Paths to Extinction:
The US Air Force in 2025

A Research Paper
Presented To

Air Force ***2025***

by

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Disclaimer

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Introduction

Contrary to popular belief, people do not learn from experience. Rather, they respond to a particular stimulus in a deliberate way and thus predictably.

—Evan S. Connell
Son of the Morningstar

The fundamental purpose of all organisms and organizations is to survive and prosper. Anything that impairs one's ability to do so is a threat. Traditionally, military services have focused on threats to the nation and on potential adversaries in the next war. But while they are the focus of military planning, not the only or the most important threats to a military service or a nation's armed forces. There are many others, internal as well as external (e.g.'s political, economic, social, technological and military). And the biggest threats may occur in peace, not war: It is the military preparedness and the superiority gained in peace that will spell victory in war. The relentless competition for more or better weapons, improved doctrines, and winning strategies may be the real competition, with war a form of public validation of peacetime realities. Given the increasing costs, lead times, and consequences of decisions about how to organize, train, equip, and fight in the future, we should take as much care in peace as we do in war regarding the security of both the service and the nation.

Though members of the United States Air Force may be discomfited by the assertion, their service is in serious jeopardy of ceasing to exist in the not too distant future. For a variety of reasons, developed later in this paper, the continued existence of the USAF is anything but secure. Five years after its greatest triumph, the USAF finds itself besieged by orchestrated attacks from the other services. In a series of exercises and war games, arguments in the Commission on Roles and Mission of the Armed Forces (CORM), meetings of the other services and Congressional committee work, the USAF is increasingly isolated and criticized.

Both the Army and the Navy have sought to gain power, prestige, and budget share at the USAF's expense. The US Army, the Air Force's parent, has always bemoaned the loss of increasingly powerful air assets. It no longer possesses capabilities that it used to control. The USAF provides the Army both inter- and intra-theater mobility through air transport and additional striking power in the form of close air support. The Navy, the USAF's most consistent adversary since William "Billy" Mitchell's destruction of battleships

by aerial bombardment in the 1920s, has always sought to gain air (and later, Air Force) missions, be it long-range air defense, strategic attack, or power projection. Since the end of the Gulf War, both services have coveted Air Force assets and missions. The Army wants to control deep attack and manage an expanded battlespace while the Navy sees carrier naval aviation as the first line of defense and the ultimate in power projection. Both argue that missiles—the Army Tactical Advanced Missiles System (ATACMS), or a next generation follow-on system, and the Tomahawk Land Attack Missile (TLAM)—can replace manned aircraft for conventional missions, thereby allowing each service to compensate for what it wishes to control.

On the heels of the Gulf War and the success enjoyed by USAF airpower, the Joint Force Air Component Commander (JFACC) concept of air operations, and the success of a large-scale independent air campaign run on the Air Tasking Order (ATO) system, several events have cast that success in a different light. The Army-Navy Joint Board's first meeting in nearly 60 years was held in November 1992 to discuss, among other things, how the Army and the Navy might better coordinate their planning. There was no USAF participation because the USAF was not invited. Exercise Atlantic Resolve, held in November 1994, was used to "prove" that a JFACC afloat concept could work and supplant an Air Force JFACC. There is a new Senate Armed Service Committee structure which divides defense issues under its review into Navy/Marine matters and AirLand matters. Such an arrangement ignores the fact that AirLand Battle was not primarily the way in which the Gulf War was fought. More importantly, all of these suggest a conscious attempt to degrade the value and validity of independent airpower as wielded by the USAF.

Worse, the USAF is assisting in its own demise. After struggling for decades to become independent, it finds itself in an era of jointness in which its unique capabilities and special talents, though demonstrated, are devalued. Under the guise of jointness, the mantra of the US defense establishment since the passage of Goldwater-Nichols in 1986, the US Air Force has sat by meekly and acceded to a circumstance which is increasingly debilitating. To the US Army, jointness means global mobility and close air support—things that it gets and the Air Force gives. To the US Navy, jointness means land-based aerial refueling of naval air assets and USAF combat air patrol in support of naval air assets attacking land-based targets. Here, the Navy gets and the Air Force gives.[1] The USAF, in the interest of jointness, has allowed itself to be directed by others. If one speaks up for the USAF, one speaks implicitly against jointness. And worse, if one speaks for jointness, it is often at the expense of the USAF.

The Argument in Brief

The USAF may well face extinction by the year 2025. If such a state of affairs comes to pass, it will be because of its failure as an institution to ensure its viability and evolve appropriately in a complex, uncertain, ambiguous environment, both at home and abroad. Given the contribution made by airpower in the Gulf War, largely wielded by the USAF, such an outcome seems sheer fantasy. But unless important issues are addressed promptly and well, this could soon become reality.

Institutionally, the participation of senior USAF leadership in US military strategy formulation and implementation has, with few exceptions, been studiously avoided. While there have been two Chairmen, Joint Chiefs of Staff (CJCS), from the US Air Force (Gen George S. Brown and Gen David C. Jones), there has been only one Regional Commander in Chief (CINC) [Gen Lauris Norstad was Supreme Allied Commander Europe (SACEUR) in the 1950s]. As of this writings, there are no USAF (CINCs) in a regional command. In a variety of settings—the National Training Center's modeling and scoring, the Navy's Global War Game in Newport, assertions in *Roving Sands* exercises, and notions of a Theater Missile Defense Tactical Operations Center as a separate operational entity—airpower's role is diminished. To ignore or dismiss the contributions of airpower in general is to ignore or dismiss the USAF in particular. Collectively, they create a climate which ensures that an airman's perspective is not a part of the conceptual formulation of national military strategy.

Many of these difficulties are of the USAF's own making. One of its greatest sins is a misplaced enthusiasm for AirLand battle. That is Army doctrine, not Air Force doctrine. The USAF, after gaining its hard won independence, willingly sacrificed most of the advantages it had obtained and served its Army masters once again.

> The Air Force has conceded the intellectual high ground to the Army with its AirLand Battle concept. While airpower must support the ground commander, it is limited to no more than that if the Air Force has no integrating concept of its own.[2]

Why did the USAF come under the spell of the notion of AirLand Battle? It is US Army Doctrine that was developed in the late 1970s and early 1980s. Having been seduced by atomic/nuclear deterrence until confronted with its second limited war in Vietnam, support for the Army was the only role for Tactical Air Command (TAC). TAC which began wresting control of the USAF from the Strategic Air Command (SAC) and the bomber side of the USAF in the 1970s. "In 1960, bomber pilots held 77 percent of the top Air Force

leadership positions, fighter pilots, 11 percent; by 1990 these percentages had become 18 percent and 53 percent respectively."[3] Thirty years from now, this ratio should be considerably different. The problem now may be how long it will take USAF to integrate non-rated missileers into the hierarchy and come to appreciate space—as a mission, an opportunity, and a place—in USAF thinking.

Not only most junior Air Force officers, but senior USAF general officers as well, saw the USAF role as supporting the Army. The legacy of Vietnam and AirLand Battle on the one hand, nuclear deterrence and the single integrated operational plan (SIOP) roles on the other, meant the USAF was somewhat schizophrenic about its mission. This was the result of the SAC versus TAC struggle for control of the USAF.[4] Air superiority was deemed critical but there were many who saw Air Force's principal mission as supporting the ground force commander and his scheme of operations, not necessarily the conventional strategic use of airpower such as we saw in the Gulf War.[5] In believing this to be true, these men were expressing the belief of the USAF at that time. No other service has thought so little of its own mastery of its medium of operations and combat potential. That reality is showcased in Col Richard T. Reynolds' book, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq*.[6] In its own mind, both prior to and after the Gulf War, the Air Force was to take notes from the land component commander and provide what he required.

Furthermore, the USAF finds itself having difficulty in supporting publicly defensible funding priorities. As the systems become more technologically advanced, the numbers required decline and the costs per unit increase. Thus, the B-2, the C-17, the F-22 (let alone space systems) are more difficult to defend. They are quite literally worth far more than their weight in gold—a concept the average American voter finds difficult to comprehend. The cost of space operations—$10,000 per pound to place things in orbit—and the cost of satellites, tracking capability, etc. are greater still and compound the problem still further. The procurement of each technologically laden system thus becomes more and more difficult with the next one always at risk.

Worse still, the failure to capitalize appropriately on its demonstrated success in the Gulf War—both internally within USAF and externally with the public at large—has squandered a once-in-a-lifetime opportunity to emblazon the image and capability of USAF and American airpower on the minds of a grateful nation. American combat forces had a casualty rate in the Gulf War lower than that of a 20-30 year old male who remained at home on the streets of our nation's cities.[7] But rather than aggressively asserting its

capabilities, the case for airpower—meaning both air and space capabilities—needs to be made quietly, effectively, and persistently.

Given this as background, the hypothesis is as follows*: Unless present circumstances and trends are reversed—and soon—the USAF will become extinct by 2025 or soon thereafter*. It would no longer exist as a separate service, would have no sustainable rationale for an independent existence, and would find its roles, missions, and assets parceled out to others. It could be suppressed, abolished, or annihilated—all meanings of extinction. Moreover, this 2025 eventuality is being determined now because "Decisions made today have 30-year implications."[8] This could happen in a number of different ways. They divide into two separate categories of paths to extinction: externally caused extinction (the actions of others) and internally caused extinction (actions taken by USAF itself). We will examine each class of actions in turn.

External Paths to Extinction for the USAF

There are essentially six different external ways in which the USAF could become extinct by 2025. They can be summarized as follows:

1) the ascendancy of other services,

2) economic and budgetary constraints,

3) a different set of defense choices in a constrained environment,

4) a transformation in the nature of war,

5) technology becoming the death knell rather than the savior of aerial warfare, and

6) the rise of jointness to its logical conclusion.

Each of these is entirely possible, some quite probable. The logic provided below shows how the extinction of the USAF could come to pass.

Other Service Ascendancy

There are three subsets of consideration here. The first of these is the ascendancy of the US Army as the backbone of America's defense. There has always been an Army, and its role in the nation's defense is central to our conception of war. In the minds of most Americans, America doesn't really go to war unless or

until it commits ground forces to combat. Though much smaller than in the past, the Army will become more technologically adept. It will invest in a continuation of rotary winged aircraft, unmanned air vehicles (UAVs), and long range attack missiles. These weapons will encroach on the tactical and even the strategic missions of USAF. In seeking to digitize the battlefield, the Army seeks a portion of information dominance too.[9] It may well win the roles and missions debate, thereby winning the right to shape the deep battle.[10] In short, the Army's roles and missions will likely grow, not shrink.

In such an environment, the land component commander (LCC) will select targets, have increased numbers of ATACMs and other ground launched missiles at his disposal,[11] control the placement and movement of the fire support coordination line (FSCL) or its non-linear progeny, and, with all these, the timing, location, implementation and lifting of joint fires. Aerial attacks will be tightly controlled by corps commanders who will see them as supportive of, rather than supported by, the Joint Force Commander's scheme of maneuver. This is necessary, it will be argued, to prevent fratricide on the ground. Theater Ballistic Missile Defense will become a major Army mission, and a Tactical Operation Center for its control will work the issue as an Army problem and solution. Counterbattery fires are seen as relatively cheap, effective, and retaliatory, rather than offensive in nature, making them somehow more acceptable — if not better — to a reluctant Congress and a public whose sensitivity to clearly offensive systems is likely to grow.

In the second subset, the US Navy could emerge triumphant from the politico-economic contest for preeminence. Navy will be bolstered by its reactions to naval threats such as those by China against Taiwan. From the rise of carrier air in the 1940s through sharing the strategic nuclear mission with Navy submarines in the 1960s to the competition to be the ultimate power projection force in the 1980s, the Navy has consistently whittled away at what USAF saw as its own missions. Though unstated, "SeaLand Battle" (as opposed to "AirLand Battle") is the doctrinal concept behind *Forward, From the Sea…* and its form of power projection. The US Marines are the light but unified crisis-deployable force with the Navy. And if we have to project a large force abroad, the bulk of it will go by sea. Although large numbers of troops went by air, 95 percent of the materiel sent to both Vietnam and the Gulf went by sea.[12]

The US Navy has a piece of all the action. It has global operational capability with nuclear powered carrier battle groups (CVBGs) and submarines. It has tactical capability along the littoral (where most of the world's crises and major battles have occurred)[13] via carrier air, TLAMS, and surface action groups (SAGs).

It has the strategic mission with submarine launched ballistic missiles (SLBMs), a crisis response capability with the US Marine Corps, and a host of systems—Aegis/ERINT (exoatmospheric re-entry intercept), antisatellite (ASAT) and theater missile defense (TMD) with which to protect the US and its interests. Despite the fact that the USAF supplies 90 percent of the people and 80 percent of the money for space operations,[14] the US Navy has its own fleet satellite (FLEETSAT) network. This is a very expensive service-dedicated luxury. The US Navy is selling the naval expeditionary task force (NETF) as the force of choice for the future.[15] The Marines have the best bumper sticker at the moment— "A certain force for an uncertain future,"—and the Navy has proved itself more adept at placing its officers in the joint hierarchy than the other services. Seventy percent of the earth's surface is covered by water the US has broad ocean moats to the East and to the West, and the US Navy has over two centuries of naval tradition. The Navy also has better lobbies, a simple message, and a more coherent vision. Placing the defense of the nation in the hands of the US Navy has been traditional for much of our history. Doing so now and for the future seems even more appropriate—and likely.

A third way in which service ascendancy could destroy the USAF has historical precedent. Space Command is to the US Air Force today as the Army Air Corps was to the US Army in 1946. Space is laying claim as a separate domain with different problems and with different vehicles to operate in a different environment. Though a part of the third dimension, space has a different environment that requires different technologies and different operations. While vehicles that can fly in the air can fly in space, spacecraft can't necessarily "fly" in the atmosphere. The separate domain of space also has a different status and different constraints, given treaties and international agreements regarding it. The combination of divergent technology choices, massive budgetary support for space initiatives, and the political difficulty of trying to control both atmospheric and exoatmospheric to deep space—all suggest that the creation of a separate Space Force may be a matter of common sense and ultimate reality.

The costs of investments in space resources are enormous. Without some dual use by commercial and military sectors alike, massive amounts of money for research and development—let alone actual operations—seems unlikely to be forthcoming. There are numerous actors in space, both domestically and internationally, national and commercial. Space is obviously of crucial importance for security as well as technological advancement. But we can't afford separate systems for air and space. Why not, the argument

goes, allocate air missions to the other service and turn the rump of the US Air Force into the US Space Force? The Space Force would focus on the arena of the far future Space.

A variant of this approach focuses on the rising importance of information dominance for military victory and suggests that we formalize much of what we do in space at the moment with the creation of an Information Command for conducting of information warfare.[16] The combination of all information war roles and missions, many of which are focused in space, into a new entity appeals to the logic of centralized control of such assets for all the services. And indeed, the consolidation of military influence in the Office of the Secretary of Defense (OSD) seems headed in this direction. The Ballistic Missile Defense (BMD), the Central Imaging Office (CIO), Defense Aerial Reconnaissance Office (DARO), the Defense Information Systems Agency (DISA), and the National Reconnaissance Organization (NRO) all have OSD backing more than service ownership. All space-based multispectral data collection, data distribution, deception operations, and verification assets would be centralized; not USAF roles or missions. It would likely place civilians even more firmly in control, thus depriving the services of these capabilities—at least directly. In short, the USAF would remain atmospheric, not "infospheric," and the latter roles and missions would belong to a separate entity.[17] And, since the Army and the Navy are laying claim to USAF roles and missions, there would then be no USAF.

Economic and Budgetary Constraints

As long as the US economy does not falter badly, there is no real crisis. Down-sizing, reorganization, and declining budgets will likely continue for the military, but not at crisis proportions. However bad it has been, the post-cold-war demobilization has been nowhere near as great as post, (World War I) or post (World War II) demobilizations. But the national and world economies are subject to a host of perturbations. For one thing, our money is not very secure. Sixty percent of US dollars are held abroad and the US cannot control their flows. Increased counterfeiting of US cash is a major weakness in our national defense. The counterfeit money is so good as to be virtually indistinguishable from the real, thus forcing us to begin issuing new currency. Our economy is at risk, too. Another oil shock, which could be caused by any number of events in the Middle East, could induce a global recession ever or depression. This could be severe, given the economic difficulties of Japan and Germany—and it's more likely, given the rapidly rising debt of many

of the organization of petroleum exporters (OPEC) states, particularly Saudi Arabia. Since there is, strictly speaking, no functioning international financial system, this could cause a banking system or currency crisis that would permeate the international community.

Our trade and financial systems are also at risk. Corruption—the human kind; for example, of those who run the financial institutions and stock markets—or the electronic kind; for example, computer viruses that infect databases—could bring international trade and financial dealings to a standstill. Our impact on the world economy could be jeopardized in any of several ways. Withdrawal of foreign investment (from the US) in favor of other markets (Asian) with higher yields could radically affect world financial flows and market stability. Or a chain reaction of events, involving less than major actors, could panic currency markets. (When peasant unrest in Chiapas, Mexico, led to a fall of the peso, a massive financial assistance effort by the US and a precipitous fall of the dollar resulted.[18]) The lack of a budget agreement in the US for more than half a year is not a confidence inspiring circumstance. A lack of significant progress on the annual deficit and the national debt may cripple the US as the major financial actor in the world. While improbable at any one point, all of these are possible. They represent wild cards to US security, that is, they are beyond the military's control.

For some time now, the US defense budget has been a target of opportunity for budget cuts. Representing as it does the largest source of fungible assets in the federal budget in a given fiscal year, the DOD budget is a raidable asset. Amid the pressures discussed above, it could become an even bigger target of opportunity to a Congress of the future.[19] This trend—of past practice, current reality, and increased future problems—exists at the service level as well. In the competition for increasingly scarce resources, USAF is the supporting, rather than supported, service. It has taken a greater percentage of the hits on its highly visible, very large systems.

> During the last half of the 1980s, cuts in the Air Force budget exceeded the combined cuts in the Army and Navy. Worse, because of mandated and protected programs, what was hurt most was the Air Force investments in the future. The Air Force lost $46 billion, while the other two services each lost less than $22 billion.[20]

Since the Gulf War, a review of service requests and Congressional budget cuts reveals a similar tendency: USAF cuts are nearly double those of the Navy; Army has lost the least in percentage terms. In the future, the need for near simultaneous replacement or continuing major upgrades of 1970s weapons systems and platforms in all services in the first decade of the 21st century will increase the pressure for scarce

resources. The great majority of all the major weapons systems of the US armed forces date from the 1970s or earlier—and obsolescence gets worse as system life expectancies are extended. Many of the aircraft in the inventory are far older than the pilots who fly them.

The USAF may have severe problems as the numbers of each new generation of fighter or bomber shrink precipitously because of higher unit costs. Cost overruns on the F-22, continuing investment in space systems, and initial research and development for emerging technologies lead to having the operations and maintenance accounts besieged in the process. The B-2 phenomenon may become the norm; that is, where one buys a squadron (rather than a wing) of particular systems to have them in the inventory, but in very small numbers. Each unit cost is then so high that the risk of aggressive training and actual deployment, let alone use in combat, increases dramatically because the loss of one could be catastrophic in the eyes of an increasingly budget conscious Congress and public.[21]

Policy Choices in a Changed Strategic Environment

It is entirely possible that the nature of the world we face and the threats to US security will become either so ambiguous or so novel that we lose the ability to respond effectively. Traditional problems—nationalist inspired civil wars, disputes over borders and resources, religious or ideological crusades—may mix with threats inspired by drug cartels, international crime syndicates, vendettas of wealthy individuals or corporations, computer hackers, resurgent communist regimes, renegade nuclear scientists, or organized international terrorism. Current trends may become even stronger. Social security continues to be more important than national security as a matter of social, political, and economic concern throughout the US and her NATO allies. Welfare is a more important problem than warfare in the minds of most. The 1990s are beginning to look more and more like the 1920s—a rising bull market, no peer competitor for the US, international organizations and agreements supplanting investments in military capability, the importance of trade and finance growing at the expense of politico-military concerns in the international arena. Who, then, is the military threat to the US? If there is none, then a return to a policy of isolationism—at least a military one with greatly diminished forward presence and power projection capabilities—becomes more likely.[22]

Increasingly, we are using military forces for military operations other than war (MOOTW). Doing so is appropriate in one sense—that is what militaries do in peace time. But it is inappropriate in another sense:

If doing an increasing number of these operations simultaneously degrades our combat capabilities, it will not have been a wise choice. Performing MOOTWs with little or no chance of solving fundamental problems or increasing national security may actually make things worse. In the name of peacekeeping and humanitarian assistance, we are progressively reducing our military capability by intervening in a series of failed states. Solving particular problems, even if we could, might not lead to a significant enhancement of peace and security in any one region, not to mention the world in general.

The USAF is particularly vulnerable to declining readiness due to MOOTW in such places as northern Iraq (Provide Comfort), Somalia (Provide Relief, Restore Hope), Rwanda (Support Hope), Haiti (Uphold Democracy), Bosnia (Provide Promise, Deny Flight, Joint Endeavor), and future efforts to provide humanitarian assistance. In support of these operations, the USAF has nearly 50 percent of its fighters deployed overseas. Many of USAF's reconnaissance, transport, and tanker assets are deployed abroad—and four times the number of USAF personnel deployed abroad in 1989 are currently deployed abroad.[23] These "peacekeeping operations" cost billions of dollars, degrade combat skills, use up precious service life of military systems (especially bare base equipment), and seriously impair retention in both the active forces and the reserve and guard components of the military. Spending scarce military resources in this way may degrade them. Keeping the peace may promote insecurity when a test of force arises.

Technology May Well Prove the Death Knell of the USAF

As the service most closely tied to technological progress, the USAF may be particularly vulnerable when there are no airborne technological solutions to many of the threats that confront us. While war has become more deadly and costly in the West, the choice to initiate war is seen as uneconomical at best and suicidal at worst (even for the victors in some cases), the test of arms will continue to be the choice of some for the foreseeable future. And the means with which to wage war are such as to make conventional war irrelevant and other forms of war more horrible. The proliferation of conventional weaponry is bad enough; the spread of weapons of mass destruction, be they chemical, biological, or nuclear, may make us long for the bad old days of the cold war. By the end of this century, some 20 nations will likely have nuclear weapons.[24] These can be delivered as large or small weapons via missiles, planes, ships, torpedoes, or artillery shells. They could also be delivered by trucks, cars, packages or shipping containers—hundreds of thousands of

which enter the US every day. Add the possibilities for chemical or biological agents—much cheaper, easier to manufacture and disperse, more difficult to detect, just as deadly and more difficult to combat and one gets a sense of growing risk.

The fruits of technology in things that do not go "bang" such as the global positioning system (GPS), notebook computers, direct satellite broadcast capability, sophisticated space-based sensors, increased bandwidth and the like, genetic engineering, possibilities for weather alteration, and particle beams—could dramatically transform warfare as well as societies. The investment in things that do bear on combat capability more directly—stealth technologies, lasers, improved munitions and guidance systems for them—make today's combat systems much more expensive and valuable assets. The investment in pilots and their planes is such that we may be loathe to utilize them. High-tech solutions to low tech adversaries are not cost-effective, as the Soviets found out in Afghanistan (they used MIG-29s against the mujahideen's goats carrying supplies in the mountains). Worse, contrary to Douhet's assertion, air superiority may be neither necessary nor sufficient to win—as both Korea and Vietnam should have proven to the US. If the USAF can't protect US citizens and win the wars the nation has to fight, and if technology costs continue to increase, the citizen might well ask why we need a USAF. Technology may not be our salvation and USAF pilots may go the way of their forerunners—the well-armored Medieval knight.

The Nature of War and Warfare are Changing

Equally important is the ambiguity of the present and future security environment. Who, or what, is our adversary? Increasingly, the threats to national and international order both here and abroad are coming from what we might call nontraditional adversaries—international crime cartels, domestic terrorists, multinational nonstate actors, drug lords, international business and economic espionage, large numbers of refugees fleeing economic, social and political oppression, the international transmission of disease, and simple, everyday, corrosive corruption. Investment in expensive and sophisticated space-based systems seems even less appropriate than it really is. What would the air campaign look like against these threats? What results could be expected?

Urban blight, decayed infrastructure, failed welfare programs, inadequate education, fouled air and water, rampant population growth, environmental degradation, species depletion, and a host of other

problems are serious threats to security. But they have no traditional military solutions—at least none that are acceptable to an American in the last decade of the 20th century. For those insidious and covert threats, how does one use military force to alleviate in the symptoms if not defeat them? If terrorists act without claiming responsibility, against whom do we retaliate? All of these make the military case for national security more difficult, to fund and preserve. It may be particularly difficult for the USAF; how does one employ an F-22 against any of these?

Wars in the future may be radically different from those to which we are accustomed—and they could run a wide gamut of possibilities. They could be high-tech information wars among nonstate actors using nonlethal weapons, leaving little collateral damage and no "finger prints" (or leaving false ones) of responsibility. Or, they may be more primitive affairs, reminiscent of the *Camp of the Saints*[25] scenario in which masses of human beings with nothing to lose migrate toward those who do and bodies replace bullets as the weapons of choice. How would the West respond to hordes of barbarians at the gates of civilization? There could be warfare among highly specialized, loosely organized technological elites, not in uniform, who conduct campaigns by telecommuting. Or, there could be increasingly little societal interest society in military issues as more and more of society's energies and resources are absorbed by problems within; for example, crime and punishment, law and order. And, some form of confrontation between the over-thirty rich and the poor but angry global teenager seems likely.

Jointness "uber alles"

For better or worse, jointness is now the mantra of the American military—as if repeating it endlessly will make it a reality. It is seen as a universal good, above reproach. To reject jointness is to be selfish, not a team player, part of the problem rather than part of the solution. The rather desultory and marginal report of the CORM did not make much headway in addressing the fundamental issues. One of these is that jointness means different things to different services. To the Army, jointness means it gets additional artillery in the form of close air support and global mobility in intertheater lift and intratheater lift—neither of which it has to pay for, maintain, or sustain. For the Navy, jointness means aerial refueling from land-based tankers for carrier air, and USAF- provided combat air patrol (CAP) and airborne warning and control system (AWACS) to allow Navy planes to strike their land-based targets.[26]

For the Army and the Navy, jointness is a paying proposition—literally and figuratively. They get and the USAF gives. For the USAF, jointness means it is always the supporting, never the supported, service—save for the anomaly of the Gulf War. But that is not likely to happen again because the Army and Navy (and certainly the Marine Corps) will not permit that sort of independent air campaign to be fought again if they can help it. (The last Roving Sands exercise began with a Marine JFACC.[27]) But the insidious effect is even worse. The Army-dominated J-6 has decreed that the very words "air campaign" are now no longer to be used. There is to be only one "campaign" — the CINC's. Air operations are to "support" the campaign, and the term "air campaign" is prohibited. One wonders just how "Instant Thunder," the air campaign for the Gulf War, could have been described and how it could have emerged if it had had to be sold not only to a reluctant USAF but to a reluctant CINC.[28] Since J-7 has authority over professional military education (PME), the term and the concept will ultimately be driven from the education and training of the US military. What, pray tell, are students at the Air Command and Staff College (ACSC) supposed to do in their ten-month school if they no longer can learn to develop and employ air assets in an air campaign?

The fact that jointness is enshrined in legislation in the form of the Goldwater-Nichols Bill makes it more difficult to overcome. A major result of the legislation is the emasculation of the services as well as their civilian secretaries. The Office of the Secretary of Defense (OSD), an increasingly civilianized and joint bureaucracy, watches carefully to ensure that service competency is not raised above the level of joint considerations. Perhaps more cynically, but accurately, Goldwater-Nichols was firmly embraced by the military because it guarantees each service a piece of the action every time there is a crisis deployment or employment.

Leadership has become management and jointness is the company way. Jointness guarantees that those who are most politically astute, rather than militarily adept, run the show. The joint requirements oversight council (JROC) decides the allocations. The individual services have the mission to organize, train, and equip their respective forces. The chairman oversees all, with the regional CINCs doing the planning, Congress doing the funding, industry doing the lobbying, and the service major commands (MAJCOMs) carrying out the mandates with little correlation among them.

The investment in jointness, intellectually and operationally, is diluting the importance of airpower. Increasingly, the incentives for service competency are being sacrificed on the altar of jointness. The concept

of joint fires is restricting and limiting the effectiveness of airpower. The surface forces, in the name of jointness, argue about the *processes* by which the war is conducted. The USAF, alone, is more concerned about strategic *effect* than the process. And the USAF has the most to lose because its very identity is enshrined in the concept of the independent application of airpower for maximum strategic effects. Consider these scenarios: Not having USAF regional CINCs, the JFACC being hobbled with a joint targeting review board (JTRB), having the other services guaranteed a right to support from USAF assets, abolishing the term "air campaign" from military usage and deleting it from PME—all in the name of jointness—virtually guarantees that air campaigns will disappear. Can the USAF be far behind?

It is extremely unlikely that all of these scenarios will come to pass. That any one of them could occur is, however, not far-fetched. Indeed, some combination of them is entirely plausible, perhaps even probable. Any one could be sufficient to cause the demise of the USAF. Strong tendencies toward several could do the same, whether or not they were fully realized. The USAF is likely to be besieged in the foreseeable future by threats to its very existence. Fending these threats off will take time, energy, and skill. The USAF may, or may not, be up to the challenge.

Internal Paths to Extinction for the USAF

In addition to the general external circumstances that could lead to the extinction of the USAF, there are, internal possibilities as well. In these, choices made by the USAF itself might actually promote or even ensure its own demise. Thus, even if it copes successfully with the external circumstances suggested above, USAF could well be responsible for its own demise if it

1) loses its sense of vision and its mission,

2) mismanages its people,

3) mismanages its programs,

4) chooses the wrong path for the future,

5) is too good at strategic warfare, and

6) fails to adapt appropriately to the changing strategic environment.

We will examine each of these in turn.

The USAF Loses its Vision and Mission

The USAF may be pulled in so many directions by jointness, the need to perform and sustain multiple MOOTW missions, and the effort to maintain combat-ready pilots and planes, that it loses sight of its fundamental mission—the employment of air and space forces in defense of US national interests. It could do this in a number of ways. It could emphasize training to the detriment of its overall capacity to deploy and employ its force in the quantity needed. Alternatively, it could become so consumed with the multiple MOOTW missions it now has and may get in the future that it sacrifices training and readiness to operational missions. Thirdly, it could try to do everything everyone else wants it to do rather than refining and honing its fundamental skills to do what it needs to do, thereby becoming incapable of doing anything well.

The potential reality of this is not hard to grasp, given the number of current operations and their magnitude. As of 3 April 1995, the USAF had flown over 18,000 sorties in Deny Flight/Provide Promise in Bosnia, over 2,600 in Haiti (Maintain Democracy), over 146,000 in southern Iraq (Southern Watch), and nearly 66,000 sorties in northern Iraq (Provide Comfort) all told, more than three times the number flown in the Gulf War. USAF has had nearly 50 percent of its fighters deployed overseas continuously, has managed 45 satellites on orbit, and has had security assistance personnel deployed to 101 countries in the two years since 1993.[28]

Perhaps most important, the USAF risks losing sight of its wartime duty and misunderstanding the nature of its peacetime interwar commitment—preparing for the next war and thinking about how it ought to be fought. If it continues its habit (and that of the American military in general) of always winning and never losing its own war games, of grading exercises on how smoothly they run rather than what is learned, of being more concerned with demonstrating success than learning from failure—in short, of being more concerned with self-promotion than with serious critical analysis and creative synthesis for future operations, then it is in serious trouble.

The USAF at times is its own worst enemy. In some of its official functions, portions of the USAF seem to prefer laudatory public affairs announcements, if not sheer propaganda, rather than even-handed objectivity.[30] Worrying more about self-promotion than self-examination is a failure to understand the problems confronting the USAF. Unless or until the USAF is seriously concerned with doctrine, with the uniqueness of airpower, with the understanding of the men and women in blue suits about what they

contribute as a service and what makes that special, then there is no real identity, no real self-confidence, and no vision for the future. Organizations that lose a vision of the future . . . die![31]

The USAF Mismanages its People

The USAF has had the image of being a rather high-living (and air conditioned) service, accustomed to better quarters and more creature comforts, and having stronger support and morale services than found elsewhere in the American military. Air Force enlisted dormitories, for example, put the rather Spartan quarters of their Army, Navy, and Marine counterparts to shame. The Air Force keeps pilot retention up "retention bonuses"—$30,000 up front after eight years of service—and $6,000 per year for five years between the 9th and 14th year of service, or $60,000 total. In treating its people well, and in using cash inducement and expensive perks, USAF may price itself out of business.

Despite the arguments made for "quality of life" issues, there is really no need for the USAF, or the military in general, to be in the commissary and exchange business in Continental United States (CONUS). Nor is there compelling reason to support the hospital and medical facilities and numbers of personnel that we do. These were designed for mobilization in wartime, but are utilized increasingly in peacetime by military retirees. Nor is there need to maintain an infrastructure, despite three rounds of base realignment and closure (BRAC), that is still far greater than our needs. Keeping the military separate from the society it serves—in housing, recreation facilities, and much of the routine of everyday life—from gas stations to fast food franchises on base—may be counterproductive in the long run. Being seen as well paid mercenaries to do society's dirty work is not an image to promote. Nor is it a wise role to play, however advantageous in the short term.

There are two points to be made here. First, the USAF is far ahead of the other services in reorganizing, down sizing and restructuring itself. That is both good and bad. Though it is not yet enough, it has taken far more cuts in the BRAC process than the other services. As of early 1995, 71 percent of all the BRAC savings were a result of USAF base closure and realignment activities. However, though USAF force structure has been cut by more than 30 percent, infrastructure has only been cut 15 percent.[32] But being, or appearing to be, a good citizen may not be a wise bureaucratic strategy; it is bases and jobs in congressional districts which keep the services powerful. As the services shrink, they have less power and

leverage on individual members of Congress. If the bases, posts, ports, and other installations of the military should ever be assigned to the CINCs (the logical extension of Goldwater-Nichols), then the USAF is dead because it has had only one CINC since WWII . It would lose out easily in competing with the other services in such a system.

There is something radically wrong with the USAF when an Air Force general officer boasts that "we have more nurses in the Air Force than we have fighter pilots."[33] That is not what the USAF is about. The ratios of officers to total enlisted force (nearly one to four), or of general officers to fighter wing equivalents (15 to 1), to satellites (6.5 to 1), to squadrons (1.4 to 1) or to Primary Aircraft Authorized (1 general officer for every 13 planes)[34] have grown out of all proportion to the need. Colonels used to be wing commanders. Now, that is a job for Brigadier Generals. Such "grade inflation" serves to make the USAF more top heavy, not leaner and meaner.

The intense competition for senior-level slots means one has to be tagged as a captain for senior leadership and be promoted below the zone routinely to be selected for senior level command jobs. Those who have been well-trained and educated in the officer corps (half of whom have MAs or MBAs, 1.5 percent of whom have PhDs)[35] and are not selected below the zone may take their training and education and go elsewhere, thus increasing the costs to the USAF by driving down retention rates. For those who stay in, one may be more concerned about playing things safe than by being bold and innovative. While the officer corps has been assured that it is not a "one mistake" Air Force, the competition is so fierce, this may be the perceived reality if not the intent. It is not wise for an armed service to select out the risk takers and reward the risk averse.

The USAF Mismanages its Programs

Cost overruns for major aerospace defense systems continue, making a jaded Congress and public even less supportive than they normally are. One observer has stated that if you multiply the original cost estimate by pi (3.14), you are generally closer to the cost of the deployed system.[36] While we built tens of thousands of one type of plane during WW II, and thousands of many types during the cold war of the 1950s and 1960s, we bought hundreds in the 1970s and began to buy only scores in the 1980s and tens in the 1990s. Norm Augustine's famous prediction that sometime in the next century, the US military will be able to buy just one

tactical fighter aircraft to be shared on different days of the week by USAF and the US Navy seems to on the cusp of coming true.[37]

Several things are at issue here. A public that doesn't know about the defense budget but does care about its tax dollars is led to the erroneous conclusion that cost overruns are examples of fraud, waste, and abuse. That public demands that something be done. In response, we expand the auditing and cost control systems in use. This means that more and more people are keeping the books while fewer and fewer are minding the store. Quantity and quality of procurement—of platforms, weapons systems, munitions, services, people—are all threatened by the general atmosphere of waste.

Acquisition, logistics, and comptroller career fields are increasingly civilianized. Specially trained civilians are becoming their own stove pipe in the system, complicating things further and separating the operators from the procurers. Concentration into fewer players and larger contracts is becoming more of a reality as the defense industry downsizes, merges, and realigns. One result is an increase in single sourcing which creates a faster revolving door of military officers retiring into defense contractor and "beltway bandit" jobs as the number of government contracts shrinks and their significance increases. Whether the Department of Defense (DOD) is purchasing weapons systems or war games, technological advice or other "knowledge" via the Defense Advanced Research Projects Agency (DARPA) or Net Assessment (NA), the public is left with the impression that a lot of money is being spent on things they don't understand and that the money goes to the same circle of people. It is, at the very least, not good public relations.

As things get worse, with a defense budget that is stagnant or likely to fall and the USAF losing its share of those resources, hugely expensive new systems (e.g., the F-22) may never be acquired in sufficient numbers to replace existing capabilities. The solution, as shown first with the F-117, then the B-2 and perhaps the F-22, seems to be to buy fewer and fewer numbers as unit costs increase. As a steady diet, this "solution" is ruinous.

There is a certain quality in quantity—and having too few of what is needed, regardless of superior capability, is tantamount to defeat by a different route. The USAF, more than any of the other services, is technologically dependent; it procures very expensive systems. It is vulnerable to making a procurement choice from which it and the nation cannot recover. The cancellation of expensive aerial systems, as was done with the B-1A, in order to purchase the ill-fated B-1B, and with the Navy's A-12, and the

preoccupation with technology demonstrators such as the joint advanced strike technology (JAST) program may become the wave of the future. There are many routes to obtaining a hollow force.

The USAF Chooses the Wrong Path for the Future

The USAF is wedded to the manned air-breathing airplane as the essence of its being. It disdained research into ballistic missiles and canceled the first contract for them in 1950. USAF took a long time to pursue the notion of cruise missiles, and then only if they were launched from aircraft. It has, until relatively recently, largely shunned UAVs. And despite the formation of Space Command in the USAF in 1982—25 years after Sputnik, 13 after Neil Armstrong walked on the moon, nine years after Skylab was launched and one year after the space shuttle Columbia first flew—the USAF has yet to integrate space successfully into its thinking as well as its operations.[38] Most visions of future air war contain a massive emphasis on UAVs. But it is difficult, perhaps impossible, for the knighthood of pilots that run the USAF—first from SAC then from TAC and now merged as Air Combat Command (ACC)—to accept the reality that the era of the manned air-breathing aircraft may eventually end. We should seriously consider the implications now.

As the images of the Gulf War fade and the likelihood of repeating such an air campaign declines, the USAF is less able to demonstrate its combat utility and necessity. And since Saddam Hussein's air force either refused to fight or fled the country, very few pilots who had any aerial combat in the Gulf War. For the bulk of the USAF, it has been 24 years since it had to deal with the reality of mortal air-to-air combat in Vietnam. The public, and increasingly the congressional, image of airpower as utilized in Somalia, Rwanda, and Bosnia is that of aerial "truckers" who deliver gasoline to other planes in flight and to people and supplies around the world. It is the "Federal Express" of the military, delivering anywhere in the world absolutely, positively, overnight and, in the minds of many, little more. When combat aircraft are used, it is often passively, as in Deny Flight, or with tragic results-the shootdown of two US Blackhawk helicopters in northern Iraq—in Provide Comfort. The great publicity success of recent times publicized a failure the shooting down of Capt Scott O'Grady over Bosnia.[39]

Because of the many competing pressures for increasingly valuable and scarce assets, the possibilities for critical disinvestments in them increases. Keeping a balance of physical, financial, and human capital for the future is extremely difficult in the ambiguous defense environment in which we find ourselves. And the

consequences of choosing wrong are enormous because there may be no second chance. Increasingly, wars are come-as-you-are affairs without years to mobilize, build up the output of the "arsenal of democracy," and bludgeon the enemy into submission by attrition and massive industrial output.

The wars of the future may well be short, sharp, limited affairs; longer insurgencies; nuclear, chemical, or biological contests—or even ones characterized by nonlethal weapons. Whatever they may be, one needs to be making important choices now for a not too distant future in which such an array of threats is a demonstrated reality. The USAF may not be institutionally able to choose intelligently among competing objectives and capabilities. It might well spread itself too thin or, worse, make no choice. Such a fate could spell the end of independently organized and controlled airpower.

The USAF is too Good at its Fundamental Mission—Strategic War

For most of the period known as the cold war, the primary mission of the USAF was strategic nuclear deterrence. It became so committed to nuclear deterrence that it nearly forgot its conventional strategic war-fighting and war-winning role.[40] The Gulf War proved that USAF was uniquely capable of fulfilling the conventional mission as well. That, and the end of the cold war, has made the conventional strategic mission paramount in the eyes of many. But there are some problems; the USAF may be too capable for its own good.

There is little doubt that the USAF could punish severely, if not destroy quickly, nearly any target or set of targets anywhere in the world within a reasonably short time. It could do so with nuclear weapons or with conventional ones. An airborne horror of chemical, biological, or fuel air explosion could be visited on adversaries if need be. The problem is that it is not likely to be permitted. The US is self-deterred from ending, a war by using the winning weapons at our disposal.

Even going to war in the Gulf—a blatant case of aggression by an unsavory dictator of a loathsome regime against a small and weak neighboring state, with control of a large segment of the world's oil-production at stake and a continuing threat to Saudi Arabia and other oil producing Gulf states—was difficult. It took six months of political preparation at home as well as abroad, in addition to a massive military buildup, and twelve UN Security Council resolutions to validate the righteousness of the crusade, before a very close US Senate vote permitted military action. A change of three votes would have meant the resolution to use force in the Gulf would have failed.[41]

Another legacy of the Gulf War is a strong sensitivity to casualties.[42] Even if we found ourselves having to fight a morally supportable traditional war in which there were large numbers of civilian casualties in urban environments, this would be increasingly unacceptable not only to Americans, but to much of the world at large. The American public is sensitized not only to collateral damage and numbers of casualties for its own forces but for those of the enemy as well. Too many casualties are simply unacceptable. Just what the threshold is cannot be determined in advance, but an adversary who can cause large casualties and/or a lengthy struggle is relatively advantaged when the center of gravity for the United States is American public opinion. Indeed, such attitudes are now ingrained in the US military. We have already had instances in which high-ranking members of the US military have uttered such statements as "No target is worth the loss of a plane and pilot"[43] and "I've buried my last Marine."[44] Even the US military may be becoming repulsed by the basic stuff of war—blood, death, and destruction.

The USAF, and the nation, still carry the burden of the two atomic bombs dropped more than 50 years ago on Japan. While there is no question of the awesome offensive striking power of the USAF, conventional as well as nuclear, the utter destruction it could cause may be morally unacceptable, both at home and abroad. Quite simply put, a Douhet-like "knockout blow" from the air may be an unacceptable way to win future wars to both our public and others. As the Tofflers characterize things, we are in need of brain force, not brute force, to fight and win future wars.[45] "Breaking things and killing people" to win a war if it is absolutely necessary may be permissible, but only in very small numbers and for very short time periods. We may be entering an era in which deterrence no longer works against our would-be adversaries who will happily risk martyrdom for their faith, religious or political. We may deter ourselves from using the weapons at our disposal because of the death and destruction necessary to "win."

The USAF Fails to Adapt to Changing Realities

Ultimately, the reason for the extinction of any species is failure to adapt. The adaptation of an organism, difficult though it may be, is probably less problematic than the adaptation of large-scale, complex organizations. They must assess things correctly, review a range of alternatives, select the best course of action, then ensure that it is implemented fully. Evolution for most animals occurs over generations, centuries, and millennia; organizations may have a few years, decades if they are fortunate, in which to adapt.

The strategic environment and its correct assessment must be reinforced with appropriate objectives, matched with the necessary resources, and blended with the requisite leadership in order to adopt the correct strategy. Along the way, there must be an implicit harmony among these and the doctrine, technology, values, and organization which undergird them. Weaving this tapestry is a very difficult task. It is this type of thinking that is most difficult and rare. It is far more important than solving operational problems in an air campaign. The US military in general, and the USAF in particular, usually does not suffer bright, iconoclastic thinkers well or for long.[46] John Boyd, Dennis Drew, Tom Fabyanic, Al Gropman, John Warden, Ted Warner, and Barry Watts, and many others retired as Colonels or Lieutenant Colonels—and many were lucky to get that far.

Such talent, as is, available is often unidentified or misutilized. Few of USAF's best or brightest become general officers—and those general officers who know, care, and try and do something about, USAF's problems often have to fight their colleagues as well as the defense establishment to succeed. The USAF simply must become more adept at permitting and promoting those who think conceptually, critically, and creatively. USAF leadership must permit bottom-up thinking, not merely top-down directives. It is on the edges of an organization (or an organism) that one first senses change and tries to respond to it. Those at the center and top of the hierarchy, charged with charting the organization's future, need the best advice and talent they can get. For the future, the organization needs educated people who are morally sound, operationally adept, and technologically and politically capable. That means fostering insight, imagination, innovation, and integration—words not normally used to describe the USAF.

The Bottom Line

There are at least twelve paths to extinction for the USAF in the next 25 to 30 years. These are *not* chimerical future threats. All either exist or could appear relatively quickly and easily *now*. Only half of the threats are external to the USAF itself and, hence, beyond its direct control.[47] But at least half are *within* its span of control—indeed, its jurisdiction—if its leadership will face them. What is at stake is the death of the USAF. *The only real question is whether we are discussing a homicide or a suicide.* Any one of these twelve scenarios is possible, perhaps even probable. The odds that some aspects of nearly all will come to pass are better than even. The likelihood that the USAF may escape any one is reasonable. The likelihood

that it can escape them all is quite remote. The odds are that one or more of these event paths will occurs and that could lead to end game—extinction of the USAF by 2025.

Of the twelve possible paths to extinction outlined above, all but two are domestic in nature, and, hence, within our control to some degree—even though external to the USAF. The external causes of USAF's causes of its demise—other service ascendancy, economic and budgetary constraints, defense choices in a constrained environment, and the rise of jointness—are matters of domestic decision making, as are the USAF's internal choices and actions. The only two that lie outside the US itself and can be manipulated by others are the transformation of war on the one hand, and technology becoming part of the problem on the other. These are not really novel in that the evolutions of warfare and technologies are constants for everyone on the planet. But the US may not be able to control them.

What is crucial about them is our understanding of these processes and their significance. Knowing that these are important—and investigating, debating, and refining our arguments about and interpretations of them—is the first step in understanding how to respond and how to shape these forces themselves in the future. Knowledge—of our problems, ourselves, our likely adversaries, our capabilities, our objectives, the risks, the costs, the consequences of alternative courses of action—is the key. Knowing as we do what the pitfalls are, it should be easier, though not guaranteed, that we can avoid them by creative adaptation.

Airpower possesses certain characteristics, elaborated below, which make it capable of reaching or striking quickly, from a distance, any place on the planet with great strategic effect. It possesses air and space assets which give it global awareness, reach, and power. These are central to deterrence, and both offensive and defensive capability. Airpower as wielded by the USAF has been central to the defense of the nation for half a century. And our reliance on air- and space-based systems is growing, not diminishing. The capacity for mass and maneuver, the versatility of air and space assets, the advantage held by controlling the ultimate "high ground," are indispensable to US military dominance. In possessing the world's largest and best—indeed, the only "full-service" air force—the US has invested much of its security in the capabilities wielded by the USAF both in war (strategic attack) and peace (OOTW and deterrence). To disinvest in airpower would be to place the nation at risk.

Extinction of the USAF might well mean extinction of the US itself. Without a USAF, the nation would lose its most formidable, longest range, most responsive, most versatile, global combat capability. If the

USAF were to become extinct, the US would lose a major set of core competencies—and their integration into an effective combat force for deterrence, defense, or attack. It would lose those things that make airpower unique and the advantages that independently controlled airpower bring to the nation. It would lose full service, global awareness, reach, and power. Most importantly, it would lose knowledge, responsiveness, versatility, and the capacity for discriminate power projection through both mass and maneuver. Without them, the nation would be at risk. *For the good of the nation, we the citizens of the US and the USAF cannot permit this to happen*. How, then, do we go about avoiding it?

The Primacy of Airpower

The first answer to the question posed above is that we must have a better understanding of airpower, its unique attributes, the nature of warfare in the third dimension, and the implications of these for the conduct of modern warfare. *The only element common to all the paths to extinction is the failure to understand the significant attributes of airpower.* Understanding how it can be deployed and employed in service to the nation—better, faster, farther, with fewer casualties, greater precision, and less collateral damage than other forms of power—is critical. Judged by these criteria, it would be foolish not to understand the airpower attributes we now possess and to diminish, exhaust, or destroy them, given their value to national security. At the moment, however, neither the public, our political leadership, nor, sadly, many in the USAF itself, have the necessary understanding to utilize this rare commodity in the most effective ways.

Airpower is a unique form of power. It is, thus, one word, not two. Airpower is the term which refers to the third dimension—what is up, vertical and above. It includes space as well as the atmosphere. But it is still called "airpower" because the attributes of operation in the third dimension are similar, though the vehicles which operate in the arena of air and that of space may be different. Air is not space, but they are part of the realm of the third dimension what is above the earth's surface. The third dimension is the medium of airpower—both air and space. Airpower is characterized by a combination of attributes:

1) perspective,

2) speed/tempo,

3) range,

4) the combination of mass/energy and maneuver, and

5) versatility.

Appreciating each of these in turn, what they mean to our capability in air *and* space—and *in the aggregate* as airpower—is absolutely vital to understanding the importance of airpower—and the existence of the USAF—to the United States.

Perspective

Perspective is what airpower provides from the vantage of the third dimension. It fulfills the wish of commanders from time immemorial "to see the other side of the hill."[48] *Put succinctly, the advantage of airpower in the first instance is its vantage.* The view from the third dimension, the distance one can see from height, the cone of view that is included at higher altitude all the way to geosynchronous earth orbit at 23,000 miles away, is unique to airpower and lies at the heart of what it can do that surface forces cannot. From height and perspective, one gains vantage. From vantage, one gains global awareness—the ability to observe the surface of the planet in greater or lesser detail from the perspective of the third dimension. That in turn conveys a form of global presence and, hence, awareness through air and space assets. Global awareness, in turn, enables global reach and global power. These are what airpower brings to the fight and the Joint Force Commander.

The importance of vantage cannot be overestimated. The perspective of the third dimension conveys a presence which is a prerequisite for global view. Global awareness conveys the knowledge that is the basis for decisions about alternative courses of action. *Knowing what is going on in near real time is the prerequisite for providing security.* Airmen call it situational awareness. Having others know that enhances our deterrent capability. Aerial or space-based presence, even episodic presence, can substitute for forward deployments of other forces, thereby diminishing the logistical problems of transportation and sustainment and the risk of human lives in large number. And much of our space-based presence is on station with multispectral sensing capability which greatly enhances our ability to see, hear, and know what is happening around the world.

Control and exploitation of the third dimension—air and space—provides us with the capability to engage adversaries from on high, from afar and through a variety of methods of attack that run the gamut from

communications jamming and target designation to bombardment via laser guided munitions, infrared sensor missiles and eventually air- and space-based lasers. The quantity and quality of information gathered and dispersed through the third dimension—increasingly from space assets—and the ability to attack from that medium enhance the power of other surface forces on both land and sea. Given the vantage of the third dimension, one can see over all hills and better cope with an array of dispersed threats, distributed capabilities, and disparate data points.

Speed/Tempo

The speed with which airpower may be brought to bear is far superior than that which can be attained by surface forces. Land-based and sea-based movements are constrained by the laws of physics, geographic features, and weather to a greater degree than systems operating in the third dimension. Air and space vehicles can travel faster and are thus capable of acting or reacting more quickly to a crisis anywhere on the earth's surface. That speed can be modulated, and can range from a few hundred miles per hour to the speed of light in space where photonic particles themselves become a means of observation and designation, communications and weaponry combined. The advantage conferred by such a range of speed is not unique to airpower but it is relatively and uniformly more useful in the third dimension than on the earth's surface.

It is what speed conveys—responsiveness—that is essential to airpower. The timeliness with which one can know, assess, decide, react to, and affect events is greatly enhanced by the speed of airpower. Airpower assets are somewhat limited by weather and terrain but they are not limited to anywhere near the degree which confounds surface forces most of the time. And, depending on the type of sensors being used from space, even weather may cause little or no difficulty. There are no valleys or river gorges, no mountains or deserts in the air, and one's ability to traverse such terrain faster is relatively unimpeded in the third dimension. Reaching nearly any point on the globe from any other point is possible in a matter of hours. Through aerial refueling, there is no spot on the earth's surface that cannot be reached within less than 20 hours,[49] many within half that time. To attempt to transport men, materiel, and munitions on the earth's surface takes days and weeks for the Navy, weeks and months for the Army.

The ability to modulate the speed of activity in—and coming from—the third dimension is essential to strategic effect. The tempo can be fast or slow, and it can be varied between extremes. The presence of

airpower can be episodic, in the form of a sudden and massive offensive strike, satellite pictures of different kinds at a particular date and time, or a single munition delivered from afar by a missile. Or it can be persistent, in the form of UAVs or sustained airlift operations for resupply, or aerial-refueled AWACS and fighter coverage of a certain spot on the earth's surface. The modulation of different types of airpower and variability in the tempo of operations means that there is no recognizable pattern for enemy sensors to establish or to which the enemy can respond effectively. Modulating tempo promotes unpredictability and unpredictability promotes survival.

Range

Simple physical realities convey a distinct advantage to airpower. Approximately 30 percent of the earth's surface is land. Another 70 percent is water. But 100 percent of the earth's surface is covered by air and the air envelope of the atmosphere in turn surrounded by space. Air and space constitute the third dimension and that is the province of airpower. Aerial refueling capability means that airpower truly has global reach. *That is, there is no place over the surface of the earth where airpower cannot go and no point on the earth's surface which airpower cannot affect in one way or another*. Space systems in constant earth orbit have both a speed and a range far greater than atmospheric ones. They can travel at orbital velocities in excess of 18,000 miles per hour and circle the globe in 90 minutes or so. While air-breathing vehicles cannot do nearly as well in relative speed, they share global reach as an attribute. They can go farther, faster, and with greater strategic effect than surface forces can. This ability to "reach out and touch someone" anywhere, and do so at any time, is unique to airpower. And increased space capabilities will only improve our range and reach.

Range is a spatial relationship. It involves distance and reach. The responsiveness factor mentioned above has a spatial as well as a temporal dimension. Global reach achieved by the characteristic of range means that responsiveness occurs in space as well as time. Getting anywhere is as important as getting there anytime. *More specifically,* ***getting precisely there, in time,*** *is the key to affecting events elsewhere in the world.* Hence, the responsiveness of airpower flows from both speed and range. These characteristic attributes of airpower thus confer a strategically and tactically important operational capability on it—responsiveness. All hinge ultimately on awareness.

The Combination of Mass (Energy) and Maneuver

A major problem for most naval and land commanders has been the necessity to choose, at the right time and the right place, between the alternatives of mass and maneuver. One could either mass forces and fires at the decisive point of attack, or concentrate defensive forces and fires to repel them. Alternatively, one could attempt to maneuver in such a way as to change the axis of advance, the avenue of attack and surprise the enemy who would be caught unawares. Either choice could lead to a great victory. Making the wrong choice at the wrong time, in the face of an adversary who had divined your intentions, could end in defeat.

Both mass and maneuver are principles of war. But in the past, one had to choose one over the other. If one maneuvered successfully, he was a hero who had, like Alexander, Napoleon, and others, split his forces and attacked the enemy from the flank or the rear to win a decisive victory. If one lost, it was because he had violated a principle of war and divided his own forces against a concentrated foe. On the other hand, if one concentrated his forces to wield a sledgehammer blow at a single point of the enemy's defense, broke through and routed his army, it was because he followed the principle of war and the Clausewitzian directive about massing forces for a decisive blow. If one lost, it was generally because his adversary had an inherently stronger position, massive fires in the defense, "the stronger form of war" according to Carl von Clausewitz, and repulsed the attack.

With airpower, one need not make the choice between mass and maneuver. One can maneuver to attack from any degree of the azimuth—360 degrees of choice and get to the point relatively unimpeded compared to a surface force commander. One can vary the axis of advance, the azimuth of attack, and the altitude from which it comes (high, medium or low) so that the exact nature of the attack cannot be anticipated. And the attack may make simultaneous use of mass in the form of aerial bombardment, be it from cannon fire, bombs, missiles, or standoff systems. This bombardment can be concentrated spatially, temporally, or functionally on a particular target. That is, it could seek to destroy an enemy's capital or central city, hit all air bases in the country at a single time, or take out all the major means of communication throughout the country—telephone, telegraph, microwave relay towers, radio and television transmission capability, postal service centers, satellite stations (both uplink and downlink), etc. If one has achieved air superiority, then all this is possible. The air component commander need not choose between mass and maneuver—he may employ both simultaneously, in a number of different ways.

As Albert Einstein showed in his theory of general relativity, mass and energy are related and, indeed, mass could be converted into energy. But we are now entering an era in which mass must be viewed simultaneously as energy. With lasers, we have light that has properties of both wave and particle. But photons are relatively massless, though energy-rich, in the form of light. Increasingly, photonic beams—as sensors, communications devices, navigational tools, and weapons—are the best examples of not only a multirole system, but a combination to the point of near simultaneity of target acquisition and destruction. This is certainly true in space and is increasingly the case even in the atmosphere. Hence, mass /energy / maneuver become fused as one. We are approaching an observation, orientation, decision, action (OODA) point—not an OODA loop.[50]

Versatility

One often hears the phrase "flexibility is the key to airpower" in the USAF—a truth uttered facetiously and in jest most of the time, referring to the constant changes in plans that affect military life. Flexibility—meaning bendable, adaptable is not quite the same as "versatile" also meaning adaptable but in the sense of being able to perform a variety of tasks, being capable of many uses. It is in versatility that airpower excels. Airpower is able to change from one task to another quickly and easily. Most of its platforms have multiple roles. They are capable of air-to-air combat or ground attack, in both defensive and offensive roles. Both pilots and planes are multifunctional and, in many cases, interchangeable on a sortie-to-sortie basis. While other platforms and personnel in other services can perform offensive or defensive missions, they are not usually as capable of performing both strategic and tactical missions. The USAF uses its bombers and fighters in both roles interchangeably; the nature of the mission is defined less by the platform than by the target set.

There is yet another role that versatility plays in the application of airpower. The same platforms and personnel perform many of the same missions whether these be warfighting or MOOTW, peacetime or combat. And there are reserve and guard components to augment active duty forces. These components have much the same equipment and, in many cases, equal or superior skills. This gives versatility in the USAF a depth and breadth not found elsewhere in the American military. Army's roundout brigades are generally seen as inferior in combat capability, and the time required to mobilize naval assets in the fleet reserve is

long. Such versatility is not to be found in other air forces either. US airmen find versatility and integration—of roles, missions, personnel, platforms—almost natural. One cannot plan or execute an air campaign without an ability to synthesize, to integrate disparate elements to achieve a desired outcome. The process of developing an air tasking order (ATO) and the concept and management of an objective wing are further examples of the ability to integrate, conceptually and operationally. Increasingly, space systems are dual use, serving both a commercial market and a military market—global positioning system (GPS), communications satellites, weather information satellites—are all examples. There are few cases in which army or navy assets are dual use with anywhere near the breadth of application and frequency of usage. *USAF versatility is a habit of mind, so ingrained in the application of airpower as to be a unique attribute of it.*

These attributes are not necessarily absolutes, however. In fact, they are relative and situational. It is in their comparative and cumulative aspects that these can be said to be unique attributes of airpower. Utilizing these attributes effectively allows the USAF to achieve air superiority, space superiority, precision employment, global mobility, and information dominance. These core competencies allow the USAF to achieve its mission: to control and exploit air and space in defense of the United States and its interests. The USAF thereby achieves global presence, global reach, and global power. While surface forces can be brought to bear anywhere, that can be accomplished only relatively slowly and with fairly long lead times. And, while the application of airpower is not instantaneous, continuing advances in technology reduce response times and make airpower's response far superior to surface force response. *Ab alto* is increasingly the preferred way—to communicate, navigate, gather information, transport people and materiel, observe, threaten, deter, defend, and apply power. And it is USAF that excels in these. It is the only "full-service" air force in the world. Its a breadth of capabilities and the quantity of its assets are far greater than those of any other air force.[51]

The United States as an Aerospace Nation

This package of unique attributes, which airpower brings to the table, is fundamental and essential to the defense of the United States of America. The nation and airpower are joined in fundamental ways that are

often overlooked or disregarded. The United States was a maritime Republic through most of its history, but it became, an aerospace nation culturally, politically, geographically, technologically and economically—in the twentieth century.

Culturally, we represent a nation which proclaims itself a *novus ordo seclorum* new order of the ages on our currency. That was a rather brash and arrogant proclamation some 220 years ago for a fledgling state in the wilderness of a vast continent. As a people, however, we have always been forward looking, had an abiding faith in engineering solutions to our problems, seen exploration as part of our national consciousness and outlook, and assumed progress synonymous with Americans—if not a God-given right. Airpower has always been seen as future-oriented, exploratory—"pushing the envelope"—and a sign of technological triumph and progress. Space is the final frontier, our high frontier, and our fascination with it continues.

Politically, airpower is the answer to a democracy's prayers. It offers a way to fight wars with far fewer casualties than if it had to be done the old fashioned way—on the ground. True, the test of going to war for America is the employment of ground combat forces. But unlike authoritarian and totalitarian regimes, which are happy to invest massive amounts of manpower in fighting wars, democracies prefer firepower over manpower. Others invest in quantity (numbers of troops) while we invest in quality (high technology weaponry). We husband our blood, not our treasures they spend blood far more willingly than treasure. We invest in our people, providing the training and education to make them superior. And we trust them to defend us with the implements of national power rather than topple the existing government. Authoritarian and totalitarian regimes cannot afford that kind of investments they have neither the level of requisite trust, nor the political tradition of no military takeovers.

Geographically, we are committed to airpower because of our continental dimensions. Great distances placed a premium on the speed and range of transportation and communication. Railroads were a great boon to our development but when aerial capability emerged and became cost-effective, it became the preferred manner for travel, rapid transport, and communication. Blessed with good neighbors to the north and the south, we face no military threat from those neighbors. Blessed with two ocean moats to the east and the west, we were secure in the knowledge that we would have ample warning of armed attack by sea. Pearl Harbor shattered that illusion, however, and long-range bombers along with ICBMs have fundamentally altered it. The threat from abroad to the US, and the means of greatest surprise, is and always will be from

the third dimension. Airpower has thus attained the stature of our premier deterrent force—a major defensive one. And has, since the end of WWII, airpower has been the primary means of power projection for strategic purposes.

Our geostrategic position means that if we seek to participate in the world, we must project our influence abroad. Not being territorially acquisitive in seeking new territory or peoples under our sovereignty—at least since achieving "Manifest Destiny" at the end of the last century—we have no need to occupy others' territory. We did so in earlier eras because that was how armies won wars. We fight our wars on other people's territories and for this century at least, mostly to undo acts of aggression by others. Germany (twice), Italy, Japan, North Korea, Iraq—all were defeated eventually, but all held the initial advantage in surface maneuver to exploit. Airpower has been used in all those conflicts to counter that initial advantage asymmetrically, by projecting force and leveraging our advantage rather than fighting a bloody war of attrition on the adversary's turf and terms. It will be that way for the foreseeable future. Airpower gives us the capability to project force, to commit far less manpower in favor of high-technology assets to defeat our adversaries. Failing to use these advantages would be foolish and would make no sense to a concerned democratic electorate.

Technologically and economically, we were destined to make certain choices and investments because of our geopolitical circumstances. We made economic investments, commercial as well as military, in order to exploit the Wright Brothers' invention for our use. We took pride in playing a leading role in the development of airpower. Monument to a martyred President or not, the race to put a man on the moon was a national commitment in which we reveled. And despite the *Challenger* disaster and NASA's difficulties, despite the enormous costs of putting things in orbit and beyond we are proceeding with the space station and deep space probes.

The third dimension represents the ultimate high ground. It is the essence of progress defined as onward and upward, the arena of greatest human and scientific challenge for us to conquer, the gateway to our solar system, galaxy, and universe, the envelope in which this "third rock from the sun" exists. Not to be wedded to the control and exploitation of air and space would be seen by many as to be almost un-American. To others, resentful of the huge costs involved in pushing the frontiers of our knowledge and capability ever

outward from our planet, it seems a waste. But it is also an escape from our earthbound problems, and therein lies a reason that space and the third dimension will continue to fascinate and excite us in the future.

And what of the USAF in all of this? For better or for worse, despite a duplication of systems, multiple air forces, competing interests and platforms, budgetary battles and bureaucratic politics, *the USAF is the premier custodian of the third dimension and should remain such.* The nexus of expertise, however flawed it may be, lies there. The projection of airpower will be the manner in which we are most likely to first engage enemy forces as far from our shores as possible. And the best way to compensate for the enemy's initial advantage of surface maneuver is through the application of airpower. But the essential contribution is this: *Airpower can compensate for shortfalls in naval or land forces, tactically or strategically, to a greater degree and more quickly, than either of those can compensate for a shortfall in airpower*.[52]

The USAF is the service which best understands that reality. It is the sole service to have at its disposal the full panoply of airpower resources required to accomplish a variety of missions—deterrence, defense, offense—quickly, at great distance, in a variety of ways. It can accomplish a number of different missions anywhere at almost anytime. The USAF is the only service capable of establishing and maintaining air superiority. While airpower and air superiority cannot guarantee victory—as Korea and Vietnam reveal—they are a necessary, if not a sufficient, ingredient in America's wars. With air superiority, all is possible; without it, all is at risk.[53] And the Navy and the Army know it—more personally and professionally than does even the USAF. We are predominant in airpower capability and must remain so to protect United States interests. Not to utilize the one truly overwhelming capability we have vis-à-vis all potential adversaries in the world would be inexcusable.

Avoiding Extinction for the USAF and the US

Regardless of the shape of the world to come and the future in which we live, airpower should remain a critical dimension of national defense. To lose such a valuable commodity, by default or design, is unthinkable if we wish to preserve the security of our nation, our allies, and the kind of world in which we can survive and prosper. Though the possibilities for extinction of the USAF are many, they must be resisted and the USAF must adapt. The test of most successful military establishments of the past was their capacity

for mutation and adaptation to a changing environment. The British adoption of the long bow, the adoption of the broadside in lieu of ramming in naval warfare, the wedding of the tank and the airplane in harnessing the internal combustion engine—all led to military success against great odds. Despite the risk and the array of threats to its very existence, the USAF has proved itself over the years to be very adept at changing enough to survive, if not always prosper.

There are airmen of great skill and competence and intellect in the Army, Navy, and Marine Corps. But their skills and platforms are different, even if some of their munitions are the same, and their missions are fundamentally different. Their concern is tactical, not strategic. Their very definition of the situation is colored by the primacy of close air support for troops (for the Army and Marine Corps) or the importance of fleet defense (for the Navy). Their notions of air operations are different from those of Air Force officers in both scale and magnitude.

The airmen of other services lack an expansive appreciation—geographic, conceptual, and technological—of many assets that airpower encompasses. Space-based systems and satellite trajectories, tankers and aerial refueling orbits, the possibilities for strategic strikes deep within an enemy's homeland, the logistical complexity of large-scale airlift operations, and the planning tools for large-scale, and very complex air campaign planning with the array of air assets available, are largely beyond their ken, jointness not withstanding. What is missing in the view of airmen not in blue suits is the detailed knowledge, long practical experience, and expansive vision of airpower's possibilities—and the demonstrated capacity to implement it at a distance over a long period of time. Airmen in other services are certainly skilled and capable, but their skills exist in more limited fashion. And their parent services will more willingly sacrifice their airpower to the more central concerns of those services—the land and the sea.

More important still is the difference in intentions between airmen in the USAF and others. Airmen in the USAF know, or feel, even if they do not quite understand, that they have an opportunity to make a significant difference in the course of a war, the duration of the conflict, and the casualties that must be suffered in order for the conflict to end. The debate over whether or not airpower was decisive in the Gulf War is proof of this assertion. *Airmen in the USAF think that they can be decisive—and that attitude combined with their unquestioned aptitude—makes all the difference.* The point is, without that conviction, no one will try to be strategically decisive in a short, quick, and less bloody air campaign. Therein lies the

crux of the matter. The willingness to try and change the course of the war at hand—if not history itself—exists (or should) in airmen who wear blue suits as opposed to those who do not.

The Navy may be the initial force in contact in a crisis and its protection of sea lanes of communication is absolutely vital to the shipment of war materiel to the theater in which the war is fought. Ninety-five percent of the materiel shipped to the Gulf in Desert Shield/Desert Storm went by sea.[54] But sea blockades and wars at sea are no longer likely to succeed as they have in the past. The deployment and employment of 500,000 troops to a distant theater for large-scale ground combat may not be either a necessary or a desirable way to win a war in the 21st century—especially if it can be avoided. Large-scale, highly lethal ground forces are less and less useful than in the past because of their very high cost, the targets that such concentrations present to an enemy, and the bloody nature of an encounter with a foe who actually uses like weaponry (unlike Iraq). We need not fight a conventional war that way, and would not fight a war with nuclear, biological, or chemical (NBC) weaponry if we could possibly avoid it. Further, we know that we cannot kill our way to victory in revolutionary insurgencies. Why, therefore, should a land force attack be the preferred manner of engaging the enemy?

Air superiority—"command of the air," as Douhet called it for the Air Force may seem to be not much different from a Mahanian notion of control of the sea for the Navy or battlefield dominance for the Army. But it *is* different—it enables to a far greater degree the application and enhancement of joint and combined operations of nearly all types. With air superiority, all else is possible; without it, all else is at risk. Airpower can carry the war to an enemy faster, to a greater distance from our homeland, and with greater strategic impact, than can the bulk of naval forces (though they too can have strategic impact, particularly nuclear), or the Army, which is destined to slug it out on the ground the old-fashioned way.

If our goals were to seize and hold territory, to increase the population under our sovereign control, to expand the territorial holdings of the United States of America, then the Army would be the preferred instrument to accomplish these goals. But they are not our goals; we need not fight in this manner. We believe it is better to serve as an example for others to emulate than to conquer the world and make it conform to our preferences. Destroying key parts of an adversary's strategic calculus or his capability is better than destroying his capital. And any of these are preferable to fighting our way to it on the ground so we can then occupy the territory of a defeated enemy.

Appreciation of these fundamental realities lies at the heart of the need for a separate air force and its continued development. *As long as airpower is seen as an adjunct capability to the Army Corps Commander or the Navy Fleet Commander, it is not thought of or utilized as the CINC's primary strategic asset—and it will likely be misapplied.* Airpower's significant attributes are squandered when they are not wielded by airmen who understand that airpower's greatest contribution occurs when it is utilized offensively, with surprise, against strategic targets. While airpower can be of great value in a number of other roles—mobility, close air support, interdiction, fleet defense—those missions are decidedly secondary in nature compared to its primary focus and advantage—strategic attack.

Lessons of the Past and for the Future

We think we learn from the past and profit from our mistakes and previous experience so we will not have to relearn painful lessons. Would that it were so! Americans have little sense of history. Hard lessons have a short half-life—about one-half of a generation. We often fail to learn what we should, or we forget what we think we have mastered. The following quotation is interesting in this regard.

What are the chief lessons with the strategic use of airpower in the last war?

> 1) One lesson is that the time we were given to make our preparations was an absolutely essential factor in our final success. —It is unthinkable that we should ever again be granted such grace.
>
> 2) Airpower in this war developed a strategy and tactic of its own, peculiar to the third dimension.
>
> 3) The first and absolute requirement of strategic airpower in this war was the control of the air in order to carry out sustained operations without prohibitive losses.
>
> 4) We profited from the mistakes of our enemies. To rely on the probability of similar mistakes by our unknown enemies of the future would be folly. The circumstances of timing, peculiar to the last war, and which worked to our advantage, will not be repeated. This must not be forgotten.
>
> 5) Strategic airpower could not have won this war alone, without the surface forces. —Airpower, however, was the spark to success.— Another war, however distant in the future, would probably be decided by some form of airpower before the major surface forces were able to make contact with the enemy in major battles. That is the supreme military lesson of our period in history.[55]

That is an accurate assessment of the US performance in the Gulf War, and it is sound advice for the future. It is a set of insights we would do well to heed. But it was not written about the Gulf War. It was written *forty-five years earlier* by Gen Carl "Tooey" Spaatz as his assessment of WWII! The article, "Strategic Air Power: Fulfillment of a Concept," appeared in the April 1946 issue of *Foreign Affairs***.** Somewhere between WWII and the Gulf War, we either failed to learn or conveniently forgot these lessons.

Fifty years hence, one might well repeat the quote above and everywhere the word "air" appears, substitute the word "space" and have it make eminently good sense. Indeed, it might be so obvious as to be overlooked. It is *toward* space that we are headed because it is *from* space where we are relatively advantaged. It is *in* space that we can have even greater leverage of our technological advantage, best offset our concern for casualties, accomplish our urge to be responsive, and achieve our need to project force against adversaries as far from our homeland as possible. And it will be the fusion of air and space assets that offers us the means to do so. Airpower means space power, as the Gulf War began to reveal. And none of the services intend to fight a war without increasingly relying on space-based assets.

In the future, the failure to have or appropriately apply independent airpower to a major military engagement in the future would be largely indefensible. Regardless of how adept an Army victory might be on the ground, that victory will not likely occur without casualties—significant ones without more airpower than the Army has. And without a continuing investment in space systems, our technological lead will diminish, both relatively and absolutely. Imagine the congressional hearing held to determine the reasons behind the huge number of American casualties sustained in barely winning a future war by slugging it out on the ground. How would we answer the congressional questions that would be asked?

- General, in your opinion, why was it necessary for the United States to suffer more casualties than in either Korea or Vietnam in this war? Could that have been avoided?
- Why didn't we fight this war they way we fought the one in the Gulf years ago—with a longer air campaign and a short ground war (if we needed one at all)?
- Was occupying the enemy's capital and most of his country really necessary?
- Couldn't we have succeeded by punishing them severely and destroying their military capability, if not their will to resist?
- General, when will we stop paying twice for every war we fight? We end up paying once to destroy the enemy and again to pay for his reconstruction!

- Why shouldn't we let the neighborhood fight over the carcass? As long as the enemy is no longer a threat and we have demonstrated our airpower capability, the odds of somebody else pushing the limits are not very good in the short run, are they?

Decisive victory need not—and should not—be achieved only by ground combat. Nor does it have to mean occupying the enemy's territory.

Airmen *do not* understand that definition (ground combat) of decisive. They seek another vision. Theirs is one where deep strategic strikes make ground war either unnecessary or anticlimactic. In an era in which we, who are not the aggressor, seek to have and retain moral ascendancy, can reach anywhere on the planet via air and space, can impede if not prevent the accomplishment of an adversary's war aims and dilute seriously if not kill the strength of his will to resist, why would we not first use an air campaign to try to thwart an enemy if not utterly defeat him? Why would we send large numbers of US troops in harm's way if smaller numbers of pilots, planes, laser-guided bombs, and missiles could accomplish the same thing? While airpower may not be sufficient to win the next war, no one wants to fight without it. And the Army and the Navy will admit such, albeit quietly and reluctantly. *Massive airpower is absolutely necessary to how the American military should fight and win its nation's wars.* To think otherwise is an act of self-delusion.

Successful Evolution: The USAF in the 21st Century

The survival and continued prosperity of the United States of America are supported by and maintained by the nation's investment in air and space, and by the superior ability to exercise airpower—control and exploitation of the third dimension—in support of the nation's interests. The one sure path to extinction for both the USAF and, ultimately, the nation—would be to disinvest in airpower and the core competencies that it provides when utilized as an independent armed service. We simply cannot allow that to happen. If the USAF does become extinct, its passing will negatively affect not only the US but also the rest of the world. Conflicts that could have been avoided, deterred, successfully defended against, or eliminated may now be more likely to erupt.

The collection of space-based sensor information, the delivery of missiles or bombs on target, or the achievement of air superiority are not ends in themselves; they are instrumental goals. They are not merely good, but good for something else—for what they in turn can offer. That something else is a more secure

environment in which the United States and its allies may survive and prosper. Anything else, if not irrelevant, is at least less so. And while there is much the USAF *could* do, there is less that it *should do* in support of national security strategy and national military strategy. For example, boring holes in the sky in Deny Flight for an ineffectual political purpose and minuscule military impact may well be a waste of resources which we cannot afford. Scarce resources are valuable *because* they are scarce. They must be husbanded. They should be expended only with great care, for good purpose, and with reasonable chance of success. We may not always meet that test successfully.

The USAF that we seek to preserve and to make prosper in service to the nation should be relatively small, highly professional, well-trained, confident, well-equipped, and organized to carry out a variety of roles and missions quickly and effectively with the least amount of extraneous duplication. It should be seen as the custodian of the third dimension—both air and space. It should possess capabilities across the spectrum of conflict, from OOTW missions to nuclear war. Its primary emphasis should be on surveillance and force projection, on knowing what is going on in the world and letting others know that we know. Information dominance—controlling the content and flow of information when necessary—should become increasingly important. And the responsiveness of airpower should be enhanced. Enhanced, that is by our investment in global awareness, increasingly flows from our presence in space.

Any mission that can be performed better or more quickly by others without unnecessary duplication, any platform that does not need to be in the USAF inventory, any role which does not accentuate the attributes of airpower and enhance its core competencies—these should be cheerfully and readily relinquished. Meanwhile, we must seek to enhance the basic attributes of airpower perspective, speed/tempo, range, mass/energy, maneuver, and versatility—within tight budgetary constraints and the need to balance research and development with operations and maintenance for a ready force. If these can be achieved, then the USAF will be preserved. If they cannot, it is doubtful that will survive very far into the 21st century.

An Aerospace World

An aerospace world would be one in which the investment in, exploitation of, and benefits from, air and space would continue to grow both absolutely and relatively. Whether the investments were commercial or military, public or private, improvement in knowledge, transportation, communication, navigation, and

surveillance in air and space will continue to grow if only because of the continuing effort to shrink time and distance for those who inhabit the earth and the utility of the third dimension. Perspective and versatility will continue to have high value, and will continue to confer even greater capabilities on the air component commander, who seeks to employ mass and maneuver simultaneously and to leverage asymmetrical strengths against miscreants on the earth's surface as well as in air and space. Increasingly, we will become a spacefaring nation. Missiles and missile defense, increased bandwidth for communications, directed energy weaponry, UAVs, transatmospheric vehicles (TAVs), and increased "infospheric" capabilities—all will become increasingly important.

Lack of these items and characteristics would indicate disinvestment in an aerospace world. Such a nonaerospace world would be neither as economically prosperous, as technologically advanced, as interdependent politically, or as militarily differentiated as an aerospace world. The margins of power, relative and situational though they are, would be narrower in almost every way economic, technological, political, and military. The dominant role played by the US, in large part dependent on airpower, would be at risk. A nonaerospace world would favor those with a large quantity of soldiers rather than those with a high quality of airmen.

Airpower is inescapably linked to the growth and vitality of the nation. We have progressed from land-based notions of Manifest Destiny and the simultaneous expression of America as a seafaring nation. We have now disinvested, relatively, in both of these concepts and their requisite competencies as new technologies have emerged. We have no desire for territorial aggrandizement and we have a minuscule merchant marine. We allow others to transport goods by sea while we are engaged in other activities, where our comparative advantage lies. Americans interact with the world via air and space and, increasingly, through the flow of ideas and products, which are exported abroad both physically and electronically. Promoting, preserving, and protecting the interchange of people, products, services, money, and ideas is central to our national security our continued growth and development as a nation. And airpower—air and space assets and capabilities—is central to our ability to survive and prosper in the next century. It is increasingly through air and space that we travel, transport, communicate, observe, orient, decide, and act in both civilian and military activities.

The Bottom Line

It is not the existence of any one of these concepts that makes airpower unique or the USAF necessary; it is rather, the understanding of the is integration and creative application which leads to an awareness that extinction of the USAF would likely hasten the extinction of the US. Airpower, as exemplified by the USAF and the air and space capabilities at its disposal, is, and of rights ought to be, an essential aspect of US security for the foreseeable future. It is best employed as an independent, full-service capability where in training, doctrine, organization, equipment, technology, understanding, and attitude are focused on its unique combination of competencies—and on the roles and missions they can perform quickly, at great distance, with less loss of life, with improved information flows, in versatile and unpredictable ways. As our capabilities increase, airpower will be increasingly defined and refined as spacepower.

Could the US long continue to survive, prosper, and protect its territory, citizens, assets, values, activities, and roles in the world without an independent air arm? The answer is emphatically, "no!" Why, then, should we disinvest in our capability to achieve our national objectives by allowing the USAF to become extinct? That it *could* happen does not mean that it *should* happen. And because the consequences of such an occurrence are so great, we should do everything in our power to prevent it. Like Blaise Pascal's wager on the existence of God, the consequences—should we be wrong in wagering that we could make it without the USAF—are so great as to vitiate the attempt. The advantages airpower confers, as wielded by the USAF, are so great that we dare not do without them.

Perhaps most important is the need to accept the truth as captured in the insight of retired Air Vice Marshal Tony Mason: "By placing airpower in the evolutionary process of warfare, as a whole, unnecessary claims of superiority and unfounded fears of subordination may be abandoned along with the growing pains of infancy and adolesence."[56] It is no longer necessary to defend a *revolution* called airpower; it is time to nurture airpower's *evolution* through creative adaptation of air and space capabilities. In so doing, we will avoid extinction for both the USAF and the nation.

Airpower—our capability in the third dimension (air and space)—is unique, valuable, and versatile. But while airpower can do much, it can't do everything. It is necessary but it may not always be sufficient. It can be, but may not always be, decisive. In any case, airpower is a critical part of our nation's ability to survive and prosper. As such, it must be wielded wisely by those who understand both its capabilities and

its limitations. Its value to the nation is not merely significant, it is vital—quite literally "necessary to life." To squander it—whether through mismanagement, ignorance, or petty politics—is an outcome which in the long run is unacceptable. Not having the USAF would be far more costly than maintaining it—an admittedly expensive, but necessary and valuable, set of capabilities. Extinction of the USAF risks extinction of the nation. We would do well to avoid both.

Notes

A note on background and bias is appropriate. The author is a civilian academic who came to an appreciation of airpower rather late—and through observation and study rather than application. His own military service was limited to a brief stint in the US Army (Inf) on active duty and a number of years in the reserves. He has been informed through the study of 20th century military history by reading works of others on airpower and through discussion with students, speakers, and faculty at the Air War College and elsewhere over the past seven years. His knowledge is vicarious. He is not a pilot, has zero hours in the cockpit, and has not directly witnessed airpower in combat. What he has to say, therefore, may be taken with the proverbial "grain of salt."

The author is indebted to numerous colleagues, and to current and former students, at the Air War College for helping him to refine his views on the unique characteristics of airpower. In particular, I would like to thank Col John R. Boyd, USAF (ret.); Mr Carl H. Builder of Rand; and Maj Gen Charles D. Link, USAF. I would also like to thank Dr Alexander Cochran, Col. Jae Engelbrecht, Jr., USAF, Dr Irene Pearson-Morrow, Col. Richard Szafranski, USAF, and Dr James H. Toner, all of the Air War College, for their insights and commentary on earlier drafts of this manuscript.

[1] Maj Gen Charles D. Link, Briefing entitled "AIRPOWER: An Airman's Perspective," given at the Air War College, 7 March 1996. Used with permission.

[2] Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U S Air Force* (New Brunswick, N.J.: Transaction Publishers for Rand, 1994), 7.

[3] Harold R. Winton, "Partnership and Tension: The Army and the Air Force Between Vietnam and Desert Shield," *Parameters* Spring, 1996 p. 115. The information cited is taken from a thesis by Maj James M. Ford, "Air Force Culture and Conventional Strategic Airpower" (Maxwell AFB, Ala.: School of Advanced Airpower Studies, 1992), 60.

[4] In addition to the Winton article cited above, and Builder's book cited in note 2, see also, General Robert D. Russ, "The Air Force, the Army and the Battlefield of the 1990s," *Defense 88*, August 1988, 12-17.

[5] See Edward C. Mann, III, Col., USAF, *Thunder and Lightning: Desert Storm and the Airpower Debates* (Maxwell AFB, Ala: Air University Press, April, 1995).

[6] Richard T. Reynolds, Col., USAF, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq* (Maxwell AFB, Ala.: Air University Press, January, 1995).

[7] The casualty rate for 20-30-year-old males in the US during the Gulf War was 104 per 100,000. The casualty rate for the same age group deployed in the Gulf War was 69 per 100,000. "Harper's Index," *Harper's Magazine*, May 1991, 17.

[8] On digitizing the battlefield of the future, see Gordon R. Sullivan and James M. Dubik, "War in the Information Age," *Military Review*, April 1994, 46-61.

[9] The debate over controlling battlespace and defining the deep battle is a matter of who controls fires in the area between the Forward Edge of the Battle Area (FEBA) and the Fire Support Coordination Line (FSCL) and how far does that space extend. If the Army Corps Commander controls joint fires in this area and it extends from only 30 km, it is one thing. If he controls these out to 70 km it is something else. If he controls them to a distance of an ATACM, we have redefined strategy and given the ground component commander a role he does not now have. In all these cases, aerial bombardment is conditional upon the approval of the ground component commander's scheme of maneuver and the scheduling of his fire support requirements. One can gain a sense of the importance of such seemingly parochial doctrinal issues in

reference to the Gulf War. The FSCL was moved back and forth in the final hours of the Gulf War in such a way that the USAF could not strike targets it could easily have hit because they were reserved for Army fires which were insufficient at that time. See Michael R. Gordon and Gen Bernard E. Trainor, *The General's War: The Inside Story of the Conflict in the Gulf* (Boston: Little, Brown & Co., 1995), 411-413.

[10] The Air Force Issues Book is the text of the Joint Posture Hearing Statement presented to Congress by the Secretary of the Air Force by Dr. Sheila E. Widnall and Chief of Staff General Ronald R. Fogleman at the FY 96 Posture Hearings. *1995 Air Force Issues Book* (Washington, D.C.: Department of the Air Force, n. d.) 15.

[11] The second US Army Space "Think Tank" meeting was held in Washington, D.C. on 25-26 January. Among the items presented at the meeting were recommendations that the Army pursue the exploitation of other people's sensors and platforms, long-range and long-endurance organic UAVs with multiple missions, a less vulnerable or better protected GPS, improved counter-battery operations and a set of transatmospheric vehicles (TAVs) called Hopper, Skipper and Jumper. These indicate not only the intent but a search for capabilities to allow the US Army to undertake current US Air Force roles and missions.

[12] Gordon and Trainor, 58.

[13] See the discussion in John Keegan, *A History of Warfare* (New York: Alfred A. Knopf, Inc., 1993), 67-70.

[14] *1995 Air Force Issues Book*, 36.

[15] See Adm William A. Owens, *High Seas: The Naval Passage to an Uncharted World* (Annapolis, Md: Naval Institute Press, 1995).

[16] See Martin C. Libicki and James A. Hazlett, "Do We Need An Information Corps?" *Joint Force Quarterly*, Autumn 1993, 88-97.

[17] This is explored in some detail in a paper by Col Richard Szafranski, Air War College, and Martin C. Libicki, National War College, ". . . Or Go Down In Flame," Forthcoming.

[18] See the section entitled "The Mexican Financial Crisis and the Fall of the Dollar," in National Defense University Institute for National Strategic Studies, *Strategic Assessment 1996: Instruments of US Power* (Washington, D.C.: National Defense University Press, 1996), 58.

[19] The case for this and alternative scenarios are presented in Michael O'Hanlon, *Defense Planning for the Late 1990s: Beyond the Desert Storm Framework* (Washington, D.C.: The Brookings Institution, 1995).

[20] Builder, 8.

[21] A briefing, given by Eliot Cohen, Director of the Strategic Studies Program at the Paul H. Nitze School of Advanced International Studies at The Johns Hopkins University and the head of the USAF Gulf War Airpower Survey, given on 7 March 1996, to the National Institute for Public Policy and since around Washington argues this point about increasing costs of systems with detailed charts for both bombers and fighters.

[22] The validity of an isolationist foreign policy for the United States is cogently argued in Eric S. Nordlinger, *Isolationism Reconfigured: American Foreign Policy for a New Century* (Princeton, N.J.: Princeton University Press, 1995.)

[23] *Air Force Issues Book, 1995*, 3, 4, 33.

[24] See the discussion of "Weapons of Mass Destruction" in the Institute for National Strategic Studies, *Strategic Assessment 1995: U. S. Security Challenges in Transition* (Washington, D.C.: National Defense University, 1995), 115-126.

[25] For a review of Jean Raspail's *The Camp of the Saints*, first published in France in 1973, and an article elaborating on its themes, see Matthew Connelly and Paul Kennedy, "Must if Be the Rest Against the West?" *The Atlantic Monthly*, December, 1994, 61-63, 66, 68-70. 72, 76, 79. 82. 84. The general idea is the barbarian have-nots invade western Europe and "trash" western civilization by their very numbers. The civilized peoples of the world acquiesce in their own demise rather than compromise their principles and tolerance.

[26] Maj Gen Charles D. Link, Briefing entitled "AIRPOWER: An Airman's Perspective," given at the Air War College, 7 March 1996. Used with permission.

[27] FORSCOM G-3 Briefing on Roving Sands *95* prepared by Lt. Col. Bill Bayer, n. d.

[28] See Reynolds, *Heart of the Storm*.

[29] *1995 Air Force Issues Book*, 3-4.

[30] This is not a private USAF matter reflecting internal disagreements but has become one of public discussion in both political and academic circles. Comments about the Commission on Roles and Missions debates, the release or suppression of the Gulf War Airpower Survey, USAF studies and public relations

problems with such issues as the *Enola Gay* exhibit at the Smithsonian have been fairly common over the last five years. For some examples, see a letter by Alfred M. Beck to the *Journal of American History*, December 1995, 1336-1337 and the comments in note 4, page 520 of Gordon and Trainor's *The Generals' War*.

[31] See Fred Polak, *The Image of the Future*, Translated and Abridged by Elise Boulding, (San Francisco, Calif.: Jossey-Bass , Inc., 1973).

[32] *1995 Air Force Issues Book*, 35.

[33] Speech by Maj Gen Charles Roadman, Commander of the USAF Medical Operations Agency, given at Maxwell, AFB, Ala. on 7 February 1996. Cited in *The Maxwell-Gunter Dispatch***,** 16 February 1996, 4.

[34] Statistics compiled from data in *Air Force Magazine*, May 1995, 37, 53.

[35] *Air Force Issues Book, 1995*, 32.

[36] Col John R. Boyd, USAF (ret.), phone conversation, 20 November 1995.

[37] Norman R. Augustine, *Augustine's Laws*, (New York: Viking Books, 1986), 111. Augustine's Law XVI states "In the year 2054, the entire defense budget will purchase just one aircraft. This aircraft will have to be shared by the Air Force and the Navy 3 1/2 days per week except for leap year, when it will be made available to the Marines for the extra day."

[38] See the final report of the USAF CSAF Study, *SPACECAST 2020* (Maxwell AFB: Air University Press, 1994). This report was an effort by the USAF to examine its relation to space and to determine the emerging technologies in which it should invest.

[39] The popularity of O'Grady's recent book with Jeff Coplon, *Return With Honor*, (New York: Doubleday, 1995)—is just one indication of the media events surrounding his shoot down, eventual rescue, and his "hero's" welcome upon his return to the US.

[40] See Builder, *The Icarus Syndrome* regarding the evolution of USAF doctrine.

[41] The House vote authorizing the use of force for the Gulf War resolution was 250 to 183. The Senate vote was much closer: 52 to 47. A change of three votes would have denied legal authority to act as we did. Gordon and Trainor, 205.

[42] A draft study—not yet released—by Eric Larson of Rand provides a very interesting analysis of the public's sensitivity to casualties.

[43] A senior USAF General Officer speaking under the promise of nonattribution in a speech to the Air War College, May 1991.

[44] A senior Marine General Officer speaking under the promise of nonattribution in a speech to the Air War College, May 1995.

[45] Alvin and Heidi Toffler, *War and Anti-War, Survival at the Dawn of the 21st Century*, (Boston: Little, Brown & Co., 1993), 10.

[46] For some dated but cogent and still relevant comments on the military mind, see Bernard Brodie, *War and Politics*, 479-496. See also remarks made by Gen Robert Russ, head of the USAF Tactical Air Command (TAC) cited in Mann, *Thunder and Lightning*, 164.

[47] A letter circulating in the USAF hierarchy from Carl Builder of Rand entitled "Ten Messages for the Chief" addresses many of the problems and gives sound advice for coping with them.

[48] The desire to see the other side of the hill is a traditional statement regarding intelligence. The array of sources which the USAF has at its disposal for looking at the other side of all the hills—by satellite, high flying reconnaissance assets, UAVs, tactical aircraft—and in a variety of ways—photographic, infra-red, radar, communications intercepts, etc. is unsurpassed and global.

[49] *1995 Air Force Issues Book*, 5.

[50] Col John R. Boyd, USAF (ret.) is the father of the "OODA Loop" concept, which has permeated Army, Marine Corps, Air Force, and even business thinking along with its related notion of cycle time. For information on the OODA Loop, its evolution and impact on others, see, among other sources referring to it, James G. Burton**,** *The Pentagon Wars: Reformers Challenge the Old Guard* (Annapolis, Md: Naval Institute Press, 1993), 51-58; Oliver Morton, "A Survey of Defense Technology," *The Economist*, June 10, 1995, 5-6; Joseph J. Romm, *Lean and Clean Management: How to Boost Profits and Productivity by Reducing Pollution*, (New York: Kodansha In., 1994), 107-111, 122-127; James P. Stevenson, *The Pentagon Paradox: The Development of the F-18 Hornet*, (Annapolis, Md: Naval Institute Press, 1993), 45. Boyd, who retired in 1975, has never published anything outside the USAF but he and his work have been cited in over 20 books and more than 100 articles in publications ranging from *Forbes* and *Fortune* to *US News and World Report* and *Time*, from the *Harvard Business Review* to *Joint Force Quarterly*. After designing the F-15 and F-16 fighters in the 1960s and 1970s, he and his "radical" ideas were, until this decade, rather

studiously avoided by the USAF. He had far greater impact on the US Marine Corps and the US Army than the USAF in terms of doctrinal thinking.

[51] As an example of the scale and dominance of a full service air force, the US inventory of aerial refueling tankers (KC 135 and KC 10) numbers 583. (*Air Force Magazine*, May 1995, 37, 51.) The Russians have perhaps 50, the British 36, the Saudis 16, Iran and Israel 14 each, France 11. We do not know about Libya and China. No other country has more than single digit numbers of tankers. (Data from *Military Technology*, January 1995 vol. XIX, no. 1). Thus, the USAF has roughly three times the number of tankers in the rest of the world combined.

[52] Maj Gen Charles D. Link, Briefing entitled "AIRPOWER: An Airman's Perspective," given at the Air War College, March 7, 1996. Used with permission.

[53] Maj Gen Charles D. Link, "The Role of the USAF in the Employment of Air Power," in Richard Shultz, Robert Pfaltzgraff, *The Future of Airpower in the Aftermath of the Gulf War,* (Maxwell AFB, Ala.: Air University Press, July, 1992), 86.

[54] Gordon and Trainor, 58.

[55] Gen Carl "Tooey" Spaatz, Airpower: The Fulfillment of a Concept, *Foreign Affairs*, April 1946, 394-396.

[56] Air Vice Marshal Tony Mason, *Airpower: A Centennial Appraisal*, Washington, D.C.: Brassey's, 1994), 278.