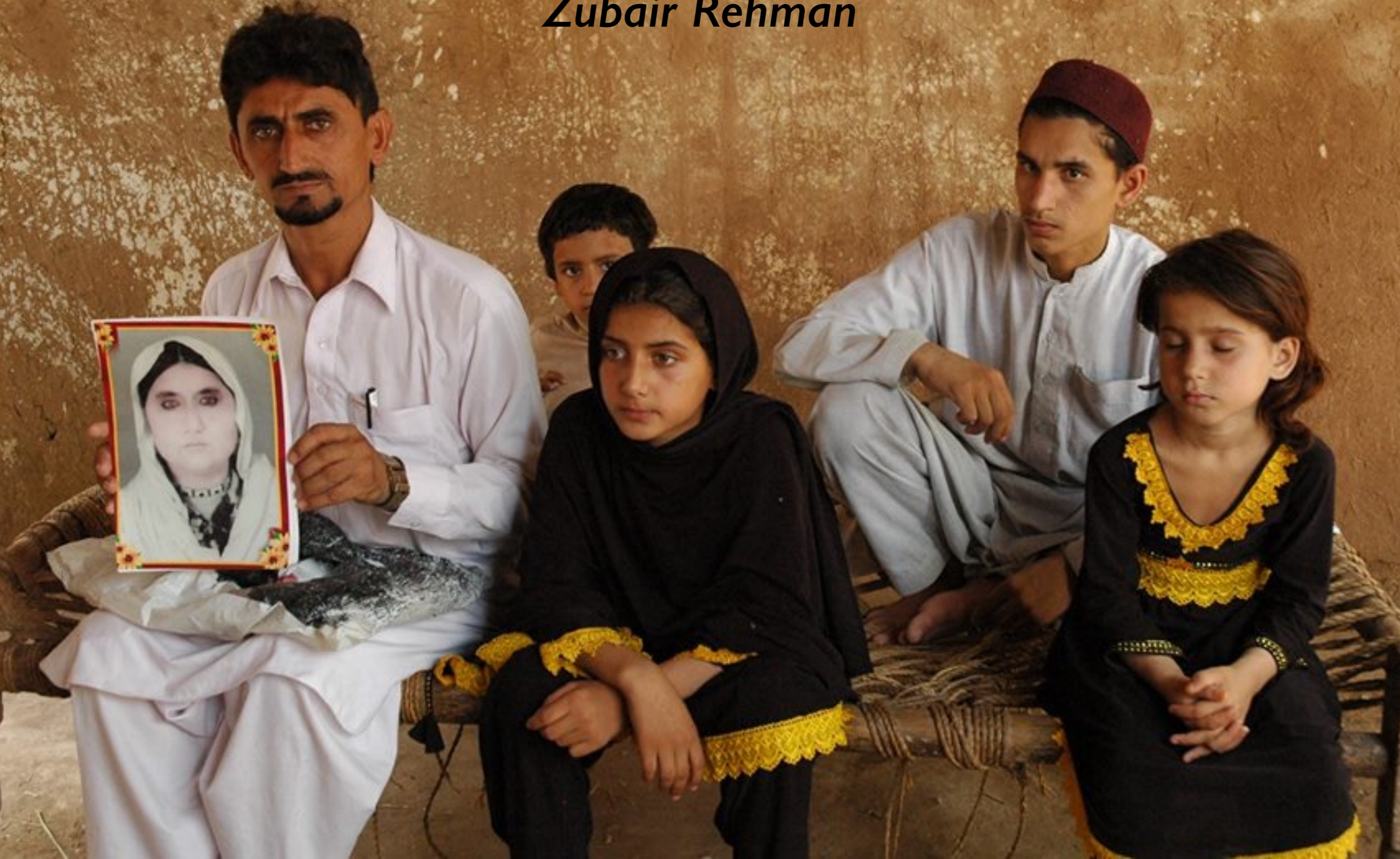
US DRONE STRIKES IN PAKISTAN

AMNESTY  
INTERNATIONAL



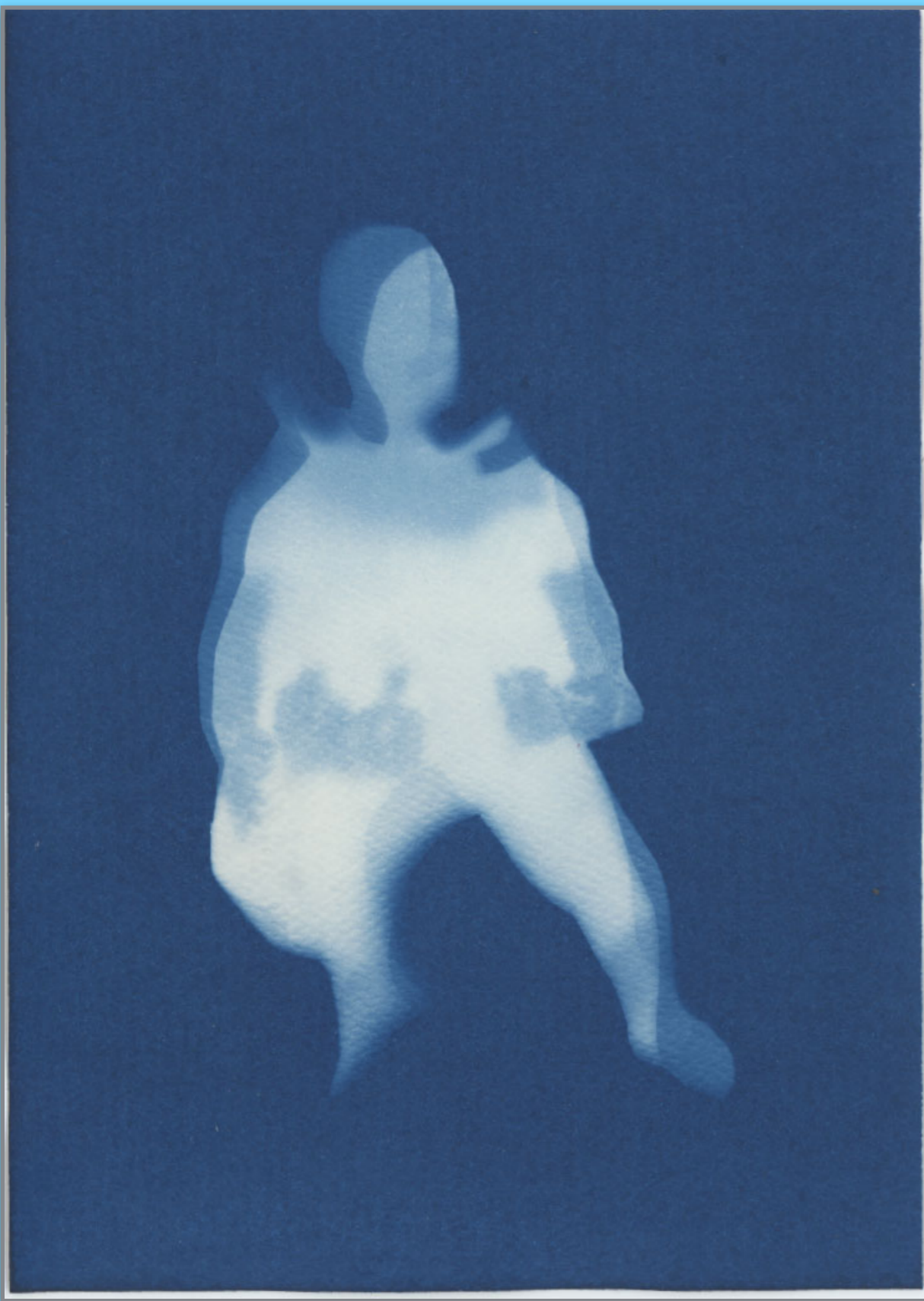
**‘I no longer love blue skies. In fact, I now prefer grey skies. The drones do not fly when the skies are grey.’**

***Zubair Rehman***





**Cai Guo-Qiang, *Shadow: Pray for Protection* (2008)**



***Rachele Riley***

(Sun print from mannequins used in the Annie Test, Nevada, 17 March 1953)



***Trevor Paglen***

*Untitled* (Predator, Indian Springs, Nevada)