Chapter 19:

Increasing the Military Uses of Space

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America's reliance on space is so extensive that a widespread loss of space capabilities would prove disastrous for both its military security and its civilian welfare. The Armed Forces would be obliged to hunker down in a defensive crouch awaiting withdrawal from dozens of no-longer-tenable foreign deployments. America's economy, and along with it the rest of the world's, would collapse.

For these reasons, the Air Force is charged with protecting space capabilities from harm and ensuring reliable space operations for the foreseeable future. As a martial organization, the Air Force looks to military means to achieve these assigned ends—as well it should. The military means it seeks include the ability to apply force in, through, and from space, as well as enabling and enhancing terrestrially based forces. Is this not self-evident?

Consider for a moment that the Navy has a similar charge: to ensure freedom of access to international waters and, when directed in times of conflict, to ensure that other states cannot operate there. Now imagine how the Navy might achieve these objectives if it were denied the use of weapons, to include shore-based weapons or those owned by other Services. What if it were further denied the capacity or legal power to research, develop, or test weapons? How effective could it be? Such restrictions would be absurd, of course. And yet this scenario is almost perfectly parallel with the conundrum facing the Air Force in space.

In this chapter, we make the case that opposition to increasing the militarization and weaponization of space is a misapplied legacy of the Cold War and that dramatic policy shifts are necessary to free the scientific, academic, and military communities to develop and deploy an optimum array of space capabilities, including weapons in space, eventually under the control of a U.S. Space Force.

Creating the Myth of Space Sanctuary

During World War II—before the advent of the atomic bomb or intercontinental ballistic missiles (ICBMs)—the Chief of the U.S. Army Air Corps, General "Hap" Arnold, had a prescient view of the future:

> Someday, not too distant; there can come streaking out of somewhere (we won't be able to hear it, it will come so fast) some kind of gadget with an explosive so powerful that one projectile will be able to wipe out completely this city of Washington. . . . I think we will meet the attack

> alright [sic] and, of course, in the air. But I'll tell you one thing, there won't be a goddam pilot in the sky! That attack will be met by machines guided not by human brains, but by devices conjured up by human brains.[1]

Within about 15 years of Arnold's comments, Soviet ICBMs armed with nuclear warheads did indeed have the ability to threaten Washington, but over 40 years later, America's ability to reliably defend itself from ICBMs remains minimal—due not to technology limitations but to long-standing policy and political constraints.

To understand the passion of the current opposition to space weapons, one must look into the fundamental issue of the Cold War: nuclear weapons deployed at a scale to threaten the existence of all life on the planet. The specter of potential nuclear devastation was so horrendous that a neo-ideal of a world without war became a political imperative. Longstanding realist preference for peace through strength was stymied by the invulnerability of ballistic missiles traveling at suborbital velocities. Thus, America accepted a policy of *assured* and *mutual* destruction to deter its opponents in a horrible (if effective) balance of terror. This meant it became politically infeasible even to contemplate shooting down missiles aimed at America or its allies— especially from machines in space that might prove so efficient as to *force* an opponent to strike while it could, before such a system became operational.

With the coupling of space capabilities, including the extremely important roles of force monitoring and treaty verification, to nuclear policy, the unique characteristics of nuclear weapons and warfare became interconnected with military space. This is perhaps understandable, if fundamentally in error, but not only did space weapons become anathema for missile defense, but also weapons in space for the protection of interests there became a forbidden topic.

Ironically, elements of the elite scientific community in the 1950s and 1960s created the conditions that frustrated the second half of Arnold's vision, which called upon America's edge in technology to provide for the Nation's defense—because they believed reaching that objective was not achievable and that seeking to achieve it was not desirable. Perhaps because they were motivated by guilt for their complicity in bringing the nuclear bomb to fruition, these individuals preferred to rely solely on diplomacy and arms control and argued against exploiting technology, which they believed would only provoke an arms race. They advocated this point of view at the highest political levels—and they were very successful in meeting their objectives.

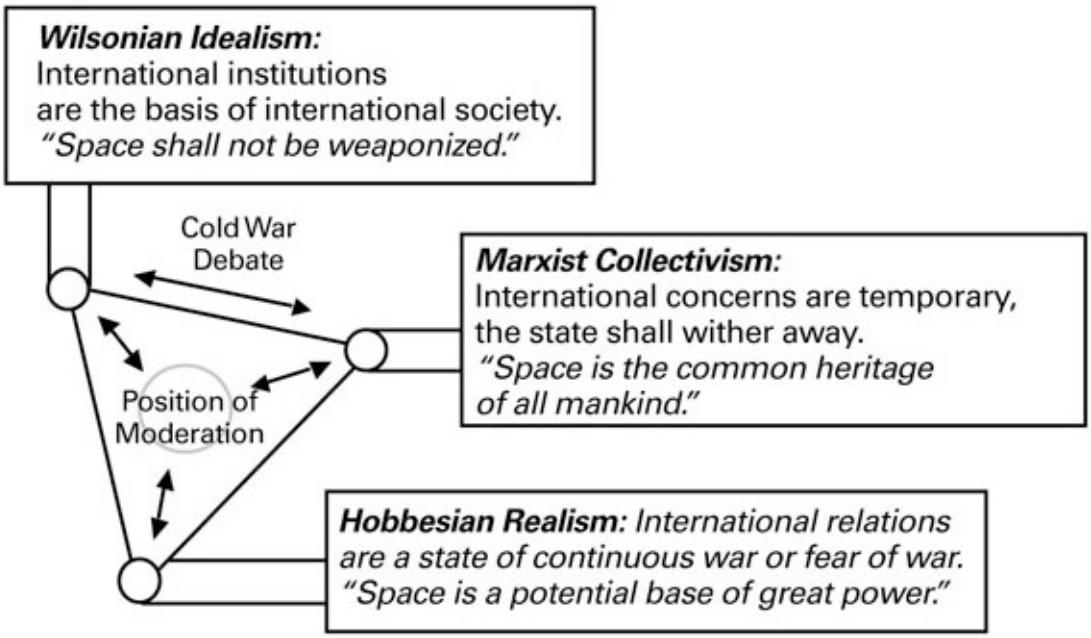
Whether by design or chance, the civilian leadership 40 to 50 years ago also imposed bureaucratic institutional constraints that limited the ability of the Services to exploit cutting-edge technologies to take advantage of space for traditional military purposes. When combined with arms control constraints and the current lack of vision among the military Services, this same dysfunctional space bureaucracy is simply not responsive to the growing threat from proliferating space technology among our adversaries as well as our friends.

What World Views Should Guide Space Exploration?

Current international relations political theory generally divides the panoply of world views into three broad outlooks: *Wilsonian idealism* or *liberalism, Marxist collectivism* or *socialism,* and *Hobbesian realism* (see figure 19–1). Arguably the most prevalent of these—certainly among practitioners if not academics—is the last, yet it has been conspicuously absent in the academic and theoretical debates concerning space exploration.

Wilsonian idealism is based on the tenets of a peaceful and democratic world order as espoused by Woodrow Wilson. It includes the notions that law and institutions are important factors leading to peace and that weapons are a basic cause of war. Hence, prevention of space weaponization through treaties and existing international organizations, completely eschewing any positive role for armed force, is its key pillar of space exploration. Equally prominent in the history of space development—due to the bipolar power structure of world politics through most of its developmental stage—has been the position of *Marxist-inspired collectivists*, who insist that space should not be appropriated by the nations or corporations of the Earth, and that whatever bounty is realized there must be shared by all peoples. Collectivist efforts are generally focused on legal and moral arguments binding states in a system of global wealth-sharing.

Figure 19–1. Triangulating the Space Exploitation Debate



Hobbesian realists, inspired in part by the political teachings of Thomas Hobbes, generally perceive the condition known as *anarchy*—that awful time when no higher power constrains the base impulses of men and states, and both survive by strength and wit alone—to be the underlying condition of international relations. Might indeed makes

right to these theorists, if not morally, certainly in fact. For them, states exist in a perpetual condition of war. Periods between combat are best understood as preparation for the inevitable next conflict. The harshest view in this group is called *realpolitik*.

We advocate a position far less harsh than that of Hobbes, an outlook increasingly known as *soft realism*, as we believe that proper use of military power within a framework of laws and rules can lead to greater security and welfare for all peoples, not just the wielders of that power. We do assert, however, that the state retains its position as the primary actor in international affairs and that violence has an indisputable and continuing influence on relations between states and nonstate actors.

Still, in most academic and policy debates, the realist view has been set aside (at least rhetorically) as states jockey for international space leadership. Those who even question the blanket prohibitions on weapons or market forces in space exploration are ostracized. To actually advocate weaponization in space brings full condemnation. Accordingly, the debate has not been whether space *should* be weaponized, but how best to *prevent* the weaponization of space; not whether space *should* be developed commercially, but how to ensure the spoils of space are nonappropriable and *distributed fairly* to all. There has been little room for the view that state interest persists as the prime motivator in international relations, or that state-based capitalist exploitation of outer space would more efficiently reap and distribute any riches found there. It is for these reasons, we insist here and in several other venues, that space exploration and exploitation have been artificially stunted from what might have been.[2]

Hence, a timely injection of realist thought may be precisely what is needed to jolt space exploration from its post-Apollo sluggishness. Our intent here, then, is to add the third point of a theoretical triangle in an arena where it had been missing, so as to center the debate on a true midpoint of beliefs, and not along the radical axis of two of the three world-views.

The Misplaced Logic of Antiweaponization

Opposition to the deployment of weapons in space clusters around two broad categories of dissent: that it *cannot* be done, and that it *should not* be done.

Space Weapons *Are* Possible

Arguments in the first category spill the most ink in opposition, but they are relatively easy to dispatch. Consider first that history is littered with prophesies of technical and scientific inadequacy, such as Lord Kelvin's famous retort, "Heavier-than-air flying machines are impossible." Kelvin, a leading physicist and president of the Royal Society, made this boast in 1895, and no less an inventor than Thomas Edison agreed. The possibility of spaceflight prompted even more gloomy pessimism. A *New York Times* editorial in 1921 excoriated Robert Goddard for his silly notions of rocket-propelled space exploration (an opinion it has since retracted): "Goddard does not know the relation between action and reaction and the need to have something better than a vacuum against

which to react. He seems to lack the basic knowledge ladled out daily in high schools." Compounding its error in judgment, opining in 1936, the *Times* stated flatly, "A rocket will never be able to leave the Earth's atmosphere."[3]

Bluntly negative scientific opinion on the possibility of space weapons writ large has been weeded out over time. No credible scientist today makes the claim of impossibility, and so less encompassing arguments are now the rule. The debate has moved to more subtle and scientifically sustainable arguments that a *particular* space weapon is not feasible. Mountains of mathematical formulae have been piled high in an effort, one by one, simply to bury the concept. But these limitations on specific systems are less due to theoretical analysis than to assumptions about future funding and available technology.[4] The real objection, too often hidden from view, is that a *particular* weapons system or capability cannot be developed and deployed within the planned budget or within narrowly specified means. When one relaxes those assumptions, opposition on technical grounds generally falls away.

Furthermore, counterexamples exist—for example, the Brilliant Pebbles space-based interceptor system was the most advanced defense concept to emerge from the Strategic Defense Initiative (SDI). After a comprehensive series of technical reviews by even the strongest critics in 1989, it achieved major defense acquisition program status in 1990, was curtailed by congressional cuts in 1991 and 1992, and then was canceled by the Clinton administration in 1993. But the cancellation of the most advanced, least expensive, and most cost-effective missile defense system produced by the SDI program was for political, not technical, reasons.[5]

The devil may very well be in the details. But when critics oppose an entire *class* of weapons based upon analyses that show *particular* weapons will not work, their arguments fail to consider the inevitable arrival of fresh concepts or new technologies that change all notions of current capabilities. Have we thought out the details enough to say categorically that *no* technology will allow for a viable space weapons capability? If so, then the argument is pat; no counter is possible. But if there are technologies or conditions that *could* allow for the successful weaponization of space, then ought we not argue the policy details first, lest we be swept away by a course of action that merely chases the technology wherever it may go?

SpaceWeapons *Should* Be Deployed

Opponents of space weapons on technical or budgetary grounds are *not* advocating space weapons in the event their current assumptions or analyses are swept aside. Rather, they argue that we *ought* not to deploy space weapons. Granted, just because a thing *can* be done does not mean it *should* be. But prescience is imperfect, new technologies emerge unpredictably, and foolish policymakers eschew adapting to them until their utility is beyond doubt. In anticipation of coming technologies that would make space weaponization a most cost-effective option, moral opposition centers on six essential arguments.

Space weapons are expensive; alternatives are cheaper and just as effective.This is the first argument against space weaponization, although it is an easy one to set aside. Of course space weapons are expensive—very expensive, though not necessarily more expensive than terrestrially based systems that may accomplish the same objectives, not to mention objectives that cannot be met otherwise—but so are all revolutionary technologies, particularly those that pioneer a new medium. Furthermore, the state that achieves cutting-edge military technology first has historically been the recipient of tremendous battlefield advantage, and so pursuit of cut-ting-edge technology continues—despite the enormous cost. Moreover, the cultural and economic infrastructure that allows for and promotes innovation in the highest technologies *tends to remain at the forefront* of international influence.

All empires decline and eventually are subsumed, but it has not been their search for the newest technologies or desire to stay at the forefront of innovation that causes their declines. Rather, it has been the *policies* of those states, generally an overexpansion of imperial control or an economic decision to freeze technologies, that result in their stagnation and demise. Space and space technology represent both the resources and the innovation that can keep a liberal and responsible American hegemony in place for decades, if not centuries, to come; furthermore, unless America maintains this technological edge, it will likely lose its preeminence.

A follow-on argument is rhetorical and usually takes the form, "Wouldn't the money spent on space weapons be better spent elsewhere?" It would be lovely if the tens of billions of dollars necessary to effectively weaponize space could be spent on education, or the environment, or dozens of other worthy causes, but this is a moot argument. Money necessary for space weapons will not come from the Departments of the Interior or State or from any other department except Defense. Any windfall for *not* pursuing space weaponization is speculative only and is therefore not transitive. This means that the funds for space weaponization will come at the expense of other military projects, from within the budget of the Department of Defense. This observation is the basis for criticism among military traditionalists, who see the advent of space weapons as the beginning of the end for conventional warfare.

Current conventional military forces and means are enough to ensure America's security needs, so why risk weaponization of space? The United States has the greatest military force the world has known; why change it when it is not broken? This argument is, obviously, tightly connected to the previous response, which points out that states failing to adapt to change eventually fall by the wayside. But more so, it shows a paucity of moral righteousness on the opposition's side. For the cost of deploying an effective space weapons program, America could buy and maintain 10 more heavy divisions (or, say, 6 more carrier battlegroups and 6 fighter wings). Let us suppose that is true. What would be more threatening to the international environment, to the sovereignty of states: a few hundred antiballistic missile satellites in low Earth orbit (LEO) backed by a handful of space lasers, or 10 heavy divisions with the support infrastructure to move and supply them anywhere on the globe?

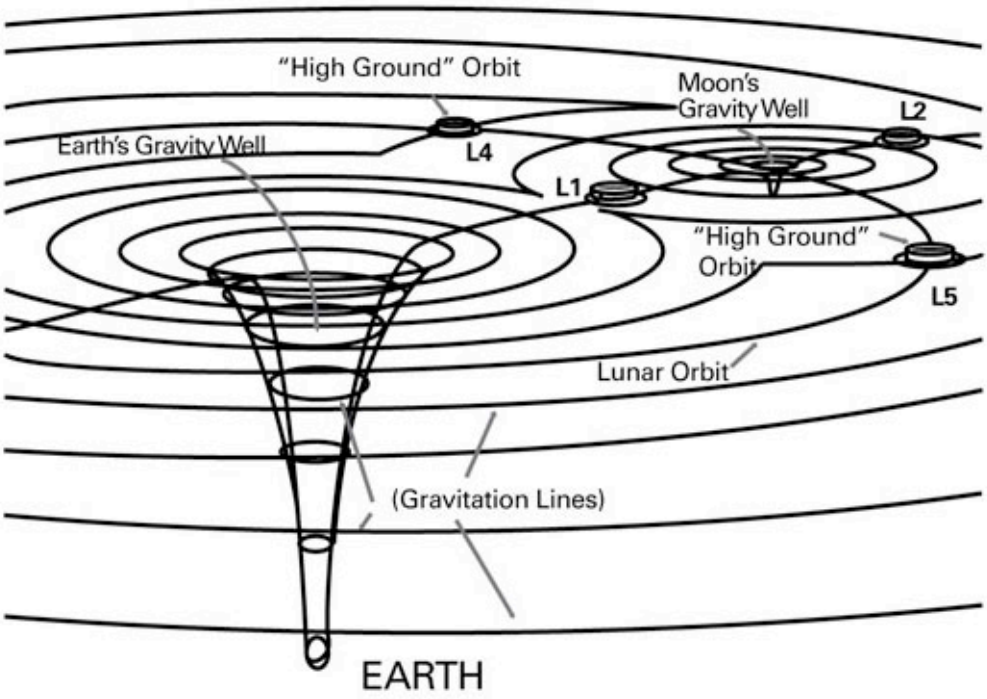
This further highlights a common ethical omission of many space weaponization opponents. Most insist they are not opposed to weapons per se, only to weapons in space. Indeed, they insist a conventional strike against a threatening state's space facility would be just as effective as destroying satellites in space and a whole lot cheaper and more reliable to boot. But what does it say about an argument that asserts weapons cannot be in space, where no people reside, and insists that wars there would be terrible, while at the same time it advocates, even encourages, such violence on Earth? Why is it that weapons in *space* are so dreadful, but the same weapons on land, on sea, and in the air are perfectly fine?

Space is too vast to be controlled. If one state weaponizes, then all other states will follow suit, and a crippling arms race in space will ensue. Space is indeed vast, but a quick analysis of the fundamentals of space terrain and geography shows that control of just LEO would be tantamount to a global gate or checkpoint for entrance into space, a position that could not be flanked and would require an incredible exertion of military power to dislodge. Thus, the real question quickly becomes not whether the United States should weaponize space first, but whether it can afford to be the *second* to weaponize space.

Space has been dubbed the *ultimate high ground* (see figure 19–2). As with the high ground throughout history, whosoever sits ensconced upon it accrues incredible benefit on the terrestrial battlefield. This comes from the dual advantages of enhanced span of command acuity (visibility and control) and kinetic power. It is simply easier and more powerful to shoot down the hill than up it.

The pace of technological development, particularly in microsatellites and networked operations, could allow a major spacefaring state to quickly establish enough independent kinetic kill vehicles in LEO (through multiple payload launches) to effectively deny entry or transit to any other state. Currently, the United States has the infrastructure and capacity to do so; China may in the very near future. Russia is also a potential candidate for a space coup. Should any one of these states put enough weapons in orbit, they could engage and shoot down attempts to place counterspace assets in orbit, effectively taking control of outer space. Indeed, the potential to be gained from ensuring spacepower projection while denying that capability in others is so great that some state, some day, *will* make the attempt.

Figure 19–2. Gravitational Terrain of Earth-Moon Space



In order to ensure that no one tries, space weapons opponents argue that the best defense is a good example. So long as the United States does not make any effort to weaponize space, why would any competing state be tempted to do so? And even if another state does attempt it, the United States has the infrastructure to quickly follow suit and commence a campaign of retrieval in space. Not only does the logic escape us, but also it seems that by waiting, the United States is *guaranteeing* what space weapons opponents fear most: a space arms race.

All states will oppose an American military occupation of space, and their combined power will accelerate the demise of the United States. There is no doubt that the United States will be opposed in its efforts to dominate space militarily. There will always be fear that any state attempting to enhance its power may use it to act capriciously, but to suggest that the inevitable result is a space arms competition is the worst kind of mirror-imaging. If the United States, in the very near future, were to seize space, it would do so in an attempt to extend its current hegemonic power. Other states may feel threatened by this and will certainly begrudge it, but would any be willing to bankrupt their economies to develop the multi-trillion-dollar infrastructure necessary to defeat the United States *in* space, all the way up the daunting gravity well of Earth? Especially after the first billions were spent and a weapons system was launched, if the United States showed the will to destroy that rocket in flight (or the laser on the ground), how long would another state be willing to sustain its commitment to replacing America as controller of space?

On the other hand, any attempt by another power to seize and control space must be viewed as an attempt to overturn the extant international order, to replace America as the global hegemon. The United States, with investment already made in the necessary space

infrastructure, would be forced to compete or cede world leadership—the latter an unlikely decision, one never historically taken by the reigning hegemon. The lesson is unambiguous; if you want an arms race in space, wait for it.

But here is where the paradox of opposing weapons in space is most apparent. On the one hand, we are told that if the United States weaponizes space, it will accelerate its own demise. The expense is too great, the ill will it fosters too encumbering, and the security too fleeting. Space cannot be controlled and therefore combat will occur, because to allow the United States to control space is tantamount to serving forever under its imperial thumb. Oddly, space weaponization is said to be both empowering and crippling—whichever argument appears most persuasive at the time.

Weaponization of space will create conditions that will make space travel risky if not impossible.Having extended the illogic of opposing space weapons to the limit, opponents then take on the mechanics of war and the evils of the military. As for the first argument, orbital debris is the challenge, which the recent Chinese antisatellite (ASAT) test confirms. The destruction of its own dying satellite in 2007 created thousands of bits of debris that are now floating at orbital velocity, an expanding cloud that poses a lasting navigational hazard to legitimate space flight. True, the Chinese test was criminal, especially since it *could have* engaged with almost no debris remnants if it had altered its engagement path. In over a dozen antisatellite tests that the Soviet Union held in the 1970s and 1980s, only the first left appreciable debris. After that, the massive co-orbital ASAT engaged in a kinetic direction toward the Earth, down the gravity well, causing all of the detritus of the ASAT and target to burn up in the atmosphere. Indeed, in a scenario where the United States is controlling space, most engagements would occur in launch phase, before the weapons even reach orbit. Any debris that is not burned up or destroyed will fall onto the launching state. Because tested weapons systems have maximized destruction to validate capabilities does not mean that future engagements must create long-lasting debris fields. Satellites are very fragile, and a bump or a push in the wrong direction is all that is necessary to send them spinning off into a useless or uncontrollable orbit—if you get to space first. Space war does not have to be dirty war, and in fact spacefaring nations will go out of their way to ensure that it is not (an argument that non-spacefaring powers may wish to fight dirty, and the only reliable defense against them would be *in* space, occurs below).

The second argument concerns commerce and tourism. Opponents say that space weapons would make individuals afraid to do business in space or travel there for pleasure, for fear of being blown to smithereens. This is an emotional appeal that has no basis in fact. Currently, for example, weapons are pervasive on the seas, in the air, and on land, but wherever there is a dominating power, commerce and travel are secure. America's Navy has dominated the open oceans for the last half-century, ensuring that commerce is fair and free for *all* nations, as has its Air Force in nonterritorial airspace. A ship leaving port today is more likely than ever to make it to its destination, safer from pirates, rogue states, navigational hazards, and even weather—all due to the enforcement of the rule of law on the seas and the assistance of sea- and space-based navigational assistance. Why would American dominance in space be different?

Space weapons advocates oppose treaties and obligations and want outer space ruled at the whim of whoever holds military power. This is a false argument, completely unsupportable. There is no dichotomy demanding law *or* order. Solutions lie in the most effective combination of law *and* order. There is no desire for a legal free-for-all or an arbitrary and capricious wielding of power by one state over all others. What we advocate is a *new* international legal regime that recognizes the lawful use of space by all nations, to include its commercial exploitation under appropriate rules of property and responsible free market values, to be enforced where necessary by the United States and its allies.

Beyond Theory: Military Space Realities

In 1991, U.S. forces defeated the world's fourth-largest military in just 10 days of ground combat. The Gulf War witnessed the public and operational debut of unfathomably complicated battle equipment, sleek new aircraft employing stealth technology, and promising new missile interceptors. Arthur C. Clarke went so far as to dub Operation *Desert Storm* the world's first space war, as none of the accomplishments of America's new-look military would have been possible without support from space.[6] Twelve years later, Operation *Iraqi Freedom* proved that the central role of spacepower could no longer be denied. America's military had made the transition from a space-supported to a fully space-enabled force, with astonishing results. The U.S. military successfully exercised most of its current spacepower functions, including space lift, command and control, rapid battle damage assessment, meteorological support, and timing and navigation techniques such as Blue Force tracking, which significantly reduced incidences of fratricide.

The tremendous growth in reliance on space from *Desert Storm* to *Iraqi Freedom* is evident in the raw numbers. The use of operational satellite communications increased four-fold, despite being used to support a much smaller force (fewer than 200,000 personnel compared with more than 500,000). New operational concepts such as *reach back* (intelligence analysts in the United States sending information directly to frontline units) and *reach forward* (rear-deployed commanders able to direct battlefield operations in real time) reconfigured the tactical concept of war. The value of Predator and Global Hawk unmanned aerial vehicles (UAVs), completely reliant on satellite communications and navigation for their operation, was confirmed. Satellite support also allowed Special Forces units to range across Iraq in extremely disruptive independent operations, practically unfettered in their silent movements.

But the paramount effect of space-enabled warfare was in the area of combat efficiency. Space assets allowed all-weather, day-night precision munitions to provide the bulk of America's striking power. Attacks from standoff platforms, including Vietnam-era B–52s, allowed maximum target devastation with extraordinarily low casualty rates and collateral damage. In *Desert Storm*, only 8 percent of munitions used were precision-guided, none of which were GPS-capable. By *Iraqi Freedom*, nearly 70 percent were precision-guided, more than half from GPS satellites.[7] In *Desert Storm*, fewer than 5 percent of aircraft were GPS-equipped. By *Iraqi Freedom*, *all* were. During *Desert Storm*, GPS proved so valuable that the Army procured and rushed into theater more than

4,500 commercial receivers to augment the meager 800 military-band ones it could deploy from stockpiles, an average of 1 per company (about 200 personnel). By *Iraqi Freedom*, each Army squad (6 to 10 Soldiers) had *at least* 1 military GPS receiver.

If, as it has been said, the 1990 Gulf War was the first space war—the birth of military enhancement and enabling space capabilities that had long gestated in the role of mission support—then the twin Operations *Enduring Freedom* and *Iraqi Freedom* represent military spacepower's coming-out party. Space support enabled a level of precision, stealth, command and control, intelligence-gathering, speed, maneuverability, flexibility, and lethality heretofore unknown. U.S. combat capabilities were absolutely dominant in these conflicts—and the entire world now understands the significant military role played by space systems.

Unfortunately, the American military has bogged down in Phase IV operations in Iraq. An externally funded and supplied insurgency continues, and the death toll mounts. For critics of the George W. Bush administration's policies, the perceived inability of the U.S. Army to win this unconventional war is evidence that too much effort has been placed on conventional capabilities. A further argument persists that air and space forces are expensive luxuries that have no place in the retro-battlefield of counterterrorism. This is a position that ignores the cultural and political realities in Iraq and confuses policy for military capability.

Wherever America's ground troops engage in Iraq, they perform magnificently. In a nation as large as California with a population of more than 20 million, the 50,000 combat troops in Iraq are hard pressed to be in the right place at the right time. Support comes significantly from space and airborne assets, which are the first line of defense in the war on terror. The refuge of individuals whose intention is to spread violence randomly and without regard to the status of noncombatants is to blend into their surroundings. They are found out when they move in areas that are restricted, engage in Internet coordination or electronic communications, purchase or move incendiary materials or other weapons, or gather in significant numbers. When they do, they can be pinpointed, but with such a small force, it takes time for Soldiers to get into position and engage their targets.

Weapons in space could provide the global security needed to disrupt and counter small groups of terrorists wherever they operate, at the very moment they are identified. Currently, UAVs, dependent on space support for operations, fly persistent missions above areas of suspected terrorist activity in Iraq, providing real-time intelligence and, in some cases, onboard weapons to support ground forces in a specific area. Tactical units are informed of approaching hostiles, and due to all-weather and multi-spectral imaging systems, both friendly (Blue Force) and enemy tracking can occur throughout engagement operations. When ground troops are unable to respond to threatening situations beyond their line of sight or are unable to catch fleeing hostiles, armed UAVs can engage those threats.

The other option in a large-scale counterterror operation is to bring in an overwhelming number of troops, enough to create a line across the entire country that can move forward, rousting and checking every shack and hovel, every tree and ditch, with enough Soldiers in reserve to prevent enemy combatants from re-infiltrating the previously checked zones. America could in this manner combat low-tech terrorism with low-tech mass military maneuvers, perhaps at a cost savings over an effective space-based surveillance and engagement capability (if one does not count the value of a Soldier's life), but we do not think dollar value is the overriding consideration in this situation.

Terrorism in the form of limited, low-technology attacks is the most likely direct threat against America and its allies today, and space support is enabling the most sophisticated response ever seen. All-source intelligence has foiled dozens of attacks by al Qaeda and its associates. But what of the *most dangerous* threats today? Weapons of mass destruction, particularly nuclear but also chemical and biological ones, could be delivered in a variety of means vulnerable to interception if knowledge of their location is achieved in time for counteroperations to be effective. In situations where there is no defense available, or the need for one has not been anticipated, then time is the most precious commodity.

A limited strike capability from space would allow for the engagement of the highest threat and the most fleeting targets wherever they presented themselves on the globe, regardless of the intention of the perpetrator. The case of a ballistic missile carrying nuclear warheads is exemplary. Two decades ago, the most dangerous threat facing America (and the world) was a massive exchange of nuclear warheads that could destroy all life on the planet. Since a perfect defense was not achievable, negotiators agreed to no defense at all, on the assumption that reasonable leaders would restrain themselves from global catastrophe.

Today, a massive exchange is less likely than at any period of the Cold War, in part because of significant reductions in the primary nations' nuclear arsenals. The most likely *and* most dangerous threat comes from a single or limited missile launch, and from sources that are unlikely to be either rational or predictable. The first is an accidental launch, a threat we avoided making protections against due to the potentially destabilizing effect on the precarious Cold War balance. That an accidental launch, by definition undeterrable, would today hit its target is almost incomprehensible.

More likely than an accidental launch is the intentional launch of one or a few missiles, either by a nonstate actor (a terrorist or "rogue boat captain" as the scenario was described in the early 1980s) or a rogue state attempting to maximize damage as a prelude to broader conflict. This is especially likely in the underdeveloped theories pertaining to deterring third-party states. The United States can do nothing today to prevent India from launching a nuclear attack against Pakistan (or vice versa) except threaten retaliation. If Iran should launch a nuclear missile at Israel, or in a preemptory strike Israel should attempt the reverse, America and the world could only sit back and watch, hoping that a potentially world-destroying conflict did not spin out of control.

When President Reagan announced his desire for a missile shield in 1983, critics pointed out that even if a 99-percent-reliable defense from space could be achieved, a 10,000-warhead salvo by the Soviet Union still allowed for the detonation of 100 nuclear bombs in American cities—and both we and the Soviets had enough missiles to make such an attack plausible.

But if a single missile were launched out of the blue from deep within the Asian landmass today, for whatever reason, a space-based missile defense system with 99-percent reliability would be a godsend. And if a U.S. space defense could intercept a single Scud missile launched by terrorists from a ship near America's coasts before it detonated a nuclear warhead 100 miles up—creating an electromagnetic pulse that shuts down America's powergrid, halts America's banking and commerce, and reduces the battlefield for America's military to third world status[8]—it might provide for the very survival of our way of life.

Looking for Leadership

Such dire speculations call for enlightened leadership. Such a call is not new, but it is as yet unanswered. For example, in their February 2000 report, the co-chairmen of the Defense Science Board on Space Superiority wrote that:

> space superiority is absolutely essential in achieving global awareness on the battlefield, deterrence of potential conflict, and superior combat effectiveness of U.S. and Allied/Coalition military forces. . . . An essential part of the deterrence strategy is development of viable and visible (and perhaps demonstrated) capabilities to protect our space systems and to prevent the space capabilities being available to a potential adversary. . . . The Task Force recommends that improvements be made to our space surveillance system, higher priority and funding be placed on the "protection" of U.S. space systems, and that programs be started to create a viable and visible offensive space control capability.[9]

Despite this specific call for change near the beginning of the George W. Bush administration, one thought to be friendly to the idea of militarizing space, any move toward space superiority has so far been frustrated— as has consistently been the case during the past 50 years, when programs critical to obtaining an effective space force ran into a political/policy buzzsaw, particularly when space weapons were in any way involved. In 1983 and 1984, for example, the Reagan administration worked hard to reverse the so-called Tsongas amendment that held hostage the development and testing of the Air Force's F–15 hit-to-kill (HTK) ASAT system to a commitment that the United States would enter negotiations on a comprehensive ban of all ASAT systems. Congress, in response to the 1982 Reagan National Space Policy (which explicitly directed deployment of an ASAT system), was taken with testimony and arguments about the dangers of militarizing space and an associated arms race, the alleged lack of a requirement for an ASAT system, and suggested alternatives to developing an ASAT

capability—especially including arms control.[10] A major component of the resistance came from members of the scientific community.

The Reagan administration's 1984 report to Congress and the administration's many meetings with Senators, Representatives, and their staffs eventually carried the day, and the Air Force was released to test successfully its prototype system on September 13, 1985—against a noncooperative target, which should be noted by those who claim all HTK tests have been against contrived targets.[11] An operational F–15 fighter used its prototype ASAT to shoot down a dying satellite that had been on orbit for years—against a cold space background. And that was over 20 years ago, using 25-year-old technology, in a program begun in the latter days of the Ford administration and carried through the Carter years into Reagan's second term.

So what happened? With fanfare about not militarizing space (responsive to criticism by the arms control elite and numerous nations, including the Soviet Union) and no serious Air Force advocacy, Congress defunded follow-on F–15 ASAT activities, and the United States has not built a hitto-kill ASAT, in spite of the then- (and still-) operational Soviet/Russian co-orbital ASAT and China's recent test of its direct-ascent ASAT.[12]

The 1996 National Space Policies embed force application capabilities in euphemistic arms control language, for example, as discussed by Marc Berkowitz:

> [C]ritical capabilities necessary for executing space missions must be assured. Moreover, the policy directs that, consistent with treaty obligations, the U.S. will develop, operate, and maintain space control capabilities to ensure freedom of action in space and, if directed, deny such freedom of action to adversaries. Such capabilities may also be enhanced by diplomatic, legal, or military measures to preclude an adversary's hostile use of space systems and services.[13]

The 2006 National Space Policy, released without fanfare on a Friday afternoon before a long holiday weekend, is consistent with the 1996 pol-icy—and numerous preceding space policy statements as well.[14] Among other things, it states that "freedom of action in space is as important to the United States as air power and sea power"; notes that the exploration and use of outer space "for peaceful purposes" allows "U.S. defense and intelligence-related activities in pursuit of national interests"; states that "fundamental goals" are to "sustain the nation's leadership and ensure that space capabilities are available in time to further U.S. national security, homeland security and foreign policy objectives" and "enable U.S. operations in and through space to defend our interests there"; and directs the Secretary of Defense to "maintain the capabilities to execute space support, force enhancement, space control, and force application missions."

While the policy certainly can be interpreted to support an agenda to fully militarize space, decisive leadership to do so is lacking, presumably because of the political impedance illustrated by the above historical examples. Even military experts seem inclined to shrink from advocacy of fully exploiting space for military purposes—

accepting that "space sensors are good, but space weapons are bad"—not a serious military perspective. Today, the Air Force contributes 90 percent of DOD's space personnel, 85 percent of DOD's space budget, 86 percent of DOD's space assets, and 90 percent of DOD's space infrastructure[15]—yet it has no comprehensive doctrine to guide the Nation's exploitation of space and assure U.S. supremacy—as the 2000 Defense Science Board stated should be the objective of the Nation's military space programs.[16]

Furthermore, the Defense establishment writ large also has taken little action to improve the situation, even under the leadership of former Defense Secretary Donald Rumsfeld, who in 2000 led a congressionally mandated Commission to Assess the United States National Security Space Management and Organization, fostered by former Senator Bob Smith (R–NH) to challenge the status quo of U.S. military space programs and move toward a needed U.S. Space Force.[17] The commission's unanimous bipartisan consensus conclusions and recommendations, which would move the Pentagon toward that desired objective, might have been expected to be guidelines under Secretary Rumsfeld—but, alas, there was little improvement on his watch. In fact, regressive steps, such as the disestablishment of U.S. Space Command, work in precisely the opposite direction. Meeting this challenge will rest with successor administrations.[18]

Astropolitical Realism

We aver that the application of space technology to military operations is simply the latest in a logical line of techno-innovations in the continuing process of developing military theory and strategy. In its narrowest construct, astropolitical realism comprises an extension of existing theories of global geopolitics into the vast context of the human conquest of outer space. In its more general and encompassing interpretation, it is the application of the prominent and refined realist visions of state political and military competition into outer space policy, particularly the development and evolution of a new legal and political regime that maximizes both global security and prosperity. Though historians have done an adequate job of describing the realist—even a harsh *realpolitik*—view of humanity's tendency toward confrontational diplomatic exchange in the chronology of space exploration, no similar effort has been made to place a stringent conceptual framework around and among the many vectors of space policies and chronicles.[19]

Thus, we propose fitting realist elements of space politics into their proper places in space strategy. While it may seem barbaric in this modern era to continue to assert the primacy of war and violence—"high politics" in the realist vernacular—in formulations of state strategy, it would be disingenuous and even reckless to try to deny the continued dominance of the terrestrial state and the place of military action in the short history and near future of space operations.

In the process, we advocate an open, honest debate about the future of American space intentions and the application of classical and emerging strategic theory to all realms of space exploration and exploitation— including:

- its protection as a domain for private investment and commercialization
- recognition of the emerging role of space as the critical, even quintessential, capacity for continuing American military preeminence in the international system
- a thorough understanding of the astromechanical and physical properties of outer space essential for an optimum deployment of military space assets
- a long-overdue development of a revamped legal and political regime based on current international realities and not Cold War fantasies.

Conclusion

With great power comes great responsibility. If the United States deploys and uses its military space force in concert with allies and friends to maintain effective control of space in a way that is perceived as tough, nonarbitrary, and efficient, adversaries would be discouraged from fielding opposing systems. Should the United States and its allies and friends use their advantage to police the heavens and allow unhindered peaceful use of space by any and all nations for economic and scientific development, control of low Earth orbit over time would be viewed as a global asset and a collective good. In much the same way it has maintained control of the high seas, enforcing international norms of innocent passage and property rights, the United States could prepare outer space for a long-overdue burst of economic expansion.

There is reasonable historic support for the notion that the most peaceful and prosperous periods in modern history coincide with the appearance of a strong, liberal hegemon. America has been essentially unchallenged in its naval dominance over the last 60 years and in global air supremacy for the last 15 or more. Today, there is more international commerce on the oceans and in the air than ever. Ships and aircraft of all nations worry more about running into bad weather than about being commandeered by a military vessel or set upon by pirates. Search and rescue is a far more common task than forced embargo, and the transfer of humanitarian aid is a regular mission. Lest one think this era of cooperation is predicated on intentions rather than military stability, recall that the policy of open skies advocated by every President since Eisenhower did not take effect until after the fall of the Soviet Union and the singular rise of American power to the fore of international politics. The legacy of American military domination of the sea and air has been positive, and the same should be expected for space.

As leader of the international community, the United States finds itself in the unenviable position of having to make decisions for the good of all. No matter the choice, some parties will benefit and others will suffer. The tragedy of American power is that it must make a choice, and the worst choice is to do nothing. Fortunately, the United States has a great advantage: its people's moral ambiguity about the use of power. There is no question that corrupted power is dangerous, but perhaps only Americans are so concerned with the possibility that they themselves will be corrupted. They fear what they could become. No other state has such potential for self-restraint. It is this introspection, this angst, that makes America the best choice to lead the world today and tomorrow.

America is not perfect, but perhaps it is perfectible, and it is preferable to other alternatives that will lead if America falters at the current crossroad.

Space weapons, along with the parallel development of information, precision, and stealth capabilities, represent a true revolution in military affairs. These technologies and capabilities will propel the world into an uncertain new age. Only a spasm of nuclear nihilism could curtail this future. By moving forward against the fears of the many, and harnessing these new technologies to a forward-looking strategy of cooperative advantage for all, the United States has the potential to initiate mankind's first global golden age. The nature of international relations and the lessons of history dictate that such a course begin with the vision and will of a few acting in the benefit of all. America must lead, for the benefit of all.

Notes

1. Quoted from Jacob Neufeld, *Ballistic Missiles in the United States Air Force, 1945–1960* (Washington, DC: Office of Air Force History, 1990), 35.
2. See, for example, Everett Dolman and John Hickman, "Resurrecting the Space Age: A State-Centered Commentary on the Outer Space Regime," *Comparative Strategy* 21 (Winter 2002), 1–45.
3. Cited by Herbert London, "Piercing the Gloom and Doom," *American Outlook* (Spring 1999), available at <http://ao.hudson.org/index.cfm?fuseaction=article_detail&id=1270>.
4. See, for example, Robert Preston, Dana J. Johnson, Sean J.A. Edwards, Michael D. Miller, and Calvin Shipbaugh, *Space Weapons: Earth Wars* (Santa Monica, CA: RAND Corporation, 2003).
5. See Donald R. Baucomb, "The Rise and Fall of Brilliant Pebbles," *Journal of Social, Political, and Economic Studies* 29, no. 2 (2002), 145–190.
6. Cited in John Burgess, "Satellites' Gaze Provides New Look at War," *The Washington Post*, February 19, 1991, A13.
7. Testimony of Deputy Secretary of Defense Paul Wolfowitz, on U.S. Military Presence in Iraq: Implications for Global Defense Posture, for the House Armed Services Committee, Washington, DC, June 18, 2003. See also Department of Defense, *Conduct of the Persian Gulf War: Final Report to Congress* (Washington, DC: Department of Defense, April 1992), 227–228.
8. While such a nuclear detonation would harm no one directly, the resulting electromagnetic pulse would wreak havoc on the U.S. powergrid, communication networks, and other critical infrastructure—with major national and international consequences. It could also cause significant upset and damage to satellite systems that are vital to U.S. terrestrial force operations and capabilities. See *Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack*, *Executive Report*, vol. I, 2004, pursuant to Public Law 201, 104th Congress, July 15, 1998.
9. Office of the Undersecretary of Defense for Acquisition and Technology, "Report of the Defense Science Board Task Force on Space Superiority," Washington, DC, February 2000. The board recommended that U.S. policymakers articulate two declaratory statements: "The United States will take all appropriate self-defense measures, including the use of force, to respond to the purposeful interference with U.S. or Allied space systems, or those systems critical in supporting national security interests"; and "The United States will take appropriate self-defense measures, including diplomatic and legal means as well as the flexible use of force, in response to the use of space by an adversary for purposes hostile to U.S. national interests." Among other things, the report concludes, "The use of space has become such a dominant factor in the outcome of future military conflict and in the protection of vital national and global interest that it should take on a

priority and funding level similar to that which existed for U.S. strategic forces in the 1960s through 1980s."

10. See "Fact Sheet Outlining United States Space Policy," July 4, 1982, Public Papers of President Ronald W. Reagan, Ronald Reagan Presidential Library, available at <www.reaganutexas.edu/archives/ speeches/1982/70482b.htm>.
11. As argued in President Reagan's March 31, 1984, report to the Congress on U.S. Policy on ASAT Arms Control, such a comprehensive ban would not be verifiable and would be ineffective in precluding the development of a number of systems—including intercontinental ballistic missiles and various space systems—that would have inherent ASAT capability and, in any case, such a ban is not in the U.S. national security interest. President Reagan declared, "[N]o arrangements or agreements beyond those already governing military activities in outer space have been found to date that are judged to be in the overall interest of the United States or its Allies."
12. The failure of the F–15 ASAT program, after a decade of research and development costing over $1.5 billion, can be traced to incoherence in program advocacy and related arms control initiatives during several administrations. See Henry F. Cooper, "Anti-Satellite Systems and Arms Control: Lessons from the Past," *Strategic Review* (Spring 1989), 40–48. For example, President Carter, while continuing the same F–15 ASAT program, proposed a comprehensive ASAT ban in 1977 in his first package of arms control initiatives—fortunately, the Soviets rejected it outright. Beginning with their 1981 UN proposal, the Soviets proposed a comprehensive ban—while conducting major military exercises including multiple tests of their co-orbital ASAT. The arms control community, including many in the scientific community, judged that the Reagan policy meant an end to arms control. See, for example, Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945–1984* (Ithaca, NY: Cornell University, 1985).
13. A comprehensive discussion of the 1996 U.S. space policy is given by Marc J. Berkowitz, "National Space Policy and National Defense," *Spacepower for the New Millennium* (Colorado Springs: U.S. Air Force Institute for National Security Studies/McGraw-Hill, 2000), 37–59.
14. The unclassified summary of the 2006 National Space Policy, released by the White House on August 31, 2006, is available at <www.ostp.gov/html/US%20National%20Space%20Policy.pdf>.
15. Michael E. Ryan and F. Whitten Peters, *The Aerospace Force: Defending America in the 21st Century—A White Paper on Aerospace Integration* (Washington, DC: Department of the Air Force, May 2000), 5.
16. For a critical review of this lack of vision, see Peter L. Hays and Karl P. Mueller, "Going Boldly—Where? Aerospace Integration, the Space Commission, and the Air Force's Vision for Space," *Aerospace Power Journal* (Spring 2001).
17. The Commission's report, issued pursuant to Public Law 106–65 on January 11, 2001, is available at <www.defenselink.mil/pubs/space20010111.pdf>.
18. For a discussion of these considerations, see "What Do You Leave Behind? Evaluating the Bush Administration's National Security Space Policy," *George C. Marshall Institute Policy Outlook*, December 2006, available at <www.marshall.org/pdf/materials/490.pdf>.
19. See Walter McDougall's incomparable . . . *the Heavens and the Earth* (New York: Basic Books, 1986).