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from time to time calls attention to published material that might contribute toward clarification or understanding of issues affecting world peace. The accompanying reprints constitute Reprint Mailing No. 82.

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The following is an excerpt from the draft of a pastoral letter recently drawn up by a panel of bishops of the United Methodist Church, as quoted in the April 27, 1986 issue of The New York Times:

> "We have said a clear and unconditioned 'no' to nuclear war and to any use of nuclear weapons. We have concluded that nuclear deterrence is a position which cannot receive the church's blessing. We have stated our complete lack of confidence in proposed 'defenses' against nuclear attack and are convinced that the enormous cost of developing such defenses is one more witness to the obvious fact that the arms race is a social justice issue, not only a war and peace issue."

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STRATEGIC DEFENSE INITIATIVE
(SDI) ALIAS STAR WARS

March 1985

THE FOUR FACES OF STAR WARS: ANATOMY OF A DEBATE

One man can make a difference! When President Reagan announced, without any serious consultation with technical experts, that he proposed to change the basis of American post-war strategy from deterrence to defense, it seemed quixotic. Today, it seems only infeasible, expensive, and dangerous. But it has produced a body of argumentation and has, certainly, ignited the enthusiasm of the military-industrial complex as well as some mixed feelings in parts of the public.

The Star Wars program is defended on four different levels and, on each, it purports to do quite different things. Thus opponents are confronted with "four faces of Star Wars."

The First Face

DEFENSE OF U.S. POPULATION (Save the World from War): On this plane of discourse, the President and his defenders talk of "saving lives rather than avenging them", of "defense" rather than "retaliation", and invoke a higher morality to argue the desirability of the program.

To establish feasibility, they appeal to American faith in American technology ("putting a man on the moon"), deride the scientists themselves for having been wrong ("even Einstein thought there was no chance for nuclear energy"), and argue "Why not try?" as the clincher.

With regard to costs, they argue that the true costs will be known later when the deployment issue is really upon us and the issue can be resolved then. In the meantime, they are asking for $30 per year for each man, woman, and child to provide $75 billion to study the matter over ten years. (See pp. 10-11 for our estimate.)

On this level of argumentation, there is nothing "anti-Russian" and nothing relevant to the arms race or deterrence. The proponent ignores the existence of the U.S.-Soviet ABM Treaty, a treaty of indefinite duration, which precludes nationwide defenses. Or he alludes to it by charging that the Soviet Union has violated the Treaty (usually referring to the still-under-construction radar at Krasnoyarsk). Alternatively, or in addition, reference is made to the Soviet ABM system around Moscow (permitted by the ABM Treaty to have 100 interceptors) as if this site has some important strategic significance (in fact, 100 interceptors is not effective in a world with 10,000 strategic warheads at the ready). Or it is observed that the Soviet Union spends large sums for defenses. (This misleading observation arises from the massive Soviet expenditures on defenses against bombers—a strategic irrelevance in the absence of defenses against missiles and one which our bomber force has made more irrelevant by steadily countering it with various countermeasures.)

The opponents of this level of argumentation for Star Wars argue the primacy of offensive weapons in an era of nuclear weapons. Here is the President telling us that terrorist successes in Lebanon are inevitable despite the best efforts of U.S. security while advising the nation that 10,000 nuclear warheads in the hands of the Soviet Union can be defended against if only the scientists will try. Star Wars opponents consider it an axiom of life that destruction is easier than protection and that in a contest between equally able groups of scientists the advantage will lie with the ones seeking a deterrent.

Star Wars defenders talk about achieving "it"—the reliable effective defense at issue—as if there would be, thereafter, an end to technological history or the giving up of the Soviet Union of its end of an historic contest to maintain a deterrent. Opponents point to the fact that even when America had the equivalent of a Star Wars defense in the 1945-49 period (i.e., Russia had no atomic bomb and America did), America was unwilling or unable to end the contest (as in pre-emptive war). The Russians were able then, as they could now, to await their assimilation of whatever new technologies were at issue, after which the contest would break out again.

Can An Arms Race Be Won?

To this, Star Wars proponents sometimes speak as if they could "win" the arms race in some decisive way by seizing the high ground, e.g., by installing battle stations in orbit that would establish a kind of Pax Americana in which America would control the airways and spaceways forever. In this vein Edward Teller talks of a combination of free nations seizing the moon as well.

Opponents of Star Wars find it unrealistic to imagine that one superpower could get, and stay, so far ahead as to suffocate the other strategically. Why, for example, could not the weaker superpower shoot down the battle stations when it was ready to? Would we attack its battle stations when they were finally put up? In the struggle for the high ground would there not be simply more grounds for military incidents and even war than there had been before? Is it safe to try to "win" the arms race, or would it not be safer to go for a truce, some kind of freeze, or to permit and encourage the petering out of the contest by avoiding challenges to the deterrent of the other side?

Star Wars opponents recall that, beginning in 1963, a decade-long debate in the two superpowers was finally decided in favor of a treaty banning defensive weapons precisely because the defenses seemed unlikely to work and likely to stir up the arms race unnecessarily. That is, they would be strong enough to encourage the other side into building more missiles yet weak enough not to be relied upon in practice—providing the worst of both worlds.

Why, these opponents argue, is this not still true? An untested and complicated array of systems facing its first

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real test in a real war is unlikely to work effectively. And, in the meantime, its existence is—if post-war history is any judge—certain to produce reactions and countermeasures, some of which could be dangerous (new weapons multiplication of weapons, hair-trigger readiness of existing weapons, etc.).

Star Wars proponents rejoin that multiplication of weapons has occurred even after the ABM Treaty (e.g., counterforce capabilities such as high accuracy have encouraged multiplication of missiles anyway.) They argue that the offensive weapons treaty successes hoped for by anti-ABM arms controllers did not materialize (e.g., the U.S. refused to ratify the SALT II Treaty, though both sides respected those limits, and both sides continued to build up under the limits of those agreements, limits which were loose.) Star Wars opponents argue, in turn, that we should simply redouble our efforts to halt offensive weapon procurement and secure subsequent reductions and not add a new pressure against such treaties in the form of a major campaign to secure defenses.

The Second Face

DEFEND U.S. ICBMS (Strengthen Deterrence): Well before the debate over defending U.S. population gets as detailed as the above, Star Wars proponents normally move to arguing the desirability of "reliable" defenses as a way of "deterring" war. As Henry Kissinger put it, defenses could "add hugely" to deterrence.

This confuses observers, who ask why the adversary should be more deterred by the (chancy) prospect that America might shoot down his attack than by the highly certain and terrible prospect that America might fire nuclear weapons back in response.

In fact, what has happened is a shift in the debate from defense of population to defense of the deterrent. Here the main object of discussion is the 1,000 U.S. ICBMs (Minuteman missiles) that are now deemed vulnerable to attack from the 1,400 Soviet ICBMs.

This Administration has made much of this "window of vulnerability" which, it argued, arose from ICBM vulnerability to adversary ICBMs. Arms control supporters tend to minimize the significance of the (wholly predicted) vulnerability of one arm of our deterrent to an enemy force that must, perforce, destroy two other arms of the deterrent as well.

But the same school of thought that backs Star Wars felt differently. It argued that the Soviet Union might destroy our land-based missiles and then issue us an ultimatum that if the U.S. responded with attacks on the Soviet Union, it would attack again. In short, this school felt that an American President could be intimidated from retaliation even after thousands of Soviet warheads had landed in our Midwest in an effort to disarm us. So it wants this attack deterred further.

Now it had long been a U.S. technological option to seek to defend the U.S. ICBMs with a missile defense. This was always considered far more feasible than defending cities, for obvious reasons: the missiles were hardened and harder to destroy in the first place and, moreover, protecting only 10% of them would be a success whereas protecting even 90% of our cities might be deemed a failure!

The ABM Treaty prevented either side from using more than 100 interceptors in such an effort, and in time, the U.S. gave up any attempt at all to save money. But one fairly plausible way to imagine U.S. defenses being used is to site them in and around the ICBM fields in what is called "site" defense.

Such a deployment would certainly, from a technical point of view, "strengthen deterrence" by adding some defense of our weapons and by complicating any attack on them. But the ICBMs will, of course, soon represent only about 15% of our strategic force—not a major part—with bombers and nuclear-armed submarines making up the rest. The significance of defending them can therefore be argued and, as noted above, the notion of an attack on ICBMs alone was never very plausible.

Why not, however, do it anyway? Star Wars opponents worry that, once any kind of ABM system is built, the hundreds of corporations involved will campaign vigorously for more contracts and U.S. compliance with any ABM Treaty will be hard to maintain. They would prefer, therefore, other methods of strengthening deterrence (if it were necessary, e.g., Midgetman missiles or shifting to sea.)

They see defense of silos as a rerun, in reverse, of a movie they have seen before. The rationales for ABM, in the earlier debate, went from heavy (anti-Soviet) defense (1959-64), to light (anti-Chinese) defense (1964-69), to defense of missile silos (1969-70), to research and development only, and then to bargaining chip—after which the Treaty was ratified. Thus proponents see the site defense as a step toward a light and then a heavy defense as the debate unrolls in the opposite direction.

The Third Face

NEUTRALIZE SOVIET ICBMs (Channel the Arms Race): Soon after the President's March 23rd speech [illegible]ed of making nuclear weapons "obsolete", the issue among Administration experts became making Soviet ICBMs obsolete—a much more limited task excluding bombers, cruise missiles, tactical missiles, and other weapons of mass destruction delivered in other ways.

The alleged special significance of ICBMs was stressed: quicker to target than bombers and with high accuracy, they could be instruments of surprise attack (here the debate turned to the above threat to Minuteman).

But the underlying emotional readiness of the Administration to consider a defense against missiles alone was the primacy of ICBMs in the Soviet inventory. As so often happens, the Soviet Union had gone into mass production of a weapon only when the U.S. was ready with a more advanced one. While the U.S. was beginning to emphasize the modern cruise missile, the Soviet Union was deploying ICBMs in fixed and vulnerable silos to the tune of 75% of its force.

These same missiles included ones that were much larger than U.S. missiles—an issue about which much psychological and political debate had centered. Accordingly, neutralizing these missiles, or even forcing the Soviet Union to revamp or redeploy them, had some attractiveness to American hawks.

Thus proponents argue that a Star Wars defense might, at least, force the Soviet side into building many smaller missiles and deploying them at distant locations. This, they argue, would reduce the effectiveness of the Soviet ICBM force. (Opponents argue that the Soviet Union might just keep the old force and add a new force to it!) In fact, →

Soviet missiles are becoming vulnerable to direct attack from Trident II missiles on submarines in the early nineties. The possibility that, someday, they might be vulnerable to Star Wars attack immediately upon liftoff of their missiles is secondary.

A critical aspect of this Star Wars approach is the ability of the U.S. to "defend the defense". Obviously, if the Soviet Union could shoot out a corridor in the Star Wars defense in advance of firing these same missiles, the U.S. would not have achieved any change in the basic situation.

This rationale for Star Wars is not really well worked out. It gets its motivation from the somewhat obsessive attention focused on large Soviet ICBMs in America and the felt importance of doing something, anything, to break up this threat.

From the point of view of Star Wars opponents, the large Soviet missiles are not so much a threat as a liability; the U.S. can destroy as large a fraction of Soviet warheads as the Soviet Union can destroy of U.S. warheads, precisely because it can attack these heavy ICBMs with their ten warheads each, on which such a high percentage of Soviet warheads sit. In other words, the Soviet preponderance of firepower based on land ICBMs is simultaneously a source of strength and of weakness, depending on who strikes first. It is American policy to threaten such first strikes to deter Soviet conventional attacks on Europe. Accordingly, the Soviets have to see their present deployment as weakness.

The Fourth Face

BARGAINING CHIP: The last refuge of Star Wars supporters is the rationale that, after all, it seems to bother the Soviet Union and, accordingly, should be useful for bargaining. Supporters overlook the impropriety of threatening to abrogate a solemnly ratified treaty unless further concessions are provided. (Faced with this observation, they raise the question of Soviet cheating on the ABM Treaty by invoking the issue of a questionable Soviet radar.) It is also argued that the SALT I agreement on offensive weapons was passed as a companion to the ABM Treaty and that the lapsing of this limited-duration treaty on offensive weapons puts in question the legitimacy of the indefinite-duration ABM Treaty—said by Star Wars supporters to have been agreed only because of hopes for limits on offensive arms.

The bargaining chip argument implicitly rejects the Star Wars arguments that defenses are desirable and unprovocative. As a consequence, rather than undermine the general theme for Star Wars, the bargaining chip argument is asserted quietly. This posture is consistent, also, with the Washington view that a position or weapon put forward for bargaining purposes is, *ipso facto,* undermined in its bargaining value as compared with a position or weapon fully warranted for its own sake.

Star Wars opponents are least in disagreement with the bargaining chip rationale which, in principle at least, would produce reductions of nuclear weapons at the end of the road. And because the Washington political process resembles a school of fish, many feel obliged to salute at least this rationale if not the others.

The danger is that the bargaining chip, as so many have, develops a life of its own. The negotiations being always complicated, one obstacle or another prevents a successful bargain—leaving us with a program that we do not need or want.

The bargaining chip argument has an apples and oranges quality to it, in its original form, since it would seek to trade off U.S. compliance with an existing ABM treaty for unspecified reductions on the Soviet side, probably in heavy missiles. (Perhaps we would offer reductions also).

One potential cure for this, which has been argued by House Armed Services Committee Chairman Les Aspin, is to give up the notion of national defense, and to focus, for the bargaining chip, on the defense of missile sites only. This has the virtue of making the thing to be bargained away (the missile defense of missiles) relevant to the thing bargained for (the reduction in the Soviet threat to those missiles). Thus, the U.S. negotiators could, in this plan, ask for sufficient reduction in the Soviet land-based missile force to make a U.S. site defense of its missiles unnecessary. But this would require, in this age of accurate MIRV, enormous reductions of missiles on the Soviet side. (For example, if two accurate warheads on the Soviet side for each U.S. fixed silo were required to mount a threat to it, only 2,000 warheads would be necessary to threaten the 1,000 silos. Thus 200 missiles with ten warheads each or 300 missiles with seven warheads each would be required. The Soviet land-based force has 1400 missiles, of which 820 have multiple warheads of several to ten warheads. And any Soviet reduction to less than a few hundred MIRVed missiles would leave it with a smaller force than ours.)

The bargaining chip theory, like the other theories above, tends to overlook the undesirability, for our strategic forces, of letting the ABM Treaty go by the board. For the same reasons that the U.S. considered a ban on ABMs to be a fair deal by itself, the abrogation of the treaty tends to have negative effects on us. While Soviet technology for defensive systems is not likely to be as highly technological, it would be massive and its inefficiencies made up for by worst-case U.S. analysis. Thus tens of thousands of air defense missiles would be treated by U.S. analysts as fully effective in our analysis even though they might be unlikely to be effective at all. And the security of our sea-based missile force might be considered to be undermined, as would be the penetrability of the French and British deterrent, not to speak of the Chinese, by Soviet ballistic missile defenses.

Can a threat to cut off one's nose to spite one's face be an effective bargaining chip? Perhaps only if there is sufficient momentum behind the program to make it credible that it might go forward anyway. But, opponents argue, if the program has that much momentum, it may be hard to stop it if no bargain results.

One returns, here, to the basic problem America finds in its negotiating posture. As a democracy, one needs public support for the weapon system to be used as a bargaining chip but not so much that it cannot be bargained away. The 50-50 Senate vote on the ABM system that underlay the ABM Treaty was a splendid example. The tie vote was broken by the Vice President and gave the ABM system some momentum with which the Soviets had to cope. But, in the absence of the 50 Senators opposed to the system, there would never have been sufficient doubt about the program reaching deployment to put it on the bargaining agenda. Can a Star Wars program, for bargaining purposes, remain long on this narrow balance?

—Jeremy J. Stone

(Reprinted from NUCLEUS, Spring 1986. Vol.8, No.1)

WHAT FUTURE FOR US STRATEGIC NUCLEAR FORCES? (Union of Concerned Scientists)

The strategic modernization program now transforming each leg of the US nuclear triad is the subject of a new UCS report, In Search of Stability: An Assessment of New US Nuclear Forces. *The report analyzes four new US nuclear weapons systems now in development or early deployment: the "Midgetman" small intercontinental ballistic missile (SICBM); the Trident II, or D-5, submarine-launched ballistic missile (SLBM); the "Stealth" bomber; and the Tomahawk sea-launched cruise missile (SLCM). Current doctrine dictates that in order to deter, US nuclear weapons must be usable, and be seen to be usable, as weapons of war. This desire for credibility at all potential levels of nuclear combat has taken the form of a search for "options"—today, an almost single-minded emphasis on the targeting of Soviet nuclear capabilities. The result, say the authors, is to increase nuclear instability by feeding the forces that drive the arms race and those that create pressures for preemptive strikes during periods of crisis. Excerpts from the report are presented here.*

The shift to a more stable deterrent policy requires a change in the criteria guiding the acquisition of US strategic forces. This process can be summarized as a reordering of the priorities attached to four key properties of nuclear weapons: lethality, promptness, survivability, and verifiability. Specifically, the first two of these should be deemphasized in favor of the second two.

The nuclear warfighting strategy has led to an emphasis on those characteristics of weapons which most threaten stability. These are *lethality*, a combination of accuracy and yield which measures the capability of a weapon to destroy hardened targets such as missile silos and command posts; and *promptness*, a measure of the flight time of a weapon from launch to impact. In contrast, those qualities that contribute to deterrence stability and arms control are *survivability*, the ability of a weapon to survive an attack on it and reach its target; and *verifiability*, the ability of each superpower to locate, identify, and count the weapons of the other.

The current modernization of US strategic nuclear forces displays one dominant characteristic—the wholesale dedication of those forces to a hard-target counterforce role. The emphasis on increased lethality is evident across the board in US ballistic and cruise missiles being readied for deployment in the late 1980s and 1990s. This conversion, if current programs go forward as planned, will produce a dramatic increase in the vulnerability of Soviet nuclear forces and command and control systems to American attack.

The number of US prompt hard-target ballistic missile warheads would grow from about 1000 (on the most advanced Minuteman III missiles) to around 6000 with the addition of the MX, SICBM, and D-5 missiles to US forces. All the new missiles will have much greater lethality than Minuteman, giving the United States a high theoretical probability of being able to destroy Soviet ICBM silos with two-on-one targeting. The US will thus have the capability (again, in theory) to destroy virtually all 1400 Soviet ICBM silos as well as hundreds of hardened command posts, while still holding in reserve a substantial force of ballistic missiles in addition to the vast destructive power of US cruise missile and bomber weapons.

This is not to say that the United States will acquire a first-strike capability. The actual outcome of a countersilo strike is extremely speculative and uncertain, despite the seeming precision of lethality calculations. In addition, even a completely successful US attack against land-based missiles would leave the Soviet Union with other surviving retaliatory forces. Nevertheless, the perception that land-based forces are excessively vulnerable can be an important source of political tension and suspicion between the superpowers—as demonstrated by US concern about the "window of vulnerability" since the late 1970s. During a serious crisis, this perception could significantly increase pressures to launch nuclear weapons.

It can of course be argued that the United States is simply catching up to the Soviet Union in the ability to threaten hard targets. The Soviets, after all, have several thousand hard-target ICBM warheads (though these are considerably less lethal than the new US forces) and theoretically already hold US silos at risk. However, the impact of US strategic modernization will be to confront the Soviets with a "window of vulnerability" far more severe than the one that has preoccupied the United States. Land-based missiles account for about two-thirds of Soviet strategic warheads, as compared with about one-fifth for the United States. In addition, Soviet ballistic missile submarines and strategic bombers are kept at much lower states of alert—and are therefore much more vulnerable—than their US counterparts. These asymmetries in US and Soviet nuclear forces mean that parity in counterforce capabilities translates in practice into a very large advantage for the United States. But this "advantage" is illusory: Instead of conferring strategic benefits or adding to deterrence, it only increases American nuclear risks by strengthening the already dangerous Soviet doctrinal emphasis on massive preemption if war appears imminent.

While the US counterforce trend is displayed most dramatically in the new ballistic missiles, high lethality is also a quality of US cruise missiles and bomber weapons by virtue of their precise accuracy. Because these weapons lack the promptness of ICBMs and SLBMs, they are less plausible for preemptive strikes and do not place quite the same destabilizing pressures on the Soviet Union as do hard-target ballistic missiles. Still, the low-altitude flight trajectory of cruise missiles and the development of stealth technologies will increasingly give these weapons an equivalent of promptness by cutting the warning time available to the Soviet Union following detection. On these grounds, the Soviets have some justification for rejecting the American contention that "slow-flying" cruise and bomber weapons are inherently retaliatory and destabilizing.

With respect to survivability, the trend of US forces is mixed but generally in the direction of reduced vulnerability. The Midgetman represents an explicit attempt to lower the vulnerability of the ICBM leg of the US triad through mobile basing. However, the survivability of the missile in its projected hard-mobile launcher deployment depends on constraints on Soviet nuclear forces sufficient to prevent barrage attacks of Midgetman deployment areas. US SLBMs on patrol, already highly invulnerable, are becoming more so with the deployment of the quieter and wider-ranging Trident submarines. On the other hand, the planned reduction in numbers of ballistic missile submarines would make the force as a whole more vulnerable should there be a Soviet breakthrough in antisubmarine warfare. In both the Midgetman and the Trident D-5 programs, survivability—in the form of greater mobility and range—has been subordinated at the margin to lethality by using payload to optimize accuracy and yield.

"The guiding principle is that US action should be directed at alleviating American vulnerability without adding to that of the Soviet Union."

Cruise missiles and the Stealth bomber would make for an overall increase in the survivability of US nuclear forces. Except in the case of SLCMs, this gain is primarily in post-launch survivability, and results from improved capabilities to penetrate Soviet air defenses. SLCMs, deployed on diverse surface ships and submarines, would in the aggregate be highly survivable and virtually impossible to destroy en masse in a preemptive attack. However, this survivability will be bought at a high price in nuclear stability and arms control verification.

The trend in verifiability, finally, is largely negative—the reverse side of the trend toward more diverse and less easily targeted nuclear delivery systems. The two most significant developments here are mobile ICBMs and cruise missiles, and deployment of these systems on a wide scale could seriously prejudice the future prospects for arms control. Of the two, cruise missiles are the more ominous for verification because of their small size, multiplicity of potential launch platforms, and dual nuclear/conventional capabilities. While less absolutely verifiable than fixed ICBMs, mobile ICBMs should be as easily monitored as strategic bombers (which have been confidently controlled in past arms control agreements) given certain cooperative groundrules such as confinement to designated deployment areas. In addition, the possible verification penalty associated with mobile ICBMs should be weighed against the potential gain in stability due to reduced ICBM vulnerability.

■ ■

In place of the current pursuit of counterforce advantages, US strategic programs should be directed toward alleviating American vulnerabilities without adding to those of the Soviet Union. Application of this principle would reduce both the capability and the incentive of the Soviet Union to attack the United States preemptively in a crisis, and would thus directly address the greatest single source of American nuclear insecurity. Other US priorities should be to reverse the trend toward short-warning-time decapitation weapons and the erosion of the firebreak between conventional and nuclear conflict.

Our analysis leads to the following conclusions and recommendations:

The Midgetman single-warhead ICBM is a potentially promising way of reducing the vulnerability of US land-based missiles. Suitably dispersed on government lands, such a missile could be destroyed only by a barrage attack involving a high fraction of Soviet nuclear warheads—although its long-term survivability requires constraints on the future growth and qualitative improvement of Soviet forces. Mutual deployment of such missiles, in concert with continued adherence to the SALT II limits on launchers and a ban on new multiple-warhead ICBMs, could help reinforce the confidence of each superpower in the survivability of its retaliatory forces. Deterrence would be enhanced and crisis stability strengthened.

The Trident II missile will transform the undersea leg of the American triad from a non-provocative deterrent to a force of almost 4000 hard-target warheads. This capability is unnecessary for a retaliatory force, particularly since the Trident submarines now being deployed are already equipped with the highly modern Trident I missiles. Deployment of the Trident II missiles could significantly aggravate Soviet pressures to "use or lose" nuclear forces during a crisis. In addition, Soviet deployment of a comparable SLBM would increase US vulnerability by making possible a simultaneous short-warning-time attack on American ICBMs and bombers. The United States should pursue arms control restrictions on hard-target SLBMs. The Trident II program could be deferred or capped at deployment levels below those currently planned without jeopardizing US security.

Sea-launched cruise missiles represent a serious future threat to nuclear stability. The diverse war-fighting roles prescribed for SLCMs, combined with their dual capability, will weaken the firebreak between conventional and nuclear conflict and increase the risks of escalation in regional conflicts and superpower crises. The US SLCM program should be reassessed with a view to constraining these weapons before large-scale and unverifiable deployments by both superpowers undermine the chances of controlling them.

The strategic bomber is in general a stabilizing retaliatory weapon, assuming adequate penetration of Soviet air defenses and survivability against pre-launch attack can be assured. The merits of proceeding with the Stealth bomber rest on cost-effectiveness considerations and on the plausibility of the missions envisioned for it during a nuclear conflict. Both issues need close scrutiny, especially in view of the high cost of this program.

While this report does not directly address the issue of strategic defense, a basic premise is that the ABM Treaty is critical to any transition toward a more prudent US policy on offensive nuclear forces. Erosion of the treaty's restrictions on defensive systems would aggravate existing destabilizing trends, creating new concerns about the adequacy of retaliatory forces and new pressures for offensive buildups. ■

In Search of Stability: An Assessment of New US Nuclear Forces, by UCS analysts Peter Clausen, Allan Krass, and Robert Zirkle, is available from UCS (see p. 7).

Viewpoint

(Reprinted from NUCLEUS, Spring 1986, Vol.8, No.1.)

After the space shuttle *Challenger* exploded in flight in January, and the shock and sadness had abated, we naturally thought about what this catastrophic accident means for US military space programs.

There is the obvious message: technology is fallible—that even after twenty-four flights, and countless hours of engineering effort, testing, and simulations, this spacecraft could fail so spectacularly.

NASA's solid safety record and the glamour of putting Americans into space had made the shuttle one of the nation's most inspiring and remarkable programs. But the shuttle program has always had its share of problems—cost overruns, schedule delays, and dissatisfied customers have pestered the shuttle's managers all along. Critics have also raised the possibility that an unstaffed vehicle could accomplish the same missions at much less cost and risk.

We often hear about military programs that are hobbled by massive bureaucracy, "routine" cost overruns, contractor fraud, and sheer wastefulness. That the shuttle, as part of the quasi-military organization that NASA has increasingly become, was similarly victimized should come as no surprise.

More pointed lessons can be drawn from the tragedy. The Strategic Defense Initiative, which will be many times more complex than the shuttle, is the most directly tainted of all related programs. The technological demands, particularly the lack of a suitable way to test the overall reliability of the SDI system, are such that no military commander is likely to have much faith in space-based missile defense. Computer software errors, for example, were common on earlier shuttle flights, despite the relative simplicity of the codes and the many opportunities to "debug"; it will not be possible to test the SDI's much more complex software as assuredly, if at all.

Questions must arise about how thousands of Star Wars satellites can efficiently be boosted into outer space if the shuttle program could not achieve complete reliability. Indeed, some near-term SDI tests will be delayed as a result of the disaster. The questions about the shuttle program's management raised by the president's investigative commission are also troubling. There can be little doubt that the rush to get the politically charged Strategic Defense Initiative off and running could create similar pressures, inhibiting reasoned analysis and careful decision-making.

With the explosion of the *Challenger* and the unraveling of the accident's causes, many Americans' unquestioning faith in space technology and the government's use of it has begun to unravel as well. It is time to pause and reflect on the best ways for the United States to explore and exploit the space frontier.

FRONTIERS
From MANAS , May 28, 1986, pp. 6-7
RELIGION SCIENCE EDUCATION

The Uses of "Truth"

EXCAVATING in our files, in the hope of reducing them, we came across a copy of a chapter in a book, *International Conflict and Behavioral Science* (Basic Books, 1964), titled "The Truth Is Not Enough" by Dr. Lester Grinspoon, a psychiatrist. After reading it we decided that it calls for treatment in Frontiers, for the reason that the author takes note of a reality in our lives that is always potentially present, does not really depend upon events, although it does not come into evidence except under the pressure of threatening events. Dr. Grinspoon begins his discussion:

> It has been said that the truth is a scarce commodity, and yet the supply always exceeds the demand. As nearly as we can determine, the truth about the state of the world is that the very existence of a whole civilization, and perhaps more, is threatened. Yet, it does not appear that most people, including decision-makers and the public, have wholly grasped this fact. If they believed that their lives and those of their loved ones were threatened, we would expect them to be seething with concern and activity.

What, then, will explain why so many people turn away from the massive reality of the threat of nuclear war? The importance of understanding this, the author says, lies in the fact that if those who warn against war wish to be effective, they need to understand why warnings are ignored. The answer, he says, is that the truth about so vast a disaster as a nuclear war is simply unacceptable.

> People cannot risk being overwhelmed by the anxiety which might accompany a full cognitive and affective grasp of the present world situation and its implications for the future. It serves a man no useful purpose to accept this truth if doing so leads only to very disquieting feelings—feelings which interfere with his capacity to be productive, to enjoy life, and to maintain his mental equilibrium.

This article is mainly an account of the ways people find to set aside what they feel might turn out to be unbearable truth. The ways are various, and one of the most important is simple denial—the threat is not there, it doesn't exist. Another way is to isolate oneself from hearing about it, or not listening when you do. Another is what the psychiatrists call displacement—you think of a threat that is more manageable and campaign against that. This gets complicated since people may use the excitement of opposing nuclear war to displace some even more immediately threatening inner psychological struggle. Then, finally, there is the solution of "rationalization" in which you say, "It's so terrible it'll never be used," or "The president will never let it happen," or, more fatalistically, "Perhaps it's God's will."

What brought home to Dr. Grinspoon the reality of these avoidances of the issue was the response he and a colleague obtained from an article they wrote for the *New Republic* in 1961. The article laid out the possibility of nuclear war in no uncertain terms. The writers received thirty-eight letters in reply. Thirteen replies offered some constructive suggestion, but twenty-one "were anything but constructive." One said, "There is nothing I can do about it." Another asked where to buy a suicide kit. Fifteen writers were planning how to leave the country for what they hoped would be a safer place, and one wondered about where to go. Reflecting on this experience, the psychiatrist came to an interesting conclusion:

> Those who would have others know "the truth" must take into account what "the truth" would mean to them and how they would respond to it. The truth is relative in interpersonal affairs; it has meaning only in relation to people, and this meaning is often difficult to anticipate. The messenger of "truth" bears part of the responsibility for the results of his effort. Doing good can be initiated unilaterally, but it must be evaluated according to the total consequences. The responsible "do-gooder" will consider this in advance.
>
> What happens when people's means of keeping facts at bay have been suddenly destroyed? For a while they may suffer anxious, depressed feelings, feelings which may be incapacitating. For some these feelings may precipitate serious mental illness. However, most will either reconstitute their defense mechanisms, much as a self-sealing tire seals over after a puncture, or they will embrace some anxiety-relieving activity which they believe is capable of altering the unacceptable facts. Perhaps what most commonly takes place is a mixture of restitution of old defenses and adoption of new ideas and activities. New activities may be primarily intellectual or largely action-oriented. While they may be helpful and adaptive as far as the individual is concerned, they may be adaptive or maladaptive with regard to the development of a peaceful world.

How is it that so many highly intelligent people can take part in plans for making nuclear war without being upset by such an occupation? (See, for example, the article, "The Authorized Version" by Tina Rosenberg in the February *Atlantic*, on how the "Strategic Defense Initiative"—the Star Wars plan—came to be adopted by the present administration in Washington.) Dr. Grinspoon quotes from Archibald MacLeish for a reply to this question:

> He says:
>
> ". . . knowledge without feeling is not knowledge, and can only lead to public irresponsibility and indifference, conceivably to ruin. . . . [When] the fact is dissociated from the feel of the fact . . . that people, that civilization is in danger."
>
> MacLeish is speaking of isolation, another mechanism men use to defend themselves against feelings which may be painful. When a man can acknowledge the fact that a continued arms race could lead to a nuclear war—which might mean death for himself, his family, and millions of his countrymen—without experiencing any more effect than he would when contemplating the effects of DDT on a population of fruit flies, then he is probably making use of the defense of isolation. People can speak quite facilely about death resulting from nuclear war because they are speaking of death as something quite apart (isolated) from the feelings associated with the concept of total annihilation. It becomes an abstraction, something which has no real connection with themselves.

What then should the eager persuaders do, who want to organize the sensible portion of the world to take steps that would make nuclear war less possible? Would they, can they, will they consider the prospect of such a war without an appeal to fear? It seems unlikely.

The following is quoted from the Rocky Mountain Institute's NEWSLETTER of May 6, 1986:

Reflections on the Chernobyl Inevitability

The tragedy at Chernobyl was not a surprise. The release of roughly 2,000 Hiroshima bombs' worth of fallout from a nuclear meltdown was just the kind of event we've long sought to prevent. A broadly similar accident could occur in any U.S. reactor, with or without containments—which are meant to contain small accidents, not big ones. Such a major release could also be deliberately *caused* by a simple act of terrorism. Interestingly, reactors of the Chernobyl type were previously considered inherently safer than light-water reactors, and incapable of exploding.

We should not let the accident pass without two lessons. First, any technology in which "No acts of God can be permitted" is unsafe in the hands of fallible people and imperfect institutions. Second, we do not now and never have faced the choice between nuclear risk and freezing in the dark. As RMI has long pointed out, nuclear power is neither necessary nor economic. RMI has always emphasized that it's cheaper to save electricity than to make it, even if constructing and decommissioning nuclear plants were *free*. Least-cost energy policy is the simplest way for any nation to avoid another reminder that we all live near Chernobyl.

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