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CONVERGENCE OR DIVERGENCE: THE RELATIONSHIP BETWEEN SPACE DOCTRINE AND AIR FORCE DOCTRINE

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Preface

With the recent publication of *Joint Vision 2010* and the upcoming Quadrennial Defense Review, the Air Force is at a critical juncture in its doctrinal development. The decisions we make today will be with us for many years to come. We must be skilled at articulating our theoretical and doctrinal foundations as members of the joint warfighting team in order to add our part to national defense.

Air Force airmen have not been very successful at articulating air or space doctrine. As a result, air and space doctrine are developing in separate directions. This paper will look at this issue, determine the root cause of this problem, and suggest a possible solution. Without well articulated air and space doctrine, the Air Force will miss out on the opportunity to contribute capability to the joint warfighting team for the next century.

I would like to thank Mr. Budd Jones and Dr. Jim Titus who mentored me through this process and gave me a deeper appreciation for the impact doctrine has on the development of our future Air and Space Force.

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Abstract

This paper suggests that Air Force doctrine, in general, and space doctrine, in particular, are moving in different directions and that this divergence poses a threat to our future capability as an air and space force. It identifies the airman and the institution as the root cause for this divergence. Airmen think too narrowly in their specialty and work in institutions that resist collective cooperation, broad perspectives, and overarching doctrine. It suggests mentoring airmen with broader perspectives and changing the Air Force institution to be consistent with combining air and space capabilities in an overarching doctrine of air and space power.

The research was prepared by reviewing key air and space doctrinal documents published since 1918 and interviewing people at all levels of involvement in air and space doctrinal development—both inside and outside the Air Force. These sources were combined to analyze the issues and support the thesis.

This paper is presented in the form of a modified critical analysis. Chapter one outlines a short history of Air Force doctrinal development to illustrate the type of airmen and institutional structures our history has created. Chapter two highlights how space doctrine has developed down a separate path from Air Force doctrine. Chapter three explores the relationship between air and space doctrine in terms of our possible futures in order to lay the groundwork for a solution. Chapters four and five explore the risks and benefits associated with both divergence and convergence of air and space doctrine.

Armed with this background and analysis, chapter six explores why diverging doctrines pose a threat to the future of our national defense. Chapter seven proposes a solution that attacks the root cause of this problem. It proposes mentoring airmen who can articulate robust air and space power theory and doctrine that encompasses the full spectrum of military capability. It suggests developing Air Force institutions that allow such cooperation and collaboration.

Only by developing a culture of broad perspectives and integrated air and space capability will we be able to contribute significant capability to the joint warfighting team of the 21st century.

Chapter 1

Air Force Doctrinal History: Institutional And Cultural Patterns

war undergoes continual evolution. New armies give ever new forms to combat. To foresee this technical evolution before it occurs, to judge well the influence of these new arms on battle, to employ them before others is an essential condition for success.

—German Army Service manual on troop leadership–1935

Thesis

The thesis of this paper has four components. First, air and space doctrines are diverging. They are diverging because the Air Force addresses the issue of doctrine from narrow and often parochial view that accompanies their specialization or emphasis, and not a service-wide perspective. Separate institutions and specialties have mentored airmen who cannot articulate consistent and overarching airpower doctrine and who fail to incorporate space into that doctrine. Second, this divergence poses a threat to the future of the Air Force because it is inconsistent with the nation's vision of the future and inconsistent with future fiscal and strategic environments. Third, the solution to this problem is to converge air and space doctrines so they are consistent with future realities. Fourth, the only way to converge air and space doctrines is to attack the root cause of this problem—the airman. We must mentor airmen to have a broad perspective about air and

space power and who can articulate air and space power theory and doctrine. Air Force institutions must also be changed to facilitate cooperation, collaboration, and ultimately convergence of air and space doctrine.

This chapter will begin the analysis of this topic by taking a chronological look at aspects of Air Force history to identify the institutional and cultural patterns that have created narrow thinking and stovepipe organizations. It will show how Air Force theory has fallen into patters of behavior over the years that contribute to these institutional and cultural patterns. These patters are represented by three pathologies (or theoretical traps), developed by Lt. Col. Peter Faber, in an attempt to characterize the cultural behavior of the Air Force.

Defining Theory and Doctrine

The definition of theory used in this essay is a codified systematic body of propositions relating to a particular phenomenon or field of study.[1] The use of the term doctrine means a mode or approach which repeated experience has shown usually works best.[2] For example, the proposition that states an enemy will capitulate in combat if their war-making infrastructure is destroyed is an example of a theory. It answers the question: "what should we do?" An example of doctrine based on that theory would be high altitude precision daylight bombing targeted against the German war-making infrastructure. Doctrine answers the question: "How should we do it?"

Three Pathologies That Continue to Shape the Air Force

There are three pathologies developed within airpower theory that we still live with today. The first pathology is an attempt by theorists to develop maxims that apply to all

wars, regardless of time and circumstance. An example would be the concept that if you attack the population of an enemy, it will force their leadership to surrender. The second pathology is the attempt to quantify and predict everything about war—a mechanistic view of war. An example of this concept would be the idea of coming up with a formula or algorithm that mathematically predicts a probability of victory. The third pathology is fitting metaphors to theories. This has a powerful effect of communicating the theory in a quick, clear, and simple way. But the metaphors usually over simplify the concept and imply relationships that do not always hold true. An example of this pathology is the metaphor used during World War II that the German nation was like a bicycle wheel. If you knock out one of the spokes the whole wheel will collapse.[3]

These three pathologies consistently appear throughout the history of Air Force theoretical and doctrinal development. The following history traces these pathologies. The conclusion is that these pathologies are a negative influence on the Air Force's attempt to develop sound airpower doctrine.

The Foundations of Airpower Theory

When the airplane first emerged on the American military scene shortly before World War One, the concept that war was all about armies destroying fielded forces and occupying enemy lands was the accepted truth.[4] The airplane was a technology that did little more than complement that Army objective.[5] After World War One, the theories about the use of airplanes in war popularized by Giulio Douhet and Hugh Trenchard began to influence American airpower theory. Ideas about striking a target other than the enemy's fielded forces were entertained. Douhet thought the enemy population was a

pivotal center of gravity that, when attacked by airpower, would quickly panic and force their leadership to surrender.[6] Trenchard mirrored many of the same concepts with additional theories about using airpower to strike other critical components, particularly industrial war-making capability.[7] Brigadier General Billy Mitchell popularized these ideas in America and began a crusade to use airpower in new and revolutionary ways.[8] This concept was more than just a theory about how to use airpower to strike at the enemy, it advocated a new and different method of warfare. Mitchell and other airpower theorists were arguing that the nature of war had fundamentally changed.

The Influence of the Air Corps Tactical School

The Air Corps Tactical School (ACTS) was a group of young Air Service (later Air Corps) officers who developed American airpower theory and doctrine after World War One. They picked up on the theories of Douhet, Trenchard, and Mitchell.[9] The men at ACTS found these theories very attractive and consistent with earlier war theorists such as Jomini.[10] They saw the medium of air giving a unique perspective and capability to the battlefield and accepted the theory that warfare had fundamentally changed.[11] They had a mechanistic and deterministic view of war. Industry was the key. Destroy industry and the war will stop.[12] The key to destroying industry was picking the right targets. They believed this new theory about the nature of warfare which was not necessarily supported by fact or experience.[13]

The Air Corps Tactical School version of airpower theory suffered from all three pathologies mentioned earlier. The ACTS version was to strike the industrial web—instead of the population as Douhet might suggest. They ultimately believed the result

would be the enemy capitulating without major conventional land battles. They developed this theory based on much research and analysis but it proved flawed. It reflected the first pathology by stating that industrial societies would capitulate if their industry for making war was destroyed. It fit the second pathology in that an attack plan based on the theory would achieve victory over Germany in 6 months with 6,860 bombers hitting hit 154 German targets. The third pathology appeared in the metaphors used to describe German industry as a wispy spider's web or a tottering house of cards—if the correct component was destroyed the whole structure would fall.[14]

The ACTS officers developed doctrine from this theory in the form of "high altitude precision daylight bombing." With the development of the B-17 heavy bomber, the assumption was that technology had caught up to doctrine. But ACTS and the Air Corps did not go back and re-question their doctrinal assumptions or adequately test the new technology.[15] The fire of combat tested their doctrine and technology, with disastrous results. Combat proved the bomber could not defend itself against fighter attacks resulting in many lives lost. Additionally, the B-17 was not as capable of efficiently destroying targets from high altitude as originally thought.[16]

Two possible problem were overcome. First, theory and doctrine must be based on fact and experience. Second, doctrine can be too far out in front of technology. Both were costly lessons. All three pathologies played a part in this tragedy. They encouraged a powerful belief in the ACTS theories and played a role in why these theories were so quickly translated into doctrine and put into combat without being rigorously tested. They further added to the tragedy by encouraging the leadership to stick to a doctrine that wasn't working despite the overwhelming evidence. Ultimately these three pathologies

encouraged doctrine to harden into dogma.[17] These same pathologies still plague us today and have had profound institutional consequences that contribute to our current theoretical and doctrinal failures to articulate comprehensive air and space power theories.

Shaping an Independent Air Force

Two influences were working toward the creation of an independent Air Force. First, there was the argument that air was a new medium of warfare requiring a separate air force to fully exploit that medium. Second, there was the argument that the nature of war had changed. This change meant a new set of targets to destroy. Therefore, an independent Air Force was needed to strike these new targets.[18] These arguments were the basis for the publication of FM 100-20, Command and Employment of Air Power, on 21 July 1943. This document was the first articulation of airpower doctrine. Regardless of which argument lent more weight to the formation of an independent Air Force, we were on the road to refining a coherent airpower doctrine by analyzing the lessons learned from World War Two.[19]

The Impact of Nuclear Weapons

Just as the Air Corps theorists were starting to analyze the lessons learned from World War Two, something very significant happened that forever changed the course of airpower theory—the atomic bomb. This one weapon seemed to prove to many airpower advocates that technology had finally caught up with theory and doctrine. In their minds this single weapon proved all the assumptions that the ACTS theorists had based their work.[20] They believed the enemy would capitulate if the United States used (or threatened to use) this weapon. This new bomb validated the notion that the fundamental

nature of war had changed and fed into the pathologies already prevalent in the theories and doctrines of the day.

The arrival of nuclear weapons, coupled with significant force reductions after World War Two, resulted in the Air Force focusing in on the strategic use of airpower as the economical solution to national defense.[21] This had significant institutional ramifications for the Air Force. Strategic Air Command (SAC) developed a culture focused on specific weapon systems to deliver the nuclear weapons, and reliable capability to ensure deterrence. The effect of this cultural focus within the Air Force was to focus airmen on doing their job well and stovepiping their focus on specific weapon systems and skills. Doctrinal development stagnated.[22] It was as if the nuclear bomb fed into the ACTS theories so well that rigorous analysis did not need to take place. The three cultural pathologies mentioned above supported such a mind-set. It was easy to believe that a single maxim, such as deterrence, could apply to all possible situations. The civilian authorities took on a significant portion of airpower theory and doctrine development in the form of deterrence theory.[23] This trend allowed the Air Force to create an institution that did not demand rigorous development of doctrine. The institution was not requiring itself to think about the overall integrated capabilities of airpower. The culture of focusing on individual weapon systems and specific skills contributed to an Air Force infested with narrow thinking about airpower application. It created a stagnate Air Force doctrine that turned into dogma. That dogma led to significant failures in Korea and Vietnam.[24]

Korea and Vietnam

The Air Force was asked to fight a war where the doctrine and weapons of deterrence had little application. Airpower's failure in Korea was the consequence of inadequate doctrinal institutions within the Air Force organizational structure. The only exception was air superiority. The F-86 was developed as a weapon consistent with that principle. It met with some success.[25] The Koreans and Chinese, however, taught us a painful lesson about what happens when doctrine is not appropriate for the situation. Doctrine becomes dogma if it fails to adapt. Korea highlighted that our theory and doctrine had not adapted. Korea proved that airpower had promised too much—and could not deliver.[26] The lack of a doctrinal process within the Air Force to analyze experience and shape doctrine contributed to this failure.

After the Korean War, no overarching theoretical "soul searching" took place. Instead, the Air Force continued down the stovepipe mentality of focusing on weapon systems, specialties, and deterrence. There was no rigorous internal analysis. Airmen just focused on "doing their job better" rather than re-thinking the question of "which job to do?" Additionally, none of the positive lessons learned about air superiority were institutionalized during the 1950's. We had not recognize our failure or figured out the root cause of why we failed in Korea. This lack of understanding resulted in the propagation of additional institutional developments. First, SAC dominated the Air Force funding wars.[27] Second, the culture of Air Force airmen continued to be shaped as narrow specialists focusing on specific weapon systems. As a result, our weapons remained inappropriate for the Vietnam War. There was no mechanism to translate theory and doctrine into the acquisition of weapon systems designed to support relevant doctrine.

The lack of a dedicated air superiority fighter in Vietnam illustrated how our institutions failed to develop appropriate doctrine for the situation.[28]

We once again applied World War Two theories and doctrine to an inappropriate situation and failed. We were stuck in a rut—shackled by our own institutions that resisted critical questioning of our doctrinal foundations. Our focus stayed on weapon systems and "doing the job better" without the foundation of theory and doctrine that could help us determine the "right job to do."

Partial Abandonment of Airpower Theory

The same institutional patterns emerged from Vietnam as from World War Two and Korea. The Air Force maintained its deterrence role with SAC but increased the role of Tactical Air Command (TAC) as the answer to perceived failures in Vietnam. No longer was there any talk of airpower destroying the enemy industrial web and winning victory.[29] Instead it was all about AirLand Battle and how TAC could help the Army win the war. Doctrinally and theoretically we were back to 1918 with one difference—we knew air superiority was essential to any future victory.[30] We now had institutionalized deterrence and AirLand Battle in the form of SAC and TAC respectively. The Air Force was institutionalizing stovepiped airmen focused on specific missions. The ramifications of these institutional creations was the lack of any overarching doctrinal development that combined all airpower capabilities together.

It is not surprising that Air Force airmen were unable to use the lessons learned from Vietnam to refine a more robust airpower theory based on historical fact and experience. This is because they had grown up in a stovepipe system of "specialists" for the last 25

years. It bred a culture of skilled execution (the warrior), and not skilled thinking (the theorist and doctrinalist). Both are critical, but without good thought, the wrong targets tend to be attacked with inappropriate weapons. Both TAC and SAC did develop useful tactical doctrine.[31] But these tactical doctrines never reached beyond narrow "weapon system specific" tasks. There was no overarching doctrine that integrated Air Force capabilities together as a whole.[32] Even the slogan of the time reflected a narrow vision—the mission of the Air Force was to "fly, fight, and win."

An Attempt to Break Out of Our Institutional Shackles

Global Reach-Global Power was an attempt to solve the narrow vision in the Air Force by articulating a broader vision that incorporated all aerospace capability. It hit the streets at about the same time the Air Force was involved in Desert Shield and Desert Storm. Its impact, however, was initially minimal because it did not change the Air Force's initial approach to Desert Storm.

The Air Force's narrow doctrinal focus of AirLand Battle became our initial strategy in Desert Storm because there was no clearly developed and articulated official alternative. We suggested striking the enemy armed forces from the air to aid the Army in winning the land battle.[33] There was no vision beyond AirLand Battle because the Air Force was a creature of its doctrinal history and subsequent institutions. Global Reach-Global Power had not yet sunk in.

If it had not been for a few unusual coincidences that pushed Air Force Colonel John Warden to the forefront with a "unique" idea for using airpower, the Gulf War might have turned out quite differently. Colonel Warden's ideas, however, were not so unique. They

were very similar to the theories of World War Two and ACTS. They also contained the same three theoretical pathologies that have stuck with Air Force theory since ACTS—a part of our repeating pattern. Warden's metaphor of the enemy as a system, much like the human body, is full of deep assumptions that are not based in fact. Iraq was compared to a snake—cut of its head and it will die. The "five-ring model" played into the pathology of developing maxims that apply to all wars regardless of time and circumstance. The target list for Desert Storm, which worked towards quantifying a victory through airpower, was reminiscent of World War Two claims that Germany would fall in 6 months once 154 targets were destroyed.[34] Warden's theory built on the ACTS theory, except with 50 years of technological advances.

The critical question still remained. Would the same airpower theory we used to fight World War Two, Korea, and Vietnam now work against Iraq? Had technology truly caught up to this theory?

We still do not know the answers to these questions. Further analysis of the lessons learned from Desert Storm are still required for several reasons. First, our technological and training advantages over Iraq were so vast that many of the foundations of this theory were not tested. Second, Iraq was the perfect economic model upon which this theory was founded back in 1930. We could not have designed a more perfect environment for our technology to succeed. Third, it has not been proven that the air strikes on strategic targets forced Iraq to surrender. We greatly weakened their army, but there is still debate whether airpower achieved victory. One could say, with good foundation, that the assumptions of American airpower theory have still not been proven true through historical fact or experience. The fact that we did so well in Desert Storm could prove to

be our greatest setback in our attempt to develop a comprehensive airpower theory and doctrine, if we think that Desert Storm proved this theory. A much more rigorous analysis must be done before we will be able to take this theory beyond the thinking of our ACTS forefathers.

The impact of space assets on airpower theory and doctrine came to a head during Desert Storm. Space assets were presented to the warfighter like no other time in history. However, the institutional patterns that existed in the Air Force were not capable of incorporating such capability into Air Force doctrine. Space was a somewhat awkward, but profoundly effective, attachment to the airpower machine that prosecuted Desert Storm.

In 1992 Air Force Manual 1-1 attempted to combine all air and space capabilities into an overarching airpower doctrine. It did little more, however, than re-write the 1943 FM 100-20 with the addition of the "aerospace concept"—defining air and space as one medium.[35] It was not well received by Air Force airmen. Many did not know what it was and most did not understand the profound attempt it was making to fix a deep rooted problem. This lack of acceptance clearly highlighted serious trouble for our culture of professional airmen because it reflected a lack of appreciation for the profound need for sound theory and doctrine. It reflected years of stovepiped cultural development. It also indicated that this problem would take a long time to fix. It takes time to change the way people think about their institutions and the roles they play in them.

It should be no surprise, therefore, that the current series of joint publications do a poor job of capturing the true capabilities of airpower.[36] When you have a culture of Air Force officers who think in narrow stovepiped ways, you cannot expect them to come to

the joint table with well articulated visions of how strategic airpower capability can contribute to the joint fight.

This task of articulating an overarching airpower theory is becoming time critical for two reasons. First, *Joint Vision 2010* will soon be written into joint doctrine. The Air Force needs to make sure all airpower capability is captured in this new round of doctrinal formulation or we will not see the full capability of airpower reflected in joint operations for years to come.[37] Second, space technologies are coming of age and provide tremendous capability to the warfighter that are not being captured either by the Air Force or in joint doctrine. These space capabilities aren't being captured because there is no articulated space theory or doctrine to contribute.[38]

The Air Force leadership is attempting to address this problem with the publication of Global Engagement and a revised basic and operational Air Force doctrine.[39] They must keep in mind, however, the tremendous inertia such a change must fight. A whole generation of airmen will not quickly embrace this needed change.

Lessons Learned From History

This analytical trip through Air Force history is designed to highlight four important points. First, the root cause of our doctrinal problems lies in the fact that we do not have a professional culture that understands the critical value of sound theory as a foundation for doctrinal development. This is ultimately an indictment on all airmen in the Air Force and our ability to think doctrinally.[40] Second, we have developed institutional organizations that do not do well at producing overarching air and space doctrine. [41] Third, Air Force doctrine is trapped in institutional patterns that resist change. The same

three pathologies that shaped early airpower theory exist today. We still have not articulated a comprehensive theory or doctrine that fully integrates the capability of air and space power across the spectrum of military operations. Fourth, space doctrine has remained an awkward add on to airpower doctrine. Space doctrine currently is not articulated in a published form.[42] Additionally, Air Force Manual (AFM) 1-1 has not adequately incorporated space capability into Air Force Doctrine.[43]

The next chapter will explore the divergence of space doctrine from Air Force doctrine.

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Chapter 2

Space Doctrine Is Diverging From Air Force Doctrine

We would do well to ask and ask again if the military establishment of the United States is sufficiently well organized to develop and exploit to the utmost these newest weapons on the horizon. Failing here, the nation will repeat the sorry pattern of the air weapon, wastefully groping forward with each innovation. To exist in a warring world the nation must pick winning weapons.

—I.B. Hollie

Space doctrine is moving in a separate direction from Air Force doctrine for two reasons. First, the space community generally believes that space is a separate medium from air that should be doctrinally developed apart from air. Second, the Air Force space community has a history, culture, and institution that focuses predominately on space with no recognition of the concept of air and space power. Very few institutional mechanisms help tie space capability to the Air Force warfighter. These factors prevent doctrinal contribution or consistency between air and space. They tend to cause air and space doctrines to diverge. This chapter explores these factors and the reason why they exist to lay the foundation for future solutions that blend air and space capabilities into one coordinated effort.

The Question of a Separate Medium

The primary reason space doctrine is moving away from Air Force doctrine is because the majority of airmen who work in Space Command believe space is a separate medium. Every interview conducted for this research project and most documents authored by Space Command airmen conclude that space is a separate medium. They argue that the principles of war and tenants of airpower must be applied uniquely to space. Additionally, the speeches given by prominent leaders in the space community are consistent with this conclusion. They allude to the fact that a separate space force would be the best direction to go organizationally—if it were affordable.[1] They base this on the same theoretical foundation that air theorists used to argue for a separate air force in 1940. One of those arguments is that a separate medium requires a separate service to properly capture all capabilities. Another argument is that space represents a fundamental change in the nature of war and that a new service is required to exploit that new nature of war.[2]

Even though the official Air Force position states that air and space are one medium, there is a powerful undercurrent of belief among the airmen in Space Command that space is separate and unique. The document that seems to be the common denominator among all those supporters of space as a separate medium is Air Force Manual 1-6, Military Space Doctrine (1982). Air Force Manual 1-6 clearly defined space as a separate medium and set the foundation for developing detailed operational space doctrine.[3] This publication had a profound impact on the culture of airmen working in space and is a major reason for this undercurrent of divergence away from Air Force doctrine.

Space Culture Has Developed Apart From Air

The second reason space doctrine is diverging form Air Force doctrine is because Space Command has had a history of institutional development shaped by policy and focused to serve national authorities—not warfighters. From the very beginning, space institutions focused on serving national authorities and never developed doctrinally.

The use of space as a medium for military applications began in the 1950's with the development of Intercontinental Ballistic Missiles (ICBMs).[4] The tone for who would control space assets was set in 1958 when the National Aeronautics and Space Administration (NASA) Act specified civilian control over space activities except for those associated with weapon systems, military operations, and national defense.[5] President Kennedy further defined the issue by directing the space program to be primarily civilian, with coordinated military and civilian efforts.[6] Space doctrine, therefore, became the domain of the civilian sector.

These events shaped an Air Force space culture that felt obligated to stay out of the doctrinal business. Air Force Manual 1-1 published in 1971, 1975, and 1979 did little more than list responsibilities for space assets and outline vague roles and operations that space should include.[7] President Carter continued this policy of conservative leaning with a "wait and see" position that essentially kept space theory and doctrine from developing.[8]

In 1982 president Reagan outlined a *National Space Policy* with the goals of strengthening the security of the US, obtaining economic and scientific benefits through space exploration, expanding the private sector investment and involvement in civil and space related activities, and promoting international cooperative activities in the national interest and the freedom of space.[9] This was coupled with the publication of Air Force

Manual 1-6 which developed a shell for future space power theory and doctrine development.[10]

This became the foundation that directed space assets to support national security and thus was a moving force behind the formation of United States Space Command in September of 1985.[11] This policy increased the potential role of the military in space and created a window of opportunity for true doctrinal integration into the military. However, no overarching theoretical or doctrinal thought came out of that opportunity.[12]

There were two primary reasons sound doctrine never developed in the mid 1980s. First, Space Command's purpose was to ensure military space systems were available and effective during crisis or wartime, provide better operational support to other unified commands, work towards enhancing the survivability of Department Of Defense (DOD) spacecraft, and enhance deterrence through surveillance and communications.[13] By this very charter, Space Command shackled itself to a culture of specialization and not theoretical and doctrinal freedom for the development of space systems and capabilities. Second, Air Force officers and engineers working in space were products of a stovepiped and doctrinally confused Air Force.

This had significant institutional ramifications. It set the space community into an operational mode focused on service support to other agencies and focused on serving the national authorities—not the warfighters. This contributed to why no theory or doctrine emerged. The Air Force space community spent little time cultivating any doctrinal or theoretical foundations.[14] The only real role of Air Force Space Command during the late 80's and early 90's was supplying products to national agencies and the warfighter, just as airpower was supplying airlift, deterrence, and close air support to those same

consumers.[15] Space institutions formed around this mode of operation making it even more difficult to develop doctrine consistent with the Air Force.

Based on the type of culture and institutions this history has developed in Space Command, it is no surprise that not much in-depth theoretical or doctrinal thought has been published. The Air Force Space community has a long way to go to build a coherent space power theory that will support a robust space doctrine.[16] The only doctrine that has been officially published by Air Force Space Command was rescinded in 1992. Its replacement, which hasn't been approved yet, doesn't improve much on the original document.[17] It is a very difficult job to write good doctrine with no theory or experience as its foundation—such is the case with space.

Additionally, this history highlights why space doctrine has an undercurrent of thought that diverges from Air Force doctrine. It is a result of Air Force Space Command's historically shaped institutions and culture.

Space Doctrine Is Diverging

Several observations are worth noting based on the above analysis. First, the space community has been shaped by policies, goals, and objectives since their inception, but never by theory or doctrine. Military history has clearly highlighted the fact that policies, goals, and objectives do not lend themselves well to integrating technologies into our national defense.[18] To continue on this path and expect space to be a major contributor to the warfighting team is inconsistent with history. More importantly, however, history has shown that our enemies will surely capture new technologies for use against us if we do not capture them first.[19] We won't capture space capabilities if we don't develop coherent

space theory and doctrine. Second, space technology is out in front of any overarching theory or doctrine designed to properly use such technology.[20] History has shown that theory and doctrine must keep up with technology or risk allowing the enemy a window of opportunity. Finally, it is clear that current space publications, and informal doctrine, are moving in a separate direction away from Air Force doctrine.[21] The space community views the tenants of airpower very differently than the tenants of space power and think space doctrine should be separate from Air Force doctrine.[22] This raises an important question. Is this divergence good or bad? Would following the space community's advice pose a threat to the future of our Air and Space Force?

The next chapter will explore our current strategic environment to see if these current diverging doctrinal trends pose a threat to our future.

Notes

[1]Major Greg Hawkes, United States Space Command and Air Combat Command, Maxwell AFB, Ala., interviewed by author, 10 January 1997.

[2]Lt Col (SEL) Greg Billman, USAF Space Command (Commanders Action Group), interviewed by author, 28 October 1996.

[3]Air Force Manual (AFM) 1-6, *Military Space Operations*, 15 October 1982, iii.

[4]Pfaltzgraff et al., *Emerging Doctrines and Technologies - Implications for Global and Regional Political-Military Balances*, (D.C. Heath and Company, 1988), 130.

[5]Ibid., 131.

[6]Ibid., 132.

[7]Air Force Manual (AFM) 1-1 series, *USAF Basic Doctrine-1971, United States Air Force Basic Doctrine-1975, Functions and Basic Doctrine of the United States Air Force-1979.*

[8]Pfaltzgraff, 133.

[9]Ibid., 133.

[10]AFM 1-6, iii.

[11]Pfaltzgraff, 134.

[12]Major Bob Newberry, United States Space Command, interviewed by author, 20 January 1997.

[13]Pfaltzgraff, 134.

[14]Dr. Joe C. Dixon, Retired Air Force Officer (Space Command), interviewed by author, 10 December 1996 and 25 March 1997.

Notes

[15]Gary A. Chilcott, *Space Doctrine* (Maxwell AFB, Ala.: May 1990), 36.

[16]Newberry, Interview.

[17]Captain James R. Wolf, "Toward Operational-Level Doctrine for Space," *Airpower Journal* 5, no. 2 (Summer 1991): 29-33.

[18]Chilcott, 36, 41.

[19] Fredinand O. Miksche, *Attack: A Study In blitzkrieg Tactics* (New York: Random House, 1942), 7.

[20]Chilcott, 51.

[21]Col Mark Ordess, Director for Doctrinal Development-CADRE, interviewed by author, 10 October 1996.

[22]Dixon, Interview.

Chapter 3

Future Air and Space Force Environments

Man has always sought to expand his domain. In subduing the earth, man moved into the water, under the water, into the air, and into space as technology allowed. With him, man took war. Man will take war into space. It is not a matter of if; it is a matter of when.

—Lt. Colonel Thomas Eller and Maj Charles Friedenstein, 1981

The analysis from chapters one and two conclude that air and space doctrines are moving in different directions. This raises a fundamental question. Do diverging doctrinal directions pose a threat? Aside from the fact that current space doctrine disagrees with Air Force Manual 1-1 (which is under review and re-write), does it matter that the space community believes a separate organization and doctrine is essential to properly develop space? Further, what consequences will result twenty years from now if both doctrines are allowed to travel down separate developmental paths? The answer depends on what kind of future awaits us. The best we can do is make some educated guesses about the trends currently developing regarding the future. Such educated guesses can be the foundation to explore the ramifications of current air and space doctrinal divergence. Such guesses can also help envision the consequences if air and space doctrine were brought under one doctrinal umbrella. Armed with the risks and benefits each path might provide, we can gain greater insight into which path the Air Force should take.

This chapter will frame the issue by exploring the current trends shaping our future. There are a number of trends shaping our future strategic environment. This chapter will focus on five that seem pivotal in determining the consequences of diverging or converging doctrines. Chapters four and five then explore the risks and benefits associated with air and space doctrines diverging and converging.

Less Money

The one trend that seems certain to affect our future is the fact that our military forces are going to receive less money.[1] Money defines everything. Money drives how we organize, train, and equip our forces. It also profoundly affects what new weapons and ideas are developed for future conflicts. In the past, the Air Force has had a fairly large portion of the defense department money. At one point in the 1950's the Air Force was receiving 47% of the DOD budget.[2] Those were days when several future weapon systems could be developed and if one idea did not work out, there was enough overlap from other development programs to prevent major capability gaps in our national defense. Today we do not have that luxury. Future Air Force development cannot afford to field systems that have numerous overlapping capabilities. There will be only enough money to invest in one concept for a specific capability. This will require some very uncommon wisdom on the part of Air Force leadership to make the right choices based on rigorous and honest wargaming, testing, evaluation, and factual analysis.

Fewer People

Our future will see fewer people serving in the military as a direct result of budgetary constraints. This will have the effect of pushing future capability towards greater

automation. We will be forced to rely on technology as technology becomes more capable of dealing with the complex, fast changing, and lethal environment of future combat. We will also rely on unmanned weapon systems in an effort to reduce costs.[3]

Technology

Technological changes are revolutionizing every aspect of armed conflict across the spectrum of military activities. It is having dramatic effects on our future. First, technology is creating a combat environment that is too complex and fast changing for the human mind to dominate.[4] We will rely on technology to do the fighting. The soldier will focus on sharpening skills to make the larger decisions of strategy and leadership. Second, technology in the future is going to challenge all the conventional pre-conceptions about waging war with separate services. Technology is going to create opportunities to leverage the enemy in dimensions we can't imagine.[5] It is a safe assumption that some of these revolutionary changes will come in the form of weapons that blend two or more types of warfare or types of mediums. Finally, the rate of change in technology will increase. This means our technological advantage over the enemy will not last long. It also means that our processes for fielding new technology must be fast enough to leverage that unique technology before our enemies capture it too. Technology is also affecting information proliferation and the media's ability to get information. Our military forces will face a future where fewer casualties and minimal collateral damage is demanded. This trend will push us towards more unmanned weapon systems and increasingly accurate weapons.

Strategic Environment

Our world is changing fast. We have an increasingly multi-polar world emerging with very complex economic, political, and diplomatic relationships around the globe. Additionally, our US forces are organized, trained, and equipped based on a bi-polar "cold war" world. We are being forced to apply a force structure designed for a bi-polar world onto a complex multi-polar environment.[6] During the cold war era we had the luxury of assuming a relatively secure US presence overseas. Therefore, we shaped a "Heavy" force and infrastructure that is slow to mobilize, deploy, and re-deploy.[7] More importantly it assumes secure access close to the proposed battle zone. Our new world is quickly changing those assumptions in two ways. First, access and overflight is no longer guaranteed in such a dynamic multi-polar environment where alliances, friendships, and regional diplomatic relationships are so numerous and fragile. Second, technology has all but eliminated overseas security. It is impossible for military activity to take place overseas without the threat of terrorism unless the military operations are significantly garrisoned in a remote location. Doctrinally, our future must include a shift in our weapons, organizations, and training to deal more effectively with this new strategic environment.

Air Force Leadership's Vision

Our future is profoundly shaped by what kind of future our Air Force leadership envisions. Two major trends have been articulated. First, the Goldwater-Nichols Act of 1986 put into law a vision that all the services will fight under one doctrine as a team. *Joint Vision 2010* supports this concept.[8] Second, our Air Force leadership has

articulated a vision of the future called Global Engagement that is consistent with joint warfare and envisions an Air Force headed down the road towards a Space and Air Force of the future.[9] These are powerful words that have profound doctrinal ramifications. The Air Force leadership is telling us that air and space should be combined with one doctrinal foundation in order to supply coherent and coordinated warfighting capability to the joint team.

Regardless of any further analysis, it is clear that we had better get our doctrinal house in order if we expect to deal with these kinds of changes in the future. The question still stands: Do diverging paths of air and space doctrine pose a threat to national defense in this type of future? We can't really answer that question until we explore the risks and benefits associated with both diverging and converging possibilities and how they affect our future. The next chapter will explore the risks and benefits associated with the current trend—diverging air and space doctrines.

Notes

[1]I.B. Holley, Jr., *An Enduring Challenge: The Problem of Air Force Doctrine* (United States Air Force Academy: The Harmon Memorial Lectures in Military History - Number Sixteen, Colorado, 1974), 9.

[2]Brig Gen Claude M. Bolton Jr., "Acquisition Requirements Definition Process," lecture, Air Command And Staff College, Maxwell AFB, Ala., 9 December 1996.

[3]Col Charles A. Miller, "Roles and Missions of the United States Armed Forces," lecture, Air Command And Staff College, Maxwell AFB, Ala., 4 November 1996.

[4]Ibid.

[5]Jeffery R. Barnett, *Future War: An Assessment of Aerospace Campaigns in 2010* (Maxwell AFB, Ala.: Air University Press, January 1996), 15.

[6]Bolton, Lecture.

[7]Miller, Lecture.

[8]Joint Vision 2010, America's Military: Preparing For Tomorrow, 5.

[9]Global Engagement: A Vision for the 21st Century Air Force, 7.

Chapter 4

Divergence

Therefore, like it or not, space is a new theater of war that must be studied in that regard as thoroughly and carefully as any other lest we suddenly find ourselves confronted by the threat of physical force and violence from others who have taken it quite seriously.

—Harry G. Stine
Confrontation in Space

This chapter will explore the risks and benefits of allowing air and space doctrine to continue on their current diverging paths. It is reasonable to postulate that the space community would like that path to someday lead towards a separate Space Force. However, some of the same sensitivities and fears that surrounded Billy Mitchell's fate are echoed in the comments of anyone advocating such a "radical" departure from published Air Force policy and vision.[1] There are very powerful reasons, however, why such an argument has merit.

Benefits

Focused Resources

One of the more profound benefits associated with separate air and space doctrines is the focus that can be achieved. All your attention and resources can be funneled into the doctrinal development of a very specific medium. This pays dividends in fully exploiting

space capabilities through the systems you develop and the tactics, techniques, and procedures that you create. Having a separate doctrinal track helps develop space systems that best serve our national interests in that medium. It also provides more money. A separate doctrinal program tends to articulate how that program supplies capability directly to national security. This, in turn, justifies more assets allocated to such a program.[2]

The Health of Space Command

Another advantage in keeping space doctrine separate revolves around the institutional "health" of space command. A study of Air Force doctrinal history illustrates why the space community would not want to trust such an important task as doctrinal development to the large and diverse Air Force organizational system. The Air Force hasn't demonstrated the ability to effectively develop coherent doctrine that strategically coordinates all aspects of Air Force capability. It is understandable that the space community feels their interests and the true capabilities of space would get lost if its doctrine were controlled by an Air Force doctrinal development program. Space Command is a smaller organization. It can start from scratch and develop a coherent doctrine that taps into the true capabilities of space without dealing with all the "baggage" that currently exists with Air Force doctrine. Additionally, it is much easier to focus on developing space theory and doctrine as a stand alone document. The task of integrating space into an overall Air and Space Force doctrine that blends together all the diverse capabilities, is monumental. Additionally, Space Command was shaped to primarily serve the National Command Authorities (NCA). Policy written by our national agencies has been the bedrock of space development in the past. It is only in recent years that the focus

has also shifted towards supporting the warfighter. Both of these customers could suffer if the doctrinal foundation of space development is diluted by being placed together with Air Force doctrine. It could also create a conflict by allowing two masters to shape Air Force Space Command—the Air Force and the national authorities.

The Unique Medium of Space

Another advantage in keeping space doctrine separate is that it maximizes the unique characteristics of the "space medium." To combine Air Force doctrine with space doctrine would compromise space system capability by diluting it with "air medium" characteristics. This assumes, however, that air and space are separate mediums. This is a controversial and debatable point. Air Force Manual 1-1 states that air and space are one continuous medium. Many authors about space argue that air and space mediums are fundamentally different and that Air Force Manual 1-1 melds the two for nothing more than doctrinal convenience.[3] If this is true, it lends credibility to the position for a separate doctrine that adequately addresses space.

Risks

Creating Friction

One of the risks associated with separate doctrinal trends between air and space hinges around the "medium" question. History has shown that separate doctrinal development tracks create separate capabilities within the mediums. These separate capabilities develop into roles and missions that define "fault lines." For example, a fault line was created between the mediums of air and ground when the air force developed its independence. The roles and missions surrounding that fault line (such as close air

support and theater missile defense), have been the subject of considerable controversy. Control of the assets that operate at the fault line becomes critical. The Army wants control because their combat survival depends on protecting the sky over their troops. The Air Force wants control because it is part of their "medium." As technology begins to blend the mediums, such as the Army's Tactical Missile System (ATACMS), the roles between the Army and Air Force for this capability become even more blurred.[4] This conflict translates into duplication of effort and wasted resources as the Army and Air Force both finance research and development programs to adequately deal with these common "fault line" requirements. This dynamic produces creative and alternative solutions, but is very expensive in time, money, and effort. If space doctrine is allowed to continue on a separate doctrinal track, it will develop a fault line between air and space. As we travel toward the future, and technology starts exploiting the edges of air and space, the boundaries between the two will blend. This will create the same dynamics between air and space as currently exist between the Army and the Air Force. Our future financial realities may not allow the luxury of such an inefficient methodology. Additionally, as technology expands each medium, there will be greater overlap between Air Force doctrine and Space doctrine. This will translate into duplication of effort, duplication of capability, and valuable national resources poured into two programs attempting to develop similar capabilities.

Opportunities Lost

Another risk to consider, if we pursue separate air and space doctrines, is our ability to capture future Military Technical Revolutions (MTRs) and Revolutions in Military Affairs (RMAs). An MTR is a concept to describe a new technology that has profound

military applications. It is described as a technology that pushes the military to use it in war.[5] An example of an MTR would be the invention of radar during World War Two. An RMA, by contrast, is a new military concept that drives the development of supporting technologies. The Germans use of "blitzkrieg" warfare would be an example of an RMA.[6] The Germans were able to capture "blitzkrieg" warfare in World War Two because of a coherent doctrinal program that encompassed multiple mediums and capabilities. Early in World War Two they leveraged this RMA over the British who had not captured this same capability due to doctrinally separate organizations and processes.[7] We run such a risk today. There may be technological developments in the near future that create RMA or MTR opportunities around the fault line between air and space. Such developments probably would not be captured if separate doctrinal tracks where pursued due to the myopic nature of medium based doctrinal development.[8]

Escape velocity vehicle technology would be an example of such a development. Imagine a technological development where an unmanned aerospace vehicle (UAV) could take off like an airliner from a conventional runway in the heartland of America and accelerate to escape velocities without significant infrared signatures. Further imagine this vehicle able to arrive over Iraq, or any hot spot, at an altitude of 50nm (avoiding "space" so as to avoid current treaty restrictions on the weaponization of space). Consider the ramifications if such a vehicle could carry a payload of 100 precision guided munitions and arrive anywhere on the globe within minutes. Envision each of the 100 munitions able to strike any target within Iraq in any weather condition with either visual remote control from any location on earth or precision coordinates guiding them to known enemy centers of gravity (COG). Army officers could direct them on enemy troops, Navy commanders

could target enemy ships, and the Joint Force Air Component Commander (JFACC) could re-target with massive firepower and precision within seconds of any requirement. Imagine the ability to detonate any munitions not under positive control to eliminate collateral damage. Add to that the ability to return the UAV to home base with all 100 munitions if they were not released. Consider the profound capability if such launches were so cost effective that one UAV could be launched every 15 minutes allowing massive and precise firepower to any commander anywhere on the globe. In times of crisis such a system could deliver weapons within seconds of any request. Our nation could even deliver food, supplies, weapons, or even humanitarian workers with soft landing capability. This type of technology would represent the type of integrated system that might not be developed if separate doctrinal paths are pursued because such a system would require air and space capabilities blended together. It might not maximize the medium of space, but it might represent an RMA or MTR that revolutionizes the military instrument of power.[9] Further, it would be a system consistent with our future strategic environment requiring speed of response, less reliance on secure overseas access, and consistent with the vision of Global Engagement. Such escape velocity technology is hypothetical, but imagine if Iran were able to develop such a system. Even if one weapon were carried by such a vehicle it could be a devastating terrorist weapon. Our current tracking systems would be unable to respond. Even if they could respond, what systems do we have that could defend such a weapon? History is full of examples were technology was developed that had great potential for the military but because no doctrinal efforts were made to incorporate such technology, it went by the wayside for years.[10] It took us a number of years to incorporate the airplane into combat—some would say we still

haven't completed that task. There are also examples where visionaries captured technology very quickly and it made all the difference. General Moltke, with his use of the needle gun against the Austrians, is such an example.[11] Combining doctrinal programs can bring the unity of effort required to capture some of these concepts.

Propagating a Stovepipe Mentality

Another risk we run by allowing air and space doctrines to move in different directions is the propagation of the "stovepipe" mentality we currently have in the Air Force. Our history has created a culture of professionals who think in terms of their specialty or weapon system. Separating space off by itself plays into this cultural paradigm by further stovepiping the space community and its institutions. This will risk further fracturing the Air Force culture and preventing the development of a culture where we are "airmen first" and specialists second.

Inconsistent With Leadership's Vision

Such a move towards further fracturing the Air Force structure along "medium" operating environments is conceptually inconsistent with the current Air Force Vision of Global Engagement. To develop separate doctrines for air and space would risk never integrating all the Air Force core competencies outlined in Global Engagement under one coherent air and space theory and doctrine.

Joint Warfighting Contribution

The Air Force also runs the risk of not contributing capability to the joint world. Military professionals have been required by law to work together as a joint team. Everything we do in space or in the air must be consistent with, and integrated into, the

joint effort. Pursuing separate air and space doctrines makes this common effort more difficult. We risk complicating the integration of air and space into the joint arena by presenting two distinct concepts of operation. There will be friction between space systems and Air Force systems as well as the inherent friction between systems from other services. This adds integration costs and inefficiencies into a joint effort that can't afford additional obstacles.

The next chapter explores the risks and benefits associated with converging air and space doctrines.

Notes

[1]Major Bob Newberry, United States Space Command, interviewed by author, 20 January 1997.

[2]William A. Owens, "JROC: Harnessing the Revolution in Military Affairs," *Joint Force Quarterly* 1, no. 5 (Summer 1994): 1-2.

[3] Lt Col James K. Eken, *Roles and Missions, Doctrine and Systems Development and Acquisition: Today's Decisions Affect Tomorrow's Space Force Capabilities* (Maxwell AFB, Ala.: Air University, April 1995), 7.

[4]Major Sam Casmus, United States Army Officer, interviewed by author, 15 November 1996.

[5]Andrew F. Krepinevich Jr., *The Military-Technical Revolution: A Preliminary Assessment* (Office of the Secretary of Defense: Office of Net Assessment, July 1992), 2.

[6]Ibid., 3.

[7]Basil H. Liddell Hart, *The Liddell Hart Memoirs* (New York: Putnam, 1956), I, 229.

[8]I.B. Holley Jr., *Ideas and Weapons* (Yale University Press, 1953) 15.

[9]Sir William Congreve, *The Details of the Rocket System, showing the various applications of this weapon both for sea and land service, and its different uses in the field and in sieges, illustrated by plates of the principal equipment, exercises and cases of actual service, with general instructions for its application, and a demonstration of the comparative economy of the system, drawn up by Colonel William Congreve for the information of the officers of the rocket corps and others whom it may concern.* (1814; reprint, London: Whiting, Ottawa, Canada: Museum Restoration Service, 1970), 7-8.

[10]Holley, 4.

[11]J.F.C. Fuller, *Armament and History* (New York: Scribner, 1945), 116-117.

Chapter 5

Convergence

Present equipment is but a step in progress. Air Forces must harmonize their equipment with their doctrine but keep their vision far into the future.

—General Hap Arnold

This chapter will explore the idea of combining all doctrinal thinking under one roof and developing one air and space doctrine.

Risks

Incorporating Space is Too Complex

It is a distinct possibility that our current organizational and educational system in the Air Force is unable to write a coherent air and space doctrine that is useful. It is very difficult to write good doctrine. This has been demonstrated by our inability, as an Air Force, to do it well since 1943. It is even more difficult to integrate two fields that are currently so far apart as air and space, into one constructive doctrinal concept.

Technological Realities Conflict With Convergence

Technologically we are not at a place yet where it even makes sense to combine air and space doctrines. Air and space are currently separate mediums.[1] We must think ahead, but we cannot have our heads so far in the clouds that we neglect dealing with

current realities. Just as "high altitude precision daylight bombing" was a theory and doctrine too far out in front of technology, so to could we fall into that trap if we try and combine two mediums into a theory and doctrine that are too far out in front of technological realities. We could be playing into the same pathologies we have been living with ever since 1920. One can argue that the current realities, both technologically and financially, support a conclusion that air and space are separate mediums and will stay that way for a long time. To chase a dream of combining air and space under one doctrinal umbrella will prematurely destroy any ability to fully harness the capabilities of space. We must prepare for tomorrow's battles, but not to the exclusion of today's battles. Combining air and space is doctrinally convenient but not technologically realistic. It puts our nation at risk for the sake of academic convenience.

Missing Out on Space Capabilities

Another risk associated with combining air and space doctrine revolves around a theory that space capability has changed the nature of war.[2] The current relationship of Air Force Space Command to the Air Force mirrors the relationship between the Army Air Corps to the Army back in 1920. If we do not allow space the freedom to control their own doctrinal development then we will never move beyond space as a support service for national authorities and warfighters. If we do not give them autonomy, space will never be able to develop a unique space power doctrine. Just like early aircraft supported the Army as their sole mission, so space is currently serving the warfighter and NCA as their sole mission. Just as the airplane represented a theory that the nature of warfare had changed, so too does space capability represent a theory that the nature of warfare has changed once again. Unless we let space develop its own theory and doctrine,

we will never fully realize the "revolutionary" impact of this change. Therefore, a definite risk of forcing air and space doctrines under one doctrinal umbrella could be the squandering of an RMA that space capabilities represent.

All Our Eggs in One Basket

A very real threat associated with converging air and space doctrines is that we put all our eggs in one basket. History is full of examples where theories and doctrines were wrong. Our nation has been blessed in the past by having the financial wherewithal to support and field a number of competing ideas, theories, and weapons to protect our national interests. The fire of combat sorted out which ideas failed and which ideas worked. A risk exists, with combining air and space doctrine, that we might develop the wrong doctrines, the wrong ideas, or the wrong weapons. Such a doctrinal miscalculation could cost us dearly. Some would say the risk of failure in this regard outweighs the added expense of doctrinal and theoretical duplication. Duplication has saved us in the past and should be preserved.

A Slippery Slope to Weaponization

Another risk associated with combining air and space doctrine is that it is the first step on a slippery slope towards the weaponization of space. Our civilian leadership has clearly stated, through international treaties and space policy, that the peaceful use of space is paramount. Developing doctrine that integrates the weapons of the air with the support assets of space will eventually lead the military in a direction our civilian leadership doesn't want to go. It is better to allow space to develop separately and focus on non-lethal applications of space support assets without the connections that might weaponize

space. This risk could jeopardize our international standing if such a doctrinal policy where supported.

Benefits

Unity of Effort

Clearly a major benefit of combining air and space doctrine is the centralized control of the integrated doctrinal process. This lends integration to all Air Force Systems and makes it easier to integrate Air Force capabilities into the joint team in support of the unified combatant commanders (CINCs).

Monetary Savings

One doctrinal development program will save money. The efficiencies realized by combining air and space doctrinal programs can be realized now and also have profound financial savings in the future as systems become more integrated and fewer capabilities are duplicated.

Reduced Friction

Convergence of air and space doctrine also prevents fault lines from forming between the two mediums as discussed in chapter four. This further reduces the financial and organizational costs down the road.

Capturing Technologies at the Fault Lines

Combining air and space doctrines now will allow us to fully capture the technological breakthroughs that may arise in the future—especially those that exploit the characteristics of both air and space. It will insure that the US is the first country to

develop such military advantages. This, in turn, will better protect our future national interests. Even if these capabilities are not politically appropriate, the concepts, theories, doctrines, and ideas can be tested, evaluated, and even fielded without military employment. This can allow us to have the technology ready to leverage against our adversaries, should they be required.

Additionally, the speed at which technology will change is going to accelerate. Having air and space doctrine under one roof can speed the pace of capturing these technologies that combine attributes of both mediums. Our capability to quickly move from an idea to the fielding of that idea on the battlefield could be the difference between success or failure in future conflicts. A single doctrinal system can facilitate such speed if properly linked to budget and acquisition.

The next chapter will analyze the risks and benefits outlined in the previous two chapters to determine if diverging air and space doctrines pose a threat. Chapter seven will then explore a possible solution.

Notes

[1]Lt Col (SEL) Greg Billman, USAF Space Command (Commanders Action Group), interviewed by author, 28 October 1996.

[2]Pfaltzgraff et al., *Emerging Doctrines and Technologies - Implications for Global and Regional Political-Military Balances*, (D.C. Heath and Company, 1988), 14.

Chapter 6

Doctrinal Divergence is a Threat

The idea of letting our doctrine drift from the whim of one operational leader to another, or from one ad hoc measure to the next, will never provide us with the comprehensive, dynamic, understandable, and salable doctrine necessary to save the Air Force.

—Major General Dale O. Smith USAF

Both of our possible paths outlined in the last two chapters have one thing in common —each would probably develop our future doctrine "well enough" to protect our national interests in the 21st century. At some level everything hinges on whose guess about the future is closer to reality. A more pressing question is: Do diverging air and space doctrines currently pose a threat? Is there a problem? Based on the above analysis the answer is yes. This chapter explores why it poses a threat and the nature of that threat.

The problem with diverging doctrine has nothing to do with one of the two approaches being any better than the other. Each approach has its merit and ultimately only time will tell which approach holds the most wisdom. The problem exists in three ways. First, diverging doctrines have already caused major problems with integration. Air Force Space Command is having a monumental task trying to fit current space products into something usable to the warfighter. The past history of space has shaped an institution that supplies data to the national authorities. That data is incompatible with most warfighter systems.[1] This happened because Air Force Space Command didn't do a

good job of communicating with the warfighters at the inception of these programs. We are already seeing the inefficiencies resulting from a lack of a coherent overarching Air Force doctrine that incorporates an integration of all space capability. Second, air and space capability isn't properly represented in current joint publications.[2] This is a problem because joint doctrine will dictate how we fight in the future. If we can't articulate the proper use of air and space power, how can we expect to write it into joint doctrine so it gives our CINCs the full potential of its capability? Third, air and space doctrines conflict with the vision our Air Force leadership has articulated. Global Engagement is more than a road map to the future. It is the first step on the road towards fixing some of the institutionalized problems that have plagued the Air Force since its inception. Global Engagement is an attempt to move our Air Force from a culture of stovepipe specialists, consumed with specific weapon systems and specialties, to an Air Force culture where every airman understands the big picture capabilities of the Air Force as a member of the joint warfighting team. The six core competencies are designed to help us move in this direction. Instead of organizing around weapon systems, mediums, and career tracks, we will organize, train, and equip around core competencies. This facilitates broader thinking among airmen and facilitates a more effective role in contributing to the joint team.[3] The current diverging air and space doctrines do not support this new vision and therefore pose a threat to our future.

The reason diverging doctrines pose a threat is because they propagate and support an Air Force culture that continues down the same road we have traveled since 1943—stovepipe thinking without theoretical and doctrinal focus (our repeating pattern). It also poses a threat because such a path will inevitably cost more money. The fiscal reality is

that there isn't enough money to go around. Doctrinal divergence could lead to both space and air having inadequate funds to protect our future national interest.[4] We must try and realize some economies of scale to continue to supply the current level of military capability required by our complex strategic environment.

Notes

[1]Major Greg Hawkes, United States Space Command and Air Combat Command, Maxwell AFB, Ala., interviewed by author, 10 January 1997.

[2]Gen Ronald R. Fogleman, "Aerospace Doctrine, More than just a theory," *Airpower Journal* 10, no. 2 (Summer 1996): 40.

[3]Gen Ronald R. Fogleman, chief of staff, US Air Force, address to the Smithsonian Institution, Washington D.C., 21 November 1996.

[4]I.B. Holley, Jr., *An Enduring Challenge: The problem of Air Force Doctrine* (United States Air Force Academy: The Harmon Memorial Lectures in Military History - Number Sixteen, Colorado, 1974), 9.

Chapter 7

A Solution: Target the Airman and the Institution

The Air Force is an aerospace force, and its future is now in space as certainly as it was in the air in 1926.

—Dr James A. Mowbray

Regardless of which direction we take into the future (convergence or divergence), we must address the root cause of this doctrinal problem or it will never be permanently solved.

The Problem

The problem is that Air Force doctrine and space doctrine are diverging and this divergence conflicts with our government's vision of future air and space power. Additionally, divergence reduces the effectiveness of air and space working together to deliver national defense.

The Root Cause

The root cause of this problem is the airman and the institution. We have cultivated an Air Force culture that focuses on specific tasks, weapon systems, and career fields instead of a culture that focuses on overarching air power capabilities and contributions to our nation's defense. This culture has shaped institutions with the same negative

characteristics. We have airmen who do not think beyond "how best to do their specific job" and institutions that prevent overarching coordinated development of air and space doctrine.

The Solution

The solution to this problem is also the airman. We must create an Air Force culture where everyone is first an airman—then a specialist. We need to institutionalize such a culture and start developing it the first day our airmen walk in the door. Until we have a culture where every airman understands his or her role in contributing to the overall capability of air and space power, we will continue to stagnate in our current theoretical and doctrinal patterns. This solution must include a re-structuring of our initial training, our professional military education (PME), and our promotion system. It must touch every aspect of the airman's life.

Our leadership has recognized this problem and are taking steps to fix it in the form of publishing Global Engagement, creating an Air Force doctrinal organization, and initiating a basic training course for our young officers. The reality, however, is that a problem as deeply rooted as this will take a full generation to heal. It is very hard to change the way a mid-career airman thinks about his or her world. Until those young airmen, who develop within themselves a culture of "airmindedness," become the working engine of our Air Force, we will struggle against parochial thinking and careerists who do not want to change a system they grew up with.

Minimizing the Risks of This Solution

Such a solution must have certain attributes and mechanisms to minimize the risks. It must not suppress the space community from developing theory and doctrine that maximize the characteristics of space and potentially harnesses a revolutionary new nature of war—in the form of space power theory. We must recognize that our current technological realities define significant and unique differences between the medium of air and space. Such a solution must focus on the development and integration of space and air systems that better supply the joint warfighting team with Air and Space Force capability. The process can be developed so space is not dragged into the muddle of Air Force doctrinal problems, but rather bolstered by the lessons learned from 80 years of struggling to develop coherent and useful doctrine.

The risk of putting all our eggs in one basket is no simple problem to solve. All doctrine must be based on experience and fact. The nature of space and air is that we have very little history of combat as a foundation for solid theory and doctrine. Bringing air and space under one roof makes this weakness even more precarious because fewer competing ideas will be pursued. It could result in a theory or doctrine that either isn't correct or is too far ahead of technology. Either error could be devastating to our nation's defense. The way such a unified air and space doctrinal process could guard against such failures is to develop exhaustive battle labs, simulations, experiments, and research programs.[1] The only way to build experience about theoretical concepts and ideas with current budgetary realities is to simulate them as realistically as possible. The use of war games, computer simulation, exercises, and battle labs can help uncover theories that are flawed—either by having no foundation in fact or historical experience or by containing

historical pathologies that support flawed thinking. Valid war gaming can also keep us from pursuing ideas that are beyond current technological realities.[2] These techniques, however, are only as good as the honesty of the people designing them. The people in the Air Force must be intellectually honest about the overall capability of the Air Force. If they have the interests of their specific weapon system or the success of their specific test in mind, then the wargames and tests are worthless. History is full of these examples were tests are set up to validate pre-arranged conclusions. In all cases we pay the price with American lives. If we want to guard against "putting all our eggs in one basket," then we need honest airmen who aren't stovepiped. They need to be people who understand the overall capability of space and air power and keep that perspective in everything they do.

There are those who fear that a convergence of air and space doctrine is a slippery slope towards the weaponization of space. This fear is legitimate, but minimal. Clear policy and oversight structures currently in place keep congress and the civilian leadership in control of any systems developed. They control the money and how it is spent, therefore they control everything. Airmen can successfully prepare for the unexpected without crossing the "weaponization of space" line. In fact, we have an obligation, as airmen, to think through the theoretical and doctrinal issues of every eventuality or we are doomed to be caught off guard by our enemies. Thinking about ideas and acting on them are two very distinct processes. We must be experts at thinking about ideas and their ramifications. Our elected leadership will tell us which ideas to pursue.

Ultimately, if we choose a path that allows space doctrine to separate from Air Force doctrine, we must expect such a choice to lead to a separate Space Force. Such an eventuality has its distinct advantages as outlined in chapter four. However, it is

inconsistent with the budgetary realities we currently face. Furthermore, it sets up the same kind of fault lines that currently exist between all the services. The joint world is currently trying to overcome these existing fault lines. It is a monumentally expensive and complex task. We do not need another fault line to overcome a few years from now. Finally, to create a separate space doctrinal track will make it that much harder to solve the root cause of our current doctrinal problems in the Air Force—namely that we have a body of Air Force "airmen" who have grown up focusing on narrow stovepipe systems and career fields. Until we start shaping our young officers to think doctrinally about the Air Force as a whole, we will never solve the doctrinal rut we find ourselves in today. Diverging air and space doctrines add to this problem and make it that much harder to solve the root cause of this problem. Converging air and space doctrines is a move that helps solve the root cause by forcing our theorists and doctrinalists to view the bigger picture of an integrated Air Force encompassing all air and space capabilities. Doctrinal convergence can help solve this root cause at the top level of the Air Force. But our people do not only work at the top. If we are to truly fix the problem we must solve it at our foundation. This means educating our young airmen to think like airmen and not like specialists.

Conclusion

The analysis in this paper concludes that air and space doctrines are diverging. Institutional and cultural patterns within our Air Force history have contributed to this divergence. The root cause, however, is that our cultures and institutions have shaped airmen who think in narrow "stovepiped" ways. It is these airmen who have articulated

diverging doctrines. Our current diverging environments pose a threat to our future Air and Space Force. It is inconsistent with our emerging strategic and financial environments and does not support the vision articulated by our Air Force leadership. This paper recommends a three phase solution that attacks the root cause of this threat. First, we must shape a culture of airmen who think in the broadest terms about the overarching capabilities of space and air power. Second, we must shape institutions that support rigorous doctrinal analysis and encourage cooperation and integration of all capabilities. Third, we must develop an organization structure that converges the development of air and space doctrine. This third component of the solution is consistent with solving the root cause by encouraging a broad perspective by the airmen who shape doctrine for our future.

The goal is to avoid falling into the same patterns and mistakes of the past. This solution achieves that by creating an airpower culture that supports viewing all air and space capability as one coherent system applied across the spectrum of military operations. It is a solution consistent with the vision of a vital Space and Air Force that will contribute seamless global power to the 21st century joint warfighting team.

Notes

[1]I.B. Holley Jr., *Ideas and Weapons* (Yale University Press, 1953) 19.

[2]Edwin A. Pratt, *The Rise of Rail Power in War and Conquest, 1833-1914* (London: P.S. King, 1916), 104.

Glossary

ACTS	Air Corps Tactical School
AFM	Air Force Manual
ATACMS	Army Tactical Missile System
AWPD	Air Warfare Planning Directive
CADRE	College of Aerospace Doctrine, Research, and Education
CINC(s)	Commander In Chief
COG	Center Of Gravity
DOD	Department Of Defense
FM	Field Manual
ICBM	Inter Continental Ballistic Missile
JFACC	Joint Forces Air Component Commander
MAC	Military Airlift Command
MTR	Military Technological Revolution
NASA	National Aeronautics and Space Administration
NCA	National Command Authority
PME	Professional Military Education
RMA	Revolution in Military Affairs
SAC	Strategic Air Command
TAC	Tactical Air Command
UAV	Unmanned Aerospace Vehicle
USAF	United States Air Force

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