THE NUCLEAR REVOLUTION AND WORLD POLITICS

Background questions: **Would the world be better off if nuclear weapons had never been invented? Would it be better off if nuclear weapons were now abolished**?

I. THE TECHNICAL EFFECTS OF THE NUCLEAR REVOLUTION

Technologies rarely have decisive effects on war or politics; more often technology is bent to serve politics or military doctrine. Nuclear weapons are an exception. They overwhelm politics and doctrine.

Five cascading technical effects flow from the nuclear revolution. These cascade further into political effects listed below in Section IV. The technical effects are:

A. Effect #1: hydrogen bombs offer an increase of six (6, count them six) orders of magnitude over the power of the TNT explosives used in World War II. The atomic bomb = x 1,000 increase on TNT; the hydrogen bomb = x 1,000 increase on atomic bombs.

B. Effect #2: due to 'A' (the destructiveness of nuclear weapons), the "cost exchange ratio" vastly favors defenders (better termed "retaliators") over attackers seeking to disarm them. Nuclear weapons pack tremendous explosive power in devices that are cheap, light, easily hidden, protected, and delivered. Hence destroying nuclear weapons is very hard, protecting and delivering them very easy.

C. Effect #3: due to 'B' (the cost-exchange ratio), a relationship of MAD ("Mutual Assured Destruction") develops between major powers. Both can destroy the other's society even after absorbing an all-out counterforce attack by the other. In short, both have a "second strike countervalue capability."

    In the Cold War, both the US and USSR sought to avert MAD, preferring instead to deny the other a second-strike countervalue capability, but they could not escape it. Technology overrode their desires.

D. Effect #4: "flat of the curve" dynamics. One of MAD's special characteristics is the "flat of the curve": beyond a certain point, the capacity to inflict damage on the other society, or to prevent damage to one's own, is inelastic to the size and capability of one's own force or one's opponent's force. Capabilities are absolute.

E. Effect #5: the "multiplier effect." The efficiency with which one side must strike the other's forces in order to leave the other unable to inflict unacceptable damage in retaliation increases sharply as the arsenals on both sides grow. Even an inefficient strike (a substantial percentage of the attacked weapons survive) can reduce the retaliation to acceptable levels if both arsenals are very small; even a very efficient strike (e.g., 99 percent effective) can fail to reduce retaliation to acceptable levels if both arsenals are very large. Hence first strikes are least thinkable when arsenals are large, suggesting the argument that "the more weapons both sides have, the less the risk of their use."

II. ALTERNATE NUCLEAR DOCTRINES: COUNTERVALUE vs. COUNTERFORCE STRATEGIES

Nuclear weapons present states with two basic nuclear doctrines: counterforce and countervalue.

>> Countervalue: the enemy society is targeted. Political aims are achieved by threatening to punish the adversary by destroying its population and industry.

>> Counterforce: the enemy nuclear forces are targeted. Political aims are achieved by threatening to disarm the adversary--that is, to remove its capacity to inflict punishment on oneself.

Since forces can be used first or second, we have a crude universe of four possible nuclear capabilities:

A. First-strike countervalue capability: the capacity to launch a first strike that inflicts unacceptable damage on the adversary's society.
    This capability is very easy to build, for reasons noted above in Section I, but is quite useless.

B. Second-strike countervalue capability: the capacity to absorb an all-out counterforce first strike and inflict unacceptable damage on the adversary's society in retaliation.
    This capability is easy to build, for reasons noted above in Section I.

C. First-strike counterforce: the capacity to launch a first strike that removes the adversary's capacity to inflict unacceptable damage on oneself in retaliation.
    This capability is very hard or impossible to build, for reasons noted above in Section I.

D. Second-strike counterforce capability: the capacity to absorb an all-out counterforce first strike and mount a counterforce counterattack that leaves the attacker's forces unable to inflict unacceptable further damage on one's own society.
    This capability is even harder to build than a first-strike counterforce capability.

These four capabilities can be displayed in a 2x2 table:

Striking what?

Striking When?	Values (cities)	Forces
First	#1 First Strike Countervalue Capability	#3 First Strike Counterforce Capability
Second	#2 Second Strike Countervalue Capability	#4 Second Strike Counterforce Capability

Past debates over US nuclear doctrine have focused on whether the US should be content with capability #2 (second strike countervalue capability) or should also strive for #3 (first strike counterforce capability).

III. FIVE NUCLEAR ORDERS: MAD AND ITS ALTERNATIVES

MAD may be a technical inevitability. However, hypothetical alternates to MAD include: BAD ("both are defended", a world of symmetrical city defenses); WORSE ("winning only requires striking early," a world of mutual first strike capabilities); MARNE ("mankind absolutely rejects nuclear explosives," a non-nuclear world); and USA ("Unilateral Superiority--American"), a world where the

U.S. is top dog--it has second-strike countervalue and first-strike counterforce capabilities against all other nuclear powers.

IV. THE POLITICAL EFFECTS OF THE NUCLEAR REVOLUTION IF STATES ARE CASUALTY-SENSITIVE, CLEAR-PERCEIVING, NOT HYPER-AGGRESSIVE, CANNOT TRANSFER NUCLEAR WEAPONS ANONYMOUSLY, CAN BUILD SECURE ARSENALS

Assume states have five attributes: (1) they are casualty-sensitive; (2) they do not value conquest unduly, e.g., they do not value it more than others value freedom; (3) their perceptions of their surroundings are fairly accurate--they have some capacity to assess their neighbors' capabilities, and to correctly anticipate how these neighbors will respond to their conduct; (4) they are unable to use or transfer nuclear weapons anonymously; (5) they have the industrial capacity to build large, secure arsenals. If so, the nuclear revolution has seven positive consequences:

A. First-strike advantages disappear, hence "crisis instability" and preemptive war also disappear. Flat-of-the-curve dynamics (see 'I D') erase first-strike payoffs. Even if a country can shift the force ratio in its favor by striking first, it merely moves itself and its enemy laterally on the flat of the curve. The relative ability to bounce rubble changes, but nothing else.

B. "Windows" of opportunity and vulnerability disappear, hence temptation to preventive war also disappears. See 'IV A': windows disappear for similar flat-of-the curve reasons.

C. Resources are less cumulative. Flat-of-the-curve dynamics diminish the additivity of resources; even large shifts in the control of industrial resources, or in control of advantageous geographic positions, won't move either power off the flat of the curve. Also, nuclear forces can be delivered over great distances, hence don't require proximity to function (so bases matter little.) (Though this was less true earlier, e.g., in 1962.)

D. Less false optimism. Nuclear weapons create very certain physical results, eliminating miscalculations of relative capability. They still leave room for miscalculations of relative will, however.

E. Defense-dominance, hence fewer wars for security and wars of opportunity. The nuclear revolution strengthens defender-states and weakens aggressor-states, since conflicts in a MAD world become to contests of will, and defenders nearly always win contests of will. Under MAD each side can harm the other without limit. Disputes are then settled in favor of the side that cares more about the issue, and hence is willing to run a greater risk or pay a higher price to prevail. Contests of will are nearly always won by defenders, since defenders value freedom more than aggressors value conquests. If so, conquest among great powers is impossible unless one power acquires a first-strike counterforce capability against the other. A first-strike counterforce capability is essentially unreachable between powers of remotely comparable resources, hence conquest is also impossible among them.

F. Limited war. Logic suggests that causes of war and intense war are similar; and if so, logic suggests that the nuclear revolution can (counter-intuitively) promote limited war, as well as less war.

G. Slower arms racing.

V. THE POLITICAL EFFECTS OF THE NUCLEAR REVOLUTION ON THE INTENSITY OF WAR IF STATES ARE NOT CASUALTY-SENSITIVE OR CLEAR-PERCEIVING, ARE HYPER-AGGRESSIVE, CAN TRANSFER NUCLEAR WEAPONS ANONYMOUSLY, & CANNOT BUILD SECURE ARSENALS

If we relax the five assumptions outlined at the front of in Section IV then the benefits of MAD evaporate and the dark face of MAD appears.

A. If the first four assumptions are relaxed, the benefits of the nuclear revolution are lost, even reversed. Defenders no longer have the clear upper hand. Moreover a new danger appears: states now must face the possibility of being physically destroyed (by a crazed, non-deterrable adversary) even if they cannot be conquered. This may impel them to take drastic steps if a nuclear-armed neighbor seems to be taking leave of its senses. If the crazed neighbor seems certain to attack eventually, killing hundreds of millions, a preemptive strike against it becomes sensible, even though the neighbor's retaliation will kill tens of millions. (In short, a "survival dilemma" arises, parallel to the "security dilemma." "The measures each state must take to ensure its physical survival threaten the physical survival of other states.") States also face the risk of anonymous use by rogue states or movements. Such rogues are less deterred because they can hope that their responsibility will not be discovered.

B. If the fifth assumption is relaxed, MAD itself may be frail, or may never develop. A first strike may be feasible by one or both sides. Hence MAD between superpowers can be good, but nuclear proliferation to small states can be bad.

Bottom line: nuclear weapons are Janus-faced. They cause peace or war, security or insecurity, depending on ... us! They pacify a world of states that are casualty-sensitive, fairly clear-perceiving, not hyper-aggressive, unable to use or transfer nuclear weapons anonymously, and able to build secure arsenals. If these conditions are relaxed the benefits of the nuclear revolution evaporate and a dark side appears; nuclear weapons themselves become a cause of war.

VI. NUCLEAR TRANSITIONS

MAD may be pacifying, but the road to MAD is dangerous. The transition to MAD opens windows; other states are tempted to strike emerging nuclear powers before they develop their forces, and newly-emerged nuclear powers are tempted to strike neighbors who are lagging in the race. (See, e.g., Israel's attack on Iraq's Osiraq nuclear reactor, 1981.)

Note: this suggests that nuclear disarmament would raise the danger of preventive war if that disarmament proved impermanent, and the disarmed states began a race back to nuclear capabilities.

VII. THE IMPACT OF NUCLEAR PROLIFERATION

Many who like the nuclear revolution, believing it has pacified relations among great powers, also fear the proliferation of nuclear weapons to more states. Two reasons are given:

A. New nuclear states may not meet the five conditions outlined above. Hence relations among them, and between them and the established nuclear powers, will be worsened by their acquisition of nuclear weapons. Examples offered: Saddam Hussein's crazed Iraqi regime; Iran under the Ayatollah and the Shia mullahs; North Korea under the Great Leader and Dear Leader.

B. As the number of nuclear states grows, so does the feasibility of anonymous use or transfer. Nuclear users can lose themselves in the crowd, erasing their victims' capacity to hold them accountable.

VIII. COMPARE FIVE WORLDS: WHICH IS BEST?

1. Few (5-10) nuclear powers.
2. Many (80-100) nuclear powers.
3. No nuclear powers, in a world of nuclear knowledge. (We would achieve this if today's nuclear powers disarmed.)
4. No nuclear powers, nuclear weapons are never invented and remain unknown. A now-impossible world still worth evaluating.
5. USA: The United States has a secure deterrent and a first-strike counterforce capability against the rest of the world.