

Theater Ballistic Missile Defense and US Contingency Operations

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“As is clear from the . . . crisis in Iraq, the growing sophistication of missile arsenals in countries that may be willing to risk attacking US forces can complicate decisions about whether and when to intervene in regional conflicts. The arsenals have already prompted concern about the safety of Western military installations and forces overseas.”¹

—Janne E. Nolan
Brookings Institution

The coalition war against Iraq in early 1991 marked the first time that theater ballistic missiles were fired at US forces engaged in a contingency operation. The threat of theater ballistic missiles (we’ll refer to them as TBMs) to US contingency operations is, however, almost certain to grow in the future.

During the 43-day war, Iraq fired a total of 86 Scud or modified Scud ballistic missiles at targets in Saudi Arabia and Israel. They had negligible military impact and, with one exception (the successful attack on a US military barracks near Dhahran), inflicted little damage and loss of life.

The ineffectiveness of the Iraqi Scuds during the war was attributable to at least four factors. First, the missiles themselves were relatively primitive. They were inaccurate, incapable of maneuvering in flight, lacked decoys, and carried small conventional (and, in desperation, even cement) warheads. Second, they were fired singly or in twos or threes rather than in barrage, which simplified available defenses against them. Third, the US Patriot PAC-2 anti-TBM proved capable of intercepting and destroying many Scuds. Fourth,

Saddam continued to “hit us where we (the Patriots) were.” He could have targeted locations, especially in Israel and Turkey, where no Patriots were deployed.

Iraq’s use of Scuds, though having no influence on the war’s outcome, initially endangered the political cohesion of the coalition by encouraging possible Israeli intervention in the conflict. The Scud threat also compelled diversion of a sizable number of coalition air sorties toward their detection and destruction; this diversion, coupled with some bad weather, delayed the launching of offensive ground operations by at least six days.² The United States and its allies were nonetheless lucky to be dealing with what technologically amounted to little more than souped-up versions of the old V-2 German rocket of World War II. Had the Iraqis possessed more advanced missiles, and had they mounted chemical or biological—to say nothing of atomic—warheads on them, coalition casualties and perhaps even the outcome of the war itself might have been different.

Indeed, the war against Iraq signals a turning point in the traditional technological milieu of US military operations in Third World regional contingencies. Given the experience with Iraqi Scuds as well as the continuing proliferation in the Third World of ballistic missile technologies (and munitions of mass destruction),³ future US contingency operations must be prepared to deal with the threat of ballistic missile attacks not only upon in-theater US military forces and installations as well as civilian population centers of countries hosting US forces, but also upon allies and US bases in allied countries outside the immediate war zone. This means that US power projection forces must be endowed with a capacity to deter such attacks, and should deterrence fail, to defeat them. As House Armed Services Committee Chairman Les Aspin recently observed of the Gulf War,

Saddam Hussein and his Scuds should teach us two lessons about theater defenses. First, we are increasingly likely to face adversaries who are not deterred by the possibility of terrible retaliation. Saddam wasn’t. He used his Scuds anyway. This is an important lesson. Second, although no Third World country can hit the United States with a missile today, short-range missiles abound. Theater defenses against these missiles are needed to protect our own forces and allies.⁴

The Threat

The Third World ballistic missile threat is pervasive and growing. The recent war and the terms of the US-imposed cease-fire will deprive Iraq of both TBMs and weapons of mass destruction for the foreseeable future. But at least 15 other Third World countries now have or are trying to acquire ballistic missile capability. Libya, Syria, India, North Korea, and Pakistan are also known to have, or to be pursuing, a nuclear weapons capability—as was Iraq before the recent Persian Gulf War.

Third World missiles already threaten such US allies as Israel, Egypt, Turkey, and South Korea, as well as US military installations in Turkey and southern Europe. Saddam Hussein *could* have fired Scuds at the US air base at Incirlik, Turkey; in April 1986, following punitive US air strikes against Libya, Gadhafi *did* launch two Scuds at a US facility on Lampedusa, an island off the coast of Italy.

For the time being, the TBM threat is limited largely to short-range, Scud-type missiles. A preview of capabilities to come, however, is already on the scene. For example, in addition to the Chinese 1600-mile-range CSS-2, India is testing the 1500-mile-range Agni missile, which has the range to hit Diego Garcia and targets deep in China. China is also reportedly marketing its 180-mile M-11 missile to Pakistan (complete with mobile launchers) and its 375-mile-range M-9 missile to Syria and possibly to Iran.⁵ Strategic Defense Initiative Organization Director Henry F. Cooper also estimates that by the year 2000, at least six countries in the Third World will have ballistic missiles with ranges of 1800 to 3300 miles.⁶

Especially important, these longer-range missiles may soon be armed with nuclear warheads. Recent UN inspections of Iraqi research facilities have shown conclusively that Iraq was pursuing both a biological and a nuclear weapon production capability. It is likely that Saddam Hussein is still bent on developing such weapons. India, Pakistan, Israel, South Africa, and North Korea are also suspected of having nuclear weapon development projects. US intelligence sources reportedly believe the Chinese are secretly building a nuclear reactor for Algeria capable of producing plutonium for nuclear weapons, and that China has supplied Pakistan the complete design of a tested nuclear weapon with a yield of about 25 kilotons.⁷

There does not, moreover, appear to be much hope for arms control solutions to proliferation. The weaponry and munitions of the Iraqi army on the eve of Operation Desert Storm stand as testimony to the ineffectiveness of national and international controls on the transfer of TBM and mass-destruction

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weapon technologies to Third World countries having the money and determination to acquire them. The Missile Technology Control Regime (MTCR) established in 1987 by the United States, Canada, France, Germany, Italy, Japan, and Great Britain has retarded ballistic missile proliferation, but China and North Korea are not party to the MTCR. Indeed, the MTCR may have actually accelerated cooperation among governments seeking ballistic missile capability. For example, in the late 1980s, Iraq, Argentina, and Egypt were jointly developing the 480-mile Condor 2 missile. (The program subsequently fell apart because of the Persian Gulf War, Egypt's withdrawal for reasons of cost, and Argentina's abandonment of it under strong US pressure.)⁸

Diplomacy certainly has an important role to play in limiting and retarding the proliferation of ballistic missiles and weapons of mass destruction. But the main deficiency of the MTCR is that it addresses only the "supply side" of the problem; it does nothing to reduce demand. Third World demand for TBMs stems from a variety of motives, including legitimate defense considerations and desire for national prestige. TBMs also offer a relatively cheap substitute for manned bomber forces and, given the proliferation of sophisticated air defenses, a higher probability of reaching their targets and causing at least some damage, even if the targets are defended by anti-TBM systems such as Patriot. Nor does the MTCR contain any enforcement mechanisms. There are no sanctions for violating the regime, and some US allies have been less than scrupulous in enforcing it. Senator John McCain has concluded that the "magnitude of [ballistic missile proliferation] compels us to be frank about the MTCR. It is . . . a nearly toothless agreement."⁹

Policy Dilemmas and Choices

The expanding TBM threat to future US interests, allies, and contingency operations poses major policy dilemmas for the United States. Until the war against Iraq the United States firmly abjured preventive military actions against hostile countries known to be seeking TBM, chemical, and nuclear capability. In late 1988 and early 1989, the Reagan and Bush Administrations even refrained from attacking the huge chemical munitions facility nearing completion near Rabta, Libya, despite the fanatical, overtly hostile, and unbalanced character of the Gadhafi regime.

However, during the war against Iraq, which was waged on behalf of Kuwait's liberation, the United States took advantage of hostilities to attack Iraq's chemical munitions facilities, nascent nuclear weapons capacity, and TBM production sites, even though few of those targets had a direct bearing on Iraq's ability to defend its occupation of Kuwait. In effect, the United States, under cover of a war fought ostensibly for other objectives, undertook a military action, like the 1981 Israeli strike on Iraq's Osirak nuclear reactor, aimed at denying Iraq certain kinds of weapons in the future.

All of this raises the question of whether the United States (and other like-minded countries) should adopt a policy of preventive armed response to forestall the proliferation of TBMs and other dangerous military capabilities, at least among monster regimes and outlaw states. The United States has always rejected the doctrine of preventive war; at a minimum, strong domestic and international political criticism would attach itself to preventive military actions undertaken by the world's only remaining superpower against "helpless" Third World states. On the other hand, not until recently has the civilized world confronted the highly dangerous phenomenon of politically maniacal regimes armed with weapons of mass destruction and ballistic missiles to deliver them.

An alternative to preventive action would be preemptive action: to await a military confrontation or crisis but to strike first in an attempt to disarm the enemy. This was, in effect, what the United States did in attacking Iraq on 17 January 1991. The main drawback of preemption is, of course, the likelihood that the enemy has already produced and fielded TBMs and weapons of mass destruction, as had Iraq. Denying an opponent an ability to acquire proscribed weapons is a militarily less exacting task than trying to eliminate weapons already deployed.

Preemptive strikes also risk higher levels of collateral damage than preventive ones, especially against enemies like Iraq which have no compunction about using their own civilian population to shield valuable military assets—although this dilemma may be lessened (as it was in Desert Storm) by the emergence of brilliant precision weapons. Strikes on already functioning nuclear reactors and chemical munition production facilities also entail risks of catastrophic collateral damage. Though both the Israeli attack on Osirak and Desert Storm strikes on other Iraqi nuclear facilities have demonstrated the possibility of taking out nascent nuclear weapon capabilities without unleashing radioactive debris in the environment, the possibility of a misdirected bomb (producing a Chernobyl) can never be discounted. In any event, preemption is likely to be only partially effective, even in the best of circumstances. If the enemy is alerted, or very cautious, he will normally disperse or conceal his assets so that the effectiveness of preemption is reduced.

Another, if more traditional, policy option would be deterrence based on the threat of retaliation. The problem here is: retaliation with what? The moral and political onus attached to a US use of either nuclear or chemical weapons against even the most despicable Third World state probably precludes them ever being used even in retaliation for a strike in kind against US military forces; during both Desert Shield and Desert Storm the United States made it clear that, come what may, it would not resort to chemical or nuclear weapons. Moreover, assuming the continuing obedience of US military doctrine to the principled avoidance of inflicting unnecessary damage on enemy civilian populations, and given the revolution now unfolding in the delivery

of brilliant conventional munitions, it is far from clear that chemical or nuclear retaliation would afford any practical military advantages over conventional responses, and certainly none that would outweigh the countervailing political negatives of their use.

There is, too, the fact that successful deterrence is predicated upon an assumption of prudent rationality on the part of the object of deterrence. Unfortunately, this assumption cannot be taken for granted with respect to the likes of a Moammar Gadhafi, Ayatollah Khomeini, Idi Amin, Pol Pot, Kim Il Sung, or Saddam Hussein. In the case of Iraq, US threats (implicit and explicit) to expand its war aims—e.g. to take Baghdad or try Saddam as a war criminal—may have deterred him from using his chemical TBM warheads.¹⁰ But there is no guarantee that this type of escalatory threat will deter a similar aggressor in the future.

Nevertheless, it is probably safe to conclude that deterrence of even crazy Third World regimes was significantly reinforced by the stunning display of US military power against Iraq. Most TBM-seeking countries are, like pre-Desert Storm Iraq, relatively well developed. They have large and valued—and vulnerable—economic infrastructures, while lacking any effective capacity to defend them against the kind of massive, sophisticated air campaign visited on Iraq by Desert Storm. The threat of such an air assault will be implicit in any future US confrontation with a relatively developed Third World state. This threat may not deter war or the use of conventionally armed missiles. However, it might be possible to use the threat of a less restrained air campaign, or attacks specifically directed against the aggressor's leadership, to deter employment of TBM-delivered munitions of mass destruction. As a note of caution, however, another air campaign of Desert Storm's magnitude would, of course, require weeks if not months of preparations, as well as access to a robust network of in-theater air bases, which might not be available. Moreover, the example of Desert Storm provides no foolproof deterrence; future US adversaries in the Third World are drawing their own lessons from the recent war against Iraq, and the advantages the United States enjoyed in Desert Storm—such as several months for deployment uninterrupted by enemy action—may not be available in other contingencies.

In sum, policies of prevention, preemption, or deterrence offer no firm protection against the emerging TBM threat to US military forces engaged in contingency operations in the Third World. Neither Iran nor Iraq was deterred from launching as many as 870 TBMs against each other during their eight-year war; nor did a war against virtually the entire rest of the world deter Saddam Hussein from shooting as many Scuds as he could against Saudi Arabia and Israel. A policy of crisis preemption against already-deployed TBMs provides no guarantee of their complete eradication—witness initial US underestimation of the number of mobile Iraqi Scud launchers and the subsequent difficulties

encountered in locating and destroying them. Nor could an avowed and implemented policy of prevention, even assuming its domestic and international political acceptability, provide foolproof guarantees; repeated heavy British aerial bombardment of Peenemünde during World War II disrupted, but did not forestall, German development, production, and use of thousands of deadly V-1 and V-2 missiles. Moreover, preventive military action is not a one-time enterprise; the Israeli strike on Osirak set back, but did not forever eliminate, Iraq's progress toward developing a nuclear weapon capability; Iraq's nuclear facilities had to be revisited by US air power ten years later, and it is still not certain that coalition forces and the UN inspection teams were successful in destroying all of Iraq's nuclear materials.

Indeed, one lesson that Saddam and other Third World dictators will probably draw from Desert Storm is the importance of having nuclear weapons. A second lesson that Third World planners will likely draw from the Gulf War is that ballistic missiles are indispensable components of their military forces. While Saddam's TBMs had little direct military impact on the campaign (in part because they were employed with so little skill), they achieved a significant political impact, nearly bringing Israel into the war—an event which would have had dire consequences for the solidarity of the coalition. As a result, the great Scud hunt became a military obsession for the coalition, diverting an enormous number of allied air sorties from other missions. And, despite this unprecedented air and ground effort, as well as total coalition air supremacy, Saddam's mobile Scuds proved highly survivable (unlike his air force).

The TBM Defense Challenge

There will be no substitute for providing US military forces direct, active protection from TBM attacks. But ballistic missile defenses in contingency operations will have to defend more than the forces themselves. Four categories of assets will have to be protected: (1) US (and allied) military forces; (2) the in-theater installations that permit them to operate (e.g. ports, air bases, encampments, ammunition and POL dumps); (3) host-country civilian population centers and critical economic assets; and (4) extra-theater allies, coalition partners, and third countries where the United States has bases.

Third World host countries willing to permit their territory to be used by US military forces for either deterrence or warfighting invite hostile retaliation against their own populations, and if a reasonable measure of protection cannot be guaranteed, an invitation to intervene or permission for base access might not be forthcoming. Apparent Saudi lack of confidence in US resolve and ability to shield Saudi Arabia from Iraqi ground and air (including ballistic missile) attack contributed to an initial, four-day hesitation in Riyadh to request US intervention following the fall of Kuwait. In the event, Saddam Hussein did not invade Saudi Arabia, and though he launched

Scuds against the kingdom after the beginning of the coalition's air offensive, their potential military and political impact was severely restricted by inaccuracy and negated by the seemingly magical (at least in Saudi eyes) performance of the Patriot PAC-2.

But what if Iraq had fired chemically armed Scuds at Saudi airports and seaports at the beginning of the US deployment to the Gulf? This would not only have delayed and disrupted our deployment, but would have also shaken Saudi resolve at a time when Operation Desert Shield was still politically as well as militarily vulnerable. Moreover, what if Saddam Hussein (or one of his allies, like Gadhafi) had had missiles capable of reaching Naples? Would that have affected Italy's willingness to join coalition forces in Saudi Arabia and to allow the US Sixth Fleet to operate from its naval bases in Italy? Or what if Saddam had fired Scuds at Turkish as well as Saudi Arabian and Israeli cities? Turkish President Turgut Ozal's decision to support the coalition and to permit Turkish bases to be used by US F-111 bombers was strongly opposed by his foreign and defense ministers—both resigned. Iraqi Scud attacks could have threatened Ozal's political survival.

The specific TBM defense capabilities needed for US contingency operations will differ, depending on scenario-specific political and military conditions, including the particular character of the TBM threat and the number and types of assets which must be defended. Point defenses which are effective against small numbers of unsophisticated Scuds will not suffice against a larger and more robust attack by more modern TBMs. Moreover, nuclear- and chemical-armed TBMs will require different interception profiles than conventional-warhead TBMs in order to minimize chances of unwanted collateral damage resulting even from successful intercepts.

Additionally, levels of acceptable protection will likely differ according to the relative value of assets being threatened and the type of TBM munitions threat. Against conventional or chemical ballistic missile attacks, relatively higher leakage rates would probably be acceptable for most military assets (ships in port being a major exception). On the other hand, political considerations would argue for lower leakage rates against civilian population centers, even if the threat is only conventional. Generally speaking, the more destructive the warhead on hostile TBMs, the lower the permissible leakage rate; for example, the successful penetration by any nuclear-armed TBMs targeted against a main military operating base or a friendly city would be unacceptable.

There are four key components to a comprehensive response to the TBM threat: (1) counterfires to disrupt and destroy the adversary's TBM launch capabilities; (2) passive defenses—such as hardening, dispersal, and improved repair/recovery measures; (3) active defense to intercept ballistic missiles in flight; and (4) the command, control, communications, and intelligence (C³I) needed for these other components to work most effectively.

• *Counterfires.* Counteroffensive operations to destroy an adversary's TBM launching complex directly and to disrupt TBM logistics support via interdiction strikes will be a necessary complement to active and passive defenses. Moreover, counteroffensive efforts may include, as they did during Desert Storm, ground action in the form of extensive special operations inside enemy territory aimed at detecting and destroying TBM launchers. Indeed, large-scale conventional ground operations aimed at occupying TBM launch areas cannot be ruled out (they are the only *sure* way of eradicating the mobile TBM launcher threat). During World War II the German V-1 air-breathing and V-2 ballistic missile threats to London and Antwerp were effectively eliminated only by Allied ground force occupation of their launch areas; the small V-1 with its simple and mobile launch rail, and the larger though bunkered (until launch) V-2, survived the full attention of the British Bomber Command and the US Eighth Air Force.

Air power, however, is likely to remain the principal instrument of US counteroffensive capabilities against contingency TBM threats. Air action is usually politically and militarily preferable to ground operations, and the relative importance of manned aircraft in contingency operations has been inflated by the steady erosion of US TBM capabilities. The Army's new Army Tactical Missile System (ATACMS), which reportedly performed well in Desert Storm (though it encountered some pre-Desert Storm congressional opposition and may yet fall prey to the budget-cutter's axe), can also be used to attack enemy missile launchers in some circumstances, though its range (roughly 90 miles) is too short to ensure adequate coverage of the launch areas for most Third World TBMs, which have significantly longer range. Unfortunately, the United States has foresworn, in the 1987 INF Treaty, future possession of any and all land-based surface-to-surface missiles with ranges falling between 500 and 5500 kilometers, and the Bush Administration's subsequent cancellation of the follow-on to Lance leaves only the ATACMS in the US surface-to-surface missile arsenal.¹¹

Critical to any counterstrike capability, of course, will be excellent and timely target acquisition. This is less of a challenge for fixed-site TBMs than it is for mobile TBM launchers, which can be concealed until perhaps just a few minutes before launch, and displaced within a few minutes after firing. During Desert Storm, in which the United States enjoyed satellite intelligence and virtually complete air supremacy over all of Iraq, the US and allied air forces were able to maintain robust combat air patrols—virtually unhindered by Iraqi air defenses—over Scud launch areas, which enabled US fighters to strike mobile Scuds within moments of their detection. Nevertheless, though the rate of Iraqi Scud launches declined during the war, the Iraqis still managed to launch 16 missiles in the conflict's last week, with some reports indicating that Iraq still possessed scores of launchers and was preparing for a massive Scud attack against Israel at the very end of the war.¹² There is, too, the fact that the United

States cannot count in future contingency operations on being able to replicate the ease and swiftness with which it gained air supremacy in Desert Storm.

Thus, it is only through the *combination* of offensive and defensive capability that it will be possible to achieve effective TBM defense.

- *Passive Defense.* Passive defense is another important component of a comprehensive defense against TBMs. Passive defenses may include reliance on hardened command and communications nodes and main operating bases of the kind that were available in Saudi Arabia during Desert Storm; mobile facilities when and where possible (e.g. aircraft carriers), dispersion and cover, concealment, and deception; and measures to enhance an asset's ability to recover after an attack. Against the threat of TBM-delivered chemical munitions, such standard passive responses as protective masks, individual protective suits, overpressure systems for command bunkers and armored vehicles, and stockpiles of decontaminants are important. As for threatened host country civilian populations, Israel has pointed the way to some measure of protection via shelters, mass distribution of gas masks, and the creation of hermetically sealed rooms in family residences. Nevertheless, it seems unlikely that most other countries will bear the financial expense or political and social costs of adequately preparing passive defenses for their civilian populations; in this regard, Israel is probably unique, because its people have lived under the near threat of imminent attack for so long.

Moreover, chemically armed TBMs would still be highly disruptive of military operations and logistics support. For example, an airfield which has been attacked with chemical weapons will certainly have its sortie generation operations disrupted for some time, even if it is well-stocked with chemical protective gear and decontaminants. Or, to take another example, what if Saddam Hussein had fired a few TBMs with chemical warheads at the port of Jubayl during Desert Shield/Desert Storm—how many civilian stevedores would have reported to work the following day? At the very least, such attacks would have disrupted the flow of shipborne forces and logistics severely. Some types of passive defense can also be costly and politically difficult. For example, one passive measure to enhance the survivability of air bases against TBM attack is simply to build more runways—a very expensive proposition in places like Europe and other areas where land costs are high and environmental concerns compete with security interests.

- *Active Defense.* Active defenses involve neutralization or destruction of TBMs already in flight. Currently, the Patriot PAC-2 surface-to-air missile is the free world's only existing anti-TBM system. Despite the public hoopla touting its success in the Gulf War, even the PAC-2 version of the Patriot missile has limited effectiveness against most kinds of TBM threats because of its relatively small and narrow engagement area.¹³ The current Patriot also requires an excessive amount of airlift for strategic deployment

(it cannot be moved while assembled except in a C-5), and subsequent analysis has shown that Patriot's effectiveness against the Scuds in Desert Storm was not as great as would be desired—especially if the threat includes TBMs with chemical, biological, or nuclear warheads.

An improved version of the Patriot, the PAC-3, will upgrade its missile (and air) defense capabilities, but will still not provide reliable defense against all classes of TBMs. Far more promising is the THAAD (theater high-altitude area defense) system, now being developed by the US Army with Strategic Defense Initiative Organization funding. The THAAD, unlike the Patriot, is designed exclusively as an anti-TBM interceptor, and has a much larger engagement area than the Patriot. An anti-TBM architecture combining Patriot and THAAD would provide coverage against both long- and short-range TBMs as well as cruise missiles and manned aircraft (the Patriot's specialty). Patriot's limited battlefield mobility also argues for the US Army's corps surface-to-air missile concept (i.e. a new air defense- and anti-TBM-capable missile) specifically designed to support US corps- and division-level forces and Marine Corps amphibious operations.

Also worth considering are the ERINT (extended range intercept technology), another Army anti-TBM under development, and the Arrow, which is being developed by Israel with US funding. ERINT's main advantages are that it is a hit-to-kill missile, i.e. it destroys its target with a direct hit, imparting massive kinetic energy, and is also fire-and-forget, i.e. it guides itself to its target. It is also much smaller in diameter than Patriot, so that more missiles can be mounted on a launcher. ERINT's main drawbacks are its projected cost, which is likely to exceed that of the Patriot, and the fact that in the Patriot it is competing with a deployed system of proven worth. The final decision on whether ERINT is needed and cost-effective will have to await further testing and analysis. The Arrow, though having greater coverage than the Patriot, is also a much larger system, and therefore too logistically cumbersome for rapid strategic mobility in support of US contingency forces.

A key feature of any anti-TBM system designed to accompany US contingency forces overseas is that it be readily compatible, in terms of size and weight, with existing US C-5 and C-141 strategic airlifters, and preferably with the tactical C-130.¹⁴ To cover initial US Air Force and Army deployments, as well as the ports and air bases for their disembarkation and logistics support, anti-TBMs must already be present or must be among the first items deployed, which means that they must go by air. The implications of this new requirement for early anti-TBM deployment in contingency operations, for both existing and planned strategic and tactical airlift capabilities, are as yet unclear, and the subject merits proper analysis.

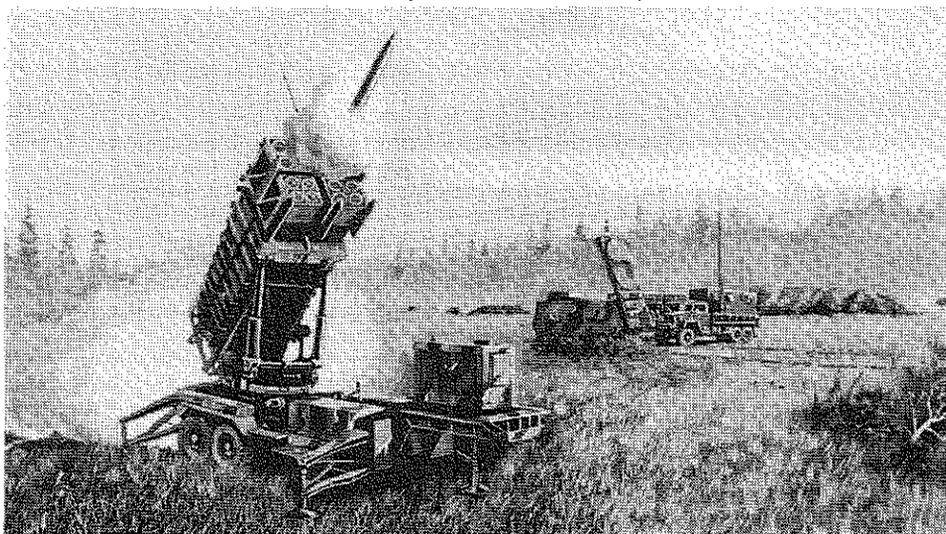
There may also be circumstances requiring heavy or even exclusive reliance on sea-based ballistic missile defenses—for example, in support of

US Marine Corps or Army amphibious operations. Sea-based anti-TBMs may be applicable too in situations in which a threatened ally or client requires protection but is unable for political reasons to invite US forces ashore, or when we do not want to put forces ashore.¹⁵

The Global Threat and Longer Term Requirements

The presumption of continued proliferation in the Third World of ballistic missiles of ever increasing range and sophistication suggests that at some point in the not-too-distant future, perhaps before the end of the century, US forces and allies will confront both Third World short- and intermediate-range ballistic missiles, and even ICBMs.

This increasingly long-range ballistic missile threat will have important consequences for theater missile defense. First, the missiles will address much larger geographic areas, threatening US bases and allies much farther from the missile-armed state. Second, longer-range missiles have much higher reentry speeds, which effectively reduce the area protected by short-range defensive systems such as the Patriot—i.e. many more Patriots are required to defend an area of given size or collection of assets against longer-range missiles. Third, the coupling of long-range missiles with chemical, biological, or nuclear warheads means that devastating damage could be inflicted on a target country with only a very small number of missiles. This means that more effective, longer-range interceptors are required, and also argues for a multi-tier defense composed of two or more weapon types. Moreover, a Third World terrorist missile strike may come with little warning, so that strategic warning times needed for the deployment of surface-based defensive systems must be very short.



Strategic Defense Command

Since ERINT is much smaller than Patriot, four missiles might be packaged in each canister on the existing Patriot launcher, as shown in this artist's conception.

The Bush Administration's reorientation of the Strategic Defense Initiative toward Global Protection Against Limited Strikes (GPALS) was driven in large measure by concern over the growth of ballistic missile capabilities in the Third World. There is also concern, as Daniel O. Graham has put it, over "the increasing danger that civil war or other violence in the Soviet Union can put strategic nuclear weapons in the hands of irresponsible elements and that shaky discipline in Soviet forces sharply increases the danger of a military Chernobyl—the accidental launch of a deadly missile."¹⁶ The performance during Desert Storm of the Patriot PAC-2 has spurred confidence in GPALS' feasibility. Moreover, Strategic Defense Initiative Organization Director Henry Cooper believes that with requested funding levels, deployment of GPALS' space-based components could probably begin by the late 1990s—just about the time that some Third World countries are expected to be acquiring intermediate-range ballistic missiles and nuclear weapons.

The principal obstacle to GPALS is congressional opposition. Some critics still question GPALS' feasibility and cost; others, including Les Aspin and Sam Nunn, support the need for theater missile defense, and even the desirability of national missile defense against small attacks (including accidental or unauthorized Soviet launches), but oppose GPALS' Brilliant Pebbles component. But by far the most potent and emotional source of opposition is the fact that deployment of Brilliant Pebbles (and perhaps even Brilliant Eyes alone) would violate the 1972 ABM Treaty in its present form. GPALS proponents claim that the treaty was designed for the Cold War confrontation between the superpowers, and point out that there was no Third World ballistic missile threat 20 years ago. In their view, the treaty has been rendered obsolete by events, by technology, and by the Third World ballistic missile threat.

However, some opponents of GPALS still regard the ABM Treaty as an important, almost inviolable symbol of arms control as well as an effective barrier to an unwanted and costly strategic defense arms race with the Soviets. Others fear possible Soviet reactions to a unilateral US abrogation of the treaty, including withdrawing from START, bringing their submarines armed with nuclear ballistic missiles up close to American shores and relying on depressed-trajectory launches, concentrating their faster-burning mobile SS-24s and SS-25s in one region of the country so as to overwhelm space-based US defenses, and/or developing sophisticated and relatively cheap penetration aids for their missiles. GPALS proponents argue that it is as much in the interests of Moscow as Washington to be able to negate the Third World missile threat. Indeed, some already see signs of a Soviet volte-face on the ABM Treaty.¹⁷ They also argue that GPALS would be (intentionally) too limited to threaten Soviet assured destruction of the United States. However, their critics argue that the Soviets would view GPALS with Brilliant Pebbles as but the first installment in a far more extensive space-based missile defense.

Soviet concerns that GPALS is but the first step toward a comprehensive strategic defense aimed at defeating a large-scale, deliberate Soviet attack might be allayed by a new or revised ABM Treaty that placed verifiable caps on the number of deployed space-based interceptors: enough to handle limited attacks, intentional or unintentional, but insufficient to defend against large attacks. A new agreement also might restrict deployment of space-based interceptors and sensors to cover only those areas of the globe between, say, the 10th and 40th parallels in the Northern Hemisphere, wherein lies the bulk of the Third World ballistic missile threat; this would bar boost- or post-boost-phase intercept coverage of the Soviet ICBM threat (though not necessarily the Soviet submarine-launched ballistic missile threat), whose launch sites and polar trajectories fall well north of the 40th parallel.

GPALS, even without space-based interceptors, may be the most effective long-term solution to the Third World ballistic missile threat posed to US contingency forces and allies. Brilliant Pebbles is but one type of space-based weapon that could be deployed, and a clear distinction must be made between space-based weapons (of whatever configuration) and sensors. Though both have ABM Treaty implications, the future effectiveness of even exclusively ground-based ballistic missile defense weaponry is almost certain to rest on space-based sensors.

Moreover, ballistic missile defense coverage by Brilliant Pebbles or some other form of space-based weaponry would be essential for global ballistic missile defense missions, i.e. in areas where: (1) theater missile defense requirements cannot be anticipated in advance, (2) the United States cannot—or chooses not to—deploy ground-based defenses, or (3) the United States cannot deploy them in time. Arguably, these three conditions are often present in most places in the Third World, and there are few countries outside of Western Europe, Israel, and perhaps Japan to which the United States is likely to transfer technology adapted for theater high-altitude area defense. However, when any or all three of these conditions are present, then space- or sea-basing of ballistic missile defenses becomes critical, and space is the more attractive of the two because ships require days or even weeks to deploy to some geographic areas. Moreover, if ICBMs (e.g. the Chinese CSS-3/4 or Soviet SS-19s) are part of the theater threat to Europe and other strategic theaters, and if we are unwilling to count solely on offensive retaliation to deter this threat, Brilliant Pebbles would provide an essential second layer for theater defense (ground-based theater missile defense systems capable of intercepting ICBMs would also violate the ABM Treaty).

Thus, the main attribute of Brilliant Pebbles is that it provides global reach and instantaneous response capability, against all exo-atmospheric trajectory missiles. Brilliant Pebbles (like sea-based weapons) might be particularly valuable as a theater missile defense umbrella for contingency operations,

before land-based weapons can be deployed. Brilliant Pebbles could also offer important deterrent leverage against Third World dictators who, having their missiles intercepted, would suffer political humiliation (as did Saddam Hussein via Patriot intercepts of his Scuds). Moreover, the presence of US space-based ballistic missile defense could have a salutary, stabilizing influence on a crisis between two missile-armed Third World states; the prospect that the United States would use its space weaponry to intercept either party's missiles would reduce incentives to strike first, and increase the possibility of a negotiated end to the crisis. A global ballistic missile defense capability might also dissuade some Third World leaders from investing their scarce resources in ballistic missiles, and could support future nonproliferation treaties.

In any event, the Gulf crisis of 1990-1991 has, for the moment at least, added a sense of urgency to the long-term need for more comprehensive and integrated ballistic missile defenses. Henry Kissinger has concluded that "limitations on strategic defense will have to be reconsidered in light of the Gulf War experience; no responsible leader can henceforth leave his civilian population vulnerable."¹⁸

Summary

The Third World ballistic missile threat to US contingency forces is expanding, and can no more be wished away than the Soviet ICBM threat to the United States itself. Indeed, as W. Seth Carus has pointed out, "There is no longer any question of keeping the missiles out of the hands of the Third World. Nor it is possible to prevent the indigenous production of missiles."¹⁹

What is certain beyond doubt is the inadequacy of the Patriot PAC-2 to provide adequate protection in the future for US contingency forces and host-country civilian population centers. Patriot is inadequate because it: (1) covers too small an area, (2) does not intercept chemical or biological warheads high enough to prevent possible massive collateral damage, (3) lacks adequate battlefield mobility to move with tactical maneuver forces, (4) has decreasing capability against longer-reaching intermediate-range ballistic missile threats, and (5) cannot deal with ICBMs at all. The improved PAC-3 version of Patriot will redress some of these deficiencies, and Patriot will remain a key element of US theater missile defense long into the next century. But no one weapon system can be adequate to deal with all aspects of the TBM threat. The need to supplement Patriot—and the wide variety of theater missile defense threats—argue for the corps surface-to-air missile for battlefield missile defense, plus the theater high-altitude area defense system and a ship-based counterpart, Brilliant Pebbles (or some other type of space-based weapon), or some combination of these weapons for higher-altitude, area theater missile defense.

The performance of the Patriot missile against primitive Iraqi Scuds during the Gulf War, dazzling though it appeared, underscores the deficiencies

of present US theater ballistic missile defenses against far more sophisticated and longer-range missiles either already deployed or under development by other thug regimes in the Third World. Neither counteroffensive operations nor passive defenses, alone or together, provide a military panacea to the theater ballistic missile problem. Nor can the United States rely on arms control or appeals for voluntary restraint to curb the proliferation of ballistic missile technologies among countries whose record of political and military sobriety makes one nostalgic for the Cold War. The United States and its allies must look to their own resources to protect themselves and their forces overseas, and improved active missile defense will be a necessary ingredient in future US contingency planning.

NOTES

1. Janne E. Nolan, *Trappings of Power: Ballistic Missiles in the Third World* (Washington: Brookings Institution, 1991), p. 9.

2. In testimony before the Senate Armed Services Committee on 21 May 1991, Lieutenant General Charles Horner, USAF, stated that initial plans called for a 32-day air campaign, but that six more days were required to accommodate unexpectedly bad weather and high Scud suppression requirements.

3. See Kathleen Bailey, *Doomsday Weapons in the Hands of Many: The Arms Control Challenge of the '90s* (Champaign: Univ. of Illinois Press, 1991).

4. "Patriots, Scuds, and the Future of Ballistic Missile Defense." Speech before the Washington Chapter of the National Security Industrial Association, Arlington, Va., 24 April 1991.

5. Bruce W. Nelan, "For Sale: Tools of Destruction," *Time*, 22 April 1991, p. 44.

6. "Statement on the Strategic Defense Initiative," Hearings Before the House Defense Appropriations Subcommittee, 17 April 1991, p. 3.

7. Gary Milhollin and Gerard White, "A New China Syndrome: Beijing's Atomic Bazaar," *The Washington Post*, 12 May 1991, p. D-2.

8. See Holly Porteous, "Argentina Cancels Condor 2 Missile," *Jane's Defense Weekly*, 8 June 1991, p. 948.

9. "National Security Implications of Missile Proliferation," Hearings before the Committee on Foreign Relations, US Senate, 31 October 1990.

10. Iraq's failure to employ chemical munitions against coalition ground forces, or chemically armed Scuds against Israel and ports and airfields in Saudi Arabia, was one of several mysteries of the Gulf War. One explanation for this and other mysteries related to Iraq's conduct of the war is that with the launching of Desert Storm, Saddam Hussein's top priority became his own survival and the preservation of his Baathist regime.

11. As ATACMS is deployed in larger numbers, the Lance will largely lose its conventional role; the US Army has stated that Lance will reach the end of its service life in the mid-1990s in any event.

12. Benjamin F. Schemmer, "Special Ops Teams Found 29 Scuds Ready to Barrage Israel 24 Hours Before Cease-Fire," *Armed Forces Journal International*, July 1991, p. 36.

13. Despite the dramatic success claimed for the Patriot during the Gulf War itself, soberer postwar studies are casting that success in doubt. See Mary McGrory, "Missiles in Search of Missions," *The Washington Post*, 21 November 1991, p. A2.

14. The current Patriot cannot be moved fully assembled except in the C-5; however, the so-called Quick Reaction Program, initiated in response to the lessons of Desert Shield/Storm, includes a "Patriot Light" proposal that would downsize some Patriot components to eliminate this restriction.

15. Several TBM defense options are available to the Navy. Both the Navy and the Air Force are also investigating the potential for anti-TBM missiles launched from tactical fighters.

16. "An SDI Program for the Clear and Present Danger," *New Dimensions*, May 1991, p. 31. See *The President's New Focus for SDI: Global Protection Against Limited Strikes*, SDIO, 6 June 1991, for a discussion of GPALS' goals and elements.

17. Jorg Bahnemann and Thomas Enders, "Reconsidering Ballistic Missile Defense," *Military Technology*, April 1991, p. 48.

18. "A Sea Change in U.S.-Soviet Relations," *The Washington Post*, 12 April 1991, p. A-13.

19. W. Seth Carus, *Ballistic Missiles in Modern Conflict* (New York: Praeger, 1991), pp. 56-57.