Green and Blue in the Wild Blue:

An Examination of the Evolution of Army and Air Force Airpower Thinking and Doctrine Since the Vietnam War

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Abstract

This study examines the nature and degree of the convergence of Army and Air Force airpower thinking and doctrine since the Vietnam War. The value of this effort lies in providing a better understanding of those areas of agreement which could form the conceptual basis for a comprehensive, conventional, land based airpower theory.

Following the Vietnam War Air Force airpower thinking and doctrine splintered into "strategic" and "tactical" camps, while within the Army airpower thinking and doctrine remained closely tied to tactical land warfare doctrine. As the Army's basic doctrine evolved from a linear, firepower intensive "Active Defense" into the maneuver oriented "AirLand Battle", debate over centralized control of airpower led to a shift in both Army and Air Force airpower thinking from tactical-level CAS to interdiction and by 1986, to a joint, theater-wide, operational campaign perspective.

Simultaneously, advancing sensor, computer processing and weapons guidance technology, combined with a renewed interest in the study of aerial warfare to cause reassessment and eventual recognition within the Air Force that "tactical" and "strategic" airpower concepts were artificial and limiting. By 1990, the dissolution of the Soviet Union and increasing non-linearity of the modern battlefield made airpower's mobility, firepower and flexibility increasingly important to both services.

This paper finds that Army and Air Force airpower theory and doctrine have converged at the operational level of warfare. The kernel of a future airpower theory may be found in two propositions. The first is the general agreement between the Army and the Air Force that airpower can provide important, potentially decisive capabilities throughout a theater of operations when centrally controlled. The second proposition is found in the realization by the Air Force that distinctions between "strategic" and "tactical" airpower are artificial and limiting. The corollary to the second proposition is that the relative effectiveness of a particular airpower role or mission is situationally

dependent.

Biographical Sketch

Major Robert J. Hamilton received his commission from the United States Air Force Academy in 1977. A senior pilot with over 3,500 flying hours, Major Hamilton has served as a B-52 flight instructor, T-38 instructor pilot and class commander, and was one of the initial cadre of B-1B flight instructors selected to bring Strategic Air Command's newest bombardment wing to operational readiness. He was instrumental in the development of the Strategic Air Command's conventional warfare training program and founded the command's first unit level strike leaders' school. Major Hamilton holds a bachelor's degree in Astronautical Engineering from the USAF Academy and a masters degree in Military History from the University of Alabama. Beginning in August 1993, he will be assigned to the Joint Operations Division, Headquarters European Command, Stuttgart, Germany. He is married to the former Terri Kell of Brooksville, Florida. They have one son, Adam.

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Chapter 1

Introduction

Thinking on Airpower to Vietnam

For 80 years the U.S. military has experimented with and argued over the proper use of airpower and yet a widely accepted and comprehensive airpower theory does not exist today. Early airpower thinkers such as General Guilio Douhet, Lord Hugh Trenchard and Brigadier General "Billy" Mitchell promised a solution to the bloody stalemate of trench warfare by using airpower to strike directly at enemy will and industrial capability to wage war. Yet, devoid of the capability to test their ideas, these airpower pioneers were relegated to the role of prophets.

However, their writings inspired a generation of airpower theorists and students at the Air Corps Tactical School, (ACTS). ACTS faculty members during the 1930s developed the "Industrial Web" theory that would become, in various guises, the foundation of U.S. Air Force airpower doctrine until the Vietnam War challenged its credibility. This theory was based on the often unstated assumptions that future wars would be fought for unlimited objectives and fought against modern, industrialized nations. It further postulated that because the economic and industrial infrastructures of modern societies are designed for peacetime efficiency, they would contain critical nodes, the destruction of which by air attack, would cause collapse of the enemy's entire "industrial web" and cripple its ability to wage modern warfare. The theory also promised an efficient method of indirectly destroying enemy morale and will to resist by simultaneously robbing the enemy society of its accustomed standard of living. The industrial web theory spawned the doctrine of precision, strategic, daylight bombardment, eventually put into practice in the aerial assaults on the economic and industrial infrastructures of Germany and Japan during World War II.

At the conclusion of World War II, Army Air Forces commanders believed the results of strategic air operations in both Pacific and European theaters generally vindicated strategic bombardment doctrine as a war winning concept and thus justified the independent employment of airpower. When the Air Force achieved independent status in 1947, service doctrine remained structured around ACTS tenets which, with the advent of nuclear weapons, seemed well suited to deal with the emerging Soviet threat.[1] The advent of limited war -- a product of nuclear weapons development, competing alliances and fear of escalation -- precluded the newly independent Air Force from using the most powerful weapon in its arsenal. The political restraints on the use of atomic weapons did not sit well with airmen reared on a doctrine of the predominance of strategic bombing. Worse, a limited war seemed to put the newly independent Air Force back into the role of providing direct support to the ground forces. The Korean conflict seemed to negate the strategic bombing concepts that had become the centerpiece of U.S. airpower theory. But the U.S. military in general and airmen in particular, decided the limited war in Korea was an aberration. There would be "no more Koreas." President Eisenhower's post-Korea "Massive Retaliation" policy reflected a return to the comfortable strategic airpower paradigm and evoked a massive build-up of the Strategic Air Command to the detriment of other Air Force capabilities -- until Vietnam.

Impact of Vietnam -- Confusion/Reassessment

Vietnam blew the widely accepted U.S. airpower theory, based on the primacy of strategic bombardment, out of the sky. The problem was twofold. First, limited war with its tight political restrictions on the targets that could be attacked, could no longer be considered an aberration. Second, the failure of the Rolling Thunder and Arc Light bombing campaigns to bring a negotiated settlement called into question the effectiveness of strategic bombing against a non-industrialized state fighting an

"unconventional" war. Though the Linebacker I and II bombing campaigns in 1972 and early 1973 seemed to provide partial vindication of traditional strategic airpower theory, the enemy had shifted its strategy by that time to a more conventional mode of warfare. "Thus, the old theory if not totally discredited, was no longer comprehensive."[2]

Since Vietnam, there has been considerable apparent confusion among the ranks of airmen. Results can be seen in the blurring of distinctions between "tactical" and "strategic" airpower, a shift in emphasis to the study of operational level/theater warfare, and in the shift of Air Force leadership from bomber to fighter generals.[3] Further, the rise of insurgency, terrorism, peacekeeping and relief operations have added new challenges for airpower theorists to consider. Yet in all of this change and confusion may lie the seeds for a new, comprehensive theory of airpower.

Thesis Statement

Official and unofficial U.S. Air Force and Army thinking about airpower have converged since the end of the Vietnam War. This study will document the nature and degree of this convergence. The value of this effort will be found in a better understanding of those areas of agreement which could form the conceptual basis for a conventional, land based airpower theory.

Methodology

A comprehensive examination of Air Force and Army doctrine, and a comprehensive search of periodical literature from 1972 through 1992, forms the foundation of this study. The 1972-1992 time-frame was chosen for several reasons. First, airpower theory from 1905 to Vietnam is a well plowed field.[4] Second, Vietnam remains a watershed event. By 1972, the inconclusive impact of airpower in Vietnam

had thrown traditional theory and doctrine into confusion. Third, since Vietnam, rising regional concerns, the collapse of the Soviet Union and Warsaw Pact, and attendant shifts in U.S. national defense policy have forced continual reassessment of our national military objectives. This coupled with exponential advances in materials, manufacturing and electronics/computer technology, have fueled constant debate within and between military services and the civilian community, about the proper employment of airpower.

Study Constraints and Definitions

This study seeks to illuminate the conceptual basis that exists for a conventional, land based airpower theory that could form the central core of a modern, comprehensive theory of airpower. However, time constraints precluded the most comprehensive, exhaustive search possible. Though over 800 published articles from the period were examined, unpublished manuscripts and documents related to airpower theory and doctrine exist in the thousands. Periodical literature was preferred as published material has a higher probability of containing valuable information by virtue of the careful scrutiny it must undergo to reach publication.

Because this paper is concerned only with airpower, it does not incorporate theories or doctrine that deal with the space medium. Further, space operations and theory are new fields and much of the material dealing with these subjects remains highly classified.

While many ideas on airpower theory have been promulgated in foreign sources, the time constraints imposed on this study preclude research of foreign airpower literature. Research was therefore restricted to American authors and publications.

Naval and Marine airpower theories are also excluded from this study for two reasons. The first is the tyranny of time. The second is that both of these forms of

airpower tend to be tailored to the specific needs of their service's environment and mission therefore tend to be highly specialized.

The same cannot be said of Army theories about airpower. The common heritage shared by the Air Force and Army still exerts a heavy influence on Air Force doctrine. Much of USAF tactical airpower theory, doctrine and weapon system development has been, and continues to be, centered on supporting the Army. Accordingly, U.S. Army theory that deals with airpower's role in land operations is examined.

As previously mentioned, one side effect of the confusion following Vietnam has been a blurring of such previously accepted terms as "strategic" and "tactical". The definitions that follow will be used throughout the study. The author believes that they represent the majority view found within periodical literature of this period. Differences in usage will be noted where they occur.

"Conventional airpower" refers to the type of weapons employed, not the aircraft used to employ them. Weapons that use nuclear fission or fusion to produce target damage, or employ chemical or biological agents against personnel are excluded from the "conventional" category.

"Airpower theory" is an idea or concept that attempts to link the advantages and constraints offered by flight within the earth's atmosphere to military applications.

"Doctrine" is the official published viewpoint of a single military service or the Department of Defense as a whole, which describes how best to accomplish tactical, operational or strategic objectives with military forces.

The term "tactical" as applied to a target implies that the target/objective is usually between the Forward Edge of the Battle Area (FEBA) and Fire Support Coordination Line (FSCL) and/or is intended to have a nearly immediate impact on a specific battle.[5] "Tactical aircraft" are aircraft designed to operate primarily within a theater of operations in support of tactical or operational objectives.

"Operational" objectives/targets are defined as those intended to contribute directly to achieving strategic objectives for a given theater of operations.[6] "Operational level air campaigns" are usually comprised of several tactical operations though a single operation may be all that is required. Operational level air campaigns are expected to have immediate to long-term effects on friendly and enemy operations within a given theater. They are designed to achieve or contribute to the attainment of theater operational objectives as specified by the theater commander.

"Strategic" operations/targets are defined as those designed to achieve national policy objectives.[7] "Strategic" aircraft are those designed to achieve national policy objectives directly. A strategic air campaign or operation can affect specific battles or an entire theater air campaign, but its focus remains the entire war effort.

Study Structure

The examination of airpower theory and doctrine promulgated by USAF and US Army writers since Vietnam, first centers on the evolution of Army airpower thinking from 1972 - 1992. Because Army surface warfare doctrine provided the framework within which Army airpower concepts evolved, its major tenets and influence on Army airpower thinking are examined in detail. Next, the evolution of USAF airpower thinking and doctrine over the same period is analyzed. Throughout these first two chapters, the influence of technology and lessons gleaned from the application of airpower during major conflicts on developing airpower concepts and doctrine are presented. Finally, the major tenets of airpower theory and doctrine that evolved are examined to determine a conceptual basis for a theory for the application of land-based, conventional airpower. Only those ideas deemed reasonably immune to situational influences such as near term political objectives, technology advancement, and service parochialism were included.

[1] Maj Mark Clodfelter, USAF, *The Limits of Airpower* (New York, N.Y.: The Free Press, 1989), 11.
[2]. Dennis M. Drew, interview with the author, 27 May, 1993.
[3]. Research into the backgrounds of key Air Force Leaders since 1972 has revealed that most had tactical fighter backgrounds. For example, every Chief of Staff since 1978, 2 of the 3 Air Defense Command commanders since 1975, all PACAF commanders since 1978, all USAFE commanders since 1980, and all SAC commanders since 1985 spent a majority of their flying careers in fighters.
[4]. See for example, Alexander P. de Seversky, *Victory Through Air Power* (New York, N.Y.: Simon & Schuster, 1942); Gen Henry H. Arnold, *Global Mission* (New York, N.Y.: Harper & Bros., 1949); I. B. Holley, Jr., *Ideas and Weapons* (New Haven, CT: Yale University Press, 1953); Brig Gen Dale O. Smith, USAF, Retired, *U.S. Military Doctrine, A Study and Appraisal* (New York, N.Y.: Duell, Sloan & Pearce, 1955); Gen William W. Momyer, USAF, Retired, *Airpower in Three Wars* (Washington D.C.: Department of the Air Force, 1978); Micheal S. Sherry, *The Rise of American Airpower* (New Haven, CT: Yale University Press, 1987); Robert F. Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, Vols I & II* (Maxwell AFB, AL: Air University Press, 1989); Earl H. Tilford, *Setup: What the Air Force Did in Vietnam and Why* (Maxwell AFB, Ala.: Air University Press, 1991); Maj Mark Clodfelter, *The Limits of Airpower: The American Bombing of North Vietnam* (New York, N.Y.: The Free Press, 1989)
[5]. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, March 1992, 2.
[6]. *ibid.*
[7]. *ibid*, 12.

Chapter 2

Army Airpower Thinking From 1972-1992

Introduction

Four major shifts in Army doctrine occurred after Vietnam that heavily influenced Army airpower thinkers from 1972 through 1992. The first shift was a refocus of attention from the peculiarities of the Vietnam War back to the Central European, high intensity battlefield. This resulted in the linear, attrition oriented doctrine of "Active Defense" in 1976. The second shift was rejection of Active Defense doctrine by 1982 in favor of a mobile, "AirLand Battle" doctrine that orchestrated long range fires with air attack to interdict Soviet and Warsaw Pact follow-on forces. The third major shift occurred in 1986 when "AirLand Battle" doctrine expanded from a divisional/tactical focus, to an operational level, quasi-linear perspective. The final shift is occurring at this writing from a quasi-linear to a fluid, non-linear "AirLand Battle Future" concept that seeks to achieve quick, decisive victory by fully exploiting the speed and lethality modern technology has imbued on ground forces.

Background - Vietnam

The foundations of modern Army airpower thinking were laid in 1962 by the Army Tactical Mobility Requirements Board, commonly referred to as the "Howze Board" chaired by Lt. General Hamilton H. Howze. The Howze Board believed the helicopter could revolutionize the mobility and tempo of land warfare. The Board designed "airmobile" and "air cavalry" organizations that emphasized the "application of Army aircraft to the traditional cavalry role of mounted combat; that of reconnaissance, security and target acquisition."[1] With the exception of increasing emphasis on

interdiction, these “cavalry roles” remain a central feature of Army airpower thinking. At the divisional level, the + Board recommended formation of an “Air Cavalry Combat Brigade” composed of a swift offense-oriented force of Air Cavalry Squadrons focused on acquisition, destruction and neutralization of enemy armor or mechanized forces from the air.[2] The next larger unit, the “Combined Arms Air Brigade,” later known as the “Combat Aviation Brigade” or CAB, remains Army aviation's rapid strike, highly mobile reserve force for Corps or Army commander employment.

The Howze Board also created the “Air Assault” and more fully air transportable “Airmobile” division concepts. When fielded, these divisions utilized airpower to transport infantry, provide aerial fire support, and forward command and control. Resupply for these highly mobile units was to be the responsibility of an “Air Transport Brigade” composed of Army fixed and rotory wing cargo aircraft. In Vietnam, an Air Transport Brigade was never formed as pure air lines of communication were rarely needed. Air Force tactical airlift, land convoys and water borne resupply generally provided adequate support. The Army continues to rely on the Air Force for strategic and tactical airlift, and on ground transport for forward resupply despite calls for improved organic aerial resupply capability.[3]

The Vietnam conflict validated the airmobile concept for counter-insurgency and to a limited degree mid-intensity war.[4] The 1st Cavalry Division (Airmobile) was employed with considerable success in Vietnam by both General William Westmoreland and General Creighton Abrams as an army level shock force.[5] Army expertise at blending battlefield air assault, infantry/artillery maneuver, and cavalry tactics reached its zenith in the 1968 -1970 time period when commanders developed concepts that more than a decade later became integral to AirLand Battle (ALB) doctrine.[6]

The Era of Active Defense - Post Vietnam to the Late 70s

Following Vietnam, the Army rapidly curtailed its airmobile capabilities, though development of an anti-armor/mechanized capability for helicopters continued. The withdrawal of US forces from Vietnam, the startling results of the 1973 Yom Kippur War and the perception of a rapidly growing Soviet threat forced the Army's newly organized Training and Doctrine Command (TRADOC) to shift attention to the high intensity, modern battlefield in Central Europe. Concern over the utility and survivability of helicopters in a high-intensity war relegated Army Aviation to a subsidiary role.[7] Authors addressing Army Aviation increasingly focused on the anti-armor and close air support (CAS) roles for both Army attack aviation and Air Force tactical airpower. In fact, the A-10 was developed and fielded specifically by the Air Force to meet projected Army needs in Central Europe.[8] By 1974 the 101st Airborne Division remained the only airmobile infantry division in the Army.[9]

From 1974 to 1975, TRADOC analysts wrestled with how to deal with the new lethality of the modern battlefield, the demanding political requirements of foward defense and the realization that a decade of attention on Vietnam had stalled modernization programs giving the Soviets time to make substantial gains in the size and quality of their forces in Europe.[10] Led by General William E. DePuy, TRADOC developed a new doctrine and published it in the 1976 revision of Field Manual (FM) 100-5, *Operations*. This new doctrine emphasized the strength of the defense - an “active defense” using maneuver and concentration near front lines to attrit the superior armies of the Warsaw Pact.[11] The new doctrine immediately touched off controversy within and outside of the Army.

Opposition to “active defense” doctrine centered as much on its spirit as its content. Critics claimed it was set-piece, positional and overly conservative.[12] They feared the de emphasis of maneuver in favor of firepower surrendered initiative to the

enemy and did not believe NATO could win a war of attrition. War games and exercises conducted by the Army in the late 70s seemed to confirm that a forward defense could not hold indefinitely against 2nd and 3rd echelon Soviet/Pact forces.[13] Additionally, this strategy's lack of dedicated reserves required lateral reinforcement to achieve concentration. The ability to accomplish this against a numerically superior enemy was deemed problematical at best.[14] Worse, "it became obvious to critics of the 1976 FM 100-5 that NATO would have to resort to early use of tactical nuclear weapons to disrupt, delay and defeat the follow-on second echelon Soviet forces: direct defense collapsed into deliberate escalation."[15] "Fundamentally, the doctrine of 1976 was a radical departure from the Army's operational tradition. It underrated the key elements of depth, maneuver and initiative, and it paid insufficient attention to the human element in battle."[16] For Army and Air Force senior leadership, active defense doctrine had the effect of focusing airpower thinking on close air support, and anti-armor roles to the detrement of more flexible and independent applications.

AirLand Battle and its Impact on Army Aviation Thinking

By 1980 the changing nature of the Soviet threat to Central Europe, increasing instability in Southwest Asia and proliferation of high technology to the Third World all combined with the military reform movement to spur formal reevaluation of basic Army doctrine.[17] Two concepts came to dominate Army thinking, both threat and technology driven: The "Integrated Battlefield" that accepted combined conventional and nuclear operations, and the "Extended Battlefield" that focused on conventional "deep attack" to disrupt, delay and destroy enemy follow-on forces well behind their front lines. The extended battlefield concept eventually gained acceptance owing to increasing doubts over the viability of extended nuclear deterrence, and an accompanying revolution in microprocessor, sensor and guidance technology that promised future conventional

munitions would nearly equal the combat effectiveness of low-yield, tactical nuclear weapons.[18]

The extended battlefield concept became "AirLand Battle" and reflected the doctrinal views of General Donn A. Starry, TRADOC commander from 1977-81, and his successor General William A. Richardson, then commander of the Army's Combined Arms Center at Fort Leavenworth, Kansas. On 25 March 1981, TRADOC pamphlet 525-5, "The AirLand Battle and Corps 86" was simultaneously published along with an article in *Military Review*, "Extending the Battlefield", written by General Starry. This article outlined the basic tenets of AirLand Battle later incorporated into the new FM 100-5 published 20 August 1982.

The basic assumptions of AirLand Battle as set forth in FM 100-5 were: That war will occur in areas (worldwide) where the enemy has numerical superiority, modern weapons and forces that utilize Soviet operational concepts and tactics; friendly forces will have insufficient room to execute properly a traditional defense in depth; and military operations would not be conducted merely to avert defeat but to win, (what defines "winning" was not clearly specified in the 1982 manual).

AirLand Battle's basic tenets assert that to succeed, the battlefield must be extended: *in depth* - follow-on forces must be delayed, disrupted or destroyed; *forward in time* - attack on follow-on forces must be carefully coordinated with the conduct of the close-in battle to create "windows of opportunity" where friendly forces can seize the initiative; and *in the range of assets employed* - higher level Army or sister service target acquisition and attack resources should be used.[19]

"Deep attack" was seen as essential to winning the close-in battle. "Interdiction - principally battlefield air interdiction (BAI) is the primary tool of deep attack."[20] Army authors until 1990 believed "The interdiction battle will be fought at the corps and division levels..."[21] The corps commander's area of responsibility was seen to extend up to 150 km beyond the forward line of own troops (FLOT). Army commanders saw

interdiction here as a function controlling the rates and densities of enemy reinforcements arriving at the close-in battle.

The division commander's area of interest began 50-70 km beyond the FLOT. Interdiction targets in this region were more directly linked to tactical objectives and the ground defensive scheme of maneuver. Heavy involvement by corps and division commanders in target selection was seen as mandatory to achieve the unity of command necessary for "careful coordination of present and future action throughout the depth of the battlefield."[22]

Needless to say, the effect on Army aviation doctrine and airpower thinking in the 1982 FM 100-5 was dramatic. The return to a mobile, extended battlefield represented, "an exciting time for Army Aviation, equal or greater in importance than that which occurred two decades ago under the Howze Board."[23] Although Army Aviation's mission remained focused on improving the Army's ability to fight and FM 100-5 still asserted that tanks remained "the primary offensive weapon in armored warfare," army commanders now saw airpower as playing a major role in seizing the initiative. Air assets could guard the flanks of armored/mechanized forces, assist in creating deeper penetrations, interdict enemy reserves, and provide force protection and aerial fire support in the event of enemy counterattack.[24] FM 100-5's expansion of the ground commander's horizon in time and space placed great reliance on near real time intelligence and timely attack execution. As a result, aerial reconnaissance, surveillance and target acquisition gained new importance.[25]

The increasing lethality of Soviet ground based air defenses meant that the suppression of enemy air defense (SEAD) mission was "recognized as a major requirement for successful combined arms operations...Its bearing on airmobile operations, close air support and joint air attack team operations cannot be overstated."[26] Taking lessons from Vietnam, the 1973 Arab-Israeli War and the Bekaa Valley operations, Army authors saw interdiction and SEAD as joint/combined arms

missions.[27] Direct and indirect artillery fire, ground maneuver elements and Army attack aviation could make synergistic contributions to Air Force CAS and interdiction efforts. As technology provided attack helicopters with increased range, night capability and long range precise rocket artillery such as the advanced tactical missile system (ATACMS), the ground commander's reach extended beyond the originally conceived 100-150 km area of responsibility (AOR).[28]

There was also a growing belief that individual and squadron size helicopter air-to-air combat (HATAC) was inevitable. HATAC field tests conducted in 1977 and 1979 suggested that a fluid AirLand battlefield would have inherent problems with C^3 and restricted visibility. This made surprise a critical factor in success. These HATAC tests also supported the Joint Air Attack Team (JAAT) concept that integrated Army attack aviation with Air Force CAS operations.[29]

The belief grew that helicopters were the best defense against helicopters and that the Army should seek the capability to gain local air superiority at low altitudes as directed by the division commander. Specialized “fighter/interceptor” helicopters were advocated for escort and division air defense, and this capability was initially designed into the Army's LHX aircraft.[30] The establishment of specialized organizations specifically equipped and trained for air to air combat operations to protect the total force under ground commander influence were briefly advocated.[31]

By 1986, an increasing awareness of the combat employment opportunities afforded by the speed, range, firepower and flexibility inherent to airpower led senior officers like Lt General Robert W. RisCassi, Commander, US Army Combined Arms Center, to suggest that attack aviation air assets were most effectively employed in independent strike packages launched from dispersed rear area locations. He also believed the Combat Aviation Brigade headquarters at division level would be well suited to orchestrate SEAD, intelligence, electronic warfare and JAAT with helicopter

attack and support operations across the entire operational area.[32] His views reflected the beliefs of the wider Army Aviation community until Desert Storm.

The airmobility/air cavalry concept never expanded to the size and capability enjoyed in Vietnam though cavalry tactics remain fundamental to Army doctrine. General RisCassi summed up Army Aviation's airmobility role well when he stated, "We seek to overlay Army Aviation as a `maneuver' force on the dynamic, fast-paced, modern-day battlefield."[33]

On November 9th, 1984 NATO adopted a sub-concept of Land-Air operations called Follow-on Forces Attack (FOFA). It deviated little from AirLand Battle tenets with the exception of increased emphasis on forward defense and expansion of deep attack to 300-400 km to strike Warsaw Pact reserves.[34]

A more significant shift in AirLand battle thinking occurred in the 1986 revision of FM 100-5. Focus of attention shifted from the tactical level to the operational level of war. The new manual contained a more balanced view of offensive actions, explaining how they fit into defensive operations and campaigns. It reiterated the belief that the success or failure of deep operations can only be measured by its impact on close operations. In an attempt to:

> ...link the Air Force's theater-wide view of air support with the Army's operational-level perspective of the AirLand battle...the new edition recognizes that major campaigns and major operations will be joint undertakings with mutually supporting air and ground functions. Consequently, those functions - air interdiction, counterair operations, reconnaissance and ground maneuver - are best directed from the theater, campaign and major operation perspectives. The theater commander must concentrate air power against objectives critical to the success of the campaign or major operation.[35]

This was a major shift towards traditional Air Force theater-wide employment/centralized control doctrine even though the desired impact of aerial

operations throughout the operational area remained focused on the close-in battle.[36] This highlights a major difference in the rationale behind Air Force and Army airpower employment - airpower for the Air Force holds an independent war winning potential. For the Army until 1990, airpower's decisiveness was measured only in its contribution to the close-in land battle.

AirLand Battle Future (ALBF)

The most recent and ongoing shift in Army doctrinal thinking revolves around the growing recognition that technology has created the potential for decisive conflict resolution anywhere in a theater of operations. This is a natural outgrowth of the extended battlefield concept. Where AirLand Battle doctrine recognized the potential for land warfare to become fluid and ill-defined, the "non-linearity" discussed in both the 1982 and 1986 versions of FM 100-5 represented a temporary condition rectified through operations that restored a structured, "linear" arrangement of forces. "ALBF, in contrast, begins with the premise that units and formations are in noncontiguous array prior to the initiation of combat operations."[37] The new FM 100-5, due for release in mid-1993, postulates that operational trends point to fewer, more lethal weapon systems and a much lower density of forces on the battlefield. Concentrations of forces in one area will thus create gaps in others. Warfare will be quick, fluid and tactically offensive. A near revolutionary ability to acquire and attack enemy targets, in near real time, across the entire area of operations will make dispersal and synchronized fire support planning mandatory. The rapidly advancing range, accuracy and lethality of long range rocket systems and field artillery will increase their role, especially in SEAD or interdiction missions. The concept of a "front" will blur as will specific areas of responsibility, or roles, resulting in an "unstructured battlefield" concept. Space surveillance, and theater

air reconnaissance and target acquisition systems will play a crucial role down to the tactical level. Command and control will become more centralized.[38]

Army envisions ALBF operations to occur in roughly four stages: *The detection/preparation stage* - where the ground commander locates enemy formations, verifies targets and activities, then decides on a course of action; *the establishment of the conditions for decisive operations stage* - here long range fires from TACAIR, MLRS and attack helicopters are concentrated to seize the initiative; *the decisive operations stage* - where the commander engages with maneuver forces supported by fires; and *the reconstitution stage* - where units disperse, reconstitute and prepare for future operations.[39]

The projected role of airpower in ALBF's fluid, high intensity environment expands considerably. Space and airborne reconnaissance and surveillance assets such as AWACS and Joint Stars become crucial to the detection/preparation stage of operations. In fact, Army authors see national, strategic and theater surveillance and target acquisition systems as essential, for the near-real-time intelligence necessary during all ALBF stages. Coordinated airpower in the form of ground artillery and rocket forces, Army attack aviation and USAF/Navy TACAIR will be the primary means of achieving second phase objectives. The draft FM 100-5 still postulates that ground maneuver forces achieve victory during the decisive operations phase (stage III); however, TRADOC analysts for the first time leave open the possibility that airpower may prove decisive independent of ground forces. "Instead of committing attack aviation units piecemeal in support of the main attacks of armor and infantry formations, ALBF provides the framework for decisive action, employing attack aviation en masse."[40]

The trend towards centralized control of air assets at the operational level continues largely due to advances in sensor and target acquisition technology that make feasible centralized battlefield management at the theater level. The TRADOC/TAC Air Attack Action Plan (AAAP) was one of several joint initiatives that focused on CAS/BAI

planning, modernization and training issues at the corps and division levels. ALBF doctrine gives control of Army attack air, airmobile, long-range artillery, rocket forces and air defense assets to the corps commander; and supports "apportionment" of sister service air assets to corps and division commanders based on theater commander guidance. This again represents a shift towards Air Force concepts of centralized control.

Summary

As the percieved nature of the battlefield became increasingly more fluid, fast paced and lethal, Army aviation thinkers began to sense that the inherent capabilities of airpower were well suited to this type of environment. Beginning in 1979, articles written by mid to senior level Army officers reflected this growing awareness. It was not until 1990 that a truly non-linear approach to warfare was examined and tenative acceptance given for centralized control of Army air assets at corps and higher levels. The Desert Storm experience helped solidify the non-linear concept and acceptance for a theater level focus when employing airpower. Throughout this period, airmobile and air cavalry capability grew only modestly and retained the basic missions accorded to cavalry since the invention of the sturrup. In general, recognition of the utility/need for airpower grew to the point that the latest draft of FM 100-5 gives tacit recognition that airpower is potentially decisive, independent of ground operations. Throughout this period, the focus for airpower remained enemy forces starting with the close-in battle and expanding through deep attack to encompass the entire AOR. However, there is no suggestion that the enemy heartland should be the focus for aerial attack. Rather, attention is given to the rear area forces, C^2 nodes and combat service support elements. The Army focus for airpower employment shifted from the front line/tactical level after

Vietnam to the deep battle/division-corps level, and after 1986, expanded to the corps/operational level where it remains in ALBF.

Notes

1. Shelby L. Stanton, "Lessons Learned or Lost: Air Cavalry and Airmobility," *Military Review*, January 1989, 76.
2. *ibid.*
3. Col Norman Dodd, "Helicopters in Modern Warfare," *Asian Defense Journal*, October 1982, 76.
4. Lt. Gen William R. Richardson, Army Deputy Chief of Staff for Operations and Plans, "Airmobility in the 1980s," *US Army Aviation Digest*, August 1981, 3.
5. The 1st Cavalry Division proved highly effective in the Ia Drang Valley Campaign (1965), the pursuit of enemy forces along the coast (1966), as a clearing force in the Binh Dinh Provice (1967), and as a reinforcing element for critical areas (I Corp during the 68 Tet counteroffensive and the protection of Saigon in 69). In 1970 the 1st Cavalry operated in classic cavalry fashion during the Cambodian invasion. Stanton, 81.
6. i*bid.*
7. Richardson, 3.
8. Although the Fairchild A-10 was designed during the height of the Vietnam war (1967) it was intended from the begining as an anti-armor platform. As such it was literally constructed around a 30mm, 7 barreled mini-gun firing spent uranium rod, anti-tank ammunition. The first A-10 flew on 21 Oct 1975 and the first squadron reached IOC in Mar 1977. *Rand-McNally Encyclopedia of Military Aircraft* (New York, N.Y.: Crescent Books, 1990), 462.
9. Stanton, 85.
10. Robert A. Gessert, "The Airland Battle and NATO's New Doctrinal Debate," *RUSI J for Def Studies,* June 1984, 54.
11. See for example, John L. Romjue, "Airland Battle: the Historical Background," *Military Review*, March 1986, 53; Gessert, 53.
12. See for example, Lt. Col Jerry M. Sollinger, USA, "AirLand Battle: Implications for the Infantry," *Infantry,* March - April 1982, 23; General William R. Richardson, TRADOC Commander, "FM 100-5: The Airland Battle in 1986," *Military Review*, March 1986, 6; Romjue, 53; Gessert, 53.
13. Gessert, 53-54.
14. Romjue, 53.
15. See for example, Gessert, 54; Sollinger, 23; Richardson, "FM 100-5: The Airland Battle in 1986," 6.
16. LtC Hubba Wass de Czege and L. D. Holder, USA, "The new FM 100-5," *Military Review*, July 1982, 53.
17. Richardson, "Airmobility in the 1980s," 4.
18. In 1983, a paper titled "Potential Future Roles for Conventional and Nuclear Forces in Defense of Western Europe" by Donald R. Cotter, a senior DOD nuclear weapons policy official, was used heavily in an independant European Security Study that supported many of the tenets of Allied Command Europe's Follow-on Forces Attack (FOFA) doctrine. The central idea of this paper was that near term technology advances could provide conventional weapons with mission effectiveness comparable to low-yeald nuclear weapons. "Those two critical and time urgent missions counterair and interdiction, now expected to be executed primarilly by nuclear forces, could be accomplished with non-nuclear forces." Gessert, 55.
19. General Donn A. Starry, TRADOC Commander, "Extending the Battlefield," *Military Review*, 8 March 1981, 32.
20. *ibid*, 37.
21. *ibid*, 46.
22. *ibid*, 39.
23. Richardson, "Airmobility in the 1980s," 4.
24. Maj Gen Carl H. McNair, Commander, U.S. Army Aviation Center, "Army Aviation Forces in the Airland Battle," *US Army Aviation Digest*, July 1981, 12.
25. LtC L. D. Holder, USA, "Maneuver in the Deep Battle," *Parameters*, May 1982, 55.
26. Richardson, "Airmobility in the 1980s," 5.

27. The October 1973 war was the only major military campaign after Vietnam and prior to Desert Storm in which modern, high tech weapons were employed in high-intensity combat environments, and it had a profound effect on the strategic concepts of competing super powers.

By 1973, the Soviet Union was exporting the highly mobile SA-6 surface to air missiles (SAMs), and ZSU-23/4 anti-aircraft artillery (AAA) systems to Egypt and Syria. Along with the hand-held SA-7 SAMs these technologically advanced weapons constituted a significant threat to low flying aircraft. Taking Soviet doctrine and modifying it to fit their unique circumstances, the Egyptian and Syrian forces attempted to create a protective umbrella under which ground forces could advance with relative impunity to air attack - an idea totally foreign to Western and Israeli military leaders. The goal of Arab planners was to engage the IAF in a costly war of attrition during the early stages of the war and when the IAF was weakened by persistent losses, commit Arab air forces previously held in reserve, to assist in the exploitation of successful ground operations.

The impact of this novel air defense tactic on IAF operations altered several time honored perceptions about the nature of aerial warfare. High Israeli losses against Egyptian and Syrian air defenses during ground support missions, (over 60 aircraft-nearly 50% of total losses), led some to speculate that technology had made close air support risky and ineffective.

The US reaction was to push development of the Sgt. York mobile AAA system (a dismal failure), the Patriot SAM system and the Stinger hand-held SAM. NATO forces began to emphasize mobile air defense. Tactical air assets were provided improved electronic counter measures (ECM) and flare systems, and suppression of enemy air defenses (SEAD) received high priority.

Less than two months after the resolution of the Falklands crisis, Israel launched a surprise attack on Syrian air defenses in the Bekaa Valley as part of a combined arms effort to evict PLO forces from Lebanon. On 9 June 1982, in a highly orchestrated attack, the IAF destroyed 17 of 19 Syrian SA-6 SAM batteries and 29 Syrian fighters, without loss.

The unprecedented Israeli success against an integrated air defense system that had cost the IAF 14% of its frontline strength in the Yom Kippur War caused worldwide reassessment of the capability of tactical airpower. Israeli doctrinal emphasis on defense suppression, training and innovative use of superior technology were considered by many American authors to be the decisive factors.

The Bekaa Valley campaign saw the first combat employment of AWACS (Grumman E-2C Hawkeye) aircraft and extensive use of modified Boeing 707 standoff jamming platforms. Israeli fighters were equipped with ECM pods including the Israeli built EL/L-8200 series that proved very effective against the SA-6 and ZSU-23/4 acquisition and track radars. Extensive use of remotely piloted vehicles (RPVs) for reconnaissance and as decoys was another "first." Syrian radars that "took the bait" were easily destroyed by air and ground launched anti-radiation missiles.

The Bekaa Valley air battle seemed to hold to significant lessons for air strategists. First, effective ECM and C3 were now vital prerequisites to air superiority. Second, the aerial battlefield was very sensitive to marginal technological advances when combined with innovative doctrine and excellent training. Finally, the IAF's authority over all assets used to take control of the air and project power from this medium, including helicopters and air defense artillery, generated debate over the roles and missions each service should have regarding airpower. "Yom Kippur Special," *Defense Update 42,* August 1983; CIC Matthew M. Hurley, USAF, "Bekaa Valley Air Battle, June 1982: Lessons Mislearned?" *Airpower Journal*, Winter 1989, 61; Hurley, 63; Cynthia A. Roberts, "Soviet Arms-Transfer Policy and the Decision to Update Syrian Air Defenses," *Survival*, July-August 1983, 154.27 In fact, while *Red Star* was extolling Syrian prowess, the First Deputy Commander of Soviet Air Defense Forces was sent to Syria to find out personally what went wrong. SA-8s, SA-9s and long range SA-5s were soon shipped to Syria along with 1,000-1,500 Soviet "advisors." Hurley, 63; John V. Cignatta, USAF, "A U.S. Pilot Looks at the Order of Battle, Bekaa Valley Operations," *Military Electronics/Countermeasures,* February 1983, 108.

28. Maj Gen John W. Woodmansee Jr., Commander, 2nd Armored Division, "Blitzkrieg and the Airland Battle," *Military Review*, August 1984, 35.

29. Maj Gen Carl H. McNair, "Air to Air Combat Operations: The Big Picture," *US Army Aviation Digest*, October 1981, 3-5.

30. Major Frank E. Babiasz, USA, "The Fighter/Interceptor Helicopter: A Concept for Today and Tomorrow," *US Army Aviation Digest,* January 1982, 32.

31. Major Lawrence E. Casper, USA, "Force Protection: Aerial Combat", *US Army Aviation Digest*, April 1986, 4.

32. Maj Gen Robert W. RisCassi, Commander, U.S. Army Combined Arms Center, "Army Aviation in the 1980s: the Success of the First 5 Years, The Challenges of the Second," *US Army Aviation Digest*, January 1986, 3.
33. *ibid.*
34. General Bernard Rogers, USA, Supreme Allied Commander Europe, "Follow-on Forces Attack", *NATO's Sixteen Nations*, November - December 1984, 49.
35. Richardson, "FM 100-5: The Airland Battle in 1986," 7.
36. The concept of centralized control of air assets has a long heritage in AF doctrine dating back to Army Air Forces Regulation FM 100-20 published in 1943 as a result of painful lessons learned during the North African Campaign and continuing through AFM 1-1, March 1992.
37. Maj Gen Rudolph Ostovich III, Commandant, U.S. Army Aviation School, "Army Aviation in AirLand Battle Future," *Military Review*, February 1991, 26.
38. General John W. Foss, TRADOC Commander, "Airland Battle Future", *Army*, February 1991, 21-24.
39. *ibid*, 24.
40. Ostovich , 28.

Chapter 3

USAF Thinking on Airpower: 1972 - 1992

Introduction

The unwillingness of civilian leadership to authorize a classic strategic bombing campaign and the percieved ineffectiveness of bombing attacks in the North (Linebacker II notwithstanding) to coerce North Vietnam into a negotiated settlement, seemed to discredit traditional strategic airpower theory. Simultaneously, the obvious tactical effectiveness of airpower in South Vietnam, most notably in close air support and theater airlift roles, coupled with the appointment of officers with tactical backgrounds to key leadership positions within the Air Force, led to a split in airpower thinking and doctrine along "strategic" and "tactical" lines.

"Strategic" airpower theory, after 1972, focused primarily on nuclear warfare. Authors and senior Air Force leaders returned their attention to the Cold War with its familiar enemies and constraints. Deterrence, strategic nuclear bombardment and massive destruction of the Soviet block's military and industrial infrastructure became the central theme. Serious consideration of a non-nuclear strategic air campaign directed against an enemy heartland did not appear until 1988.[1]

In contrast, "tactical" airpower became synonymous with conventional warfare prosecuted by fighter aircraft. Examination of periodicals spanning the twenty years since Vietnam shows a clear evolution in tactical airpower thinking from a CAS oriented battlefield perspective to a centralized, theater-wide, operational view of air warfare heavily weighted toward highly coordinated aerial interdiction. Army doctrine and the near revolutionary advances in target acquisition, computer, weapons guidance, and stealth technologies were the driving forces behind this evolution.

In 1990, the Army's AirLand Battle doctrine, technology, the Cold War's demise, and a paranoid dictator's unprovoked aggression, resulted in a war that reinvigorated strategic airpower theory and accelerated the fusion of tactical with strategic airpower concepts.

The Impact of Vietnam on USAF Airpower Thinking

Throughout the 1950's, Air Force doctrinal publications and published literature espoused the continuing belief that strategic nuclear bombardment was "the most decisive use of air power usable across the spectrum of conflict."[2] Under the Kennedy administration's "flexible response" strategy the Department of Defense was directed to search for military response options short of "massive retailation". Despite Secretary of Defense Robert S. McNamara's initiatives to improve US military capability to prosecute "unconventional warfare," Air Force doctrine remained basically unchanged as evidenced by the 1964 revision of AFM 1-1 that paid scant attention to anything other than general or tactical nuclear warfare. Thus, airmen entered the Vietnam War with a doctrine geared to the total destruction of an industrialized state through massive strategic attack on its vital production facilities. Unfortunately, both of the assumptions underlying strategic bombment were missing in the Vietnamese case. North Vietnam was not an industrialized state and total destruction was never a national policy objective. The subsequent failure of various limited bombing campaigns to bring North Vietnam to its knees left American airmen unsure of their beliefs.[3]

As a result, airpower thinking splintered into "strategic" and "tactical" camps. Doctrinal manuals written after Vietnam concentrated on nuclear deterrence and "theater-level `conventional' warfare...clearly centered on the European case."[4] The nuclear war arena remained the province of strategic airpower doctrine as the percieved totality of nuclear war and the requirement to destroy the Soviet Union's massive military-industrial

complex rested securely on the traditional foundations of strategic bombardment theory. Conversely, warfare below the nuclear threshold became identified with "tactical" airpower employing fighter aircraft and "conventional" weaponry.[5]

This artifical division of airpower into "strategic" and "tactical" elements was a long-standing Air Force organizational response to the complexities of airpower employment that dates as far back as The Great War and the subsequent creation of "pursuit" and "bombardment" aviation in the 1930s. Although "World War II, Korea and Vietnam showed in practice that weapon systems are not `strategic' or `tactical',"[6] organizational imperatives born of the "requirements of nuclear deterrence and budget allocations," influenced airpower thinking after Vietnam.[7]

Another consequence of the Vietnam War was the rebirth of a large, tactically oriented force with broad experience in, and an affinity for, close air support. During the Vietnam War, a large body of airmen and future commanders became accustomed to employing airpower in a supporting role. A close air support/battlefield focus was molded by the nature of the conflict. Airmen received nearly immediate feedback on the results of air strikes from Forward Air Controllers (FACs) and grateful ground forces. This stood in marked contrast to the maddening inconclusiveness of aerial interdiction missions. It was not until the North Vietnamese shifted to a more conventional/mechanized warfare strategy during the Easter Offensive in 1972, that aerial interdiction and strategic bombardment, (Linebacker I & II), appeared effective and a measure of credibility was restored to these methods of airpower employment.

Finally, the highly divisive, emotional nature of American involvement in Vietnam clouded thinking on airpower employment with the same "never again" syndrome the Air Force experienced following Korea.[8] "The first thing one notices is that the Air Force has largely ignored the war in Vietnam."[9] In fact, "We have yet to complete a comprehensive, analytical, and conceptual study of airpower application in that [Vietnam] war."[10] The 1979 revision of AFM 1-1 did not mention the Vietnam War

by name and sidestepped consideration of its implications for airpower. Instead, the Vietnam War was refered to as an "unpopular conflict that was not and is not yet, clearly understood."[11]

Part I

USAF Airpower Thinking From 1972 - 1979

Strategic Nuclear War and Airpower

"Strategic" airpower theory, after 1972, focused primarily on nuclear warfare as authors and senior Air Force leaders returned to the Cold War with its familiar enemies and constraints. Strategic airpower with it's range and nuclear capability remained "the *sine qua non* of strategic nuclear warfare."[12] "Virtually all conceptions of strategic nuclear warfare and its deterrence center[ed] on the delivery (or threatened delivery) of the [nuclear] weapon through the use of airpower - either manned aircraft or unmanned missiles."[13] The Air Force's focus on the threat posed by Soviet military forces was not unwarranted. A decade of attention focused on Vietnam had diverted funding for new weapon systems giving the Soviets the opportunity to make substantial gains in the relative quality and quantity of their ICBM, long range aviation, and air defense forces. Gen. John D. Ryan, Air Force Chief of Staff, noted in a 1972 article published in *NATO's Fifteen Nations*, "Air Force plans have been strongly influenced by... the existence and anticipated continued growth of what is already the greatest potential military opposition ever faced by this country...Under the Nixon Doctrine the United States has accepted primary responsibility for deterrence of nuclear attacks on this country and our allies...The deterring effect of our nuclear forces must work regardless of many uncertainties..." Thus, "the United States must continue to rely on a mixed force of manned bombers and intercontinental ballistic missiles..."[14] The Cold War's strategic,

nuclear bombardment focus was also reflected in the 1975 revision of AFM 1-1 *United States Air Force Basic Doctrine*. Unlike the 1971 version that placed "strategic attack" last in its list of Air Force "basic tasks," the 15 Jan 1975 manual, buoyed in part by the perceived success of Linebacker II, returned strategic attack to the top of its list of "basic missions," and reasserted that "the region above the earth's surface permits largely unhindered access to any point on or above the earth, thus provides a unique opportunity to apply aerospace power against all elements of an enemy's resources, regardless of their location."[15] The edition also discussed nuclear deterrence in light of national defense guidance and addressed the flexibility of the "triad": a mixed nuclear deterrent force comprised of land based intercontinental ballistic missiles; sea launched ballistic missiles carried on nuclear powered submarines; and long range, recallable, bombers.[16]

Thus, in line with national security policy, deterrence remained the keystone of Air Force doctrine and the "deterrence of strategic nuclear warfare... our highest defense priority."[17] True to the fundamental tenets of strategic bombardment, the 1979 AFM 1-1 also addressed "strategic" operations aimed at "devastating bases or industrial centers behind enemy lines,"[18] and discussed the efficacy of the triad.[19]

Close Air Support and the "Tactical" View of Airpower

In sharp contrast to strategic nuclear bombardment's focus on destruction of the Soviet homeland, "conventional" airpower theory in the 1972 -1979 time period acquired a close air support (CAS) orientation.[20] General John D. Ryan, Air Force Chief of Staff wrote, "the primary purpose of tactical air forces is to provide the necessary protection and support to ground and sea forces to allow them to control their environment. The classic missions remain air superiority, close air support, and interdiction."[21] This CAS orientation was also reflected in the Air Force's A-X program that eventually led to the procurement of the A-10. Gen. Ryan explained, "The A-X is optimized to support the

man on the ground... the capabilities of the two A-X prototypes (designated the A-9A and A-10) were determined by a careful analysis of Army requirements and the CAS mission."[22]

Since the Air Force has "traditionally regarded Central Europe as the epitome of the high threat environment...,"[23] the constraints and requirements imposed by the Soviet threat to Central Europe also influenced conventional airpower thinking and weapon system procurement.[24] First among these concerns was the growing size and capability of Soviet conventional forces. As of 1981 the Soviet Union had a 2:1 advantage over NATO forces in manpower and fighter aircraft, a 4:1 advantage in tanks and combat infantry vehicles, and a 7:1 advantage in artillery. In the previous decade the USSR spent $450 billion more than the US on defense.[25]

The second concern centered on the concerns of NATO allies that a traditional "defense in depth" strategy in Western Europe would sacrifice excessive amounts of sovereign territory to Soviet and Warsaw Pact forces. At the same time, the question of deep air strikes into East Europe was problematic. The only apparent alternative that remained was to focus on defeating Soviet and Warsaw Pact forces as they attempted to penetrate forward defenses. These limitations drove development of the Army's "Active Defense" doctrine with it's heavy reliance on concentrated firepower and close air support. In a September 1975 interview published in Air Force Magazine, Gen. David C. Jones reaffirmed the Air Force's CAS orientation when he stated, "Its being said that the Air Force is out to win the air battle and then plans to go for deep interdiction... Our first job in the tac air is to help blunt and stop the armored thrust."[26]

At odds with the Air Force's preference for close air support was the growing lethality of air defense weaponry. The startling effectiveness of newer Soviet mobile air defense weapons against low flying Israeli aircraft during the 1973 Yom Kippur War, raised concerns that "the character of CAS will change... small, accurate anti-air weapons will limit access to the battlefield for both combatants."[27] The growing lethality and

concentration of Soviet ground based air defenses in Central Europe led nearly every author and senior Air Force commander, who discussed close air support and interdiction, to advocate the acquisition and fielding of stand-off munitions.

The concept of general (theater wide) air superiority or "air supremacy" remained the Air Force's primary objective, followed by close air support, yet the growing lethality of mobile air defense systems, and increasing capabilities of electronic acquisition and guidance technologies raised concerns that "air superiority will become increasingly problematic" and that "air superiority missions will take on an increasingly point-oriented character."[28]

Summary

In essence, from 1972 - 1979 both the Army and Air Force wrestled with the dilemas of a growing Soviet threat, modernization, forward defense and the new lethality of the modern battlefield. They both reached the same battlefield focused, attrition and firepower oriented strategy.[29] Though non-traditional, defensive and set-piece, the Army adopted "active defense" strategy as its official doctrine in 1976 out of perceived necessity. Forward defense policy did not allow a defense in depth, and the sensor and target acquisition technology required to disrupt or destroy second echelon forces had not yet matured. Conversely, although the Air Force had "not yet digested new weapons technology", and had begun to recognize that increasingly lethal air defense weapons may make close air support costly, the service fell in line with Army doctrine because close air support was a role a large number of Air Force officers and senior leaders understood and with which they were comfortable.[30]

Comic Books and Doctrine

A dearth of critical thinking in airpower literature and doctrinal manuals from 1972 - 1979 abetted the tendency to rely on the familiar. One frustrated young officer wrote, "In the field of concepts the Air Force has become a status-quo institution, feeling middle age and inclined to rephrase proven formulas."[31] The basic doctrinal manuals of the `70s concentrated nearly exclusively on Central European warfare and reflected muddled thinking. Even a principle of war as crucial to effective employment of airpower as economy of force "was interpreted in economic terms rather than stated in traditional [and useful] terms of mission priorities."[32] In most cases, doctrine seemed "written for use by harried Air Staffers involved in never ending budget battles within the Pentagon."[33] In 1974, one officer in the Air Force's Directorate of Doctrine summarized their situation stating, "Sometimes we feel we are so busy stamping ants, we let the elephants come thundering over us."[34] The 1979 revision of AFM 1-1, *Functions and Basic Doctrine of the United States Air Force*, represented "the nadir of the Air Force doctrine."[35] The largest edition to date, it contained numerous "generalities, unsubstantiated assertions and irrelevant quotations."[36] Excessive use of graphics and illustrations of famous people and aircraft led to it being nick-named the "comic book" edition by disgruntled officers.[37] Worse, "Basic doctrine was buried among extraneous image building and irrelevant discussions of the Triad, the total force, education and training, and personnel management...the overall result was a manual that pointed to an organization apparently more concerned with training, organization, and equipment than with war fighting."[38] The bright spot in this otherwise dismal tale is that the comic book manual served as a "wake-up call" for Air Force officers. Starting in 1979 the number and quality articles on doctrine and airpower theory increased dramatically. The younger

generation began to question the accepted "truths" of the past and a healthy debate ensued.

Part II

The Evolution in USAF airpower thinking 1980 - 1986

The Army's promulgation of AirLand Battle doctrine had a major impact on USAF airpower thinking from 1980 - 1986. Army concerns with Active Defense mirrored airmen's growing dissatisfaction with the defensive, close air support focus of Air Force tactical doctrine. When the 1979 edition of AFM 1-1 regenerated debate in periodical literature over the proper employment of airpower, the Army's evolving AirLand Battle doctrine provided a framework for that debate. Simultaneously, joint initiatives begun in 1975 to improve close air support coordination, provided senior Army and Air Force leaders with the organizational mechanisms necessary to turn "extended battlefield" concepts into joint doctrine. The underlying effect of AirLand Battle doctrine was to return tactical airpower thinking to a more traditional emphasis on interdiction and lay the conceptual foundation for a rebirth of thinking on warfare at the operational level.

AirLand Battle and Airpower

General Donn A. Starry's article, "Extending the Battlefield," published in the March 1981 edition of *Military Review*, sent a clear message to airmen that the Army believed "deep attack" was absolutely necessary to winning the close-in battle. The doctrinal decision to extend the battlefield in space and time made "Interdiction - principally battlefield air interdiction (BAI)...the primary tool of deep attack."[39] The release of General Starry's article was well timed.[40] Disenchantment with confusing,

organizationally oriented airpower doctrine reached a peak following the 1979 release of the "comic book" edition of AFM 1-1. As early as 1975, younger Air Force officers had begun to question the effectiveness of employing airpower as mobile artillery against heavily defended Soviet armored divisions.[41] "Airpower, as a strike instrument, is not an extension of artillery or the M-16. Its focus is too fleeting and it costs too much for that form of application."[42] AirLand Battle's central concepts of deep attack, second echelon interdiction and joint air-land operations were readily accepted by airpower thinkers hungry for an expanded role for conventional airpower and a common conceptual framework to analyze Air Force doctrine.

The TAC - TRADOC Connection

It was no accident that AirLand Battle doctrine lent itself to Air Force conceptual thinking. Since 1973, TAC and TRADOC commanders had met regularly to discuss offensive air support issues.[43] In June 1975, a Joint Army/Air Force Studies Group was created at Nellis AFB to explore future joint concepts and by July, the Air-Land Forces Applications Agency (ALFA) was created at Langley AFB, Virginia. Initially established to regulate day to day joint activities, ALFA became a focal point for the development of joint concepts and procedures for the AirLand Battle.[44]

The Air Force's contributions to AirLand Battle doctrine centered around airpower employment and control concepts. The shift in employment emphasis from CAS to interdiction began in May of 1979 when the Joint Studies Group at Nellis AFB was assigned the Joint Second Echelon Interdiction (J-SEI) study under the supervision of ALFA.[45] On 20 April 1981, the J-SEI study was expanded to include tactical nuclear and chemical weapons, and *offensive operations* [emphasis added by author].[46] On 15 August 1981, a J-SEI working group at Langley AFB was tasked to identify changes in current procedures necessary to implement extended battlefield concepts in the near-term

(1981), and develop second echelon attack concepts and detailed joint procedures for the 1986-87 time frame.[47] At this time the study's name was changed from J-SEI to Joint Attack Second Echelon (J-SAK). In September, General Starry approved the initial J-SAK concept and distributed the study throughout both services for comment. J-SAK concepts and procedures were key to implementing the Army's new AirLand Battle doctrine and the study was intended for publication prior to the August 1982 release of the Army's new FM 100-5. However, further development, staffing and revisions delayed final approval by TAC and TRADOC commanders until 13 December 1982.[48]

Though the most significant, J-SAK was just one of several joint studies orchestrated by ALFA in the 1979 - 1986 time frame. A variety of mission areas from suppression of enemy air defenses (J-SEAD) to joint counter air to air defense (J-CAAD) were jointly examined and agreement reached on joint procedures. Concurrently, TRADOC and the Air Force initiated separate AirLand Battle 2000 and Project Air Force 2000 studies to define the nature of the warefare from 2000 to 2015. These documents, completed in 1982, further highlighted the limitations of unilateral approaches to warfare, and the benefits possible from closer integration and joint concept development.[49]

With the primary attention focused on CAS and interdiction, rear area operations were not examined until mid 1983. At that time TAC and TRADOC began a dialog on ground air base defense. This study quickly expanded by September into rear area CAS, and command and control of operations behind front lines or “rear area.” On 15 July 1984, the Joint Action Steering Committee tasked ALFA to develop a Joint Rear Area Protection (J-RAP) study. In line with doctrinal changes the study concept expanded in October 1984 and became the Joint Rear Battle (J-RB) project.

The culmination of the Army-Air Force cooperative effort began with the 21 April 1983 signing of a *Memorandum of Understanding on Joint USA/USAF Efforts for the Enhancement of Joint Employment of the AirLand Battle Doctrine*, by the Army and Air Force service chiefs. This document called for increased: integration of Army and

Air Force forces in field training; cooperation in the development of deep attack/BAI/interdiction programs; and resolution of doctrinal and procedural concerns as AirLand Battle is integrated into joint theater operations.[50] On 22 May 1984, the historic *Memorandum of Agreement on US Army - US Air Force Joint Force Development Process* was signed by General John A. Wickham, Jr. and General Charles A. Gabriel. More widely known as the "31 Initiatives" this document committed the services to: increased study, development and possible realignment of roles and missions assigned to the Army and Air Force in support of AirLand combat operations; realignment of competing joint service development efforts; termination of duplicate programs; seeking joint economies when fielding systems that support AirLand combat forces; and formalization of cross-service participation in the five year POM process.[51] Thus, from 1975 through 1986 the Air Force was a major contributor of employment concepts and procedures during the development of Army AirLand Battle doctrine.

Who's in Charge?

AirLand Battle doctrine stimulated Air Force thinking on airpower because it simultaneously broadened the horizon for airpower employment and challenged a core Air Force belief that air assets must be centrally controlled. Much periodical literature written on the subject from 1979 to 1986 deals with the issue of centralized control of airpower.[52] Examination of this issue had the side benefit of forcing airmen to reexamine the nature of airpower, the characteristics of the aerospace medium, and the impact of technology on future airpower employment.

The roots of the airpower control debate stemmed from then Army Chief of Staff Craighton W. Abrams' 1973 decision to eliminate army headquarters from the operational chain of command. This made the corps the army's largest tactical maneuver unit and created a disconnect between the Air Force's traditional allocation and control of

offensive air support assets from an air component/theater level, and army corps commanders' intent to influence their portion of the theater of operations.[53] AirLand Battle's focus on the corps and expansion of the corps commander's horizon in space and time exacerbated the problem. Instead of waging the main battle at the forward line of own troops (FLOT), corps commanders now looked to influence enemy activity150 km beyond the forward edge of the battle area (FEBA) or about 72 hours away from their front lines. AirLand Battle's expansion of the corps commanders "area of responsibility/influence" to 150 km and "area of interest" to 300 km, or 96 hrs out, gave them an operational requirement to influence target selection and allocation of deep strike and tactical reconnaissance assets well beyond the fire support coordination line (FSCL) that marked the traditional boundary between Army and Air Force control.[54]

The portion of the interdiction effort that had a near-term or immediate effect on the close-in battle, (72 hrs - from the FSCL to approximately 150 km), was termed battlefield air interdiction (BAI) and became the central issue.[55] From the Air Force perspective, the problem was that ground commanders did not trust TACAIR planners to attack those targets they felt were critical to the land battle.[56] The Air Force's perspective, derived from experience dating back to the North African Campaign in World War II, remained that limited air assets have a decisive impact on ground operations only when concentrated at the decisive points throughout a theater of operations. This concentration requires centralized control at the air component level. Airmen quickly pointed out that AirLand Battle doctrine did not address operations in a theater containing more than one corps. Thus, without a higher operational echelon to coordinate and prioritize the theater ground campaign, there would be no one to resolve conflicting corps commander demands for air resources.

In December 1979, the Air Force released a position paper proposing that the air component commander retain control and direction of the BAI mission rather than distribute BAI assets to the corps. To the Army, this represented a major shift from

agreements reached on offensive air support since 1976. For the Air Force, offensive air support had been primarily CAS, not interdiction oriented. An intensive effort to reach a compromise resulted in an initial TAC-TRADOC BAI agreement in April, followed in September 1980 by a broad Memorandum of Agreement for offensive air support which TAC and TRADOC commanders approved.[57] One year later on 22 September 1981, Headquarters Air Force declared the September 1980 Memorandum of Agreement official Air Force doctrine.[58]

The procedures finally developed for corps and air component commander interface under the September 1980 agreement basically acceded to the Air Force's position. Under the terms of this agreement, a battlefield control element (BCE) was added to a theater's tactical air control center (TACC) to coordinate and prioritize corps and division air support requests in accordance with theater commander guidance. However, the air component commander retained allocation and control over interdiction assets.

In the midst of this debate, accelerating technological advances in sensor, target acquisition radar, and data processing capabilities were making it possible for the Air Force to find and target enemy forces farther behind the FEBA. Along with the development of long range rocket systems like Multiple Launch Rocket System (MLRS), and helicopters with increased combat radius, ground commanders began to acquire the means to strike deep with Army assets initiating an increasingly complex coordination problem that has not been resolved to this day.

Reassessment of “Strategic” and “Tactical” Airpower

The critical examination of airpower generated by AirLand Battle doctrine evoked a growing awareness that “strategic” or “tactical” divisions of airpower were artificial and limiting. As early as 1975 the Air Force, owing largely to budget

constraints, began to reinvest in training programs to employ strategic assets, such as the B-52, in conventional conflicts.[59] Some authors began advocating using the inherent characteristics and capabilities of aerial weapon systems to define their employment not predetermined mission categories, and warned against the, "Tendency to measure progress by hardware improvement within old paradigms."[60]

General Lew Allen Jr., Air Force Chief of Staff, stated in a 1981 address to the Air Force Association national convention that a "new bomber must be able to deliver nuclear and conventional weapons...in a variety of missions including...counterintervention attacks in theater conflicts..."[61] General Bennie L. Davis, CINCSAC noted in a 1984 article that, "declining assets and an increasing threat has forced a reexamination of traditional concepts of airpower employment and a search for doctrinal concepts that increase flexibility and promote optimum use of limited airpower assets...in peacetime we have tended to disregard valuable wartime lessons about the optimum application of airpower. In our efforts to accommodate new technology - most notably nuclear weapons - the words `strategic' and `tactical' came to be associated not only with missions but with aircraft as well...Capability to perform specific missions must be the fundamental reason for deciding how we employ airpower and how we allocate resources for future forces."[62]

Part III

Airpower Thinking From 1986 - 1990

Introduction

Wide spread disillusionment with doctrine tailored more for bureaucratic success than battlefield victory and the reexamination of Air Force doctrinal beliefs spurred by AirLand Battle debate awakened senior Air Force leaders to the fact that a broader

"warfighting perspective" of airpower employment was needed. Simultaneously, the Army realized the increasing tempo, mobility and lethality of surface combat also demanded a broader - operational/theater level view of warfare. The ensuing emphasis in Army literature on the "operational art" of war elicited a similar response within the Air Force shifting attention from interdiction towards airpower employment from an operational level perspective. By 1988, greatly improved aerial refueling offload capability and the maturation of day/night, target acquisition and tracking technology gave "tactical" fighter aircraft the range and flexibility of "strategic" bombers. This blurred the distinction between tactical and strategic airpower concepts at the operational level of warfare, and heralded the a shift towards the "strategic" employment of "indivisible airpower" in the future.

"Warfighting" and Doctrine

By 1982, senior Air Force leadership awakened to the fact that, "without an understanding of war, doctrine becomes an army of abstract words and phrases searching for a unifying idea."[63] Senior Air Force commanders, as Bernard Brodie had observed nearly a decade earlier, also recognized that "soldiers usually are close students of tactics, but only rarely are they students of strategy and practically never war."[64] One senior officer noted, "Air Force officers and enlisted personnel...have not spent nearly enough time learning all they can about war."[65] A "warfighting" approach to airpower thinking was needed. In 1982, Air Force Chief of Staff, General Lew Allen Jr., initiated the Project Warrior program to encourage Air Force officers and enlisted personnel to study warfare, particularly airpower history. Air Force Chief of Staff, General Larry D. Welch later noted, "we initiated the Project Warrior to emphasize the Air Force warfighting perspective and to increase our understanding of the application of air power in combat."[66]

The 1984 AFM 1-1 codified this significant shift toward a warfighting philosophy. Even though this new doctrinal manual took a traditional "abstract-Jominian" approach to doctrine and continued the "artificial, illogical, and confusing distinctions between strategic and tactical operations," it was widely recognized as a major improvement over its predecessor.[67] Gone was "the puffery of the 1979 edition." The 1984 version "[spoke] candidly of war and victory."[68]

Warfare at the Operational Level

Simultaneously, the Army began to realize that a centralized, highly coordinated air-land effort was essential to cope with the increasing tempo, mobility and lethality of the modern battlefield. The 1986 revision of FM 100-5 represented a significant shift in Army thinking from strategic and tactical levels to the operational level of war.[69] Unlike its 1982 predecessor, the new manual fully described the operational level of war as "the linchpin between strategy and tactics," and "clearly differentiated between tactical and operational warfighting."[70] The new edition attempted to "link the Air Force's theater-wide view of air support with the Army's operational-level perspective of the AirLand Battle," and recognized that "air interdiction, counterair operations, reconnaissance, and ground maneuver - are best directed from the theater, campaign and major operation perspectives."[71] In short, Army AirLand Battle doctrine accepted, in principle, Air Force theater-wide employment/centralized control doctrine even though the impact the Army desired from aerial operations remained focused on the close-in battle.

The new FM 100-5 created a flood of articles in Army literature on operational warfare. This elicited a similar response from Air Force commanders, many of whom first published their views on the operational art along side of their Army counterparts in Army sponsored periodicals such as *Parameters* and *Military Review*.[72] General Michael J. Dugan, then Commander, Allied Air Forces Europe, wrote in *Military Review*,

"Airpower's attributes embody a theater-wide, warfighting perspective...the `air campaign' for an airman, embodies `operational art.' It represents unified application of available air forces to best achieve the objectives established by the theater commander."[73] General Charles L. Donnelly, Jr. (ret), another former commander of Allied Air Forces Europe, became a frequent contributor of articles on operational warfare in *Airpower Journal* and *Military Review*. He noted, "The majority of our senior military leaders have never had wartime experience commanding forces from a theater level. Because this is true, the operational art of modern war deserves our attention. This theater-level perspective of warfighting must pervade all our thinking, military planning, training, and equipping."[74] He justified this assertion by saying, "Air power is a theater-level concept...air, land, and naval component commanders translate theater objectives into joint campaigns aimed at theater goals."[75] The emphasis placed by senior Air Force leaders on warfighting and the AirLand Battle debate over centralized control of airpower thus led to a shift in both the Army and Air Force airpower thinking from tactical-level CAS and interdiction to a joint, theater-wide, operational campaign perspective, making " the `operational art' the subject of much attention in the professional military during the 1980s."[76]

Indivisible Airpower

The shift to an operational level focus, quantum increases in the range, flexibility and lethality of fighter aircraft, and increasing budget pressure from 1985 - 1990 also led airmen to question the division of airpower into "strategic and "tactical" roles. Operational warfare by its nature focuses on the desired effects of military operations not the specific weapon system employed. As early as 1983, the Commander-in-Chief of Strategic Air Command noted, "World War II, Korea and Vietnam showed in practice

that weapon systems are not `strategic' or `tactical'...mission capability must be the criterion for allocation of resources for future forces."[77]

Quantum improvements in the range, flexibility and lethality of fighter aircraft during this period further blurred the distinction between "tactical" and "strategic" aircraft. The re-engining of the KC-135 and acquisition of KC-10 tanker aircraft increased fuel off load capability by 50% from 1980 to 1990.[78] The advent of advanced, fuel efficient jet engines, enhanced air refueling off load and airlift capability, made it possible by 1990 to deploy a squadron of fighters overseas in hours, using half the airlift support required during Vietnam.[79] The entry into service of the F-15E long range, multi-role, strike aircraft and the accompanying Low-Altitude Navigation and Targeting Infrared System for Night (LANTIRN) greatly increased the Air Force's capability to employ fighter aircraft deep behind the FEBA and "virtually eliminate night as a sanctuary for the enemy."[80] Enhanced E-3A AWACS and the new E-8 Joint Surveillance and Targeting Attack Radar System (Joint STARS) were available by 1990 to locate and guide long-range strikes to their targets deep into enemy territory. Stealth technology, sophisticated electronic surveillance and countermeasures equipment; and advanced, stand-off, antiradiation missiles like the HARM promised to greatly reduce combat losses of valuable strike aircraft and aircrews.

The maturation of precision guided munitions technology resulted by 1986 in the expectation that pilots would destroy "three times the number of targets they could have with the 1980 force."[81] What took one F-4, 66 MK-82 bombs and 11 sorties to destroy in 1980 required only one bomb and one sortie in 1986 - a 98% increase in kill capability.[82]

Budget pressures added the final glue that brought tactical and strategic airpower together. Declining defense budgets and the rising cost of strategic bombers, made it both desirable and necessary to exploit their range and payload capabilities for conventional, theater warfare. Accordingly, by 1985, B-52 squadrons throughout SAC began training for conventional warfare.[83] General Lawrence Skantze, then Commander, Air Force

Systems Command, declared that same year, “the B-1B has been designed to support tactical forces behind the FEBA...there is no doubt that it can play a significant role in the kind of tactical warfare expected in the AirLand Battle environment.”[84] Major General Charles C. Boyd, then Director of Plans for the Air Force Plans and Operations Division, stated in 1989, “the B-2 may also be the best system for non-nuclear conflict that we have... Absolutely fundamental to the concept of indivisible air power is the notion of a long-legged, stealthy penetrator that can be armed with conventional or nuclear weapons.”[85]

Although strategic nuclear bombardment remained a distinct airpower mission, the Air Force's “indivisible airpower” concept and declining budgets became the rationale for the merger of Strategic and Tactical Air Commands into a single Air Combat Command, under General Michael Loh, former Commander-in-Chief of Tactical Air Command, in June 1992. General Loh reflected in a 1991 interview, “Quite frankly, we're after modernization and budgets, so we're trying to showcase airpower in its best light...And to the extent that using terms such as `tactical' and `strategic' to define aircraft and missions was getting in the way of that effort to foster airpower, then we needed to do it [reorganize the Air Force] sooner rather than later.”[86] Within this reorganization, two “composite wings” containing a mix of bombers, tankers, fighters and surveillance aircraft were formed and, as of this writing, are training for world-wide employment as integral units.[87]

The concept of “indivisible airpower” became official Air Force doctrine with the publication of the 1992 AFM 1-1 “Basic Aerospace Doctrine of the United States Air Force” which states, “Strategic attacks are defined by the objective -- not by the weapon system employed, munition used, or target location.”[88] Care is taken throughout this manual to classify effects, not weapon systems, as strategic, operational and/or tactical.[89]

Thus, by 1990, the reemergence of "indivisible airpower" concepts provided the genesis for a doctrine well suited to a world environment where the United States may have to flexibility employ airpower assets globally from its own shores.

Rebirth of Strategic Conventional Bombardment

The lessening of Cold War tensions and the eventual dissolution of the Soviet empire generated renewed interest in traditional strategic conventional bombardment concepts. As superpower tensions eased, concerns arose that friendly nations, no longer faced with an overtly hostile Soviet Union, may close or restrict U.S. access to overseas bases for nationalistic reasons, or to avoid involvement in Third World crises that didn't directly threaten their national interests.[90] The 1988 White House Commission on Integrated Long-Term Strategy noted, "The United States must develop alternatives to overseas bases...in defending our interests in the Third World. We have found it increasingly difficult and costly to maintain bases there."[91]

Simultaneously, the decline of Soviet influence and consequent rise of ancient enmities and ambitions among former client states made the future appear less stable. The proliferation of powerful, high tech weaponry to developing regions of the world afforded potential aggressors the capability to quickly seize an objective then consolidate gains. A rapid response capability became increasingly critical if the United States wished to avoid a *fait accompli*. Thus, the elimination of Cold War tensions and eventual dissolution of the Soviet empire made maintaining a large U.S. military presence overseas politically untenable while simultaneously increasing the probability U.S. forces would be needed on short notice to protect national interests.

The retreat of the Soviet Union from international affairs also promised to make a strategic air campaign more effective. Without the threat of Soviet escalation on behalf of their client states, it appeared likely that political leadership would allow airmen to

strike directly at an enemy's strategic "centers of gravity." Target sets with the potential to paralyze an enemy's leadership, economy or military might now be struck. To airmen, the fusion of mature stealth and precision guided munitions technology with modern long range aircraft imbued strategic, conventional bombardment with the precision, lethality and reliability necessary to directly pursue national policy objectives in a world where near instanteous, world-wide dissemination of information made the highly selective application of force a political imperitive.

The above factors gave the rapid, global, power projection capabilities of strategic conventional bombardment new importance to military leaders. Senior Air Force commanders were quick to promulgate airpower's ability to project power world-wide as "a key that opens and closes the doors of many strategy and policy options."[92] And, in a world full of unknowns, strategic airpower's response time was seen by some airmen as potentially "the most important factor in deterring a threat or attempting to contain a crisis."[93]

Part IV

Airpower Thinking 1990 - Present

In June 1990, Air Force Secretary Donald B. Rice and Chief of Staff Merrill A. McPeak issued a "white paper" entitled "The Air Force and U.S. National Security: Global Reach - Global Power" which delt with the Air Force's evolving role in the post-Cold War era. "Its central theme was that world-wide political instability in combination with a diminishing Soviet threat and the declining presence of U. S. forces overseas, plays to Air Force strengths in rapid and lethal power projection."[94] The white paper concluded, "While complementary forces of all services will be essential - the Air Force offers, in most cases, the quickest, longest range, leading edge force available..."[95]

The Global Reach - Global Power concept represented a shift from an operational level employment perspective for airpower to a global/strategic focus containing operational *and* strategic air campaign elements. The underlying belief behind the Global Reach - Global Power concept was that advances in technology had eliminated airpower's traditional limitations allowing it to catch up to the promises of the airpower pioneers. Most significant, was the Air Force's technological ability to reach any target on earth, locate it accurately, defeat enemy air defenses guarding it, and precisely destroy that target. Obviously, the concept relied heavily on the extended range and payload of modern long-range strike aircraft bolstered by a robust aerial refueling and airlift capability. It also assumed forward bases would be made available. "As forward forces decline but global interests remains, airlift will be even more in demand...It provides vital speed and flexibility."[96] "Faced with the potential of reduced overseas bases for U. S. forces, the concept of global reach highlights aerial tankers as a critical asset..."[97] "When the interests of allies are threatened, basing will normally be made available - and our fighter forces can deploy within hours...With an emphasis on lean and deployable forces, [they] can move forward with very little baggage compared to the massive firepower they deliver. An F-15E squadron can deliver over 400,000 lbs of ordinance per day..."[98]

The ability to locate precisely intended targets through advanced surveillance and targeting systems such as AWACS and Joint STARS was assumed, as were the ability of stealth aircraft and advanced SEAD weapons to defeat modern air defense systems. Faith was also placed in the growing night/all weather strike capability promised by LANTIRN and advanced radar targeting systems.

Precision strike capability was a fundamental pillar of global reach. A small, lean force was necessary to ensure a rapid reaction capability. This mandated employment of long-range precision guided munitions to achieve high target kill probabilities with a small number of aircraft, while minimizing risk to American airmen or non-combatants. "Investment in these advanced technologies will provide us with decisive capabilities

against potentially well-equipped foes at minimum cost in casualties - increasingly important in an era in which the American people will have low tolerance for...mounting casualties."[99]

Global Reach's incorporation of strategic and operational airpower employment concepts into a global framework was an attempt to utilize airpower's greatly expanded capabilities to reconcile American isolationist tendancies and declining U.S. military presence overseas, with increasingly unpredictable and dangerous threats to U.S. national interests. The fundamental tenets underpinning global reach were the increasing value of time and the fact that conventional airpower could now live up to the claims of its prophets at the operational and strategic levels of warfare. Desert Shield and Desert Storm would test these claims.

Desert Shield

Desert Shield began two days after the Iraqi pre-dawn invasion of Kuwait on 2 August, 1990, when President Bush signed the execution order for CENTCOM Operations Plan 1002-90, *Defense of the Arabian Peninsula*.[100] OP 1002-90 was a defensive regional contingency plan that consisted of three phases. Phase I aimed at deterring further aggression through rapid build-up of airpower and light Army forces in theater. Phase II added sufficient ground and air forces in theater to defend, delay and attrit an attacking force until the build-up of military forces allowed the execution of Phase III, a classic counteroffensive. Phases I and II became Desert Shield.[101]

The Desert Shield airlift effort was the most massive in history and validated the global response aspects of Global Reach. General Merrill A. McPeak, Air Force Chief of Staff, stated, "The USAF's Military Airlift Command (MAC) [flew] a daily average of about 2,450 passengers and 2,500 tons of cargo into the theater. The Berlin Airlift - lasted 65 weeks. In less than 6 weeks of Desert Shield, we exceeded the total ton miles flown into Berlin."[102] In total, over 482,000 passengers and 513,000 tons of cargo were

airlifted over 8,000 miles into Saudi Arabia in the six month period from the initial deployments to the cease fire.[103]

Desert Storm

The air war against Iraq was in fact two separate air campaigns. The first was a strategic air campaign conceived by Colonel John A. Warden III, and members of the "Checkmate" strategy division at the Pentagon. Code named "Instant Thunder," the strategic air campaign's objectives, as briefed to General Swartzkopf on 10 August 1990, were to: Isolate Saddam Hussein, incapacitate national leadership, destroy Iraq's strategic offensive and air defense capabilities; and minimize damage to the Iraqi economy to enhance rebuilding after the war.[104] The six day campaign was organized around five major target sets; leadership, key production, infrastructure, population and fielded forces. This was in-line with Colonel Warden's "5 Ring Theory" which envisions a a nation-state as a set of five concentric rings with leadership comprising the most important inner ring. "Strategic paralysis" is accomplished by attacking an enemy system from the inside ring out. Instant Thunder placed heavy emphasis on direct attack of civilian and military command, control and communications centers and prioritized targets in the other four rings, or target sets, by their potential to induce strategic paralysis within Iraq.[105] Until sufficient forces could arrive in theater, "Instant Thunder offered American high command the only offensive option they would have for months."[106]

General Charles A. Horner, CENTAF commander, took a more operationally oriented view and disapproved of Instant Thunder's neglect of fielded Iraqi forces occupying Kuwait. He directed Brigadier General Buster C. Glosson to meld Colonel Warden's plan into a joint force operation that also addressed targets in Kuwait. On 25 August, General Swartzkopf briefed Joint Chiefs of Staff Chairman General Collin

Powell on a four-phased plan, code named Desert Storm. The first phase was a strategic air campaign which deviated little from Instant Thunder. The second phase concentrated on establishing air superiority over Kuwait. The third phase targeted Iraqi ground forces in Kuwait to prepare the battlefield for the fourth phase's ground offensive. Phases II, III, and IV represented an operational air campaign focused on the Kuwaiti Theater of Operations. Although now part of a larger plan, the strategic air campaign was developed and employed separately through a Special Planning Group, nicknamed "The Black Hole", comprised of several of Colonel Warden's planners plus one representative from each sister service and headed by Brigadier General Glosson.[107]

By January 1991, coalition forces comprised nearly 1800 combat aircraft from 12 countries, two large naval task forces, and over 660,000 personnel from 31 countries.[108] Based on Defense Intelligence Agency reports, CENTCOM planners estimated coalition forces faced 42-43 Iraqi divisions occupying Kuwait . This force was believed to possess 540,000 troops, 4,200 tanks and approximately 3,100 artillery pieces.[109] The Iraqi Air Force possessed over 700 combat aircraft including modern MiG 29, and French F-1 fighters.

The strategic air campaign commenced on January 17, 1991 with extensive air strikes against the aforementioned strategic target sets. "After less than 48 hours of bombing, Baghdad was still largely intact-but Saddam Hussein could no longer broadcast on television or nationwide AM radio, all major military headquarters were wrecked, military telecommunications no longer worked, Iraqi air defenses were largely incapacitated, and in Baghdad the population at large was deprived of electricity, telephone service, and piped water."[110] The desired levels of strategic paralysis were achieved in ten days.[111] Owing to an overwhelming preponderance of air assets, Phase II began nearly simultaneously with Phase I. The near total air supremacy achieved over Iraq and Kuwait is best illustrated by the fact that the USAF lost only 11 aircraft in combat during 50,000 sorties flown in the first 30 days of the air campaign.[112] Total

coalition losses (all types) amounted to 39 aircraft for over 118,661 sorties flown.[113] By day 10, Phase III began with intensive attacks on Iraqi fielded forces in Kuwait. By the beginning of the ground campaign on 24 February 1991, overall Iraqi military capability in Kuwait had been reduced by 75%.[114] Perhaps the most telling effects of Phase III operations were the sporadic resistance encountered by coalition land forces and the ready surrender of over 86,000 Iraqi soldiers.[115] General Collin Powell admitted candidly in congressional testimony three day before the ground offensive was scheduled to begin, that airpower would likely "be the decisive arm into the end of the campaign, even if ground forces and amphibious forces are added to the equation."[116]

Senior Air Force leadership shared General Horner's assessment of the lessons of the Gulf War that: The United States' rapid response capability was crucial to stabilizing the crisis; technology was worth every penny, stealth and precision guided munitions magnified combat capability and greatly reduced collateral damage and loss of life; the Joint Forces Air Component Commander (JFACC) concept worked, the compressed, highly coordinated air war could not have been orchestrated without centralized control; and early air supremacy and the "dynamic initial air phases set the stage for the successful ground operations with minimum friendly loss of life."[117]

Desert Shield and Desert Storm seemed to confirm the USAF's assertion that it could project power globally and that airpower employed at the operational level was decisive. The speed and magnitude with which the strategic air campaign disrupted Iraqi communications, electrical power and transportation infrastructures surprised many observers, however, as of this writing, evidence seems to suggest that strategic paralysis was not completely achieved and considerable debate exists as to the influence it had on Saddam Hussein's decision to withdraw from Kuwait.[118] Regardless, the apparent stunning success of airpower in Desert Storm turned the major tenets of Global Reach - Global power into doctrine. In December 1991, General Loh stated, "We're now using its [the Global Reach - Global Power White Paper] objectives to build our budget, to look at

our resource allocation and to restructure our commands...`Global Reach' was a receipe for air power. It has become our strategy, our framework and our culture. In fact, rather than pointing to some manual, I call this our doctrine now."[119] The 1992 version of AFM 1-1 made it official.

Notes

1. *The Air Campaign* (New York, N.Y.: Pergamon-Brassey's Int'l Defense Publishers, 1989) by Lt. Col John A. Warden III, USAF, was one of the first serious Post-Vietnam works on non-nuclear, strategic airpower. The concepts Col Warden developed had a significant influence on the strategic air campaign against Iraq in 1991.
2. Col Dennis M. Drew, USAF, "Two Decades in the Air Power Wilderness: Do We Know Where We Are?" *Air University Review*, September-October 1986, 3.
3. See for example, Maj Mark Clodfelter, *The Limits of Airpower* (New York, N.Y.: The Free Press, 1989); Earl H. Tilford, Jr., *Setup: What the Air Force Did in Vietnam and Why* (Maxwell AFB, Ala.: Air University Press, June 1991), Chapter 6; Col Dennis M. Drew, USAF, *Rolling Thunder 1965: Anatomy of a Failure* (Maxwell AFB, Ala: Center for Aerospace Doctrine, Research and Education, Air University, 1986), 47-51.
4. Drew, "Two Decades in the Air Power Wilderness," 11.
5. By "conventional" weaponry the author means weapons that employ kinetic energy or high explosives to destroy targets. Weapons employing chemical, biological, or nuclear warheads are excluded from this catagory.
6. Gen. Bennie L. Davis, USAF, "Indivisible Airpower," *Air Force Magazine*, March 1984, 47-48.
7. From Maj. Grover E. Myers' work *Aerospace Power: The Case for Indivisible Application,* (Air University Press, 1986) In this monograph he states that General Vandenberg and other Air Force leaders of the post-World War II era "supported an end to the parochial strategic/tactical division of labor," but had to give way to "the requirements of nuclear deterrence and the realities of budget allocations."
8. Col Thomas A. Fabyanic, USAF, Retired, "War, Doctrine, and the Air War College," *Air University Review*, January-February 1986, 17.
9. Drew, "Two Decades in the Air Power Wilderness," p 11.
10. Fabyanic, p 16.
11. "Facets of Aerospace Power," *Air Force Times*, 10 December 1979, 22.
12. Lt. Gen Charles G. Boyd and Lt. Col Charles M. Westenhoff, "Airpower Thinking: Request Unrestricted Climb," *Airpower Journal,* Fall 1991, 9.
13. Col. Dennis M. Drew, USAF, "The Airpower Imperative; Hard Truths for an Uncertain World," *Strategic Review*, Spring 1991, 28.
14. Gen. John D. Ryan, "United States Strategic and Tactical Air Forces: Today and Tommorow," *NATO's Fifteen Nations*, August - September 1972, 17.
15. *TIG Brief*, 14 March 1975, 17.
16. i*bid.*
17. Capt. Stephen O. Manning III, USAF, "Its Power and its Punch," *Airman*, October 1975, 39.
18. "Facets of Aerospace Power," *AF Times*, 10 December 1979, 22.
19. Editorial, "Unfinished Business," *Air University Review*, September - October 1984, 2.
20. According to the *Air University Index to Military Periodicals,* articles written by Air Force officers on close air support out numbered articles on aerial interdiction 4:1 from 1972-1979, with the widest difference of 10:1 occuring in 1974.
21. Ryan, 24. Note that in his remarks CAS is placed before interdiction.
22. *ibid,* 25.
23. Statement by Gen Larry D. Welch, Air Force Chief of Staff, during an address to the Air Force Association Symposium in Los Angles, Calif., 1989. Quoted in James W. Canan, "The Watchword is Flexibility," *Air Force Magazine*, February 1990, 58.
24. Although the Fairchild A-10 was designed during the height of the Vietnam war (1967) it was intended from the begining as an anti-armor platform. As such it was literally constructed around a 30mm, 7

barreled anti-tank gun with exceptional firepower. The first A-10 flew on 21 Oct 1975 and the first squadron became operational in Mar 1977. *Rand-McNally Encyclopedia of Military Aircraft*, p 462.
[25]. Gen W. L. Creech, Commander, Tactical Air Command, "Commitment to Excellence"address to the Aviation Hall of Fame Induction Dinner, Cleveland, Ohio, 4 September 1981. Text in *Air Force Policy Letter for Commanders*, *Sup 2*, 1981, 12-15.
[26]. Gen David C. Jones, Air Force Chief of Staff, quoted in "The Quiet Revolution in USAF's Capabilities," Edgar Ulsamer, ed., *Air Force Magazine*, September 1975, 39.
[27]. Maj Dennis W. Stiles, USAF, "Air Power: A New Look From and Old Rooftop," *Air University Review*, November - December 1975, 57.
[28]. *ibid.*
[29]. Robert A. Gessert, "The Airland Battle and NATO's New Doctrinal Debate," *RUSI J for Def Studies* 129*,* June 1984, 54.
[30]. Stiles, 50.
[31]. *ibid*, p 52.
[32]. Drew, "Two Decades in the Air Power Wilderness," 11.
[33]. *ibid.*
[34]. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1961-1984* (Maxwell AFB*,* Ala.: Air University Press, 1989), 728.
[35]. Drew, "Two Decades in the Air Power Wilderness," 12.
[36]. *ibid.*
[37]. Lt Andrew D. Dembosky, "Meeting the Challenge: United States Air Force Basic Doctrine Through 1992" (Master's thesis, North Carolina State University, 1993).
[38]. Editorial, "Unfinished Business," 2.
[39]. General Donn A. Starry, "Extending the Battlefield", *Military Review*, 8 March 1981, 70.
[40]. John L. Romjue, "The Evolution of the AirLand Battle Concept," *Air University Review*, May-June 1984, 8-9. In a carefully orchestrated campaign TRADOC presented briefings on the AirLand Battle concept and AirLand Battle 2000 studies to Pentagon action officers from both services, DOD civilian personnel including the Under Secretaries of Defense, service chiefs and their deputies, members of Congress and finally to Vice President George Bush.
[41]. Stiles, 57; Maj Donald J. Alberts, "A Call From the Wilderness," *Air University Review* November - December 1976): 35; Col Robert D. Rasmussen, "The Central Europe Battlefield: Doctrinal Inplications for Counterair -Interdiction," *Air University Review,* July - August 1978, 11; Steven L. Canby, "Tactical Air Power in Armored Warfare -- The Divergence Within Nato," *Air University Review,* May - June 1979, 2-20; Charles Gilson, "Can the A-10 Thunderbolt II Survive in Europe?" *International Defense Review*, No. 2, 1979): 184-189.
[42]. Stiles, 59.
[43]. John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982,* TRADOC Historical Monograph Series (Fort Monroe, Virginia: Historical Office, United States Army Training and Doctrine Command, June 1984), 61.
[44]. TAC-TRADOC ALFA Air Land Bulletin, 19 July 1979, 18.
[45]. *ibid,* 7.
[46]. TAC-TRADOC ALFA Air Land Bulletin, 20 April 1981, 5.
[47]. Romjue, *From Active Defense to AirLand Battle,* 64; TAC-TRADOC ALFA Air Land Bulletin, 25 Sep 81, p 5.
[48]. *ibid.*
[49]. F. Clifton Berry Jr., ed., "USAF Doctrine Comes Alive," *Air Force Magazine*, July 1983, 35.
[50]. Richard G. Davis, *The 31 Initiatives,* Air Staff Historical Study (Washington, D.C.: Office of Air Force History, 1987), appendix 1, 91-92.
[51]. TAC-TRADOC ALFA Air Land Bulletin, 28 May 84, p 11. See also Davis, 47.
[52]. Col Thomas A. Cardwell, "One Step Beyond -- AirLand Battle, Doctrine not Dogma," *Military Review*, April 1984, 45-53; Col Thomas A. Cardwell, "Extending the Battlefield: An Airman's Point of View," *Air University Review*, March - April, 1983, 86-93; Maj James A. Machos, "TACAIR Support For AirLand Battle," *Air University Review*, May-June 1984, 18; Maj James A. Machos, "Air-Land Battles or AirLand Battle?" *Military Review*, July 1983, 38-39; Gen Merrill A. McPeak, "TACAIR Missions and the Fire

Support Coordination Line," *Air University Review*, September - October 1985, 65-72; Tidal W. McCoy, "`Full Strike' -- The Myths and Realities of AirLand Battle," *Armed Forces Journal, International*, June 1984, 78+.

[53]. Romjue, *From Active Defense to AirLand Battle,* 65.

[54]. Maj James A. Machos, USAF, "TACAIR Support For AirLand Battle," *Air University Review*, May-June 1984, 19.

[55]. Army corps commanders in Europe first identified the necessity to strike Soviet and Warsaw Pact second echelon forces in 1977. By 1979, the concept of BAI was created and the procedures for direction and control of BAI assets were developed jointly by NATO's Central Army Group and 4th Allied Tactical Air Force. In 1979 Allied Air Forces Central Europe put the new term and principles into its 80-2 manual, *Offensive Air Support.* Later TAC-TRADOC agreements deviated little from the guidance contained in this manual. John L. Romjue, *From Active Defense to AirLand Battle,* 62.

[56]. Maj James A. Machos, USAF, "Air-Land Battles or AirLand Battle?", *Military Review*, July 1983, 38.

[57]. Romjue, *From Active Defense to AirLand Battle*, 63.

[58]. *ibid*, 65.

[59]. Jones, 44.

[60]. Maj Dennis W. Stiles, USAF, "Air Power: Medium or Message?", *Parameters*, July 1977, 28; Maj Grover E. Myers, *Aerospace Power: The Case for Indivisible Application* (Maxwell AFB, Ala.: Air University Press, 1986).

[61]. General Lew Allen Jr., Air Force Chief of Staff, "The Chief's Views on Key Issues," address to 1981 Air Force Association National Convention, Washington, D.C., 15 September 1981. Text in *Air Force Policy Letter for Commanders*, *Sup 2*, 1981.

[62]. Gen Bennie L. Davis, "Indivisible Airpower," 46-48.

[63]. Fabyanic, 20.

[64]. Bernard Brodie, *War and Politics,* New York: Macmillan Publishing Co, 1973. Note: In this case Bernard Brodie used the term "soldier" generically to represent all military personnel.

[65]. Col John F. Shiner, USAF, "Reflections on Douhet," *Air University Review*, January-February 1985, 93.

[66]. General Larry D. Welch, "Airpower Journal: A Message from the Chief of Staff," *Air Power Journal*, summer 1987, 2.

[67]. Fabyanic, 15, 19.

[68]. Editorial, "Unfinished Business," 3.

[69]. The operational level of war is warfare viewed from a theater-wide perspective. It is that level of warfare where the theater commander turns strategic objectives established by national command authority into an overarching military strategy that guides component commanders' planning and employment of available military assets. This "overarching military strategy" is often referred to as "commander's intent." The theater component commanders serve at the lowest level of authority that permits them to act as operational commanders. For the air component commander, the planning and employment of airpower to maximize its contribution to the theater commander's intent is the essence of the "operational art." AFM 1-1, March 1992, 10.

[70]. General William R. Richardson, "FM 100-5: The Airland Battle in 1986", *Military Review*, 5.

[71]. ibid, 7.

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[80]. Gen Robert D. Russ, Commander, Tactical Air Command, remarks to Air Force Association National Symposium, 24 - 25 October, 1985, quoted in Edgar Ulsamer, ed., "Progress, Priorites, and Fantasies," *Air Force Magazine*, January 1986, 89.
[81]. *ibid*, 87. Quote from AF Chief of Staff Gen Charles Gabriel's address to AFA National Symposium October 24 - 25, 1985.
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[109]. GWAPS, p 8 notes that these estimates were found to be overstated after the war. Actual troop strength was closer to 390,000.
[110]. Edward N. Luttwak, "Victory Through Air Power," *Commentary*, Aug 1991, 28.
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[115]. *ibid*, 240.
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Chapter 4

Summary, Conclusions and Implications

The foregoing review of Army and Air Force doctrine and of the periodical literature on airpower since Vietnam suggests that the evolution of Army and Air Force airpower thinking from 1972 to the present has been highly interrelated.

For the Air Force, airpower thinking and doctrine splintered into "strategic" and "tactical" camps following the Vietnam War. (See Fig 1.) The perceived ineffectiveness of bombing attacks in the North and the obvious tactical effectiveness of airpower in South Vietnam, seemed to discredit traditional strategic airpower theory. However, strategic airpower with it's range and nuclear capability remained the centerpiece of strategic nuclear warfare. Conversely, it appears likely that the appointment of officers with tactical airpower backgrounds to key leadership positions within the Air Force abetted a tendency, born of the Vietnam conflict, to view warfare below the nuclear threshold from a tactical/battlefield perspective. "Tactical" airpower thus became synonymous with fighter aircraft employing "conventional" weaponry in direct support of surface operations.

Within the Army, airpower thinking and doctrine remained closely tied to land warfare doctrine. The Vietnam conflict illustrated the value of airpower in close air support and airmobility roles. Further, concern over the rapidly growing Soviet threat to Central Europe and the political requirement to maintain a "forward defense," resulted by 1976 in a doctrine of "active defense" that relied heavily on concentrated firepower and close air support to attrit Soviet and Warsaw Pact forces as they attempted to penetrate front lines. This doctrinal emphasis induced Army airpower thinkers to de-emphasize airmobile operations in favor of anti-armor, close air support roles for both Army attack aviation and Air Force tactical airpower.

Although the Air Force began to recognize that increasingly lethal air defense weapons might make close air support costly, the service fell in line with Army doctrine because close air support was a role a large number of Air Force officers and senior leaders understood and with which they were comfortable. In essence, from 1972 - 1979, the Army and Air Force both reached the same battlefield focused, attrition and firepower oriented strategy to cope with the growing Soviet threat, forward defense and the new lethality of the modern battlefield.

By 1979, Army concerns with Active Defense coincided with the growing dissatisfaction of many airmen with the muddled, bureaucratic focus of Air Force doctrine. When the 1979 edition of AFM 1-1 regenerated debate over the proper employment of airpower, the Army's evolving AirLand Battle doctrine provided a framework for that debate. AirLand Battle's central tenets of deep attack, second echelon interdiction and joint air-land operations were readily accepted by airpower thinkers hungry for an expanded role for conventional airpower and a common conceptual framework to analyze airpower doctrine. This was no accident. Since June 1975, Tactical Air Command and TRADOC had worked jointly through ALFA to develop second echelon interdiction concepts and resolve procedural differences.

However, because the Army's doctrinal decision to extend the battlefield in space and time made interdiction, especially battlefield air interdiction (BAI), the key instrument of deep attack, corps commanders now had an operational requirement to control target selection and allocation of Air Force deep strike and tactical reconnaissance assets. This violated strongly held Air Force beliefs that only centralized control allowed the effective employment of limited air assets. The ensuing debate in the literature indicated that airmen in both services were reexamining the nature of airpower, its inherent characteristics and the possible impact of rapidly advancing computer processing, sensor and target acquisition technology on future airpower employment.

Although Army Aviation's mission remained focused on enhancing ground force combat effectiveness, Army commanders now saw airpower playing a major role in seizing the initiative. Air assets could guard the flanks of armored/mechanized forces, assist in creating deeper penetrations, interdict enemy reserves, and provide force protection and aerial fire support in the event of enemy counterattack. For the Air Force, AirLand Battle also represented a welcome shift to a more flexible method of airpower employment *if* it could retain centralized control. Thus, the near-term, underlying effect of AirLand Battle doctrine was to shift airpower thinking from front-line CAS toward a more flexible, and for the Air Force, traditional emphasis on interdiction. In effect, the Army doctrinally raised its sights and recognized that what happened in enemy rear areas was important to success on the front lines.

The AirLand Battle debate also appeared to have a long-term influence on airpower thinking and doctrine within both services. First, the AirLand Battle debate developed among Army airpower advocates a growing awareness that the speed, range, firepower and flexibility of airpower made the Air Force's concept of centralized control desirable. This is evidenced by an ensuing trend to centralize control of Army air assets, first at the division, then the corps level. Simultaneously, the Army recognized that a theater-wide, centralized and highly coordinated air-land effort was essential to cope with the increasing tempo, mobility and lethality of the modern battlefield. The 1986 revision of FM 100-5 represented a significant in Army thinking from tactical levels to the operational level of war.

For the Air Force, AirLand Battle debate coincided with a movement in the early 1980's to take a critical look at the application of airpower in World War II, Korea, and especially Vietnam. These studies evoked a growing awareness that “strategic” and “tactical” divisions of airpower were artificial and limiting. As a result, by 1985, the Air Force was actively involved in training programs designed to expand the utility of traditionally “strategic” aircraft, such as the B-52, in conventional conflicts. Senior Air

Force leadership also decided in the early 1980s that a "warfighting" approach to airpower thinking and employment was needed rather than the bureaucratic approach reflected in the 1979 "comic book" version of Air Force doctrine, and instituted the Project Warrior program to encourage this perspective among Air Force officers and enlisted personnel. The 1984 edition of AFM 1-1 codified this significant shift toward a warfighting philosophy.

The spark that brought evolving Air Force warfighting doctrine, conventional strategic bombardment; and long-range tactical interdiction concepts together appears to have been generated in part by the flood of articles on the operational level of warfare that appeared in Army literature following the publication of the 1986 version of FM 100-5. Senior Air Force commanders eagerly responded to the Army's new focus on operational-level warfare pointing out that, if employed from a theater-wide perspective, airpower provides the theater and air component commanders with an immediate and highly versatile operational-level capability.

The emphasis placed by senior Air Force leaders on warfighting and the AirLand Battle debate over centralized control of airpower thus led to a shift in both the Army and Air Force airpower thinking from tactical-level CAS and interdiction to a joint, theater-wide, operational campaign perspective, which in turn, provided a framework for the Air Force's "indivisible airpower" concept.

From 1986 until the end of the decade, developments such as long-range strike aircraft, AWACS and Joint STARS, stealth technology and the maturation of precision guided munitions, made the distinction between "tactical" and "strategic" aircraft as meaningless in application as it was limiting in concept.

The lessening of Cold War tensions and the eventual dissolution of the Soviet empire also had a marked effect on airpower thinking. The decline of Soviet influence and consequent rise in ancient enmities and ambitions combined with the proliferation of high tech weaponry to developing regions of the world to make the future appear less

stable and more dangerous. Worse, U.S. withdrawal from many overseas locations made a rapid reaction time to aggression crucial if the United States wished to avoid a *fait accompli*.

Without the threat of Soviet escalation on behalf of their client states, it appeared more likely that U. S. political leadership would allow airmen to strike directly at an enemy's "center of gravity" in future conflicts. Airmen realized the extended unrefueled range, flexibility and surgical strike capability embodied in modern fighter aircraft gave airpower the capability to apply precise, yet overwhelming, firepower world-wide within hours. Many authors suggested that technology had finally caught up with the predictions of early airpower prophets, and seized on airpower's unique ability to rapidly project military power world-wide as potentially the most decisive factor in deterring a threat or containing a crisis. Thus, conventional strategic bombardment theory was reborn and dedicated to achieving "strategic paralysis" through surgical destruction of critical nodes within an enemy's infrastructure. The reemergence of conventional strategic bombardment theory meant that, by 1990, the "indivisible airpower" concept contained within it strategic, conventional bombardment and operational/theater warfare elements.

Desert Storm saw the employment of both these elements in separate but nearly simultaneously executed operational and strategic air campaigns. The unparalleled success of these dual operations vindicated, in the eyes of many, the concepts of indivisible air power, strategic conventional bombardment and "Global Reach - Global Power." Following Desert Storm, Global Reach - Global Power concepts quickly became widely accepted and the subsequent publication of the March 1992 edition of AFM 1-1 reflected its indivisible airpower, global force projection tenets.

Conclusions

Since the end of the Vietnam War, U.S. Air Force and Army airpower thinking have converged at the operational level of warfare. The increasing non-linearity of the modern battlefield and this convergence have provided areas of agreement which could form the conceptual basis for a conventional, land based airpower theory. When the Army doctrinally extended its battlefield in space and time TRADOC analysts, with TAC assistance, quickly recognized that airpower was the only force capable of prosecuting the deep battle. What airpower could accomplish well beyond the front lines became accepted by the Army as important and possibly decisive to the outcome of the close-in battle.

As the increasingly nonlinear nature of modern warfare forced ground commanders to raise their sights from the front lines and orchestrate combat action across the entire theater of operations, AirLand Battle doctrine evolved from a tactical/close-in battle perspective to an operational level view of warfare. On a nonlinear battlefield, the time required to execute cautious, step-by-step, prescriptive tactics no longer existed. Instead, the ability to recognize and rapidly seize opportunity, or regain balance, - flexibility - became the key to victory or defeat. This fluid, unpredictable battlefield and ensuing operational level focus led to conceptual agreement that centralized control of airpower is desirable.

Within the Air Force, the reduction or outright elimination by technology of traditional limitations on airpower and an inherently operational level perspective of warfare led to the recognition that airpower is indivisible. Effects, not the aircraft that induced them, mattered. This carried the implicit acknowledgment that there is no universally effective mission for airpower. All missions are important and their relative effectiveness is situationally dependent. Gone are the days when “strategic” or “tactical” airpower dominates Air Force thinking.

The kernel of a future airpower theory may be found in two propositions. The first is the general agreement between the Army and the Air Force that airpower can

provide important, potentially decisive capabilities throughout a theater of operations when centrally controlled. Although there appears to be general agreement that the level of control for Air Force and some Army assets should remain at the operational/theater level, the degree of control lower echelons should exercise over helicopter, long range surface to surface munitions and fixed wing assets, and the precise mechanisms for control remain unresolved issues. The second proposition is found in the realization by the Air Force that distinctions between "strategic" and "tactical" airpower are artificial and limiting. Air strikes may have strategic or tactical effects, but technology has rendered the employment flexibility of fighter or bomber aircraft nearly indistinguishable. The corollary to the second proposition is that the relative effectiveness of a particular airpower role or mission is situationally dependent.

Implications Beyond the Scope of This Study

A significant implication of the foregoing discussion is that modern conventional warfare must be viewed in great depth. AirLand Battle doctrine, and the subsequent focus by each service on the operational level of warfare, created consensus that airpower should be employed across the entire theater of operations. In the process, the Army discovered that airpower's characteristics of speed, range, flexibility and lethality are well suited to the nonlinear battlefield. In fact, employing airpower in great depth creates non-linearity. Airpower used in depth means the front line is everywhere because everywhere is where airborne firepower can be brought to bear. This is a natural extension of the evolving Army view of nonlinear warfare.

One of the major outstanding issues remains the role of conventional strategic bombing. There is considerable debate between and within the Army and Air Force over the decisiveness of direct attack on an enemy nation's leadership, economic or military support infrastructures. Examination of strategic bombing campaigns from World War II

through Desert Storm offers little definitive proof that strategic conventional bombardment is independently decisive.

This debate may in fact be a conflict between different center of gravity concepts. Airmen traditionally seek to destroy an enemy nation-state's capability (and hopefully will) to continue a conflict by attacking critical nodes within it's national infrastructure. The Army takes an entirely different view, seeking centers of gravity that reduce or eliminate the combat effectiveness of enemy fielded forces. For the Army, strategic bombardment is an effective role for airpower *if* these strikes support the corps commander's scheme of maneuver and/or the theater commander's intent. In truth, the value of an airman's strategic center of gravity may be highly situational. The nature of an enemy nation's infrastructures and their vulnerability to aerial attack can vary widely from nation to nation, and vary significantly within a single nation over time, depending on that nation's culture and ability to work around shortages caused by strategic bombardment.

Finally, finding the appropriate level of abstraction is vitally important to the development of a comprehensive airpower theory and doctrine. If a theory is too abstract, it ceases to function as an effective guide for airpower employment. If it is too concrete, a theory becomes prescriptive - valuable only within a narrow set of circumstances. An environmentally focused framework, one that first analyzes the basic nature of an employment environment such as the atmosphere, and discerns the capabilities and limitations imbued by technology on military forces that operate exclusively within it, provides an appropriate level of abstraction for a comprehensive airpower theory. Airpower draws its unique strengths and limitations from its environment. The relationships between airpower and surface forces are determined by the boundaries that technology and the characteristics of each environment impose on forces.

Environmentally based airpower theory and doctrine, like the operational level of warfare, focuses on the effects of aerial operations, not the weapon system employed or the service that owns it. This allows room for innovative approaches to airpower employment without sacrificing combat effectiveness. As the flexibility, range and capability of Army and Air Force air assets continues to grow, the blurring of traditional "roles and missions", and service oriented control boundaries will continue. An environmentally motivated focus on the effects of aerial operations may free the services from restrictive "roles" and "missions." For example, a more comprehensive, and less divisive definition for the Air Force's roles of CAS, BAI and interdiction may be "denial operations." Defensive Counter Air (DCA), SEAD and rear area CAS may also fit into this category.

Finally, by raising its sights to the operational level of war, Army leadership laid the seeds for a conceptual framework that will support a more comprehensive theory for land based airpower. Army and Air Force airpower thinkers should now raise their sights once again and ask "how far does non-linearity go?" If future battlefields are characterized by a low density of forces and fast, highly mobile, tactically offensive, combat operations throughout the theater of operations, then it may be wise to consider striking directly at the heart of enemy power. Without well defended, linear front lines, or defense in depth, imaginative combined air-ground operations might be conducted directly against the enemy homeland. Such a "strategic campaign" concept could mesh well with strategic paralysis concepts traditionally sought by conventional "strategic" bombing.

Recommendations For Further Research

Considerable research remains before a comprehensive theory of airpower can be written. The research represented here only scratched the surface of available literature.

Thousands of documents exist at military sponsored libraries, historical research centers and schools on the topic of airpower theory and doctrine. Foreign periodicals contain a wealth of information and incisive thinking on this subject. Naval and Marine airpower theories, concepts and doctrine should be factored into the development of a comprehensive airpower theory. Low-intensity conflict sorely needs detailed study and analysis, as do peacekeeping, air blockade and drug interdiction operations. Above all, airpower thinkers need to raise their sights above service concerns and do some hard thinking on how airpower is best employed to protect this nation's vital interests in a era of austerity. The development of airpower thinking and doctrine since Vietnam illustrates that the Army and the Air Force have a long track record of cooperation, and that areas of conceptual agreement exist from which to build a comprehensive theory of airpower.

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