IS DETERRENCE STABLE?

Confidence builders, arms controllers, congressmen, US military planners, and most US citizens share a common faith: the present US nuclear arsenal is more than enough to deter the Soviets from launching a nuclear first strike. After all, we can "destroy the Soviet Union at least ten times." Can't we?

The Star Wars Theory of Nuclear Weapons

Darth Vader pushed a button and blew up Princess Leia's planet Alderaan, just as a little demonstration of the power of the Death Star battle station.

The energy source for the battle station was not revealed. But nuclear fission or fusion couldn't have done the job -- the Star Wars Theory of Nuclear Weapons ("they're gonna push a button and blow up the world") notwithstanding. A little simple arithmetic shows why.

A airburst 1-megaton nuclear weapon subjects an area of 64 square miles to lethal overpressure (more than 5 psi). The land area of the Soviet Union is 8.6 million square miles. How many 1-megaton nuclear weapons would be needed to subject the entire Soviet Union to lethal blast? Dividing 8.6 million by 64 gives 134,000. That's not enough, because to level every square mile, the circular areas of destruction would have to overlap. But it's already more than 10 times as many warheads as are in the US arsenal.

Of course, most of the square miles in the Soviet Union are uninhabited. We could still kill all the people 10 or 30 or 40 times, couldn't we?

The overkill ratio is calculated by assuming that people would crowd together as densely as in Hiroshima and do nothing to protect themselves while every existing bomb is dropped on them. An equivalent assumption for chemical weapons is that everybody would cooperate and line up for an injection. Although mythical, the idea of overkill serves as an effective opiate, leading people to believe in a safety margin so large that it makes the calculus of deterrence irrelevant.

Deterrence Theory

The logic of deterrence is basically this: For country A to deter country B, country A has to have enough warheads left after a "counterforce" first strike to inflict an "unacceptable" number of casualties in a retaliatory "countervalue" strike.

Mathematicians can build models filled with differential equations, and arms controllers are reassured when "stability" is demonstrated. Various weapons can be evaluated in terms of their effect on stability. For example, at the recent Nuclear War and Peace Education Conference sponsored by George Mason University, the introduction of multiple warheads into a popular model was shown to convert a "stable " situation into an "unstable" one (D. Sulock, *When Is Stability Instability?*) Game theory can also be used as a model for deterrence. Of the various possible games, Steve J. Brams states that "Chicken" is the most suitable (*Superpower Games*, Yale University Press, 1985).

Arms race modeling poses the danger that people will take the results of simplistic though impressive equations too seriously. But it is does call attention to our assumptions, of which symmetry is the most important. In the model presented by Sulock, the parameters (counterforce effectiveness of missiles, countervalue effectiveness or casualties per missile, and the minimum unacceptable casualties) are assumed to be equal for the US and the USSR. And as Brams states, "the worst outcome for both players is equally bad (for example, nuclear war)." Is it?

Expected Casualties

A missile's ability to kill another missile depends on its accuracy and yield, and the hardness of the enemy's silos. The Soviet SS-18 force alone is capable of destroying 65 to 80% of the US ICBM force, with 1000 warheads still in reserve. About half of the SS-18 silos have been hardened since 1980 (*Soviet Military Power 1988*). Against 4,000 psi silos, two Minuteman warheads have a 70% kill probability. Against the latest Soviet 10,000 psi silos, Minuteman has a 0% kill probability (cf. 90% for the MX). In the past two years, the Soviets have deployed 140 SS-24 missiles (rail mobile, with ten warheads each), and 200 SS-25s (road mobile with single warheads). These powerful and accurate missiles are not targetable. They bring the inventory of Soviet first-strike-capable warheads to more than 8000, at least three for every US hardened (counterforce) target. For comparison, the US has one such warhead for every eight hardened Soviet targets.

Human casualties depend on population density and population protection measures; 200-psi blast shelters reduce the lethal blast area of a 1-megaton weapon to about 0.78 square mile, i.e. by a factor of 82. The proportion of Soviet citizens protected by such shelters is not known. About $200 billion has been invested in shelters, and in the late 1970s, Soviet civil defense literature started to change the emphasis from evacuation to in-place shelter. The proportion of US citizens protected in this way is close to 0%.

Does Deterrence Exist?

Given these asymmetries, deterrence at present may be only "existential," McGeorge Bundy's term for deterrence based on doubt. The outcome may hinge on the definition of what is "acceptable."

"Acceptable" Casualties

While conceding that civil defense might reduce the number of US casualties in a nuclear war, say to 20 million or so, Dr. Justin Frank (a psychiatrist with offices on "N as in Nuclear Winter" Street) declared that 20 million is "just unacceptable."

The "minimum unacceptable casualties" in the model for stable deterrence is assumed to be 40 million on each side.

"Unacceptable" is a word currently in vogue to express the strongest possible disapproval. What does it mean operationally?

To "accept" casualties doesn't mean to choose to have casualties or to approve of them. There is always a dilemma -- accept this, *or else*. If the casualties are "unacceptable," the "or else" must be preferable.

In the US, some preventable deaths are accepted. One premature death per week, due to the substitution of less safe methods of generating energy, was preferred to restarting the undamaged reactor at Three Mile Island. More than 1 million abortions per year are tolerated, because the cost of the alternative would include higher welfare expenditures and a few maternal deaths at the hands of incompetent operators. (There is controversy over when life begins; the operational definition here is that something is alive if it can be killed.)

Other preventable deaths are not accepted. Hypothetical future deaths due to nuclear power plant operation are so unacceptable that an expenditure of about $2 billion per life saved is mandated by law (*Physics and Society* 7/87).

In the context of nuclear war, what is the "or else"? Dr. Frank seems to mean "not starting the war." But what if the other side is starting the war? In that case, "or else" means surrender -- an option that is not without casualties. How many American deaths due to war would be acceptable in preference to surrender? Zero? One? One million? And how many due to accidental war or a surprise attack are acceptable in preference to having civil defense? One hundred million or more?

From the Soviet perspective, as from the American, the acceptability of a casualty appears to depend on the circumstances: *who* dies and *how*, and what is the "or else."

Death while defending the socialist Motherland is glorious and heroic, as first graders learn from picture books filled with goose-stepping soldiers. Protection of Communist Party officials warrants elaborate Führer bunkers. Essential workers are assigned to good blast shelters. Peasants are taught how to dig. Persons who foment ethnic strife (as in Soviet Georgia) are killed with gas or sharpened shovels. (The relative value scale for various nationalities was learned early by Vladimir Golyakhovsky, a Jew, author of *Russian Doctor*.)

So far, the Soviets have been deterred. Why?

Perhaps the US still has enough submarines that might escape detection to threaten an unacceptable portion of Soviet industry. Perhaps the prospect of losing 5% of the population is unacceptable, especially if some years of building improved defenses can reduce that proportion. Perhaps a bomber pilot *might* penetrate air defenses and drop a 10-megaton bomb directly on Gorbachev's shelter, causing the one unacceptable casualty. Or perhaps Gorbachev truly desires peace.

Theorists setting up the payoff matrix for paper-and-pencil games of "Chicken" really don't know.

Ominous Parallel?

"The German government is ready to agree to any limitation which leads to the abolition of the heaviest arms, especially suited for aggression... Germany declares herself ready to agree to any limitation whatsoever of the caliber of artillery, battleships, cruisers, and torpedo boats. In like manner, the German government is ready to agree to the limitation of tonnage for submarines, or to their complete abolition..."

> Adolf Hitler, speech to the Reichstag, May 21, 1935
> (five days after reintroducing universal military service
> in defiance of the Treaty of Versailles)
> -- from the Historical Archives of Fort Freedom

From the Assembly Lines

In addition to the ICBMS mentioned above, Soviet assembly lines have recently turned out:

382 SLBM warheads in one year (a 15% increase);

4,200 T-80 tanks in the first quarter of 1989 (47 per day cf. 9.5 per day in 1988);

7,700 combat aircraft in the past decade (cf. 3,600 for the US), including 260 fighters with look-down/shoot-down capability against bombers and cruise missiles.

Hitler-Stalin Accords Exhumed

The Baltic states of Lithuania, Latvia, and Estonia are seething over evidence that National Socialist Germany and the Soviet Union concluded secret agreements over the division of eastern Europe in September, 1939. Original internal files from the German embassy in Moscow record a cable from Ribbentrop to Hitler seeking advice on Stalin's demands to include two more Baltic ports in the protocol; Hitler agreed.

Moscow "can't find" the original copy of the protocol in its archives, and alleges that a German microfilm is a forgery. The document would cast doubt on the assertion that the Baltic states joined the Soviet Union of their own free will. Gorbachev has so far denied that the Red Army's push into the three republics was tantamount to an occupation, but has set up a panel to investigate (*Wall St J* 6/22/89).

Treaties

Charles: It's all very well for these big men with their armor that is too heavy for me, and their swords that I can hardly lift, and their muscle and their shouting and their bad tempers. They like fighting...; but I am quiet and sensible; and I don't want to kill people; I only want to be left alone to enjoy myself in my own way....I am not such a fool as I look. I have my eyes open; and I can tell you that one good treaty is worth ten good fights. These fighting fellows lose all on the treaties that they gain on the fights. If we can only have a treaty, the English are sure to have the worst of it, because they are better at fighting than at thinking.

Joan: If the English win, it is they that will make the treaty: and then God help poor France! Thou must fight, Charlie, whether thou will or no.

George Bernard Shaw, *Saint Joan*

CIVIL DEFENSE VIDEOS

Soviet Civil Defense

Little known in the West, Soviet civil defense constitutes an entire branch of the Soviet military and an important part of Soviet education, with mandatory civil defense courses beginning in the second grade. The Soviets have built a $200 billion shelter system, and spend $6 billion annually for maintaining and improving their program.

The tapes feature Dr. Leon Gouré, the leading American authority on Soviet civil defense, 15 actual Soviet civil defense training filmstrips for adult training, and 2 filmstrips prepared for use with fifth graders. English translations are given in the sound tracks.

___ Tape 1. Introduction and interview of Dr. Gouré (97 min)
___ Tape 2. Soviet training manuals, books, and journals, section 1 (86 minutes)
___ Tape 3. Journals, section 2, and Soviet training film: *Injury from Fallout Radiation Can Be Avoided* (81 min)
___ Tape 4. *Actions in the Face of Nuclear Attack -- the Main Point is Not to Panic; The Shelter -- a Dependable Means of Protection; What You Must Know About Nuclear Weapons; Learn How to Use Your Gas Mask; The Danger of Bacteriologic Weapons* (88 min)
___ Tape 5. *Blast Shelters, Fallout Shelters, and the Rules for Using Them (5th grade); Skillfully Respond to the Threat of Attack and to Warning Systems (5th grade); Protecting Livestock; Dealing with Public Utility Emergencies; Fallout Shelters and How to Build Them* (91 min)
___ Tape 6. *How to Counteract Chemical Contamination; Countering Pathogenic Bacteria; Fire Fighting; The Reception and Billeting of the Evacuating Population; If the Siren Sounds* (89 min)
___ Tape 7. Slide Presentation by Dr. Leon Gouré; *After Departing the Area of Destruction*; Soviet civil defense posters (92 min)
___ **Complete set $145.** (Individual tapes $29.50)

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Nuclear War Survival Skills

The book *Nuclear War Survival Skills* by Cresson Kearny, with over 400,000 copies in print, is the authoritative text on expedient survival during nuclear war. Acclaimed by nuclear defense experts throughout the world, the book should be in every American home and place of business.

In these videos, the field-tested instructions in *Nuclear War Survival Skills* are demonstrated by civil defense volunteers, with explanations by Cresson Kearny.

___ Part 1. Expedient Blast and Radiation Shelters (102 min)

___ Part 2. Shelter Ventilation and Various Other Survival Skills (including water purification, fireless cooking, preparing whole grains for cooking, and much more) (78 min)

___ Part 3. Home-makeable and Commercial Fallout Radiation Meters (117 min)

___ Part 4. Nuclear War Facts as Told to Teenagers (74 min)

___ **Complete set $95.** Individual tapes $29.50

___ *Nuclear War Survival Skills* (282 p. book) $10.50

Steel Shelter Design Tour

Dr. Arthur B. Robinson leads a 35-minute tour of a permanent steel blast and radiation shelter, constructed from a diesel fuel tank. Such shelters could save lives one-half mile from a groundburst and at Ground Zero of an airburst. They could be constructed for as little as $250 per person.

___ Steel Shelter Design Tour (35 min) $29.50

Emergency Medical Preparedness

In any disaster, including nuclear war, informed and prepared citizens could save lives. Dr. Jane Orient of Doctors for Disaster Preparedness discusses the prevention and treatment of illness and injuries.

___ Emergency Medical Presentation (91 min) $29.50

___ Facts About Nuclear War, as Explained to School Children $29.50

Tapes are in 1/2 inch VHS format. Beta tapes available for $32 each.