MILITARY INNOVATION AND THE HELICOPTER:
A COMPARISON OF DEVELOPMENT IN THE UNITED STATES ARMY AND
MARINE CORPS, 1945-1953

A Thesis

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ABSTRACT

After World War II all of the services explored the helicopter's military potential. It was of particular interest to the United States Marine Corps after the atomic tests at Bikini Atoll demonstrated the need for a new means to conduct amphibious assaults. In a period of less than three years the Marine Corps created helicopter units and developed a doctrine for the employment of helicopters in amphibious assaults. Called 'vertical envelopment' the Marines successfully executed large movements of men and supplies during the Korean War under combat conditions. The Army, although the first service to express an interest in the helicopter, was much slower in its exploitation of the helicopter's versatility. For a variety of reasons the Army failed to field helicopter units until near the end of the Korean War, despite the repeated cries from ground commanders in the theater for more helicopters. Using military innovation as the theme, this study explains why the Marine Corps enjoyed a much greater success with the helicopter than did the United States Army.
Dedicated to my wife Kimberly,
without whose patience, understanding, love, and editing skills
this project could never have been possible.
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INTRODUCTION

The development of airmobility doctrine in the United States armed forces is significant for two reasons. First, airmobility is an example of the inter-relationship between technology and doctrinal development in modern warfare. Technology did not serve as the driving factor in tactical and doctrinal innovation. Instead it was the conceptual visions of airmobility that provided the impetus for change and technology provided the means to achieve it. Helicopters and ancillary equipment were designed to meet military requirements and not the other way around. Some historians have asserted that civilian technology forced the Army to change the way it did business. While this may be the case today with microprocessors and Force XXI, this was definitely not the case in the twenty years after World War II.¹

The second comparative theme is the Army’s attempt to reinvent itself in the 1945-1965 period and the Army’s similar efforts today. The airmobility concept was considered revolutionary during its time, much like the current efforts at digitizing the Army to obtain information dominance and the use of precision weapons are considered the key components in the “revolution in military affairs” of today. The insights extracted from the Army’s experiment with airmobility may serve as a guide for the
Army’s current dilemma of meeting the demands of modernization, personnel, and mission within the constraints of limited funding.

The development of airmobility occurred in four phases: the interwar years between World War II and Korea; the Korean War; the Eisenhower Administration’s peacetime years; and the period from the Rogers Board in 1960 to the deployment of the 1st Cavalry Division (Airmobile) to Vietnam in 1965. In each of these phases the rate of development varied based on the current national strategy, the inter-relationship between strategy and doctrine, the rigor of bureaucratic politics, and the rate of technological developments. This thesis explores the first two phases which have been ignored and under appreciated for their significance. Chapters One and Two respectively examine the efforts made by the Marines and the Army towards integrating the helicopter into their force structure and doctrine from 1945 to 1950. Chapter Three conclusively demonstrates the success of the Marines’ innovation during the Korean War. Conversely, Chapter Four chronicles the Army’s failed efforts to develop and employ transport helicopters in Korea, and how this lack of success served as the basis for future Army success.

**Innovation: A Conceptual Framework**

Except for the emphasis on nuclear issues, the period immediately following World War II is often portrayed as an era of intellectual sterility in the United States armed forces. Scarcity of fiscal resources and a lack of political emphasis on defense

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1 Force XXI is the digital age version of today’s Army. The basic intent is to create an Army that is more agile and powerful than any potential adversary. The Army hopes to do this by creating a digital force with the ability to gather information, process the data, and make decisions faster than the enemy.
issues created an environment unfavorable for innovation within conventional forces. An exception to this was the innovation centered around the development and use of the helicopter. In his book *Winning the Next War*, Stephen Peter Rosen described the development of airmobility as the most expeditious case of peacetime innovation that he has studied. Unfortunately, he counts only the eleven years from 1954 to 1965 as required for transforming it from an idea into a functioning combat capability.\(^2\) The period from 1945 to 1954 was deemed insignificant by Rosen due to the lack of progress and interest expressed by the Army. What Rosen and others ignored was the development of airmobility doctrine by the United States Marine Corps (USMC) during this time period. The Marine Corps’ experiments provided a basis for officers in the Army to explore the potential of the helicopter as something other than a logistical tool. The next chapter will integrate these two strands of innovation to give a more complete and balanced picture, but, before going any farther, it is important to define military innovation.

An analysis of military innovation requires a detailed examination of the internal operations of a particular organization. For the purposes of this paper, Rosen’s definition of military innovation is sufficient. He defines a major innovation as “a change in one of the primary combat arms of a service in the way it fights or alternatively, as the creation of a new combat arm.” Further clarification is needed, though, to differentiate between a strategic/operational innovation and a tactical innovation. A strategic/operational innovation changes the way a combat arm uses its forces to win a campaign, whereas a

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\(^2\)Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca: Cornell
tactical innovation affects the application of individual weapons against a target in a battlefield environment. Therefore, a strategic/operational innovation usually achieves a change in the working relationship between combat arms and may result in the discarding of obsolete doctrinal concepts and weapon systems. If a change in the formal doctrine of a military organization does not change the essential workings of that organization, then it is not an innovation, using this definition.³

There are four basic areas that must be examined in order to understand the innovation process as it relates to the development of airmobility. The first requirement is to understand the strategic context under which the services were operating: What was the influence of the services’ perceived external threats and where did they expect to fight? What was the impact of the lessons from the last war? What was the interrelationship of strategic planning and operational doctrine? The second area necessary for understanding is the importance of technology in innovation. Specifically, do technological developments inspire military innovation or do military requirements drive technological improvements? The third requirement is to evaluate the influence and importance of organizational politics. Organizational politics encompasses many components, to include inter-service and intra-service relations, the service culture, force structure, roles and missions, and the responsibilities for research and development. Finally, it is necessary to understand the relationship between civilian bureaucracies and military organizations. In this case, what was the role of government and industry within the airmobility innovation process? Did they accelerate or hinder the innovation?

Historiography

Currently, there is a growing interest in the growth and development of Army aviation within military circles. Despite this, the historiography on the development of airmobility is surprisingly small, considering its long maturation period and eventual impact in Vietnam. While there are currently ten published studies that discuss the various aspects of airmobility's evolution and development from 1945 to 1965, they are incomplete in coverage, research, or perspective. Five of these are official histories, which provide a very good summary of events but do not contain a high degree of analysis or criticism. Richard P. Weinert, *A History of Army Aviation, 1950-1962*, chronicles the role played by the Continental Army Command in the development of organic Army aviation. The most detailed account of the development and importance of aviation logistics is found in Howard K. Butler, *The Restoration of the Army Air Corps, 1947-1953*. Eugene W. Rawlins, *Marines and Helicopters, 1946-1962*, and Gary W. Parker, *A History of Marine Medium Helicopter Squadron 161*, use primary documents to provide a thorough, organizational account of the development of the helicopter in the Marine Corps. General John J. Tolson, *Airmobility, 1961-1971* provides a very good account of the importance of the airmobility concept in the Vietnam

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War, but it lacks perspective and provides only a brief examination of the maturation of airmobility prior to 1965.\footnote{John J. Tolson, \textit{Vietnam Studies: Airmobility, 1961-1971} (Washington, D.C.: Department of the Army, 1972). General Tolson directly participated in the development of airmobility starting in the mid-1950s and wrote this monograph while still on active duty. Although Tolson draws from hundreds of documents and personal correspondence, the lack of documentation only provides the reader a starting point for additional research.}

Of the five civilian publications, three were written prior to 1969 by authors who lacked access to primary sources. The other two accounts, although written later, were not able to utilize all available archival material due to fiscal and temporal restraints. In \textit{The Army Aviation Story}, Richard Tierney and Fred Montgomery use interviews to create the first narrative of the development of army aviation from 1942 to 1962.\footnote{Richard Tierney and Fred Montgomery, \textit{The Army Aviation Story} (Northport, AL: Colonial Press, 1963).} In 1969, General John R. Galvin wrote \textit{Air Assault: The Development of Airmobile Warfare}, a narrative of airborne operations and their impact on the development of airmobile operations. In the 1980 book \textit{The Army Gets an Air Force}, Frederic A. Bergerson analyzes the development of Army Aviation by studying the bureaucratic process. He concluded that the creation and expansion of the post-World War II aviation component was primarily due to the actions of a large number of junior officers.\footnote{Frederic A. Bergerson, \textit{The Army Gets an Air Force: Tactics of Insurgent Bureaucratic Politics} (Baltimore: Johns Hopkins University Press, 1980).} Christopher C.S. Cheng presents an opposing view in his \textit{Airmobility: The Development of a Doctrine}. Cheng recognizes the desire of the lower ranking officers for aviation assets, but he also asserts that the Army's senior leadership supported these developments as well.\footnote{Frederic A. Bergerson, \textit{The Army Gets an Air Force: Tactics of Insurgent Bureaucratic Politics} (Baltimore: Johns Hopkins University Press, 1980).}

The most common approach to examining military innovation is through the use of bureaucratic politics and organizational theory. Political scientists employ this
technique in many important books. Michael Armacost, The Politics of Weapons
Innovation: The Thor-Jupiter Controversy saw the competition for weapon system
development as an example of adversarial process in defense politics. He saw external
and internal political factors as the central explanation in weapons innovation. In 1984
Barry Posen, Sources of Military Doctrine and Jack Snyder, The Ideology of the Offensive
both successfully applied social science theory to analyze the development of military
doctrine. In Innovation and the Arms Race, Matthew Evangelista used organizational
theory to explain the development of the Soviet-American arms race. Principally
examining strategic systems, Evangelista focused his analysis on the willingness of the
military to accept and incorporate new technology. His conclusion was not very novel.
Evangelista concluded that if an armed service believes that the technology is an enabler
for its mission, the process will proceed with little opposition, but if the technology
challenges the mission, opposition quickly builds. A more comprehensive examination
of the conditions under which military organizations are likely to change military
doctrines is found in Kimberly Zisk’s Engaging the Enemy. She argues against the
theory that military institutions are conservative and undertake drastic changes only when
compelled by external factors. Instead, she believes that military organizations “develop

10Christopher C.S. Cheng, Air Mobility: The Development of a Doctrine (Westport, CT: Praeger, 1994).
University Press, 1984); Jack Snyder, The Ideology of the Offensive: Military Decision and the Disasters of 1914 (Ithaca:
13Matthew Evangelista, Innovation and the Arms Race: How the United States and the Soviet Union Develop New Military
innovative doctrines on their own, in the absence of civilian intervention," in response to changes in the national security environment by other nations.\textsuperscript{15} While their theories on organizations are insightful, the weakness of all these works is their attempt to apply a bureaucratic model to explain military innovation. This theoretical model lacks historical research to create a perspective that integrates the relationship between technological development, strategy, and military institutions.

There is very little published material that uses innovation as the framework for evaluating change in the post-WWII American military. Only the previously cited work by Steven Rosen discusses the development of airmobility in terms of an innovation process -- and this is done in a single chapter consisting of only twenty pages. \textit{Military Innovation in the Interwar Period} does not deal with airmobility, but it is the only serious work that examines modern military innovation as a process. A collection of essays written by a prestigious group of historians, the authors do provide a useful model to explore military innovation. Each of the ten essays uses an international comparative approach to describe the development and implementation of innovation in the major powers of World War II. To ensure continuity, all the essays explore the innovation process by examining, at a minimum, three concepts: the strategic framework, organizational politics within institutions, and the services' doctrinal framework.\textsuperscript{16}

The official doctrinal publications are useful tools for tracing the evolution of organizations and tactics within the military. The acceptance of a new concept at the

\textsuperscript{15}Zisk, \textit{Engaging}, 26.
official level is reflected in the field manuals, circulars, and training guidance provided by senior military officials. How quickly a concept is added to official publications, and the depth of thought in the writing, indicate the willingness of the military to adapt. An example of this is the relatively long period of time it took for the Army to produce a field manual (FM) specifically addressing the employment of helicopters; or the inclusion of helicopters into combined arms training and doctrine. The year was 1957 -- more than ten years after the Army had first used helicopters. This long lead time indicates that the Army’s leadership, for many reasons to be explored later, would not commit quickly to the helicopter as a potential tool on the battlefield.

The articles, letters, and discussions in the professional journals of the various services and military organizations also provide insight into the attitudes and characteristics of the organizational culture. These secondary sources reflect an overall attitude concerning Army aviation that cannot be gained from any one account and as such they complement the primary documents.

The professional journals themselves fall into two categories: strategic journals and tactical journals. The strategic journals are publications from the various war colleges and universities.17 Of all the journals, Military Review provides the greatest insight into the development of the Army’s doctrine because the majority of articles were written by officers who were then involved in the development and implementation of

17 Until 1971, the Army’s senior journal was Military Review published by the Command and General Staff School at Fort Leavenworth, Kansas. After 1971, Parameters, the journal of the United States Army War College at Carlisle, Pennsylvania, became the senior Army publication. The Air Force’s senior journal, Air University Review, began in 1947 as the quarterly periodical from the Air University at Maxwell Air Force Base, Alabama. The latest iteration of this venerable journal is Aerospace Power.
doctrine. Unfortunately, these articles tend to be general in nature and rarely advocated or explored new doctrinal concepts. While the articles usually endorsed the doctrine being taught at the service schools, the journal did publish articles that criticized Army doctrine.\textsuperscript{18} The tactical journals examine issues that usually concern small units of brigade-size and lower.\textsuperscript{19} The quality of the writing in these journals varies greatly, but they all reflect the serious concerns of the junior and middle-level leaders in the services which may not be represented in the higher service journals.

There are two other types of publications that warrant perusal. The first type includes the journals of the professional associations for the Army, Navy, Air Force, and Marines. Despite being official publications, they are usually edited by military retirees and civilians. These periodicals provide both propaganda and criticism of national strategy and military policy, and provide valuable research material.\textsuperscript{20} The second type are the civilian journals concerned with national security issues. They provide useful information concerning the policy-making process within the national defense establishment that the standard military publications cannot. Authors in these journals include senior political and military leaders, both active and retired.\textsuperscript{21}

\textsuperscript{18}As an example, the Army's shift to emphasizing tactical nuclear weapons received much criticism in \textit{Military Review} as being impractical and unnecessary.

\textsuperscript{19}In the Army, each branch usually has its own journal which provide a forum for developments at the tactical unit level (in this case no higher than a brigade-sized unit of approximately 5,000 personnel). \textit{Army Aviation Digest, Armor, Infantry,} and \textit{Field Artillery} are the journals with the most significance in this study.

\textsuperscript{20}In the order of the above listed services (with year of first publication): \textit{Army} (1922), \textit{Proceedings of the Naval Institute} (1874), \textit{Air Force} (1918), and \textit{Marine Corps Gazette} (1916).

\textsuperscript{21}Examples are (titles may have changed over the years): \textit{Armed Forces Journal International, Aviation and Space Weekly, Jane's Defense Weekly, Royal Uniformed Services Institute}
The current state of the scholarly literature dealing with the development of airmobility is poor. While there is an increased interest in the development of Army aviation, the only recently published pieces have been a few small articles in tactical journals.\textsuperscript{22} As of yet, there is no monograph that thoroughly examines the development of airmobility from 1945 to 1965. Using a combination of the previously mentioned published sources and archival material, this study can help span the current gap in the historiography.

\textsuperscript{22}Although I do not have a publication date, Dr. Edgar F. Raines (Historian) is currently working on a history of Army aviation for the Center of Military History. At the Army War College, Colonel John A. Bonin (Director of Joint Flag Officer Wargaming) has written numerous papers presented at the Army War College on the development and employment of armed helicopters.
SECTION I

1945-1950: THE BIRTH OF AIRMOBILITY

Early in 1942 Igor Sikorsky predicted a great future for the helicopter in both civilian and military applications. Continuing a theme similar to the “Winged Gospel” that swept America between the two world wars, Sikorsky and many others envisioned the sale of hundreds of thousands of helicopters as replacement for the American automobile. 23 Harold Pitcairn had envisioned a similar future for the autogiro in 1930s, but the technology was lacking; by 1947 helicopter technology was sufficiently advanced and was generating great anticipation for commercial success. 24 Unfortunately the commercial success that they envisioned never materialized. Lacking a satisfactory market, the helicopter designers continued to compete for an increased presence in the only large market for helicopters -- the military.

24 Warren R. Young, The Helicopters (Alexandria, VA: Time-Life Books, 1982) 99. By 1947 there were more than 70 companies working on helicopter development. A very large number of requests for the establishment of short-haul helicopter routes overwhelmed governmental oversight agencies. The Greyhound Bus Company even submitted a request to provide inter-city helicopter service.
By the end of the Second World War, the Army Ground Forces possessed a fairly large organic aviation component with tremendous potential for expansion. The war confirmed the ground force’s need for organic aviation while displaying the Army Air Forces’ reluctance to undertake the mundane, but necessary, ground support missions. The Army Air Forces’ leadership made numerous efforts at eliminating organic aviation by arguing that it was a waste of resources, duplication of effort, and that the aircraft were not survivable on the battlefield. The performance of the aerial observation posts showed all of these assertions to be false.

The first helicopter delivered to the Army Air Forces was an XR-4 flown from the Sikorsky plant in Stratford, Connecticut, to Wright Field, Ohio, on 17 May 1942. In the following eight months of tests the XR-4 “had far exceeded expectations.” In the following years, the helicopter quickly demonstrated its potential to perform a variety of missions: anti-submarine patrols, artillery observation, liaison activities, and rescue of personnel. The most notable American operation with the helicopter occurred on 23-24 April 1944 when it rescued the pilot and passengers of an aircraft behind Japanese lines.

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25By May 1945, the AGF owned over 700 aircraft for its own use. The Army’s proposals to expand organic aviation to all units would more than triple that number.

26While overall statistics do not exist the survivability and usefulness of the aircraft are highlighted by the following statistics. Liaison aircraft of the First United States Army from June 1944 to April 1945 flew a total of 56,488 combat missions, 4,392 training missions, and 13,733 administrative missions for a total of 74,613 flights (and 78,665 operational flight hours). A total of 136 aircraft were lost (less than half were due to enemy fire) for a sortie loss rate of only 0.17% -- easily the lowest of any class of aircraft in the war. For more information see Ken Wakefield, The Fighting Grasshoppers (Leicester, England: Midland Counties Publications, 1990) 103, 151.

27Historical Division Intelligence, T-2, Army Air Forces Helicopter Program (Wright Field, Dayton, OH: Air Material Command, October 1946) 27. It was considered fully qualified for short-range liaison missions and had demonstrated its ability to operate from ships for escorting convoys.

28For a detailed account see Colonel Hollingsworth F. Gregory, Anything a Horse Can Do (New York: Reynal & Hitchcock, 1944) 111-114.
in Burma. The success of his operation and others convinced the Army Air Forces of the helicopter’s potential in rescue operations. The R-4 was also used in a variety of activities to gain operational experience to aid in the future design of helicopters.

While debates raged over the role of aviation, all the services looked upon the helicopter as a vehicle with great potential. The immature state of the technology prevented the helicopter from playing a larger role causing the services to press for greater research into improving the helicopter. The technological advancement of the helicopter could never have been accomplished in such a short time without the emergency funds designated for helicopter development. The war brought not only funds, but a sense of urgency and creativity which would not have occurred as rapidly in peacetime.

**Strategic Overview**

The surrender of the Japanese on 2 September 1945 brought an end to the most destructive war in history. The American desire to end the war quickly was now replaced by the desire to demobilize and return to “normalcy.” In America, the general belief

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29Joint Intelligence Collection Agency, China-Burma-India Report, 3 May 1944, Subj.: Burma -- First Combat Use of Helicopter in. See also Major Kristin L. Wells (USAF), “Luck of the Irish,” The Retired Officer (October 1986) 36-39; Howard K. Butler, *The Army Ground Forces and the Helicopter, 1941-1945* (St. Louis, MO: Historical Division, United States Army Aviation Systems Command, 1987: History Study No. 1 in “A History of Army Aviation Logistics, 1935-1961”) 2. The helicopter was participating in operations with the 1st Air Commandos, Project 9 Force, to support the British Long Range Penetration Group in Burma, performing courier service and delivering small amounts of supplies. A light aircraft from Project 9 Force with four passengers had landed behind Japanese lines in Burma and was unable to take off again. On 23 April the YR-4, piloted by Lieutenant Carter Harman, United States Army Air Forces, picked up two of the men and returned them to friendly territory. Upon return it overheated and the pilot had to wait until the next day to collect the others.

30Army Air Forces Helicopter Program, 29. One of the helicopters was sent to Ladd Field in Alaska for winterization tests; another went to Langley Field for National Advisory Committee on Aeronautics (NACA) wind tunnel tests; three remained with Sikorsky for research. The Navy used its helicopters as anti-submarine platforms and for air-sea rescue.
during and after the war was that the United States would suffer a recession just as it did after World War I. The faster that the large military could be dismantled, the less of a burden it would place on the economy. The public’s desire for a small military was also understandable from a security standpoint. The defeat of the Axis left America without an enemy and as the only dominant power. While a gulf grew between the United States and the Soviet Union during WWII, it was not until 1946 that the Soviet Union occupied the position as the number one enemy.

At the national level, the desire of the public to return to normalcy meant a rapid reduction in military forces along with a very small military budget. Senior civilian and military leaders thought that they could maintain an efficient, but credible, defense based on America’s nuclear monopoly. The employment of nuclear weapons in August 1945 created an era in which military professionals and intellectuals widely expected a new “revolution” in warfare. The general thought was that conventional forces were no longer necessary except for ‘mopping-up’ operations and civil operations. Many experts predicted that nuclear weapons ensured only two states -- peace or annihilation. The belief in the nuclear weapon as the guarantor of peace also allowed the United States to quickly transition back into a peacetime stature. This meant a massive reduction in the size and capabilities of the American armed forces. For the Army, its force structure would decrease by over 77 percent in less than a year.31

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31 Russell F. Weigley, The American Way of War: A History of United States Military Strategy and Policy (Bloomington: Indiana University Press, 1977) 368. When the Japanese surrendered on 2 September 1945, the Army numbered over 8,267,000; by 1 January 1946, that number had been reduced to 4,228,936; by 30 June 1946 the number stood at 1,891,011. The final force level was set at 1,070,000 with 400,000 of that belonging to the Army Air Forces (AAF), but this level was never reached.
Nuclear weapons made conventional combat unnecessary and, therefore, there was not a need for large ground and naval forces. In the early Cold War years, aircraft were the only vehicles capable of long range delivery of the large and heavy nuclear weapons. Its nuclear monopoly and prestige gave the Air Force a predominant position in the nation’s defense establishment. The Army meanwhile endured a much less enviable position. Gutted by its rapid de-mobilization, the Army struggled to maintain a viable force dispersed throughout the world. Army leaders in Washington tried to present their views that the nuclear age had not altered the need for large conventional forces. The Army was still needed to seize overseas bases for American bombers to strike at the Soviet Union. To transport the Army, there needed be an extensive sea lift (as well as air lift) capability thus guaranteeing the need for a strong Navy. Unfortunately, its desires for a 70 wing strategic bomber force meant that the Air Force neglected most other forms of aircraft. The lack of transport aircraft undermined the Army’s ability to make itself a more valuable resource within the defense establishment. Besides not having enough transport aircraft to move Army units, the Air Force’s focus on strategic aircraft impinged on the development and procurement of tactical aircraft assigned to the Army.

Unfortunately, there were problems with a nuclear-only policy. The first was its inflexibility -- what amount of force would an enemy have to exert in order for the United States to retaliate with the use of nuclear weapons? The second was the lack of a balanced force to respond to lessor threats. Third, would this policy on nuclear retaliation
be effective? Did the United States possess enough nuclear weapons and delivery systems to make the threat credible? How effective would this policy be if the enemy also possessed a nuclear capability?

Given this strategic context, each service saw its role in implementing national policy and strategy differently; the only consensus on military matters in the five years after World War II was that there was none. The three services, pressured by budgetary restraints and efforts at increasing military efficiency through unification, in addition to a demoralized and understaffed forced, made strenuous efforts at promoting their mission and demonstrating their viability in a world expected to be dominated by nuclear weapons. The Air Force, the service with the greatest amount of influence due to its exclusive nuclear capability, set the agenda from which the other services reacted.

Organizational Politics

America’s need for a strong but economical defense led to the restructuring of the national military establishment in 1947. The National Security Act of 1947 (NSA 1947) ‘unified’ the services under the auspices of the Department of Defense. While it made many changes, the one that had the foremost impact on the development of army aviation

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32 The Joint Strategic Survey Committee presented a report on 30 October 1945 to the JCS which showed the United States to be more vulnerable to nuclear weapons than the Soviet union. Unlike the United States, in which industry and population centers were highly concentrated and vulnerable to strikes from sea based platforms, the Soviet Union’s cities and industry were dispersed and located inland out of range of most naval delivery systems. For more information see James F. Schnabel, *History of the Joint Chiefs of Staff. Volume I: The Joint Chiefs of Staff and National Policy, 1943-1947* (Washington, D.C.: Office of Joint History, 1996) 127-128. See also JCS 1477, 18 August 1945, and Dec On, 23 August 1945; especially JCS 1477/1, 30 October 1945; CCS 471.6 (8-15-45) sec 1.

33 Although kept hidden, the Air Force lacked the bombers, crew training, and, most importantly, the bombs to carry out any extensive nuclear bombing campaign. For more information see David Alan Rosenberg, “U.S. Nuclear Stockpile, 1945 to 1950” *The Bulletin of Atomic Scientists* 38:5 (May 1982) 25-30.
was the establishment of the Air Force as an independent service. Air Force leaders had long-sought autonomy and now that they had it, were not going to allow anyone to come close to impinging on their roles and missions.

The separation of the Air Force from the Army went without too many disagreements. The Army's senior leadership recognized prior to 1947 that this was inevitable and had prepared for it. While the separation was somewhat amicable, disagreements still sprang forth over a variety of issues: the roles and missions of organic Army aviation, pilot training and ratings, logistical support for army aircraft, and the command and control relationships in the field and within the bureaucracy. The NSA 1947 failed to provide guidance on any of these issues. In Section 205 (e) of the document it states:

> In general the United States Army, within the Department of the Army, shall include land combat and service forces and such aviation and water transport as may be organic therein. It shall be organized, trained, and equipped primarily for prompt and sustained combat incident to operations on land.\(^\text{34}\)

The vague language of "aviation as may be organic therein" created much friction between the Army and the Air Force. Each had their own interpretation of the definition of this statement and the resolution of this problem would require almost two decades of fighting.

The executive branch made numerous attempts to resolve these inter-service conflicts. Unfortunately, these resolutions in the form of documents on national security

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used similar, vague wording. Executive Order 9877 (26 July 1947), the "Functions of the Armed Forces and the Joint Chiefs of Staff" of 21 April 1948 at Key West, and the 1949 revision of the National Security Act all failed to provide any further clarification of the issue.\textsuperscript{35} The effects of this were twofold. While the vague wording allowed for a great disparity in its meaning and served as a major point of friction between the Army and the Air Force, the lack of clarity allowed "a high degree of flexibility" for the development of Army aviation. The Army interpreted the documents as allowing for the expansion of its aviation and responsibilities; the Air Force believed the exact opposite.\textsuperscript{36} While these acts did not expand the mission of Army aviation, they did not further restrict it either.

After the Key West Agreement of 21 April 1948, the Army published AR 95-5 which provided the guidance under which army aviation would operate in the new environment. The regulation delineated the Army's responsibilities while ensuring that they did not infringe upon the Air Force's responsibilities. It established three missions for army aviation. The first was to expedite and facilitate the conduct of operations on land. Next was to improve mobility, command, control, and logistic support of Army forces. Finally, organic aviation was to facilitate greater battlefield dispersion and maneuverability under conditions of atomic warfare.\textsuperscript{37}

Another attempt at resolving the conflict between the Air Force and the Army was the creation of 'adjustment documents' which better defined the responsibilities of Army aviation. One of these documents, issued on 29 May 1949, was known as The Joint


\textsuperscript{36}Cheng, \textit{Air Mobility}, 18.
Army and Air Force Adjustment Regulations (JAAFAR) 5-10-1, “Combat Joint Operations, Etc.: Employment of Aircraft for Performance of Certain Missions.” Besides imposing weight regulations on Army aircraft, it allowed the Army to use its organic aviation for “the purpose of expediting and improving ground combat procedures in forward areas of the battlefield.” While maintaining this general statement, the regulation provided more specific guidance which were very similar to the missions authorized for the liaison aircraft of WWII:

1. Maintenance of aerial surveillance of enemy forward areas in order to locate targets, adjust fire, and obtain information on hostile defense forces.
2. Aerial route reconnaissance
3. Control of march columns
4. Camouflage inspections of ground forces areas and installations
5. Local courier and messenger service
6. Emergency aerial evacuation
7. Emergency aerial wire laying
8. Limited aerial resupply
9. Limited front line aerial photography

According to this agreement, Army aircraft were responsible for the first four missions, while the Air Force would provide liaison aircraft units to normally perform missions five through nine.

A memo from Vandenberg to Eisenhower in 1949 reflects the Air Force’s position on military matters. In it, Vandenberg emphasized increasing the Air Force’s retaliatory power and enhancing the mobile striking power of the Army. Much of the Navy in the current defense structure was not essential and needed to be eliminated. To alleviate the fiscal restraints imposed on military spending he recommended significantly reducing the

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37 Weiniert, History of Army Aviation, 10.
Navy and Marine Corps. This could be done because the Soviet Union did not possess much in naval forces, the Soviets did not rely on sea line of communication, and because the United States was aligned with the world’s second greatest naval power, Great Britain. As a result, Vandenberg proposed a budget that had neither fleet nor attack carriers, but did support a strong anti-submarine naval force. In addition, the Marines were to be reduced to six battalions (not even a whole division) with no aviation, since their mission could be done by the Army. The Army did not escape Vandenberg’s ax either, calling for a force that totaled approximately 15 divisions (with only one armored division and five cavalry regiments). The Air Force would remain near its overall current strength, but with greater emphasis on its nuclear retaliation capability. Out of the minimum 63 groups, only five would be capable of tactical operations.38

Vandenberg’s memo represented the AF view that they were the dominant player with the Army in a secondary role. Considering the projected threats in 1949, the Navy and Marine Corps were essentially not needed for the national military establishment. Of course, the United States Navy and Marine Corps disagreed with this assessment. The United States Navy emerged from World War II as the largest and most powerful navy in the world. In the Atlantic, it defeated a large submarine threat. In the Pacific, the Navy defeated a foe who was initially its equal at sea and in the air. Throughout the war, the Navy successfully supported amphibious operations and attacked land targets despite the large Japanese land-based air force opposing it.

Unhappy with being supplanted by the Air Force as the premier service, the Navy seized upon a semi-legitimate threat to try and get their own nuclear weapons. Their efforts resulted in the unsuccessful ‘Revolt of the Admirals’ and forced many of the participants to be denied promotion or forced into retirement. One effect that it had on the Navy was the early promotion of naval officers who brought with them new concepts and a revised perspective of the Navy’s role in the defense of the nation.

The next two chapters examine the Marine Corps’ and the Army’s efforts at developing air mobility. For the Marine Corps the innovation resulted in new tactics, techniques, and procedures (TTPs) being applied to an existing doctrine. The experiences of the Korean War refined these TTPs and solidified the use of the helicopter in USMC operations. For the Army, the concepts were explored on a limited basis but with no tangible results. It would take another war before the Army became sufficiently moved to employ the helicopter.
CHAPTER 1

THE MARINES’ DEVELOPMENT OF VERTICAL ENVELOPMENT

The years immediately following the end of World War II were ones of great consternation for the Marine Corps leadership. Similar to the Navy, the Marine Corps encountered many difficulties from 1945 to 1950: repeated attempts to eliminate the Marine Corps, an uncaring Navy focusing only on carrier aviation, and the advent of nuclear weapons. Through deft handling and public relations, the Marine Corps’ leadership managed to take care of the first by getting Congress to guarantee its permanent existence and force structure into law. The Navy’s focus on carriers took a major hit with the cancellation of the super carrier. The unsuccessful “Revolt of the Admirals” resulted in the replacement of the Navy’s senior leadership and less focus on naval aviation. It was the third problem which posed the greatest long-term threat to the USMC’s reason for existence.

The July 1946 testing at the Bikini Atoll showed the vulnerability of a large amphibious force to nuclear weapons.39 These tests also endangered the Marine Corps

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39For a good account of the Bikini tests see W.A. Shurcliff Bombs at Bikini: The Official Report of Operation Crossroads (New York: William H. Wise and Co., 1947). The preliminary statement by the evaluation commission concluded that “protection from catastrophe...lies rather in wide spacing of task forces...We are convinced distance is the best defense.” (page 204 of Shurcliff).
since nuclear weapons now threatened to make its primary mission, amphibious assaults, virtually impossible. Marine Corps Lieutenant General Roy S. Geiger observed the Bikini Atoll tests. As a former commander of the III Amphibious Corps in World War II, he expressed his concerns about the future of amphibious warfare: “Since our probable future enemy will be in possession of this weapon... I cannot visualize another landing such as was executed at Normandy or Okinawa.” Motivated by a combination of mission preservation and the natural desire to solve the problem, the Commandant of the Marine Corps (CMC) General Alexander A. Vandegrift quickly reacted to these observations and convened a Special Board on 13 September to find a solution. Composed of three major generals who had extensive experience in amphibious operations, the board quickly produced their report on 16 December. In the first Marine Corps study, Marine officers recognized the potential of the helicopter to alter radically the conduct of all future amphibious operations. “Personnel can be landed in the proper formation on the flanks and rear of the hostile position. The helicopter method would be used primarily for the initial assault only...but helicopter units will have further use subsequent to the assault in operations ashore by providing a valuable means for the movement of troops and cargo when speed is a necessary element. Although the findings

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40Rawlins, Marines and Helicopters, 1946-1962, 11. Citation of letter from Geiger to CMC, dated 21 August 1946.
41Major General Lemuel C. Shepherd, Jr., commanded the 1st Marine Provisional Brigade at Guam and the 6th Marine Division at Okinawa; Major General Oliver P. Smith was the ADC for 1st Marine Division at Peleliu and the Deputy CoS with Tenth Army for Okinawa; Major General Field Harris was Commander of Aircraft in the Northern Solomons campaign and was currently the Director of Marine Aviation. The Special Board also consisted of a three officer Secretariat: Colonel Merrill B. Twining, Colonel Edward C. Dyer, and Lieutenant Colonel Samuel R. Shaw. It was the Secretariat that did most of the research and recommendation formulation. They concluded that the helicopter appeared to be the “answer to the amphibious prayer.”
emphasized the belief that the helicopter probably provided the best solution to the problem, the immature state of both the helicopter and its production industry led the board to propose that “two parallel programs be initiated which would provide for the development of both a transport seaplane and a transport helicopter.” The report recommended the creation of an experimental helicopter squadron to train personnel and test ideas. It also proposed that the “Marine Corps Schools be directed to submit tentative doctrine for helicopter employment.”

Based on these findings, General Vandegrift authorized on 19 December 1946 the creation of a provisional helicopter squadron to be based at Quantico, Virginia. The unit’s mission was to test the feasibility of the aforementioned concept and to create the necessary tactics, techniques, and procedures for mission execution. At the same time he outlined the concept of future amphibious operations. The concept was to have the assault fleet spread out over a large area. The initial assault would be conducted by helicopters which would approach from different directions and then meet at the objective (whether it be on the beach or behind it) to drop off their troops.

In a letter he sent to the Chief of Naval Operations (CNO), Fleet Admiral Chester W. Nimitz, Vandegrift described the Marine Corps plan for future amphibious operations.

\[\text{Footnotes:}\]


43Rawlins, Marines and Helicopters, 1946-1962, 105. Actually the CMC had already expressed interest in evaluating the helicopter. In a letter to the CNO, dated 18 June 1946, he outlined the establishment of a helicopter development program which included one officer and two enlisted men to be added to his staff. On 8 August 1946, Major Armand H. DeLallo became the first Marine helicopter pilot.

44In addition, the squadron was to also study operations and maintenance of the helicopters; develop flight proficiency of pilots and crewmen; develop and maintain proficiency of the mechanics; and submit recommendations for the organization and composition of helicopter squadrons. See Rawlins, 21; citation.
Called the Vertical Assault Concept for Amphibious Operations, Vandegrift emphasized that the helicopter was the key to making amphibious operations work in the nuclear era.⁴⁵ Almost a year after authorization, the first Marine Corps helicopter squadron, HMX-1, was commissioned on 1 December 1947. The long delay between authorization and implementation was a result of having to operate within a peacetime bureaucracy. Various agencies within the office of the CNO had to review and comment on the proposal before a final decision could be made. The biggest problem was funding; 1949 was the earliest that funding could be authorized in the budgets.⁴⁶

Under Nimitz, the CNO office exhibited strong support for the Marine Corps program and often interceded to resolve problems. One issue was the necessity of modifying the escort and light aircraft carriers’ elevators to transport the 5,000 pound helicopters that the Marines needed. Another was the reallocation of the funding priorities between assault helicopters and anti-submarine warfare (ASW) helicopters at a time when the Navy was strapped for procurement and R&D funds. On 4 November 1947, the CNO made the assault helicopter a higher priority over the ASW helicopter.⁴⁷ This early Christmas gift was undermined, though, by the Navy’s Bureau of Aeronautics (BuAer), which linked the development of the assault helicopter to the Air Forces XH-16

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⁴⁶Rawlins, *Marines and Helicopters, 1946-1962*, 15. There was no support for taking money from existing programs to begin faster procurement for the unit’s helicopters.

program. The result was a program that moved very slowly and seriously disrupted the Marine Corps time table. It would not be until the Korean War broke out, that the Navy would revise its decision on the method for developing and procuring an assault helicopter.

The problem was that no helicopter operational in 1947 could carry more than a couple of fully equipped marines, but the planners were confident that technology would catch up with tactics if they could point out the urgent need for such a craft. The publication that the Marine Corps School produced was entitled *Amphibious Operations - Employment of Helicopters (Tentative)*. Printed in 1947, this was the first military manual in the world to discuss the concept, tactics, and techniques to be used for operating helicopters in amphibious operations. Supervised by Colonel Robert E. Hogaboom, the manual established the doctrinal basis for all aspects of helicopter employment during amphibious operations.\(^\text{49}\)

Given the nomenclature of *Phib-31*, the manual’s vision for the helicopter was significantly more advance than the state of helicopter technology.\(^\text{50}\) Years later General Krulak, who had written the introduction to the manual as a Lieutenant Colonel, remarked that “Dyer was unhappy with [the introduction’s wording], and properly so,


\(^{49}\)Rawlins, *Marines and Helicopters, 1946-1962*, 26. The authors of the publication consisted of members from HMX-1 and the Helicopter and Transport Seaplane Board (this board was to create a concept for both the transport helicopter and the assault seaplane; *Phib-31* was its first product).

\(^{50}\)Rawlins, *Marines and Helicopters, 1946-1962*, 25-26. The booklet was designated as such because it was the 31st booklet in a series of publications concerning amphibious operations. Its 52 pages were divided into eight sections which discussed organization, employment, command, tactics, fire support, logistics, and communications among others. The Marine Corps School initially used it as an instructional guide and later as a basis for planning in Packard II.
because no helicopters of that era could do these things, or even approach them.”51 As for the body of the manual, Krulak commented that “We had so little to go on; no data; just conviction.”52 Yet, the wording emphasizing the importance of continually developing the concept ahead of technological advances remained. The end of the introduction concluded that “the evolution of a set of principles governing the helicopter employment cannot await the perfection of the craft itself, but must proceed concurrently with the development.”53

On 9 February 1948, HMX-1 received the first of its helicopters, a Sikorsky HO3S-1, a modified version of Sikorsky’s commercial S-51 model. The unit spent the following months training its pilots and maintenance crews. Their rapid progression enabled them to participate in Operation Packard II in late May 1948.54 Despite possessing only five aircraft, the squadron performed very well during this exercise and demonstrated the validity of the helicopter in amphibious assaults. As the Marine Corps official history states:

The success of PACKARD II proved that the helicopter could achieve the desired troop build-up ashore. As a result, Marine Corps planners became more firmly committed to the new techniques of


54Rawlins, *Marines and Helicopters, 1946-1962*, 24. Operation Packard II was a Marine Corps School (MCS) amphibious command post training exercise held annually by the Navy and the Marine Corps. This joint exercise simulated a ship-to-shore assault landing against an enemy defended beach.
vertical assault in amphibious warfare. This was truly the beginning.\textsuperscript{55}

The delivery of the first Piasecki HRP-1 helicopter on 19 August 1948 gave the squadron a helicopter truly capable of conducting air insertion missions. By April 1949 the unit operated nine Piasecki HRP-1 helicopters and had practiced enough to conduct its first public demonstration. The unit demonstrated its capabilities before members of Congress and senior Department of Defense officials on 9 May 1949.\textsuperscript{56}

The unit then participated in the Marine Corps School’s amphibious command post exercise of 1949, Operation Packard III. Packard III was an operation which attempted the most ambitious use of the helicopter up to that time. During this exercise, the unit executed three different missions to further the development of tactical doctrine. It operated its HRP-1 helicopters from the aircraft carrier USS \textit{Palau} to conduct ship-to-shore movement of troops and supplies. It also performed search and rescue operations using HO3S helicopters based on land. Finally, its HTL-2 helicopters executed liaison missions and artillery and infantry observation from a Landing Ship Tank (LST). While the performance of all the helicopters were good, the most impressive performance was by the HRP-1s. Their performance confirmed the initial conclusions formulated during Packard II, namely that the helicopter could successfully transport and support an

\textsuperscript{55}Rawlins, \textit{Marines and Helicopters, 1946-1962}, 25. Its success helped the authors of \textit{Phib-31} envision the day when a RCT could be lifted in by helicopters in one move.

amphibious assault by a regimental combat team.\textsuperscript{57} The successful exercise confirmed that the developing doctrine and TTPs were "sound and workable in all respects."\textsuperscript{58}

In the months following Packard III, the squadron continued to experiment with air assault procedures and conduct pilot training. Despite the grounding of the HRP-1 helicopters from 25 November 1949 to 5 April 1950 because of a problem with the mid-transmission pump, the unit managed to conduct numerous public demonstrations. The unit also began its first night operations in December 1949 using the HO3S in 45 minute flights. The flights were successful but they also demonstrated the need for landing lights and lighted instruments before they could conduct any large formation night operations.\textsuperscript{59} In April 1950, the unit participated in Operation Crossover. During the exercise the unit transported troops and 75mm pack howitzers into designated landing zones. The unit also performed wire-laying, resupply, and aeromedical evacuation missions.\textsuperscript{60}

The success of these operations convinced many observers that the helicopter was the answer to the problem of dispersion and could revolutionize military mobility. The experience gained in this exercise and others allowed the Marine Corps to develop a working doctrine which could be refined during and after the Korean War.

\textsuperscript{57}Rawlins, \textit{Marines and Helicopters, 1946-1962}, 27. See HMX-1 Squadron History, 1 December 1947-30 June 1949, p. 15. File found at the Historical Reference Section, History and Museums Division, Headquarters, USMC.

\textsuperscript{58}Rawlins, \textit{Marines and Helicopters, 1946-1962}, 27. See HMX-1, Amphibious Command Post Exercise Operation PACKARD III, 18-24 May 1949, p. V-1. File found at the Historical Reference Section, History and Museums Division, Headquarters, USMC.

\textsuperscript{59}Rawlins, \textit{Marines and Helicopters, 1946-1962}, 28. See HMX-1 Squadron History, 1 July 1949 - 31 December 1949, p. 3. File found at the Historical Reference Section, History and Museums Division, Headquarters, USMC.

\textsuperscript{60}Rawlins, \textit{Marines and Helicopters, 1946-1962}, 28. See HMX-1 Squadron History, 1 January 1950 - 30 June 1950, p. 1-5. File found at the Historical Reference Section, History and Museums Division, Headquarters, USMC.
Its successful experiments with helicopters were due to four main factors. First, the external stimuli that the Marine Corps perceived to threaten their very existence made it essential to re-examine their methods. This review was aided by the second factor -- the innovation-friendly culture of the USMC. The Marine Corps' experiences in developing amphibious warfare created an organization which encouraged new methods for solving problems. If not always embraced, change was accepted by the Marines as the road to survival. The third factor was the support the USMC received from external organizations. The Marines made sure they kept government support by having Congressional leaders observe Marine Corps experiments. The Navy did not hinder the Marine Corps' efforts because of their focus on retaining the largest number of aircraft carriers possible. Finally, the technology existed to support ever larger air assault operations. This allowed for the extensive testing of the new doctrine's theoretical concepts and their eventual inclusion into the official doctrine.
CHAPTER 2

THE ARMY AND THE HELICOPTER

The Army monitored the Marine Corps’ exercises from 1947 to 1950, but failed to aggressively pursue their own experiments. While the development of the helicopter during World War II resulted in greatly improved performance, its use was mostly for rescue and administrative missions. After 1945, the military development of the helicopter continued at a much slower pace. The reasons for this lack of emphasis were many but they all stemmed from one basic problem -- the scarcity of funding.

At the political level, the Army was not perceived by the political leadership as vital and therefore received less funding than the other services. With its limited funding the Army chose to emphasize its strategically mobile airborne forces. This overemphasis on the airborne increased the rate of neglect in the rest of the Army, including the development and use of the helicopter. Within the Army there was support for the expansion of light aviation, but Air Force opposition and low funding prevented this from happening.

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After the end of World War II the Army conducted an extensive re-examination of its doctrine. On a strategic level, the development of America as the world’s only nuclear power afforded a certain freedom for the Army to experiment and change the doctrine, organization, and equipment necessary for the national defense. Unfortunately, this opportunity was restricted by the new attitudes that developed among the politicians, military planners, and the general public during the same time period. The nuclear monopoly appeared to make a large conventional military superfluous. The technology of the 1940s was not capable of producing small-yield nuclear weapons or nuclear weapons that were small and light enough to be carried by anything other than large bombers. As a result, the Air Force maintained a monopoly on the delivery of the nuclear weapons required to end future wars quickly. The reliance on nuclear weapons for America’s defense seemed to forecast the demise of ground combat. The Army’s contribution to the nation’s defense appeared insignificant and made any debates about the Army’s equipment and tactical doctrine seem unnecessary. Thus, the traditional reliance on ground combat as the major means of implementing American policy fell into disfavor.62

The Cult Of Airborne Warfare

In the immediate post-war years, the Army searched for an organization and doctrine that would provide increased mobility and firepower to fight another war in Europe. Despite a flurry of activity, the United States Army remained essentially unchanged between the end of the Second World War and the beginning of the Korean

62Jonathan M. House, Toward Combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and
War. The lack of funding, the development of nuclear weapons, and the numerous Army studies had little effect on the basic organization, equipment, and doctrine of American ground forces. American tactical units entered the Korean War with a doctrine that was essentially the same as that used in World War II. The infantry and airborne divisions remained the centerpiece of the Army’s structure and the Army’s efforts to improve its flexibility and firepower. The problems confronting the Army after World War II (the impact of atomic weaponry, the changing nature of mobility and the demand for greater and more accurate firepower) would continue to evolve and “challenge the Army’s tacticians and doctrine writers for the next three decades.”

Despite the bleak outlook for the Army, its leadership continued to advocate the need for a large ground capability. In the final report of the 1946 War Department Board on Army Equipment (Stilwell Board), it was argued that the next war might begin with a surprise attack to which the United States would respond with nuclear bombing, but complete victory could only be gained through “occupation of the hostile territory.”

The Army’s efforts at expansion evolved around the one core component -- its strategically mobile airborne forces. The emphasis on the employment of airborne forces reflected at all levels. General Omar N. Bradley, the Army Chief of Staff, presented his vision of future warfare in a 1949 article in Military Review. In the article, Bradley imagined war in three distinct phases. In phase one, the United States would employ its

Organization (Fort Leavenworth, KS: Combat Studies Institute, CGSC, August 1984) 141.

63Doughty, Evolution 6.

64Office of the Chief of Staff, War Department, Report of the War Department Equipment Board, 29 May 1946 (also commonly referred to as the Stilwell Board) 10; Doughty, Evolution 2.
strategic weapons against the enemy, and, in the second, American military forces would seize strategic bases from which the enemy’s homeland might be bombed or from which the enemy might bomb the United States. The strategic mobility of airborne forces made them especially useful in this second phase. The third and final phase would be a large-scale ground assault to defeat the enemy.\textsuperscript{65}

General Groves agreed with Bradley’s assessment. Groves believed that the mere threat of using nuclear weapons would require a reduction in the size of combat units. Concentrations of troops and supplies would not be possible anymore because they would be too easily attacked and destroyed. He continued by emphasizing the logistical problems by stating, “I do not see how large armies can be supported in combat. I anticipate the use of widely dispersed small forces -- combat team size and even smaller - - their equipment light -- their supplies limited -- not only air-supported but probably air-transported and air-supplied.”\textsuperscript{66}

Other members of the Army also recognized the need for mobility on the battlefield. One was Lieutenant General Raymond S. McLain. He saw limits being placed on the use of nuclear weapons and thus other, conventional weapons were still

\textsuperscript{65}General Omar N. Bradley, “Creating a Sound Military Force,” \textit{Military Review} 29 (May 1949) 3-6; Doughty 2. The British held similar views. See P.H.H. Bryan’s digested article from the British “The Fighting Forces” (August 1949) entitled “The Ground Offensive in Atomic Warfare” \textit{Military Review} 30 (July 1950) 106-110. Bryan sees next war as being atomic oriented. This article is an insane proposal for using airborne troops to seize a base deep in enemy territory to destroy enemy nukes and resupply them from the air.

\textsuperscript{66}\textit{Military Review} 30:4 (July 1950) 110.
important. In an unusual, though completely legitimate tact, McLain saw the importance of air, land, and sea services varying, depending on the capabilities of the enemy.67

While Bradley and others saw the use of airborne forces as an extension of current doctrine, others saw future warfare as being faster moving and much deadlier. Forces would need to be dispersed but have the ability to quickly concentrate. Consequently, many predicted that airborne operations in any future war would be on a scale and magnitude never before seen.68 Others recognized that World War II was primarily a war of surface movement but saw the next big war as a war of movement in space and using surface movement for the support of strategic missions.69 Describing airborne forces as “the type of soldiers who would play a major role in any future war” and fighter-bombers as “the artillery of airborne operations” the Army continued to push for joint training exercises and in fact training of these forces intensified just prior to the beginning of the Korean War.70

In the immediate post-war environment, two leaders stood out in their avocation for airmobile forces for strategic purposes. One was Lieutenant General Lewis Hyde Brereton. Brereton’s World War II experiences placed him in an uncommon position

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70Quotation from General J. Lawton Collins in an abstract of a New York Times’ article; found in “Airborne Training” Military Review 30 (April 1950) 64.
among Air Force officers of understanding the unique capabilities of airborne forces. In a 1947 speech to the Air War College Lieutenant General Brereton stated:

To consider airborne operations only in the tactical field restricts exploitation of its most important attributes; namely, dispersion at the bases, and mobility, range and speedy concentration of mass at the objective. These characteristics make airborne operations a strategic factor of the greatest importance.

The other vocal proponent was Lieutenant General James M. Gavin. Commander of the 82nd Airborne Division in World War II, Gavin presented a similar argument in his book, *Airborne Army*:

The future of our armed forces is in the air. All fighting men and everything they need to fight with in the future and live on as they fight must be capable of movement by air. Only through flight can we wage a future war in accordance with the principles of surprise, mass and economy of means.

Both leaders also emphasized the necessity of developing new cargo aircraft to move the heavy equipment needed by the Army to conduct large scale operations from an airhead.

The major deficiencies with airborne forces were their lack of tactical mobility, limited firepower, and reliance on resupply from the air until linking up with ground forces. Despite the increased need for tactical mobility, only a small number in the Army of the late 1940s saw the helicopter as a potential solution. Lieutenant Colonel Chester F.

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71Among his many assignments, Lieutenant General Brereton commanded the Ninth Air Force (October 1943-August 1944) which provided the air support for the invasion of France, and the First Allied Airborne Army (Operations Market Garden and Varsity).


73During the Second World War, Gavin served as the commander of the 505th Parachute Regiment prior to assuming command of the 82nd Airborne Division.


Allen was one of those who recognized that the fundamental nature of warfare had not changed with the development of nuclear weapons. He saw the need for increased dispersal which would create the need for greater mobility and flexibility. Among other development trends, he saw the helicopter as a “possible solution to transportation problems” in rugged terrain and “especially desirable for a variety of military uses” in other land campaigns. Allen saw another use during amphibious operations, the “helicopter may prove a valuable means for ship-to-shore movement.” The helicopter was still seen as a form of cargo hauler but not as a fighting vehicle.

These articles, and many others, revealed an Army that saw itself as still strategically significant and as the final arbiter of victory regardless of the use of nuclear weapons. Since the Army considered ground combat as not obsolete its doctrine continued to utilize its experiences in the European theater in World War II as a “valid basis for postwar doctrinal development.” As relations with the Soviet Union worsened in the post-war environment, the Army began to focus on the problem of defending Western Europe from a Soviet attack. “Concern for European security as the most important strategic problem thus reinforced the Army’s doctrinal preference for large-scale conventional operations.” While the Army acknowledged the possibilities of fighting elsewhere, “its doctrine was increasingly oriented toward a European-type battlefield reminiscent of World War II.”

**Development Of Army Aviation**

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As early as August 1944, the United States Army began examining its needs for equipment in a post-war environment.\textsuperscript{78} The demands of the war delayed the implementation of this directive until December 1944 when Major General Gilbert R. Cook convened the board.\textsuperscript{79} After more than six months of deliberations, the board released its findings on 20 June 1945. It called for an extremely large tactical air force within the Army Ground Forces (AGF). Acknowledging the roles and importance of missions as established by the Army Air Forces, the board identified five missions for which purpose-built aircraft would be needed to provide the tactical support that the Army desired: photographic, tactical reconnaissance, liaison, fire support, and transportation. These missions represented the Army’s wartime disappointment with the poor support of close air support (CAS) and reconnaissance missions. Essentially, it advocated the duplication of some aspects of tactical support between the Army Air Forces (AAF) and the AGF’s projected tactical air force stating “the organic ground support aviation should have as its sole mission the close support of ground troops in combat.” The large number of aircraft needed to do this required a decentralized command and control in order to be effective. The board saw the helicopter’s potential to

\textsuperscript{78} Memorandum from Major General Russell L. Mexwell, Assistant Chief of Staff, G-4, to the Commanding General, Army Ground Forces (AGF), 19 August 1944, Subject: Equipment for the Post War Army.

\textsuperscript{79} Memo No. 40, Major General E.F. Olsen, Headquarters, Army Ground Forces, to Major General Gilbert R. Cook, December 5, 1944, Subject: Equipment Review Board. This board is often referred to as the Cook Board. Also on the board: Major General Floyd E. Jones, Brigadier General Benjamin G. Ferris, and Brigadier General Rupert E. Starr. See History, Army Ground Forces Board Number I (AGFB) (Fort Monroe, Virginia, 1948) pp 114-117.
fulfill the Army’s tactical needs and advocated in Annex I of its final report an extensive acquisition program for light, medium, observation, transport, and armed helicopters.⁸⁰

During fiscal year 1945, the Army acquired a total of 34 R-5 and 193 R-6 Sikorsky helicopters with many of the helicopters being sent to the 82nd Airborne Division.⁸¹ Under the auspices of the Army Ground Forces Board, the 82nd Airborne Division experimented with using the R-6 helicopter for a variety of tactical missions. The board concluded that the experiment was highly successful and they believed that the helicopter could be substituted for a number of ground vehicles. They recommended that helicopter development be given the highest priority, including the development of larger helicopters for the transport of airborne troops.⁸² As a result of these reports the AGF requested on 28 November 1945 for the AAF to procure a variety of helicopters to facilitate the development of new doctrine, tactics, and organization.⁸³

Testing of the helicopter did not stop after the release of the reports. The Army Ground Forces (AGF) Air Support Service Test Section began testing in December 1945 on a wide range of concerns: rockets and aircraft guns for use against ground targets, aerial reconnaissance and photography equipment, helicopters, parachutes, and gliders. In December 1945, the Airborne Board, using a Sikorsky XR-6A borrowed from the

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⁸³Butler, *Restoration* 740. These included a single seat helicopter for use as an aerial motorcycle; a two-seat helicopter for field artillery observation; transports and ambulances of the small (2,000 pound) and medium (up to 6,900 pounds) helicopters; and heavy (20,000 pound) cargo helicopters.
AAF, mounted and fired rockets. On 7 December 1945 the Department of Air Training at Fort Sill became the Army Ground Forces Air Training School with Brigadier General William W. Ford as its first commander. The mission of the school was to provide tactical training to support combat arms that were acquiring organic aviation. Its existence was short-lived, though, and was disestablished in April 1946 when the AAF organized the Air University at Maxwell Air Force Base, Alabama.

The Army continued to conduct numerous studies at various locations after the war concerning the potential use of the helicopter. The primary document was the 1946 War Department Board on Army equipment. After analyzing the capabilities of the helicopter, the board concluded the helicopter as suitable only for moving supplied from ship to shore or for resupplying airborne troops. The June 1946 Infantry Conference at Fort Benning viewed the helicopter in a more favorable light. In its conference report it noted that the helicopter was "particularly adaptable to uses such as supply and evacuation, reconnaissance, observation, photography, column control, wire laying, and liaison and courier missions."

In 1946 the first helicopters entered the AGF's inventory. These were thirteen Bell YR-13 helicopters. The AGF Board No.1 began experiments to see if the YR-13s

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86Doughty, Evolution 4. 
87Lectures and Demonstrations, Infantry Conference, Fort Benning, GA, June '46, Tab D-3, p. 46, USACGSC 13561.
could serve as a replacement for light fixed-wing aircraft. After observing a 
demonstration of the Bell Helicopter’s YR-13 in 1946, the Army Ground Forces bought 
fourteen for experimentation. Seven of these helicopters were sent to the 82nd Airborne 
Division to investigate potential applications. In the tests, the helicopter displayed an 
unprecedented maneuverability which gave it an almost unlimited number of tactical 
possibilities. Its performance during these tests sufficiently convinced General Jacob L. 
Devers, the Commanding General of the AGF, to request funding from the Army Chief of 
Staff, General Dwight D. Eisenhower, for an additional fifty helicopters.

The conflicting conclusions drawn from these conferences and reports show the 
difficulty in developing a vision based on an immature technology. Helicopters at this 
time were still small and fragile; to foresee the helicopter as having a major combat role 
in a high intensity environment required a vivid imagination. As the Army toyed with the 
helicopter it is interesting that the Marines’ efforts were not more closely followed. This 
lack of interest was not due to the information being unavailable. Many of the Army’s 
tactical journals carried bits of news and the popular media found the Marine helicopter 
experiments to be newsworthy.

One potential reason for the Army’s failure to closely follow the USMC’s efforts 
with helicopters was the belief that large-scale amphibious operations were outdated. 
This was reflected in General Omar Bradley’s testimony as Chairman of the Joint Chiefs

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89 John R. Galvin, Air Assault: The Development of Airmobile Warfare (New York: Hawthorn Books, 
1969) 256. Eisenhower approved this request but ordered that the funding come from the existing 
appropriations for other Army aircraft.
of Staff to Congress on October 19, 1949, during the Revolt of the Admirals. In it, Bradley did not believe that providing support for amphibious operations could be one of the reasons used for justifying the cost of aircraft carriers. He predicted that “large-scale amphibious operations will never occur again...Frankly, the atomic bomb properly delivered almost precludes such a possibility. I know that I shall never be called upon to participate in another amphibious operation like the one in Normandy.”90 Since he was Army Chief of Staff in the 18 months prior to being named the first chairman of the JCS on 16 August 1949, Bradley’s views no doubt permeated downward and the importance of observing amphibious operations would be considered negligible.91

**Army Aviation Procurement**

After World War II, some of the most emphatic supporters of the helicopter came from Army airborne officers who were veterans of World War II. To them the helicopter possessed the potential to give the airborne the enhanced tactical mobility it needed. The army’s experimentation with helicopters, however continued to be limited by its inability to obtain a sufficient quantity. The problems with acquisition stemmed from the Army’s reliance on the Air Force for procurement approval. While the National Security Act of 1947 created the Air Force as a separate service it did allow the Army to retain organic aviation for its units. Unfortunately, the act also allowed the Air Force to retain complete

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91Bradley as the Army Chief of Staff from 7 February 1948 to 16 August 1949. It must also be said that Bradley’s remarks concerned large scale amphibious operations like Sicily and Normandy, although he did not see a future amphibious campaign like that conducted in the Pacific during World War II. Bradley did not consider landings like those at Inchon to be of the “large-scale” type.
development and procurement authority for Army aircraft, to include helicopters. When fiscal austerity hit the Air Force budget, the Air Force reduced its research and development budget by 46%. The surviving procurement programs focused on the development of jet fighters and strategic bombers while transport aircraft and helicopters were neglected. As an Air Force spokesman said in 1949 “Our top level planners must first insure (sic) the adequacy of our defensive and striking weapons before they can give consideration to the improvement of auxiliary equipment even though its desirability is readily admitted. Viewed in this light it is gratifying...to see helicopters accorded as much attention as they are in these trying times...” The army could expect very little help in the improvements in helicopter techniques. The Air Force continued to develop and test only small observation helicopters, under a very restricted schedule.93

The Air Force shared the same concerns that most Army leaders did about the helicopter’s combat potential. When combined with the Air Force fascination with the big bomber and nuclear weapons, there existed little urgency for the Air Force to develop the helicopter. Lieutenant General James M. Gavin experienced the Air Force’s lethargy when he tried to discuss the development of the helicopter with the Air Force’s director of requirements. The Air Force general bluntly informed Gavin: “The helicopter is aerodynamically unsound....No matter what the Army says, I know that it does not need any.”94

93Galvin, Air Assault 256.
Despite these concerns, the helicopter’s potential to enhance airborne operations convinced the Army to buy a small number more during the Berlin Crisis. Using the $10 million in the supplemental budget for fiscal year 1948 dedicated towards buying Army aircraft, the Army allocated $800,000 to buy 100 L-16X and 25 L-17 liaison aircraft, $1.6 million for helicopters (especially the H-13), $6.9 million for gliders, and $278,000 for 38 liaison aircraft. While the Berlin Airlift continued, Army and Air Force negotiators continued to find time to try and resolve their differences. Eight days after the Soviet Union lifted the blockade on Berlin on 12 May 1949, the product of their efforts was released. Known as Joint Army-Air Force Regulation 5-10-1 (JAFFR 5-10-1), it listed the missions that army aircraft could be used. It also established weight limitations for Army aircraft at 2500 pounds for fixed wing aircraft and 4000 pounds for helicopters. The Army’s increasing interest in the helicopter prior to the Korean War culminated on 17 November 1949 with the report of the Commanding General, Army Field Forces Board No. 1. The Board concluded that the Army needed six types of helicopters including a flying crane capable of lifting ten tons for a distance of 100 miles and a medium transport helicopter capable of lifting four tons for 200 miles. Seizing

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96*History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation.* pg 3, para 18. It authorized Army aviation to perform aerial surveillance, route reconnaissance, artillery adjustment, emergency transportation, and emergency MEDEVAC. The weight and mission limitations would also be included in the joint regulation AR 700-50 and AFR 65-7 on 23 March 1950. See also Stephenson, 6.

upon this report, the Office of the Chief of Army Ground Forces generated requirements for light, medium, and heavy-lift helicopters.98

General Galvin makes the claim that "The real limitation on the army's helicopter program, however, was the continuing emphasis on the parachute as the means for providing air mobility to ground troops."99 In the rapid post-war demobilization, the Army went from more than 85 divisions to less than 20 in less than 18 months. The Army made an extra effort to keep two airborne divisions among the survivors, the 11th and the 82nd Airborne Divisions. Their status as elite units kept them fully manned and allowed them the opportunity to participate in almost every major field exercise from 1945 to 1950. The Army also made extensive efforts at improving the equipment used in airborne operations. It replaced canvas and wood gliders with all metal ones and developed the C-82 "Flying Boxcar" as a replacement for the venerable C-47.100 The Army's focus on its airborne component kept these forces well-trained and well-equipped. While Galvin's claim has merit, it is also true that the support of the airborne allowed for additional testing and limited procurement with the expectation that the airborne would derive the greatest immediate benefit.

Conclusion

The period between the wars is one of contrasting performances in the development of air mobility. The Marine Corps had a vision and successfully began its

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99Galvin, Air Assault 256
exploitation of the helicopter. The Army perceived some of the helicopter’s potential but did relatively little to develop the situation. The reasons for the dichotomy in performance are many and complex. Each service interpreted the impact of nuclear weapons on their mission very differently. Their mere presence appeared to make large armies obsolete, but did not completely remove the need for an Army to occupy and control the defeated enemy. Forces with great strategic mobility, like airborne units, would be needed to seize enemy bases and nuclear weapon sites. As the Soviet Union and its large conventional forces emerged as the primary threat in the late 1940s, the Army focused on refining its organization and doctrine to make its conventional forces more mobile and powerful. Little attention was paid to the use of nuclear weapons on the battlefield. Unlike in the Army, nuclear weapons threatened to make the Marine Corps’ primary mission, large amphibious assaults, impossible. With its very existence threatened, the Marine Corps embraced the helicopter as the solution to modern amphibious assault operations.

While survival of the Corps dictated that this change would have to occur, the Marines’ previous experience with innovation had created an environment conducive to innovation and the creation of a new doctrine. In addition, the relationship that the Marine Corps had with the Navy was significantly better than that which the Army had with the Air Force. While the Navy was concerned with maintaining naval aviation, it did little to impede the Marine Corps’ efforts. In contrast, the Army bureaucracy did not

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106Galvin, Air Assault 256. The C-82 was a twin engine transport that utilized a monorail system to drop large loads out its rear door. First used in Exercise Combine at Fort Benning in 1947, the C-82 greatly increased the efficiency of airdrops.
see the need for any extensive changes. While receptive to the helicopter, the Army did not have a directorate responsible for developing Army aviation. This resulted in a lack of leadership to direct the aviation program and prevented aviation from having an important voice on the Army staff. The development of all aspects of Army aviation suffered from Air Force opposition to any expansion of the organization, roles, and missions of Army aviation.

The result was that the Marine Corps was able and willing to fund the development of its ‘vertical envelopment’ concept. The Marines took great care to promote the success and importance of the concept both within the beltway and in the popular media thus ensuring appropriations. The Army could not do this. Suffering from a small budget and extensive commitments, it had to be very careful in how it apportioned funds. It lacked the will to set aside a significant amount of scarce funds and personnel on a contraption that was both expensive and unproven. The helicopter’s limited capabilities also made it hard for the average person to envision the helicopter’s potential to alter the ways future wars would be fought.
SECTION II

KOREA: A WATERSHED (1950-1953)

It was the Korean War which first brought widespread attention to helicopters. The USMC’s exploits with the helicopter were recounted in periodicals across the nation. Used to transport men and supplies into the combat zone, the helicopter provided the Marines, an unprecedented degree of tactical mobility on land. The Marine Corps’ experiences verified their belief in the helicopter, enhanced support for the helicopter program’s development, and aided in the further refinement of its doctrine.

The Army entered the Korean War much less prepared than the Marine Corps. Whereas the Marines wrote a doctrinal document for helicopter assaults and created an experimental unit to test and refine it, the Army could only bleakly look to its limited experiments with the 82nd Airborne Division. Despite this negligible effort, soldiers quickly found many uses for this versatile machine. Wire laying, command and control of columns, messenger service, artillery spotting, and transporting supplies were a few of the missions performed. The most well known use was aerial medical evacuation (medevac). The successful use of the helicopter to save American lives brought much needed publicity while also permanently changing the support of forces on the battlefield. By the end of the war, the Army’s experiences displayed the helicopter’s potential as a
logistics tool, but efforts at expanding its role as a combat transport had been confined due to a lack of vision within the Army and to disagreements over roles and missions with the Air Force.

The Marine Corps' use of the helicopter to transport troops in a combat zone began a new era in helicopter operations. For the first time in a combat environment, the helicopter demonstrated its ability as more than a vehicle for supply. The Marine Corps' willingness to use the helicopter in this capacity stemmed from its experiments and exercises conducted in the years prior to the Korean War. The experiments with air envelopment gave the Marine Corps a great deal of experience in mass helicopter flying. These experiences resulted in the creation of Phib-31, the first tactical doctrine for helicopter assault. Although the Army had monitored the Marines' experiments at Quantico, by contrast it lacked any experience until the 6th Transportation Company (Helicopter) participated in Exercise Southern Pine in the summer of 1951.
CHAPTER 3

THE MARINE EXPERIENCE: A DOCTRINE VERIFIED

When the Marines landed in Korea on 2 August 1950, the commander of the 1st Provisional Marine Brigade,¹⁰¹ Brigadier General Edward A. Craig, found the helicopters of VMO-6 to be extremely useful. Craig frequently employed the unit’s Sikorsky HO2S-1 helicopters to control his brigade, which at one point was fighting at points 25 miles apart in the Pusan Perimeter.¹⁰² Since the helicopters were too small to carry troops, Craig also used them for reconnaissance, liaison, laying wire, evacuating casualties, and rescuing downed pilots.¹⁰⁷ While these missions were not glamorous, they were essential and “reinforced the Marine conviction that helos had an important battlefield role.”¹⁰⁴ Large scale heliborne activities could not be conducted because of the small number of helicopters in theater at the time. It was not until 30 August 1951 that the first USMC transport helicopter squadron arrived in Korea. Designated Marine Helicopter Transport


¹⁰²The Sikorsky HO2S-1 helicopter was a two seat reconnaissance and observation helicopter built by Hughes.

¹⁰⁷J. Robert Moskin, The U.S. Marine Corps Story (New York: McGraw-Hill Book Company, 1977) 673. Brigadier General Craig performed the first air rescue in the Korean War when he used his helicopter to rescue Lt. Doyle Cole after his Corsair was shot down on 11 August 1950.

¹⁰⁴Millett, Semper Fidelis 505.
Squadron 161 (HMR-161) and commanded by Lt. Col. George W. Herring, it was equipped with fifteen of the larger and more capable Sikorsky HRS-1 helicopters. With the arrival of this unit “A new era of military transport had dawned.”

Prior to the Korean War, the Marine Corps had made detailed plans for the commissioning of at least two helicopter transport squadrons. Headed by Major General Oliver P. Smith, the 1948-49 Marine Corps Board’s single recommendation was “that a transport helicopter program with the objective of activating one 12-plane squadron [on each coast] in 1953 and one such squadron in 1954 be initiated immediately.” The lack of funding prevented the recommendation from being adopted in 1949. The terrain in Korea quickly confirmed the requirement and need for helicopters and the war placed an urgency that, along with emergency funding, allowed for the rapid creation of these new units.

The Marine Corps commissioned HMR-161 on 15 January 1951. Commanded by Lieutenant Colonel George W. Herring, the unit did not receive its first helicopter until 7 April 1951 and only totaled three by the end of the month. The helicopters were the capable Sikorsky HRS-1. The Marine Corps accepted the HRS-1 as an interim aircraft

\[105\] The designation HMR-161 means: H=Helicopter; M=Marine; R=Transport; West Coast Units were part of the First Wing and designated 161, 162, etc.; units on the Eastern Coast were part of the Second Wing and designated 261, 262, etc.

\[106\] Moskin, \textit{USMC Story} 663, 779.


\[109\] Herring had previously been the executive officer for HMX-1.

\[110\] The HRS-1 was an aircraft with a single main rotor and a vertical tail rotor. A ten-place aircraft, it was designed with a crew of two and a full load of oil and fuel, to cruise at 90 knots while carrying a payload of 4,420 pounds at sea level. The HRS-1 could lift 1,500 pounds or 4-6 combat-equipped troops or 3-5 litter
in July 1950 because the helicopters proposed by the Marine Corps Board in 1949 had not been funded. Despite the lack of aircraft, the squadron embarked on an ambitious flight training program and logged 339.1 rotary-wing hours by the end of the month.\textsuperscript{111}

For the next four months as the unit continued to slowly receive its helicopters, the training of pilots and maintenance crews continued to be the squadron's priority.

The urgent demand for helicopters in Korea necessitated the deployment of the unit to Korea earlier than planned. The conflict provided an opportunity to "complete the testing of the HRS and the evaluation of tactical concepts." Receiving the alert notification on 10 July 1951, the unit began its preparation for deployment. During their preparations, they performed a demonstration at Camp Pendleton, California, on 18 July. Carrying assault troops, 75mm pack howitzers, supplies, and simulated casualties, the unit introduced to the press the Marine doctrine for using helicopters in combat.

Departing the United States in mid-August, the unit arrived in Korea on 30 August 1951. Administratively attached to the 1st Marine Aircraft Wing, the squadron fell under the operational control of the 1st Marine Division. This arrangement would continue throughout the Korean War.\textsuperscript{112}

On 13 September 1951, the squadron executed Operation Windmill I. The unit’s helicopters transported a day’s worth of supplies to the 2nd Battalion, 1st Marines which was preparing for an attack from one hill to another. The battalion had been relying on 400 Koreans of the Korean Service Corps to carry its supplies over a treacherous four
casualties when operating in mountainous terrain. The large variance in field capabilities depended on the altitude, temperature, fuel load, and pilot experience.

\textsuperscript{111}Parker, \textit{Squadron 161}, 2.
miles of foot trails through the mountains. The Koreans' valiant efforts could not adequately support the logistical requirements of the battalion in combat. Using HMR-161 to make up the shortage, the helicopter squadron moved 18,848 pounds of cargo and evacuated 74 casualties a distance of seven miles.\textsuperscript{113} Two days later the unit repeated the mission after getting the request at 1130 hours that day. Dubbed Windmill II, the squadron transported, on very short notice, more than six tons of supplies in one hour with just ten aircraft and a total of 18 flights.\textsuperscript{114} While these operations were more experimental than necessary, they allowed the air and ground units to develop standard operating procedures and served as a rehearsal for the next operation that would alter how future wars would be fought.

On 21 September 1951, the USMC conducted the first ever combat movement by helicopter during Operation Summit. Since both Major General Gerald C. Thomas, commander of the 1st Marine Division, and Colonel Victor H. Krulak, division chief of staff, were avid helicopter enthusiasts, they decided to use helicopters to fulfill a requirement to relieve a ROK regiment occupying a remote hill.\textsuperscript{115} Although an airlift of such proportion by helicopters had never been done before, the performance of the unit in its first few weeks in country convinced them that it could be done.

In a period of four hours, HMR-161 landed 224 Marines of the Division Reconnaissance Company at two sites on a hill in the main line of within enemy mortar

\begin{footnotesize}
\textsuperscript{112}Parker, \textit{Squadron 161}, 3.
\textsuperscript{113}Parker, \textit{Squadron 161} 4. For an after action account, see Colonel F.B. Nihart, Comments on draft manuscript (of Parker's official history), dated 16 February 1968 in HMR-161 Comment File.
\textsuperscript{114}Parker, \textit{Squadron 161}, 4.
\textsuperscript{115}Millett, \textit{Semper Fidelis} 505.
\end{footnotesize}
range. The initial assault squads descended from the hovering helicopter down a thirty-foot knotted rope. Once on the ground they quickly cleared landing zones for the follow-on flights. Each helicopter carried five fully equipped Marines and transported the force from its assembly area to the objective in only eight minutes; much shorter than the nine hours it would have taken the Marines to roadmarch through the mountainous terrain. After moving all the men and equipment, the squadron took only fifteen minutes to lay eight miles of communication wire that connected the reconnaissance company with the division command post. The successful movement of the Marines to the renamed "Mount Helicopter," earned front page coverage in many newspapers throughout the United States.

Despite being an unopposed operation, Operation Summit’s success encouraged the division’s leadership to conceive an even more ambitious operation. Since the communist forces utilized the hours of darkness to maneuver and attack, the Marines desired a way to counter the enemy’s tactics in a quick and decisive manner. Intended to gain experience in operating in adverse weather conditions, Operation Blackbird was a plan to move a company from the division reserve to a predesignated position near the front. The squadron practiced flying at night and conducted a full dress rehearsal during daylight hours prepared both the ground and the air units for the operation. On 27 September, Operation Blackbird commenced, and as planned the unit conducted a night transport of E Company, 1st Marines, from its reserve position to a position on the front.

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117 Parker, *Squadron 161*, 4; Millett, *Semper Fidelis* 506. The squadron flew 65 flights which also included lifting a total of 17,772 pounds of cargo.
line. Although HMR-161 successfully moved all 223 men and equipment, there were many problems with the operation including inadequate lighting at the landing zone, helicopters lacking night instrument lighting, and a lack of a night navigation system to direct the helicopter to the landing zone. The hazards of operating at night in the vicinity of the enemy convinced planners to restrict future such night movements to within friendly territory, but the unit continued to conduct night indoctrination flights for its pilots.\textsuperscript{118}

Operations quickly involved the movement of larger units. In Operation Bumble Bee, HMR-161 moved the entire 3rd Battalion, 7th Marines, to a position near the front on 11 October so that it could relieve a battalion of the 5th Marines. Using twelve helicopters, they lifted the entire battalion of 958 combat-equipped marines in an operation that lasted approximately six hours, required 156 flights and again made headlines. Four days later, six helicopters from HMR-161 transported 19,000 rounds of ammunition to a surrounded ROK unit and then evacuated 24 wounded. The unit continued its hectic pace for the remainder of the month performing additional troop and supply lifts, reconnaissance for commanders, evacuating casualties, and laying communication wire. By the end of its first two months in Korea, HMR-161 had flown more than 1,200 flight hours on over 1000 flights (to include 192 medical evacuations), lifted over 150 tons of supplies, and transported more than 1400 Marines.\textsuperscript{119}

\textsuperscript{118} Parker, \textit{Squadron 161}, 5. The squadron’s success was due to the great skill of the pilots and crew. The unit’s log acknowledges that the equipment available at the time was unsuited for conducting large scale operations at night within the range of enemy fire. See HMR-161 Squadron Historical File (HistRefSec, Hist&MusDiv, HQMC).

\textsuperscript{119} Parker, \textit{Squadron 161}, 6.
Throughout the rest of the war, the squadron found itself in constant demand and performing operations of ever greater magnitude. The largest support mission was performed in February 1953 when the squadron transported supplies for two regiments for five consecutive days.129 The division experimented with HMR-161 performing many other types of missions. One of these was conducting counter-guerrilla operations. Operation Bushbeater was the first of these efforts. Begun in October 1951, the helicopters landed armed patrols in selected rear areas of the division. The terrain and weather conditions made it extremely hard for the Marines to disembark from the helicopters, but careful study of the terrain and weather eased some of that difficulty. In December 1951, the division again employed the squadron to carry armed reconnaissance troops and to cover areas that could not be reached by ground patrols. If they found anything unusual they were to lower a Marine patrol by knotted ropes to investigate.

During another relief in place mission in mid-December, Operation Farewell, the Marine innovator Colonel Keith B. McCutcheon took command of HMR-161 from Lieutenant Colonel Herring. McCutcheon continued to develop new tactics, techniques, and procedures for moving troops and supplies in the Korean theater. When the 1st Marine Division moved to the Western Front, the squadron also moved. Its first operation in this new sector occurred on 5 April. Given only three and half hours notice, the squadron successfully transported 662 troops and 10,000 pounds of rations in 99 flights and 115.9 hours of flight time. Known as Operation Pronto, the round trip average distance of 57 miles was the longest performed up to that point for any mass movement.

129Parker, Squadron 161, 11. This was Operation Haylift II.
Colonel McCutcheon recognized the significance of the mission’s success by proclaiming
"This airlift, more than any other in which HMR-161 has participated, proved that a
Marine transport helicopter squadron can successfully operate as an ‘on-call’ tactical
tool..."\(^{121}\)

Another experiment was the movement of rocket batteries by helicopter. Called
Operation Ripple, it began on 19 August 1952 and evaluated the helicopter’s ability to
rapidly redeploy rocket launchers and their supporting personnel and equipment from one
firing point to another. The rocket batteries created large dust clouds when fired,
revealing their position and making them very vulnerable to counter-battery fire. Prior to
the starting of the exercise, the 1st 4.5-inch Rocket Battery and the HMR-161 developed
TTPs and practiced them. The coordination resulted in new methods for sling-loading
and the development of procedures which ensured minimal time to establish a firing
position, fire the rockets, and then shift to another position.\(^{122}\)

Consistent with the initial intent of testing ideas, the Marine Corps conducted
twelve Marine Landing Exercises (Marlex) beginning in June 1952 and continuing
throughout the rest of the year. The intent was to evaluate the vertical envelopment
concept. Due to a lack of an available carrier, the early exercises substituted the island of
Sung Bong-do, approximately 40 miles southwest of Inchon to represent the carrier.
These early exercises encountered very few difficulties and confirmed the basic tenets of
Phib-31. It was not until the first two days of September 1952 that a carrier (the USS

\(^{121}\)Parker, *Squadron 161*, 8. Cite: Marine Transport Helicopter Squadron 161 Historical Diary, March
1951-March 1955 and HMR-161 Squadron Historical File (HistRefSec, Hist&MusDiv, HQMC).
\(^{122}\)Parker, *Squadron 161*, 10.
Sicily) became available for these exercises. The squadron would execute only two more large-scale landing exercises in 1953 before the armistice on 27 July.\textsuperscript{123}

By the end of the Korean War, the Marine Corps had performed the first helicopter lift of a combat unit in history. The two USMC helicopter units had transported more 60,046 men and 7.5 million pounds of cargo. The helicopter units swiftly transported 9815 seriously wounded personnel from the front to medical facilities which resulted in many more saved lives than could have been possible using the traditional ground evacuation procedures.\textsuperscript{124} Among many other things, the Korean War enabled the Marine Corps to put into action what it had developed in the years prior to 1950. While not used in a combat amphibious assault, the mass movement of large numbers of troops and supplies combined with the Marine landing exercises validated the concept of vertical envelopment. The extensive and continuous activities of HMR-161 and VMO-6 demonstrated the helicopter’s durability and showed that the helicopter could survive on the modern battlefield and still perform its support missions for ground troops. Its performance “convinced Marine planners that the helicopter would eventually revolutionize Marine Corps operations. A new era for Marine air-ground cooperation had dawned.”\textsuperscript{125}

The Marines successful exploitation of the helicopter was due to a combination of factors. First, the nature of the threat and the terrain in Korea provided an excellent

\textsuperscript{123}Parker, *Squadron 161*, 9-12.

\textsuperscript{124}Moskin, *USMC Story* 663, 812. The HMR-161 transported all of the men and cargo; it also evacuated 2,748 wounded. The smaller helicopters of the VMO-6 performed many utility missions and also evacuated 7,067 wounded during the war.

\textsuperscript{125}Millett, *Semper Fidelis* 506; Montross, *U.S. Marine Corps...vol 4* 156-179.
opportunity to test doctrine and aircraft in a combat environment. Second, the
development of doctrine, tactics, and equipment before the war were invaluable. A more
important third factor was the Corps' embracing of the helicopter as an essential
component for performing its mission. This created a positive environment which
allowed a great deal of experimentation in a combat setting. Leaders of both the ground
and air elements were receptive to new ideas and willing to implement them in the desire
to increase effectiveness. It is significant that the commanders of the HMR-161
Squadron all had previous experience in the HMX-1 unit prior to the Korean War.\textsuperscript{126}
Their experiences in that unit proved useful in refining doctrine while also encouraging
further experimentation. Without the confluence of these factors in Korea, the Marine
Corps' experience would have been much different.

\textsuperscript{126}Not mentioned in this essay, in August 1952 Lieutenant Colonel John F. Carey assumed command of
HMR-161 from Colonel McCutcheon. Carey had previously commanded HMX-1.
CHAPTER 4

THE ARMY: NOTHING VENTURED, NOTHING GAINED

When the North Koreans invaded South Korea on 25 June 1950, there were only a few light fixed-wing aircraft and no helicopters available to the American forces in the Far East. In fact, the Army as a whole possessed only 56 utility/observation helicopters and no cargo helicopters on 30 June 1950. Korea’s geography of high and rugged mountains combined with a primitive surface infrastructure to make the movement of supplies and personnel a challenging one at best. This was not an environment suited to the mechanized and motorized Army that fought victoriously in Europe only five short years before. Reliant on the few available roads, American forces became predictable targets that were often ambushed by the enemy. The helicopter, unrestricted by terrain and obstacles, could at least provide a partial solution to this problem.

Early in the war, requests for more helicopters came to Washington with increasing frequency from Korea. Having observed firsthand the many uses of the helicopter in Korea, General MacArthur’s Far East Command made repeated requests to

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128 John W. Kitchens, “Cargo Helicopters in the Korean Conflict” U.S. Army Aviation Digest (November-December 1992) 38. 52 were the Bell H-13B Sioux and 4 were the older Bell YH-13A.
Washington requesting additional aircraft, especially helicopters.\textsuperscript{129} These helicopters would be used to perform a myriad of tasks much like their Marine counterparts: liaison activities, reconnaissance, medical evacuation, short transport of supplies, wire laying, and artillery spotting were only a few of the many missions. While the Army made plans for an extensive increase in the number of helicopter units, its efforts were delayed by almost two years. It was not until 1953 that the Army deployed its first helicopter company to Korea. By the end of the war, the Army had fewer 200 helicopters in theater operating in two transportation companies, medical evacuation detachments, and independently.

The successful employment of the utility helicopter in the medevac role garnered most of the public recognition. At the same time, the Army and Marines continued to experiment with using the helicopter in other ways. The significance of these concurrent developments remained obscure until the announcement of the Marine Corps’ much publicized Operations Summit Bumble Bee.\textsuperscript{130} Little public fanfare met the announcement that the Army was forming transport helicopter companies; only those associated with the development of helicopters and transportation found it exciting. The Army’s intentions “did not make the same strong public impression as recorded by other helicopter developments. Routine development rarely does.”\textsuperscript{131}

\textsuperscript{129}Memorandum from Major General Charles Bolte, Army G-3, to Chief, Army Field Forces, 5 September 1950.

\textsuperscript{130}“21 Sikorskys Land Marine Company on Korean Mountain,”\textit{American Helicopter} 24 (October 1951) 3.

\textsuperscript{131}Albert Newton (Lieutenant Colonel, USA), \textit{The Use of the Helicopter in Military Cargo Operations} (Unpublished MA Thesis, University of Southern California, June 1952) 30-39.
On 1 December 1950, the Army activated the 6th Transportation Helicopter Company at Fort Sill, Oklahoma, under the provisions of T/O&E 55-57T.\textsuperscript{132}

Unfortunately, acquisition delays prevented the company from reaching full strength until 6 December 1951, over a year after being activated, and it would not receive its first cargo helicopter until the summer of 1952. Still, the company participated in many exercises which demonstrated the unit's capabilities and versatility and garnered much respect and praise from the ground commanders and increased the awareness of the helicopter and its potential.\textsuperscript{133}

The unit minus its helicopters arrived in Korea on 5 January 1953. During the next few months the helicopters were ferried in and it was not until 24 March 1953 that the company reached its strength of 20 H-19 helicopters. It performed its first mission on 20 March 1953 when it transported 17 tons of supplies in just 80 minutes to forward elements of the 3rd Infantry Division which were cut off due to flooding. During the next four months the 6th Transportation Company executed six operations to determine the

\textsuperscript{132}This was the Transportation Helicopter Company Tables of Organization and Equipment (T/O&E) 55-57. Authorizing 21 helicopters per company, the mission of the unit was "to provide short-haul air transport to expedite tactical operations and logistical support in the forward areas of the combat zone." This mission included both "logistical and tactical." It was intended that a helicopter transport company be capable of moving an infantry rifle company in one lift. These and other missions in the document provided the first glimpses at what would later become air mobility. See the report prepared for the Army Chief of Transportation entitled Army Helicopters Transport Cargo: An Evaluation of 1950-1953 Experiences as a Basis for Current and Future Programming (1 January 1954) no pagination.

\textsuperscript{133}The major exercises were Southern Pine (13-17 August 1951), Snowfall (17 January -16 February 1952), and Longhorn (25 March-15 April 1952). In Exercise Longhorn Air Force opposition denied the Army an opportunity to integrate for the first time a helicopter unit into ground combat operations. The helicopters were to perform two air mobility type missions -- moving an infantry company from a reserve to a position on the front and the evacuation of an infantry company from an exposed position but were denied by the Deputy Maneuver Commander, an Air Force officer, because they violated Air Force policy. For more information see Jean R. Moenk, A History of Large Scale Army Maneuvers in the United States, 1935-1964 (Fort Monroe, VA: Headquarters CONARC, 1969) 153, 163, 170-179; "Army Helicopters to Fly Cargo at Longhorn," Transportation Corps Notes, Department of the Army, March 28, 1952, p.2. Army Helicopters, Transport and Cargo Annex A, C, D, and E.
feasibility of using helicopters to support large tactical units.\textsuperscript{134} While none of these missions were performed under the threat of enemy fire, they still provided excellent experience and verified the helicopter’s capabilities in the harsh environment of Korea. These operations also convinced military leaders of the helicopter’s combat potential. Lieutenant General Isaac D. White commented that, “The helicopter delivery of lightly equipped combat elements, directly to critical blocking and holding positions in advance of the main body of a striking force, is a practical maneuver.”\textsuperscript{135}

The Korean War provided aviation supporters with an opportunity to finally increase the size and role of army aviation. The Army Operations Officer, Major General Charles Bolte, was one of these promoters. Army studies in the years prior to the Korean War had shown the helicopter to be a very versatile tool which could provide the short-haul capability needed at all levels.\textsuperscript{136} Once the war began, he immediately had his G-3 staff implement a program in August 1950 to field the five helicopter transport companies.\textsuperscript{137} The Army’s interest in the helicopter continuously increased and by the end of the war there were proposals envisioning an aviation component exceeding 10,000

\textsuperscript{134}Army Helicopters, Transport and Cargo Annex A, K-P.

\textsuperscript{135}Army Helicopters Transport and Cargo Annex Q. This is an extract from CG, X Corps to CG, EUSA dated 4 July 1953.

\textsuperscript{136}The most far-reaching was the Army Field Forces Board No.1 of 1949. See Aircraft Service Test Section, Army Field Forces Board No.1, 16 November 1949, “Report of Study Project Number GA 249.

\textsuperscript{137}Memorandum from Major General Charles Bolte, Army G-3, to Chief, Army Field Forces, 9 August 1950; Richard P. Weinert, A History of Army Aviation -- 1950-1962 (Fort Monroe, VA: Office of the Command Historian, USA TRADOC, 1991) 15-16; Joseph Bykofsky, The Support of Army Aviation, 1950-1954 (Washington, D.C.: Department of the Army, Office of the Chief of Transportation, 1955) 15-17. These companies were to be equipped with the H-19 Chickasaw helicopter. The last company would not be formed until the second half of FY 1951, since it was to be equipped with the H-21 Workhorse helicopters which were not expected to be in service until the Fall of 1951.
aerial at a cost of over a billion dollars. The Army G-3 even recommended creating experimental helicopter transport units as organic components of divisions and lower to test the feasibility of substituting helicopters in lieu of ground vehicles.

An even more voracious proponent of the helicopter was Major General Frank Heileman, the Army’s Chief of Transportation. He considered the cargo helicopter to be a vital piece of the Army transportation system and pushed for a plan in June 1951 to begin procurement of 3,000 helicopters. He argued that the helicopter represented “a greater relative addition to the ability of the Army than the introduction of the motor vehicle” and could provide an element of surprise in military operations by its ability to improve mobility and concentrate forces at critical points. Heileman also proposed that the Army should employ helicopters to tactically deploy troops much like what the Marines were doing. He envisioned the helicopter as having an almost unlimited role on the battlefield. Emphasizing centralized control under the field army G-4, Heileman envisioned helicopter battalions providing “short haul air transport for combat divisions on a basis similar to that of our present truck companies. In addition to helicopter transport companies, thought is being given to using helicopters in battalions and companies of combat units to complement and to replace, partially, the present vehicular transport of these units.”

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138 Memorandum for File: Discussion with Secretary Pace, General Collins, General Hull, Army: Under Secretary McCone and General Vandenberg, Air Force; Subject: Liaison Aircraft Helicopters (sic) as found in History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation (No other bibliographic data available, found in MHI library) Tab M.

139 Army Helicopters, Transport and Cargo Annex B.

140a Air Transport,” Officer’s Call 3:12. To ensure the rapid development of the helicopter program, Heileman recommended the forming of a panel to oversee the development of the transport helicopter program for the Army Chief of Staff. See (1) Memorandum from Department of the Army, Assistant Chief
The Department of the Army initially rejected any expansion beyond five companies because of the cost, Air Force reluctance to procure, and questions concerning the helicopter’s ability to reliably perform the transportation mission in a combat environment. After the Marines received extensive publicity for their Operation Summit in September 1951, the Army found the money to expand the program to ten companies. The Air Force performance in Korea combined with a greater understanding of the helicopter to convince General Collins in August 1952 to authorize a modified program of twelve transportation battalions. Procurement was to be over a five year period at a cost of $688 million and would require 6,000 personnel. In October 1952, the Secretary of the Army approved the program and thus began the expansion of the Army aviation program.

of Staff, G-3, to Chief of Transportation, 19 November 1951, Subject: Requirements for Cargo Helicopters.
(2) Letter from Chief of Transportation to Department of the Army, Assistant Chief of Staff, G-3, dated 4 December 1951, Subject: Army Helicopter Program, with 1st Endorsement ATTN G-22 457 (4 December 1951).

141 Weinert, History of Army Aviation 21-22.
142 Weinert, History of Army Aviation 23-24. Cite of Letter from Chief, Army Field Forces, to Department of the Army, Assistant Chief of Staff, G-3, 29 January 1952. (1) Summary Sheet G-3 452 (4 March 1952), Department of the Army G-3 OT Division Organization R&D Branch, dated 28 April 1952, Subject: Requirements for Cargo Type Helicopters. (2) Bykofsky 22-23. The 1951 and 1952 budgets authorized procurement of 97 H-19s and 85 H-21s while the 1953 budget added another 80 H-19s.

143 This program was based on the Materiel Requirements Review Panel of 1952. In addition a research and development program funded at $15 million per year was to be established to support the development of the helicopter and related equipment. The panel also urged the Army to assume responsibilities for procurement from manufacturers, all levels of maintenance, and all areas of pilot training. In addition, the panel recommended that a staff section be created in the Army G-3 that would oversee the aviation program. Weinert 33-38. Cite of Memo G-3 452 (30 June 1952), Brigadier General G.J. Higgins for Army Chief of Staff, dated 31 July 1952, Subject: Materiel Requirements Review Panel Review of the Army Helicopter Program.

144 Weinert, History of Army Aviation 38. Cite of (1) Memo from General J. Lawton Collins to the Secretary of the Army, dated 28 August 1952, Subject: Army Helicopter Program. (2) Memo from Secretary of the Army Frank Pace Jr. to Army Chief of Staff, dated 2 October 1952, Subject: Army Helicopter Program.

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The most significant reason for the slow deployment of cargo helicopter units by the Army was the acrimonious disagreements between the Army and the Air Force concerning procurement, roles, and missions. The Army believed that it had the responsibility to perform transport missions within the combat zone and intended “to meet the Army’s requirements for transportation [using] rotary-wing type aircraft.”\textsuperscript{145} The Air Force maintained that it had primary responsibility for providing airlift for the Army. Since the Air Force had primary responsibility, the Army’s helicopter companies by definition must therefore be limited and secondary.\textsuperscript{146} Using these definitions, the Air Force justified filling its own helicopters units before allocating critical aircraft for the Army to perform a limited function.\textsuperscript{147} Many efforts were made to resolve these differences.

The National Security Act of 1947 and its 1949 amendment described roles and missions in vague terms which resulted in different interpretations by each service. Realizing that it could not eliminate Army aviation, the Air Force sought to use the National Security Act and other agreements to limit the growth of Army aviation. Furthermore since the Air Force retained responsibility of procurement for Army aviation, it slowed Army aviation growth through selective procurement and fielding. Referred to as “command editing” the Air Force selectively procured aircraft for the Army regardless of the fact that Congress specifically authorized the aircraft. When the

\textsuperscript{145}History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation Tab Q.

\textsuperscript{146}The Air Force argued that “As such, this Army function was not intended to duplicate nor eliminate the Air Force function of providing the Army with assault transport and other troop carrier airlift... The function of aeromedical evacuation has been and is an Air Force responsibility.” History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation Tab R, S, T.
Air Force could not stop procurement, it still denied the Army by redirecting the new aircraft to recently formed air assault and medical air evacuation units.\textsuperscript{148}

Initially, the service secretaries and the Chiefs of Staff met to resolved the issue on 16 February 1951. It was at this meeting that the Army laid out its plan to procure a total of 10,600 helicopters and liaison aircraft by the end of 1952 with the eventual total to be a fleet of approximately 20,000.\textsuperscript{149} The magnitude of the Army’s proposed program shocked General Vandenberg who noted that the proposed fleet would be more than the entire procurement of aircraft for the Air Force. General Vandenberg proposed that the Army’s backorder on one hundred helicopters currently be requisitioned from the Air Force but emphasized that this would not change the existing weight limitations. The services would revisit the subject once the Army’s experiments had concluded and the Army had a firm number on what aircraft it actually needed. The Army representatives agreed with Vandenberg’s proposal and very happily left the room with all of their immediate objectives accomplished. This began the Army’s gradual shift away from fixed-wing aircraft since the Army managed to convince the Air Force to procure a limited number of the congressional authorized cargo helicopters, but could not get the

\textsuperscript{147}Weinert, \textit{History of Army Aviation} 33-34.


\textsuperscript{149}Memorandum for File: Discusion with Secretary Pace, General Collins, General Hull, Army; Under Secretary McCone and General Vandenberg, Air Force; Subject: \textit{Liaison Aircraft Helicopters} (sic) as found in \textit{History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation} Tab M. The 1952 budget included 1156 H-19 helicopters (72 were in the 1951 budget) with an estimated procurement cost of $487,200,000; and 813 H-21 helicopters at an estimated cost of $610,000,000. The total cost for just these two items equaled $1,102,000,000, with all the helicopters delivered by 1955. The remainder of the planned Army program would, when including spare parts, total another $1.5 billion. This budget did not include any of the related costs: facilities, training, ground equipment, and maintenance depots.
Air Force to procure any L-20 and L-23 airplanes for Army use nor did it get a removal of the limitations on aircraft weight.\textsuperscript{150}

Despite this agreement, interservice disputes over roles and missions continued. These arguments eventually led to two agreements between the Secretary of the Army Frank Pace and the Secretary of the Air Force Thomas Finletter. The first agreement, completed on 2 October 1951, removed the weight limitation on Army aircraft and instead limited aircraft only in terms of the missions to be performed.\textsuperscript{151} Relatively quickly, different interpretations of this document arose between the Army and the Air Force. The Army’s program to field twelve transport helicopter battalions and twelve helicopter ambulance units directly clashed with the Air Force’s efforts to create assault groups. Unable to resolve the issue, both services continued to organize and equip aviation units to perform the same mission. Eventually, the Secretary of Defense, Robert A. Lovett, accepted the Army’s position on helicopter operations. However, Lovett did place limitations on the Army’s use of fixed-wing aircraft to ensure no duplication of the Air Force’s troop transport mission.\textsuperscript{152}

\textsuperscript{150}Once the Air Force finally agreed in February 1951 to procure a sufficient number of the Congressional authorized helicopters to equip the Army’s five transport helicopter companies, the program still moved slowly. This time the delay was due to the helicopter industry’s infant status. Production capacity was limited, and the orders for the Air Force and Navy programs had tied up almost the entire capacity. The Army’s requisitions had to wait until the orders for the other services had been filled. Memorandum for File: Discussion with Secretary Pace, General Collins, General Hull, Army; Under Secretary McCone and General Vandenberg, Air Force; Subject: Liaison Aircraft Helicopters (sic) as found in History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation Tab M. Memorandum for Secretary Pace from Office of the Secretary of the Air Force, dated 1 August 1951 found in History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation Tab N.

\textsuperscript{151}History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation Tab P; John W. Kitchens, Command Historian, United States Army Aviation Center, undated, “Army Aviation and Search and Rescue” in historical chronology files at Army Aviation Historian Office.

\textsuperscript{152}History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation. pg. 5, par. 35, See also Tab V.
The Secretary of Defense’s decision led to the 4 November 1952 modification known as the second Pace-Finletter Agreement. This new agreement limited Army fixed-wing aircraft to 5000 pounds but allowed for the Secretary of Defense to make future adjustments based on advancing technology and mission requirements. It ensured the Army of a “definite and continuing requirement for helicopter units.”\footnote{History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation, pg. 6, par. 38.} The helicopter was defined solely in terms of performance of functions and not on size. The agreement recognized the Army’s support of its ground units in the combat zone to be a primary function but limited Army aviation to aerial observation, C2, transportation, and medevac within the combat zone.\footnote{Weinert, History of Army Aviation 38-39. Cite of DA SR 95-400-5, 19 November 1952. History of Army-Air Force Conflicts Concerning the Functions of Army Organic Aviation Tab W; In airborne operations the Air Force had responsibility from the objective area until ground link-up was achieved. In normal ground operations, the combat zone was defined as 50-100 miles behind the forward edge of the battle area (FEBA). This would be a point for further disagreement as helicopter performance improved. See also United States Senate Committee on Armed Services, Hearings Before the Special Subcommittee on Close Air Support of the Preparedness Investigating Subcommittee…, 92nd Congress, 1st Session (1972) 15; Bykofsky 27-29.}

The second Pace-Finletter Agreement proved to be satisfactory enough for and ‘normalized’ relations between the Army and the Air Force for the remainder of the war. The stabilized relationship allowed the Army to rapidly increase its procurement of helicopters. By the end of the war, the Army had over 800 helicopters of which 84 were cargo helicopters. The Army acquired two-thirds of these helicopters in the final year of the conflict, but only 200 helicopters made it to the Far East.\footnote{John W. Kitchens, “Cargo Helicopters in the Korean Conflict” U.S. Army Aviation Digest (November-December 1992) 38. Of the 800 helicopters 460 were Bell H-13s (including 405 of the newest E models), 262 were Hiller H-23s, 72 were Sikorsky H-19C cargo helicopters, and 13 were Piasceki H-25A Army Mule cargo helicopters. The Piasceki H-21C did not enter service until September 1954.}
Despite being the first to field a regular helicopter unit, it took the Army over eighteen months longer to conduct its first combat mission using a helicopter transport company. Why did the Army take so long compared to the Marine Corps and why did it not employ its helicopters for mass combat transport of soldiers? There is the obvious fact that the lack of helicopters played a significant part. The helicopter industry’s limited production capacity combined with interservice arguments denied the Army from fielding helicopter transport companies until late 1952. However, even if the Army had helicopter units available it is unlikely that any mass movement on a regular basis would have occurred due to its inexperience and lack of doctrine. By the time a sufficient number of cargo helicopters and trained personnel did arrive in Korea, the situation had become relatively static. The opportunity to employ helicopters in the offense had long passed. Still, the Army’s leadership failed to capitalize on the opportunities available to them in Korea. Whereas the Marine Corps used the war as an opportunity to perform more realistic experiments, the Army was content with limited operations. It had begun to move men and equipment in exercises in the United States, but it was not willing to push the conceptual envelope in Korea. The helicopter had conclusively shown its value for air rescue and aerial medical evacuation missions, but the same could not be said for the air mobile and logistical operations. The capability of performing these missions while opposed by the enemy had not been tested.\textsuperscript{156}

\textsuperscript{156}John D. Vanderpool Interview by Lieutenant Colonel John R. McQuestion, Senior Officers Oral History Project 83-12, page 41. Found in Oral History Box, \textit{The Jay D. Vanderpool Papers} at MHI. The Air Force’s rescue helicopters did operate under combat conditions, but only with fighter escort.
Yet the delay in creating such a program could have been averted if started earlier. Interest in the helicopter became a low priority after World War II. With a lack of priority came a lack of funding. This combined with the doubts surrounding the helicopter’s durability and capability ensured that practical experiments would not occur. Despite the Army’s lack of experience in helicopter operations, the Army staff could have drawn upon the knowledge already accumulated by the Marine Corps. Unfortunately, and for reasons that still remain unclear, the Army failed to take advantage of this source. In fact, the Army appears to have remained relatively ignorant of the Marine Corps’ progress with helicopters both before the Korean War and during it. Many of the key leaders in Army aviation remained unaware of the extent that the Marines had experimented with the helicopter.\footnote{An example of this is General Williams’ and General Howze’s claim minimal knowledge of the Marines’ progress. See General Robert R. Williams, Interview by Colonel Robert J. Powell and Lieutenant Colonel Philip E. Courts, 28-29 March 1978, and Hamilton H. Howze, Interview by Robert Reed, 5 February 1973. Both found in box A History of Army Aviation, Senior Officers Debriefing Program, MHI} This ignorance of Marine activities remained despite the popular media’s and military journals’ coverage of the Marine helicopter operations prior to and during the war.\footnote{“Navy XHRP-1 Helicopter” Military Review 27.5 (September 1947) 70; “Helicopter Squadron” Military Review 28.4 (July 1948) 71; “Marines Put on Show” Infantry Journal (July 1949) 41; Sergeant John S. Boyd, “Helicopter Warfare” in To the Editors Infantry Journal (June 1950) 32-33.} In addition, reports coming back from Korea repeatedly describe Marine Corps operations. This failure to capitalize on the experience of the Marines needlessly resulted in an Army program that had to suffer extensive intellectual growing pains to develop T/O&Es, doctrine, tactics, techniques, and procedures. This increased the time needed to organize, equip, and train helicopter units for deployment to Korea.
By the time the Korean War ended, there was a greater appreciation and awareness for the helicopter's capabilities. General Maxwell D. Taylor, commander of the Eighth United States Army wrote that helicopter operations in Korea "have left little doubt as to the capability of the cargo helicopter to fly units and supplies to points beyond the means of other methods of transportation. The cargo helicopter, employed in mass, can extend the tactical mobility of the Army far beyond its normal capability. I hope that the United States Army will make ample provisions for the full exploitation of the helicopter in the future." Despite accolades like this, there was relatively little thought to applying the helicopter in combat. It would take the publication of a small article in a popular magazine to spur interest in the next 'revolution' in warfare.

Section Conclusion

Why the Army did not employ its helicopters for mass combat transport of soldiers is hard to discern. There is the obvious fact that the lack of helicopters played a significant part. The helicopter industry's limited production capacity combined with interservice arguments denied the Army from fielding helicopter companies until late 1952. However, even if the Army had helicopter units available it is unlikely that any mass movement on a regular basis would have occurred due to a lack of experience and doctrine. By the time a sufficient number of cargo helicopters and trained personnel did arrive in Korea, the situation had become relatively static. The opportunity to employ helicopters in the offense had long passed. Thus its only experiences were on a static

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159 Army Helicopters Transport and Cargo Annex P.
battlefield which emphasized the helicopter’s logistical utility rather than its mobility differential.

Yet, the Army’s leadership failed to capitalize on the opportunities available to them in Korea. Whereas the Marine Corps used the war as an opportunity to perform more realistic experiments, the Army was content with limited operations that did not push the conceptual envelope. Thus, the Korean War confirmed for the Army the helicopter’s value as a military vehicle. The limited capabilities and small numbers of helicopters in the theater combined with the late arrival of the cargo helicopters prevented any thorough experiment with air mobility. The helicopter had conclusively shown its value for air rescue and aerial medical evacuation missions, but the same could not be said for the air mobile and logistical operations. The capability of performing these missions while opposed by the enemy had not been tested.160

The Army’s experiences during the Korean War would have a lingering effect on its future efforts at developing its aviation component. First the operations in Korea, the Medical Department’s active campaigning for a helicopter dedicated to medical evacuation, and a desire to allay Air Force fears pushed the Army to emphasize the helicopter’s utility as a logistics vehicle. The Transportation Corps’ focus on using the helicopter as a logistic tool was correct for its mission. As the concept of warfare changed, the pattern for supply and logistics also needed to keep pace. The Transportation Corps, which provided the means of distribution for supplies, had to be flexible in its approach and appreciation to meet those new demands. The problem was
that other uses for the helicopter received less attention and funding. So while Transportation Corps provided a valuable service by taking a moribund helicopter program from an indifferent Ordnance Corps, the potential still remained that the helicopter might only be seen as an aerial truck. To prevent this required the establishment of an agency dedicated to exploring aviation's full utility.  

Next, the Army's inability to obtain adequate quantities of aircraft in a timely manner, despite having a legitimate need and having Congressional funding, convinced many in the Army that it needed to gain total control over its own aircraft procurement and development. Despite being an immature technology, the helicopter had quickly become an issue between the two services. The helicopter was in the "unusual position of being an aviation vehicle whose major applications lie in non-aviation fields or in applications not yet encompassed by air thinking." Once the war began the Army quickly made plans for increasing the size of its aviation assets. Its expansion plans were foiled by strong Air Force opposition. The Air Force restricted growth through "command editing" in the procurement process and through the enforcement of bureaucratic agreements restricting size and missions.

Finally, aviation supporters realized that the only way to gain greater support was to develop it themselves. Aviation needed to have a broad base of support both in the

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160Vanderpool Transcript 41. The Air Force's rescue helicopters did operate under combat conditions, but only with fighter escort.

161The aviation program for the Army had become so important, expensive, and controversial, that Secretary of the Army Pace established the Army Aviation Branch of the Army G3. The three assigned officers were to be the focal point on the Army Staff for all aviation matters. See Williams, "From Balloons..." 22.

162Williams, "From Balloons..." 22.
Army and in Congress in order to ensure understanding and expansion. This need would result in the creation of a program known as Eagle Flights for rising field grade officers and the forming of a helicopter unit to shuttle the President and members of Congress around.

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CHAPTER 5

CONCLUDING THOUGHTS

The Marine Corps’ and the Army’s efforts at incorporating the helicopter into their force structures are illuminating examples of the innovation process. The Marine Corps was the first to grasp the potential of the helicopter for transporting combat forces on the battlefield. The helicopter’s successful demonstrations in moving men and equipment from ship to shore allowed the invasion fleets to be more dispersed and less vulnerable to nuclear attack.

Its successful experiments with helicopters were due to it having compelling reasons in all four areas of the innovation process. First, the external stimuli that the Marine Corps perceived to threaten their very existence made it essential to re-examine their methods. This review was aided by the second factor -- the innovation-friendly culture of the United States Marine Corps. The Marine Corps’ experiences in developing amphibious warfare created an organization which encouraged new methods for solving problems. If not always embraced, especially by the Marine fixed wing aviators, the majority of the ground commanders strongly supported the new concepts and ensured that it became accepted by the Marines as the road to survival. Furthermore, this change was
reinforced at the Marine Corps School which continued to run war games and refine doctrine.

The third factor was the support the Marine Corps received from external organizations. Although the relationship between the Marines and the Navy could be described as a “behind closed door domestic dispute,” it was still better than that of the Army and Air Force.\(^\text{164}\) The Marines and the Navy readily accepted the helicopter and the associated change in the doctrine for amphibious assaults because of their experiences between World War I and World War II. During this time, innovations included the development of naval (carrier) aviation and submarine warfare for the Navy; for the Marines it was the development of amphibious assault doctrine. The junior officers of that period embraced the innovations and became the senior officers who effectively implemented them in the Second World War. In the immediate postwar years, the Navy’s institutional culture was more tolerant of innovation and change than at any other time in its history; the senior officers were in a position to continue to effect this change and did so as needed.\(^\text{165}\) The Marines also made sure they kept government support by having Congressional leaders observe Marine Corps experiments.

\(^{164}\) The potential reasons for this are threefold. One was the Marine Corps’ ability to mobilize key members of Congress to preserve its existence and funding. Although its force structure, procurement of equipment, and manning levels varied from 1945 to 1965, the Marine Corps’ existence as a significant component of the armed forces was never seriously challenged after the 1947 National Defense Act. The second was the close relationship and combat experience of senior leaders that was developed in the Pacific. Finally, the Navy had a shared interest in maintaining the amphibious assault mission. This mission was a component of sea power and brought prestige as well as funding to the Navy.

\(^{165}\) A qualifier on this must be placed. Almost always the willingness of a military organization to innovate is due to a problem that needs a solution and not necessarily because the leadership is searching for innovation for innovation’s sake. Besides the use of helicopters in amphibious assaults, the Navy readily adopted the use of nuclear power for its major surface and undersea combatants.
Finally, technology continued to improve and indicated that larger air assault operations would be feasible in the near future. This allowed for the extensive testing of the new doctrine’s theoretical concepts and their eventual inclusion into the official doctrine.

For the Marine Corps, the innovation process essentially ended with the forming of transport helicopter squadrons during the Korean War. After the conflict ended, the Marines continued to refine its doctrine and create additional helicopter units, but it does not make any major changes in organization and employment until the Vietnam Conflict. Although the Marines’ highly successful small scale experiments with helicopters were novel, the entire doctrine did not change. Despite the initial assaults being conducted from over the horizon from dispersed amphibious forces, the marines recognized that the follow-on waves would move, in the traditional manner, by ship. Also Phib 31 did not change how forces were structured. The helicopter squadrons would remain part of the Marine Aircraft Group and not integrated with the ground forces. This was compensated by the thorough procedures and close relationship traditionally enjoyed between marine air and ground components.

In contrast to the Marines, the Army lacked most of the conditions necessary for successful peacetime innovation. The Army’s leadership did not perceive the strategic situation as one that threatened its existence nor its traditional mission. The most serious threat came from the Air Force which opposed any attempt to expand Army aviation.

The Army lacked the innovative culture of the Navy and Marine Corps. With the creation of the Air Force as an independent service, almost the entire population of
experienced and combat tested light, fixed-wing pilot leadership departed with it. This left the Army with only junior pilots who had never seen combat and those aviators who wanted to fly but did not aspire to command. Both of these types of pilots lacked credibility when compared to their combat arms counterparts who had commanded units. If innovative ideas were to come from any area of the Army, it would have to be from the combat arms branches.\textsuperscript{166} Except for a few individuals like Major General Gavin, this did not happen in the decade that followed World War II. As British Army Colonel John Mitchell once stated, “In no profession is the dread of innovation so great as in the army.”\textsuperscript{167}

Throw into the mix the helicopter’s being in its technological infancy and the Air Force’s ambivalence towards the helicopter and the result is an innovation process with a much longer gestation period. Thus, the Army left the Korean War with helicopter units that had moved supplies under combat conditions, but not men. It was an Army that had many different agencies examining helicopter development and employment, but no central agency with overall authority to provide direction. It had a working paper on helicopter usage, but no formal doctrine or field manual (that would not occur until 1957). Finally, it was an Army that would fund the helicopter in wartime, but could find little room in the tighter, peacetime budgets.

As a result, the Army’s post-Korean War developments followed a haphazard course. Advocates of army aviation and helicopter enthusiasts believed that the

\textsuperscript{166}The lack of experienced pilots may have increased the legitimization of the helicopter as an alternative aircraft within the Army.
helicopter was the next logical step in airborne-type operations. Opposition within the Army centered on the immature state of the technology and a belief that helicopters would continue to remain frail machines too vulnerable to ground fire. They saw the helicopter's usefulness as being a logistical tool operating in areas far away from enemy direct fire weapons. The establishment of the Office of Army Aviation, although a step forward, lacked the centralized authority to guide the development of the helicopter and experiments with tactical doctrine. Instead, the Army pursued diverging efforts at making the helicopter a replacement for the wheeled cargo vehicle, an assault vehicle, and an anti-tank weapons platform.

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