

# The Role of Nuclear Weapons in International Politics

A large, glowing mushroom cloud from a nuclear explosion, rendered in shades of orange and red, serves as the background for the text.

**Andrew L. Ross**  
**University of New Mexico**

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# Outline

- The Dawn of the Nuclear Age
- The Nuclear Revolution
- The Nuclear Revolution in Military Affairs
- The Nuclear Revolution in Strategic Affairs
- The Central Role of Deterrence
- Non-Deterrent Roles

# The Dawn of the Nuclear Age

- **The Nuclear Revolution**
  - Manhattan Project
  - Trinity Test
  - Hiroshima
  - Nagasaki



# The Nuclear Revolution

- **Manhattan Project**
- 1942–1946
- Trinity Test—16 July 1945, 5:29:45 AM
- “Gadget”
- <20 kilotons
- Implosion-type fission device



# The Nuclear Revolution

- “I am become Death, the shatterer of Worlds.”

—J. Robert Oppenheimer

- “[W]hat was gunpowder? Trivial. What was electricity? Meaningless. This Atomic Bomb is the Second Coming in Wrath!”

—Winston Churchill

# The Nuclear Revolution

**“The effects could well be called unprecedented, magnificent, beautiful, stupendous, and terrifying... The lighting effects beggared description. The whole country was lighted by a searing light with the intensity many times that of the midday sun. It was golden, purple, violet, gray, and blue. It lighted every peak, crevasse and ridge of the nearby mountain range with a clarity and beauty that cannot be described but must be seen to be imagined...”**

**Brigadier General T. F. Farrell**

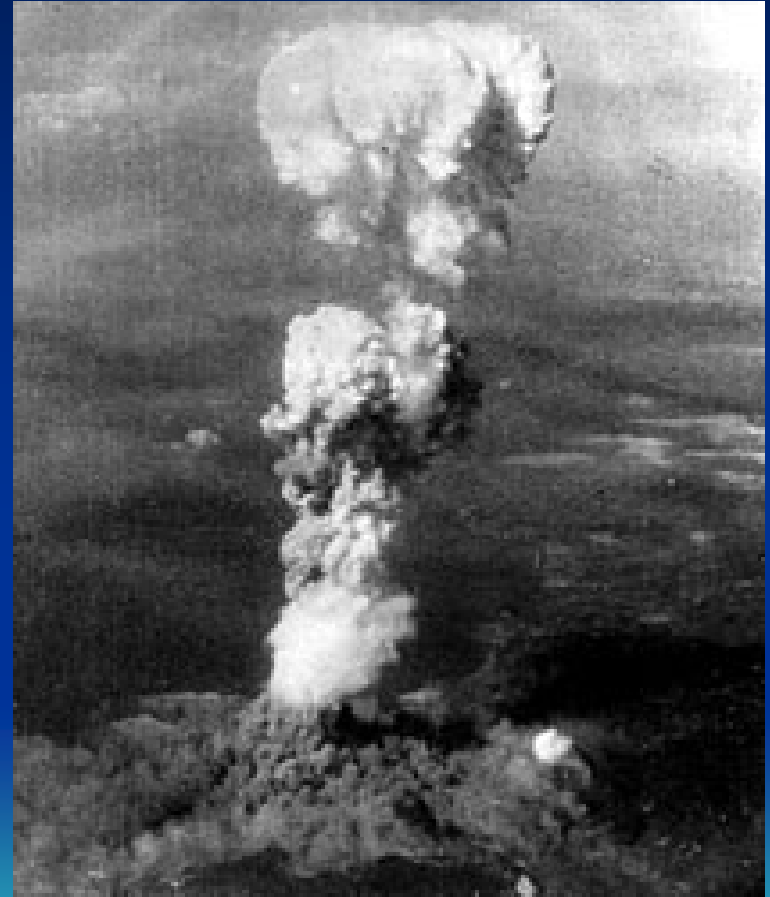
# The Nuclear Revolution

- **Hiroshima**
- 6 August 1945
- “Little Boy”

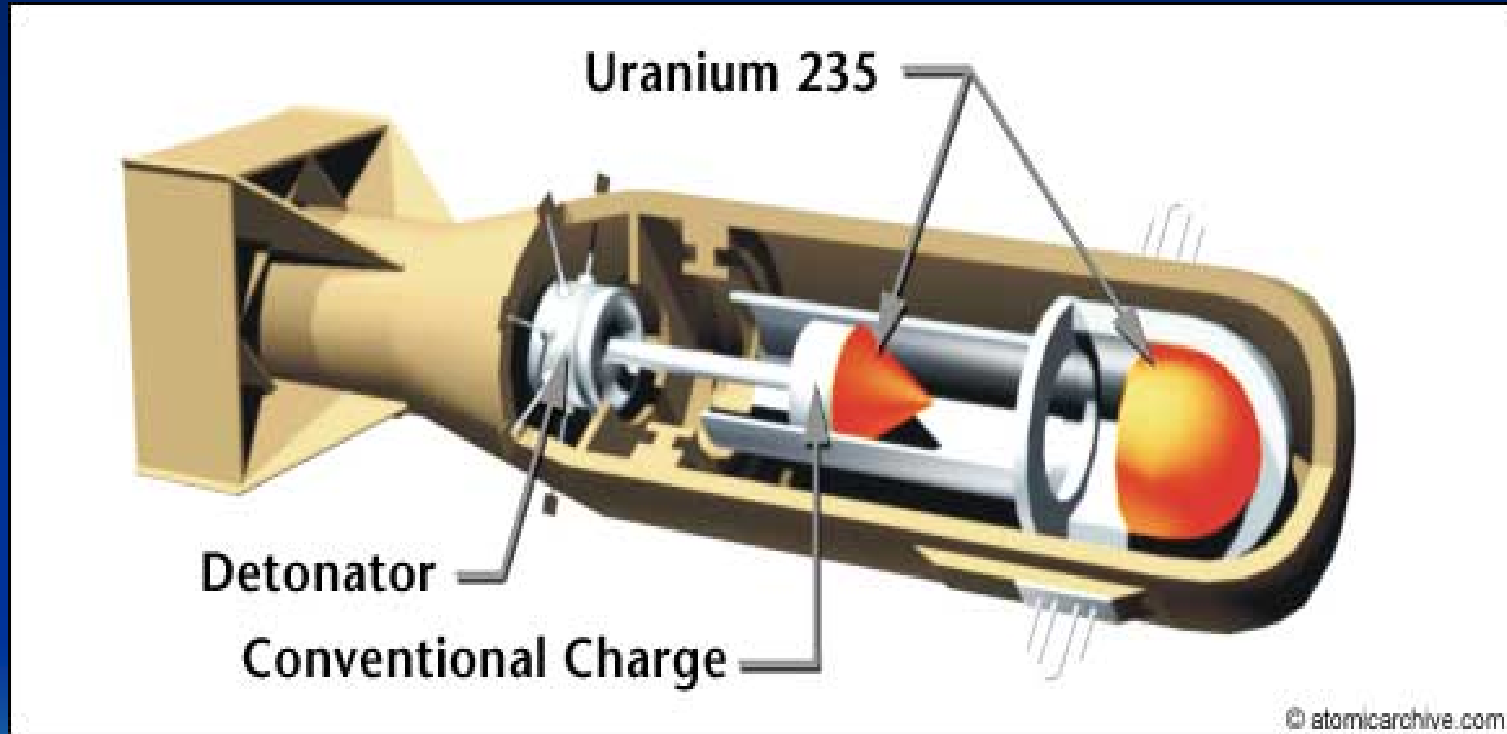


# The Nuclear Revolution

- **Hiroshima**
- 6 August 1945
- “Little Boy”
- 15 kilotons
- Gun-type fission weapon; relatively simple, uranium 235-based bomb

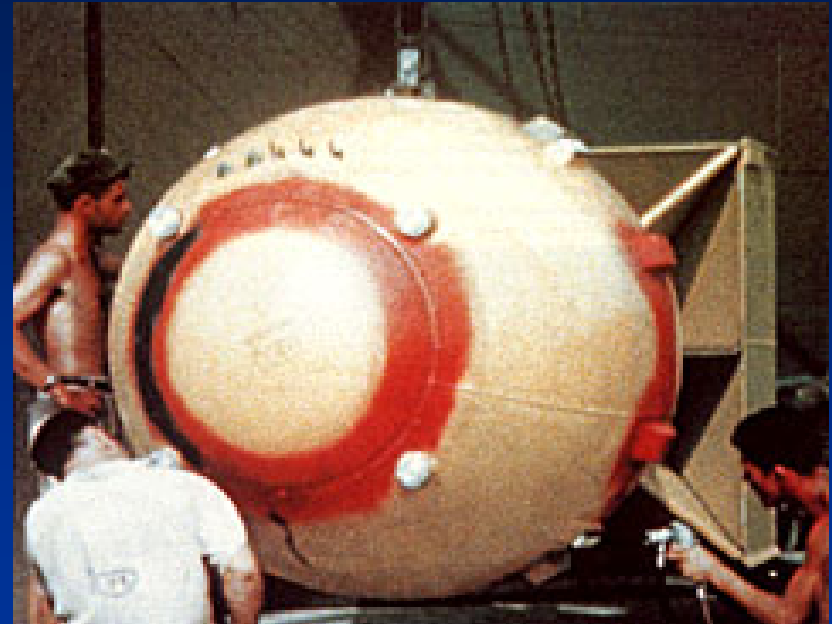
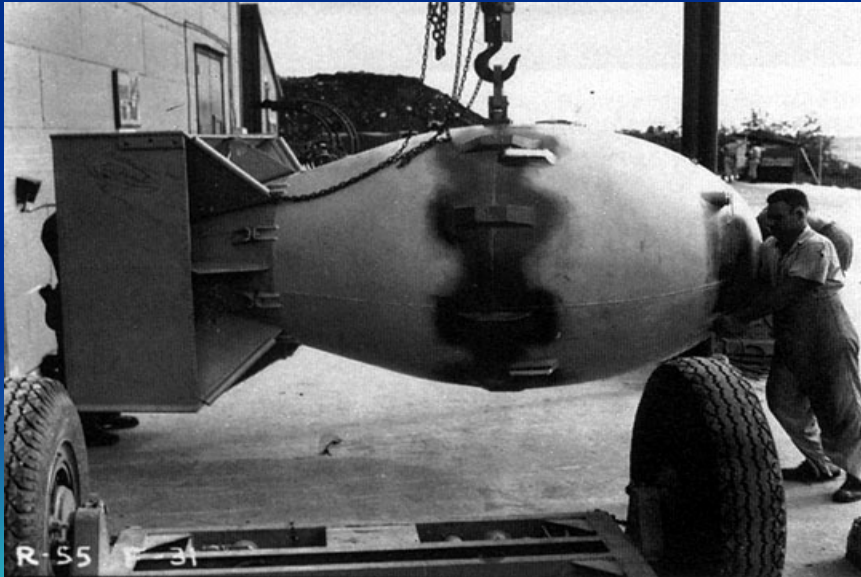


# Little Boy: A Gun-Type Bomb



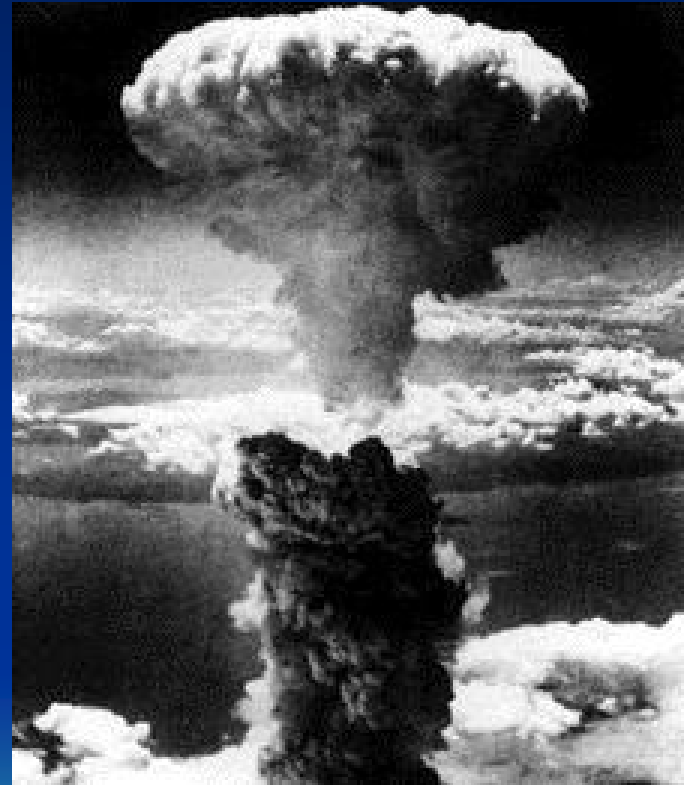
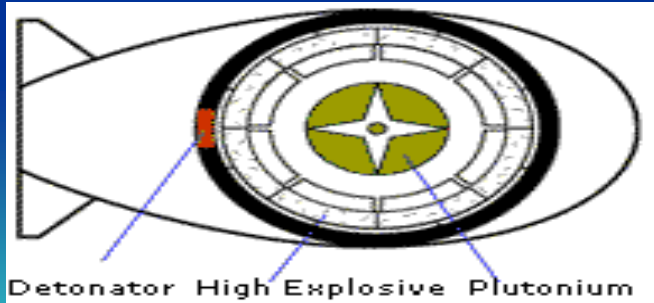
# The Nuclear Revolution

- **Nagasaki**
- "Fat Man"
- 9 August 1945

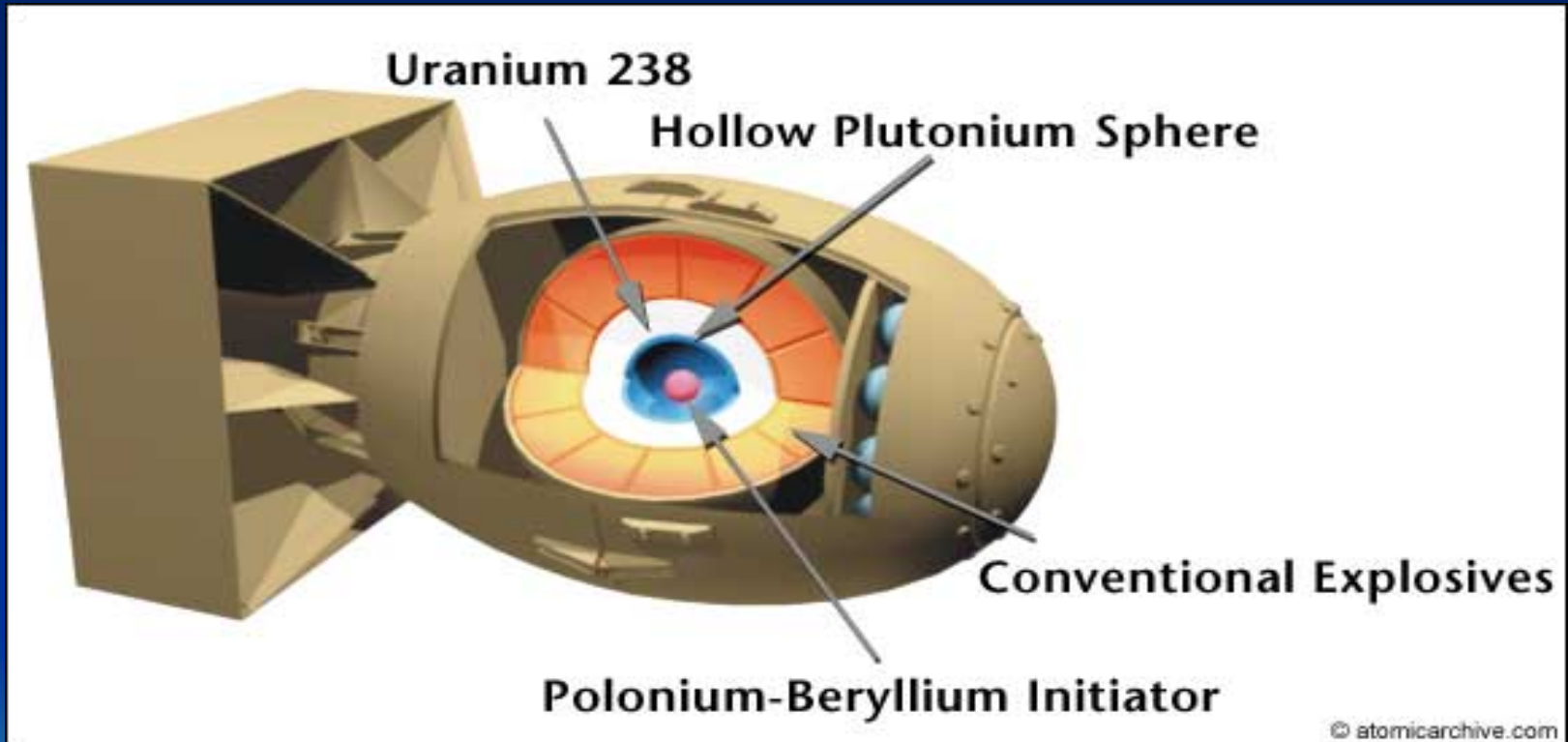


# The Nuclear Revolution

- **Nagasaki**
- "Fat Man"
- 9 August 1945
- 21 kilotons
- Implosion-type fission weapon; a more complex plutonium bomb



# Fat Man: Implosion-Type Bomb



# The Nuclear Revolution



Replicas of “Little Boy” and “Fat Man” at the National Atomic Museum in Albuquerque, NM

# The Nuclear Revolution

- A revolution in military affairs:
  - From the start, nuclear weapons were regarded as qualitatively different
  - All that came before was rendered “conventional”



# The Nuclear Revolution

An exponential increase in firepower:

- The most powerful bombs used in World War II contained 10 tons of TNT
- The average yield of the Hiroshima and Nagasaki bombs was the equivalent of 18,000 tons of TNT—18 kilotons
- The first thermonuclear test, in November 1952, had a yield of over 10 megatons, almost 580 times the power of the first nuclear weapons
- One ICBM warhead possesses the equivalent of all the explosive power used in WW II

# Revolutions in Military Affairs

Andrew Krepinevich identified ten:

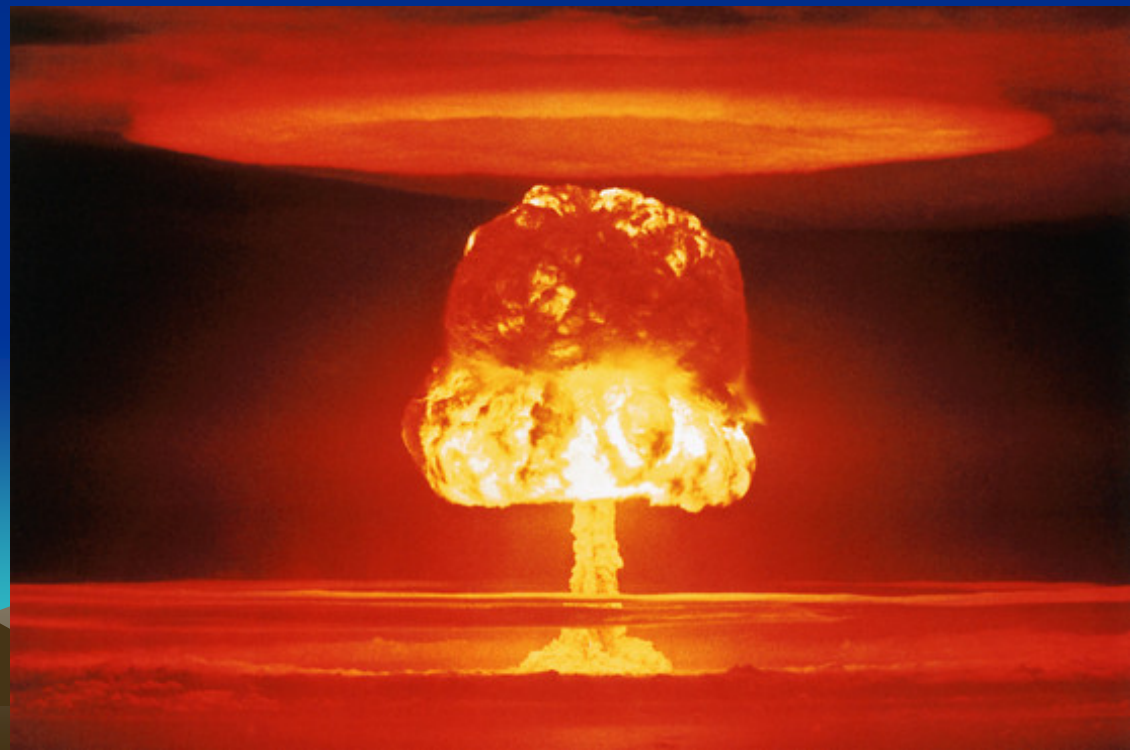
- Infantry revolution
- Artillery revolution
- Sail and shot revolution
- Fortress revolution
- Gunpowder revolution
- Napoleonic revolution
- Land warfare revolution
- Naval revolution
- Interwar mechanization, aviation, and information revolutions
- Nuclear revolution

Max Boot identified four:

- Gunpowder revolution
- First industrial revolution
- Second industrial revolution
- Information revolution

# Revolutions in Military Affairs

- Three components of revolutions in military affairs:
  - Technology
  - Doctrine
  - Organization



# The Nuclear Revolution in Military Affairs

- A technology-driven RMA
- New doctrine (and strategy)
- New organization
  - Military
    - New service elites
  - Civilian
- Additional technological developments:
  - Delivery systems
  - Platforms

# The Nuclear Revolution in Military Affairs

A RMA with a difference:

- Emerged during wartime rather than during interwar period
- Not demonstrated repeatedly on battlefield
  - NW not used in war since August 1945
    - Used only against a non-nuclear foe
    - **We have never, fortunately, seen “nuclear combat” or a “nuclear battlefield,” much less a nuclear war**

# The Nuclear Revolution in Military Affairs

A RMA with a difference:

- Strategic rather than operational or tactical
  - About deterrence rather than warfighting—deterrence became central
  - High level of strategic interdependence
  - Nuclear weapons widely held to be responsible for the “long peace” of the cold war
  - A revolution in ***strategic***, not merely military, affairs
- Civilian led

# The Nuclear Revolution in Strategic Affairs

“To compress a catastrophic war within the span of time that a man can stay awake drastically changes the politics of war, the process of decision, the possibility of central control and restraint, the motivations of people in charge, and the capacity to think and reflect while war is in progress.”

—Thomas C. Schelling

# The Nuclear Revolution in Strategic Affairs

“Nuclear weapons make it possible to do monstrous violence to the enemy without first achieving victory.... *Victory is no longer a prerequisite for hurting the enemy.*

[T]he power to hurt is more impressive than the power to oppose.

—Thomas C. Schelling

# The Central Role: Deterrence

**“Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other purpose.”**

**—Bernard Brodie, 1946**

# The Central Role: Deterrence

**[O]ur first line of defense is the ability to retaliate even after receiving the hardest blow the military can deliver.”**

**—General H. A. P. Arnold, 1946**

# Four Questions

1. Can nuclear weapons be used to fight a war (against another nuclear power)?
2. Is it possible to win a nuclear war (against another nuclear power)?
3. Can a nuclear war be limited, or controlled?
4. Does nuclear superiority matter?

# Deterrence

Objective of deterrence?

- To prevent war/aggression
- Not to fight a war
- May require ability to fight:
  - Defense
  - Offense

# Deterrence

What is to be deterred?

- Threats against the homeland—  
central/fundamental deterrence
- Threats against allies and friends—  
extended deterrence

# Deterrence

- How is a threat to be deterred?
- By persuading potential aggressors that the costs of aggression will exceed the benefits:

Costs > Benefits

- Generally thought to require that the target be a rational actor

# Deterrence

- How is a potential adversary to be persuaded that the costs of aggression will indeed be greater than the benefits?
- Two alternatives:
  - Threat of punishment
  - Denial of objectives

# Deterrence

## Threat of Punishment

What kind of nuclear capabilities are required to punish an aggressor, to impose unacceptable costs on an aggressor?

# Deterrence

## Threat of Punishment

Capabilities required:

- Offensive strike
- Retaliatory, second strike (as opposed to first strike)
- Survivability
- Redundancy
- Passive defense (of military systems)
- Active, point defense (of military systems)

# Deterrence

## Threat of Punishment

Capabilities required:

- Ability to destroy urban/industrial targets—“countervalue” targets
- Countervalue targeting capability (doesn't require a high degree of accuracy)
- No civil defense capabilities
- No national ballistic missile defense capabilities (population centers remain vulnerable)

# Deterrence

## Threat of Punishment

Requires relatively low cost, finite, or absolute, capabilities—identifies how much is enough

AKA “Assured Destruction”

or

“Mutual Assured Destruction”

**MAD**

# Deterrence

## Denial of Objectives

What kind of nuclear capabilities are required to deny an aggressor the accomplishment of objectives?

# Deterrence

## Denial of Objectives

Capabilities required:

- Warfighting
- Offensive strike
- First strike (not merely second strike)
- Survivability
- Redundancy

# Deterrence

## Denial of Objectives

Capabilities required:

- Robust, survivable C4ISR
- Ability to destroy military targets—  
“counterforce” targets
- Counterforce targeting capability (requires  
a high degree of accuracy)

# Deterrence

## Denial of Objectives

### Capabilities required:

- Defense
  - Active
    - Civilian, particularly national ballistic missile defense capabilities (population centers not to remain vulnerable)
    - Military
  - Passive
    - Civilian (civil defense capabilities)
    - Military

# Deterrence

## Denial of Objectives

Requires full suite of nuclear warfighting capabilities. Costs more and emphasizes relative rather than absolute capabilities—superiority matters. Essentially open ended—one can never have enough superiority.

AKA “Flexible Response”

or

NUTs

# Deterrence

- Can nuclear weapons be used to fight a war?
  - AD: No; their role is to deter via punishment
  - FR: Yes; deterrence requires ability to fight a nuclear war
- Is it possible to win a nuclear war (against another nuclear power)?
  - AD: No
  - FR: Yes

# Deterrence

- Once initiated, can nuclear war be limited or controlled?
  - AD: No, or at least we can't assume so
  - FR: Yes
- Should we develop the capabilities to enable us to fight a limited nuclear war, to control a nuclear war?
  - AD: No; doing so would erode deterrence and make nuclear war more likely
  - FR: Yes; escalation dominance would provide that capability

# Deterrence

- Does nuclear superiority matter?
  - AD: No; absolute capabilities are what matter
  - FR: Yes; relative capabilities matter most
- Is deterrence difficult?
  - AD: No; “The healthy fear of devastation... makes deterrence relatively easy.”
  - FR: Yes; must be able to deter along the entire spectrum of conflict, which requires escalation dominance; the balance of terror is delicate

# Deterrence

- Do nuclear weapons represent a revolutionary military development?
  - AD: Yes
  - FR: No; nuclear weapons were a technological breakthrough, but they are weapons to be used like any other weapons.

# Deterrence

Difference in objectives:

- AD: Ability to deter
- FR: Ability to deter, fight, and win a nuclear war

# Deterrence

Flexible response has a fallback; assured destruction does not.

- Should we want a fallback?
- Does having a fallback make it more likely that deterrence will fail?
- Does a nuclear warfighting capability enhance or erode deterrence?

# Deterrence

Have we been MAD or NUTs?

Yes...

# Deterrence

“I don’t think we ought to use this thing unless we absolutely have to. It is a terrible thing to order the use of something that is so terribly destructive beyond anything we have ever had. You have got to understand that this isn’t a military weapon. It is used to wipe out women, children and unarmed people, and not for military use. So we have to treat this differently from rifles and cannon and ordinary things like that.”

—Harry Truman

# Deterrence

“Where these things are used on strictly military targets and for strictly military purposes, I see no reason why they shouldn’t be used just exactly as you would use a bullet or anything else.”

—Dwight Eisenhower

# Deterrence

We've been both MAD and NUTs

What should we be now?

# Deterrence

- Deter what?
  - State use of nuclear weapons?
  - State use of other WMD?
  - State use of conventional weapons?
  - Nonstate actor use of nuclear or other WMD?
  - State support for nonstate actor use of nuclear or other WMD?
  - Nonstate actor use of “conventional” weapons?
  - State support for nonstate actor use of “conventional” weapons?

# Non-Deterrent Roles

- **Warfighting?**
  - August 1945
  - Truncated warfighting role
    - Tradition of nonuse
    - Nuclear taboo

# Non-Deterrent Roles

- **Status symbol**—indicator of major power status
  - Got nukes?
    - United States (1945)
    - Soviet Union (1949)
    - Britain (1952)
    - France (1960)
    - China (1964)
    - Israel (1966/67)
    - India (1998)
    - Pakistan (1998)
    - DPRK (2006)
    - Iran?

# Non-Deterrent Roles

- **Equalizer**—offset conventional advantage of others
  - In the past: United States, NATO
  - Today: Russia, nuclear aspirants (state & nonstate)
- **Substitute for conventional forces**
  - In the past: United States, NATO
  - Today: Russia
- **Dampen defense spending**
  - United States—under the New Look, for example
  - NATO
  - Post-cold war Russia

# Non-Deterrent Roles

- **Discourage horizontal proliferation**
  - Preventive/preemptive use?
    - Nuclear preventive/preemptive strikes contemplated but not executed
    - Preventive/preemptive strikes to forestall horizontal proliferation have been conventional:
      - Israel: Iraq, 1981
      - United States: Iraq, 2003
  - Extended deterrence
  - Dissuasion

# Questions?



# Backup Slides



# Status of World Nuclear Forces 2009\*

<u>Country</u>	<u>Strategic</u>	<u>Non-Strategic</u>	<u>Operational</u>	<u>Total Inventory</u>
Russia	2,800	2,050 <sup>a</sup>	4,850	13,000 <sup>b</sup>
United States	2,200	500 <sup>c</sup>	2,700 <sup>d</sup>	9,400 <sup>e</sup>
France	300	n.a.	~300	300 <sup>f</sup>
China	180	?	~180	240 <sup>g</sup>
United Kingdom	160	n.a.	<160	185 <sup>h</sup>
Israel	80	n.a.	n.a.	80 <sup>i</sup>
Pakistan	60	n.a.	n.a.	60 <sup>i</sup>
India	60	n.a.	n.a.	60 <sup>i</sup>
North Korea	<10	n.a.	n.a.	<10 <sup>j</sup>
<b>Total:</b>	<b>5,850<sup>k</sup></b>	<b>2,550<sup>k</sup></b>	<b>8,190<sup>k</sup></b>	<b>23,335<sup>k</sup></b>