Wood, Fabric, and Wire:
Insights from the Biplanes Era, 1919-1936

Forward

The study of the early years of military aviation's contribution to land warfare has an obvious appeal to the historian. But, in these years of advanced technology, and the vivid demonstration of airpower in the days of Desert Storm, it is easy to forget that there are underlying continuities in warfare.

It is obvious that there have been many innovations in air warfare since the days of the fabric-covered biplane. A few of these include precision guided munitions, surface-to-air missiles, night and all-weather target identification, electronic warfare, standoff and air-launched missiles, and of course, the "stealth" technology which performed so well during Desert Storm. As these technologies emerged they have been used in a wide variety of situations in Korea, the Middle East, Southeast Asia, Afghanistan, the South Atlantic, and Latin America. These more recent conflicts have been extensively analyzed by not only historians, but also by many military staffs, all in an attempt to derive some sort of "lessons" which could be used to point the way towards the most effective use of airpower in a future conflict. Such inquiries are not merely academic exercises, but are used to make force structure, training, deployments, and procurement decisions by all nations from the superpower to the emerging nation. Ultimately, they influence the decision of a nation to resort to military force as an instrument of national policy. By and large, the use of airpower in very similar situations in the period between the world wars has been ignored.

However, as with any historical examination intended to develop guidance for the future, it is absolutely essential to discern between those situations which may be transitory or applicable in a specific, highly unique situation and those which have enduring, consistent certainties. When the details from this period of a less technological era are added to those which have developed during this more intensive technological period, the likelihood of identifying these enduring aspects can be increased and the certainty of making decisions for future airpower employment can be improved.

INTRODUCTION

The remarkable pace of technological developments since the dawn of manned flight in the early twentieth century have had a profound effect upon the employment of air power for military purposes. Nowhere is this more striking than in the differences between the wood, fabric and wire biplanes which by and large were obsolete by the late 1930s, and the aerial armada which rained pinpoint destruction down upon Saddam Hussein's Iraq sixty years later during Desert Storm. Yet, the use of airpower in the interim between the two world wars and its employment in the Third Balkan conflict or over Iraq are joined by more than just the medium they operated and operate in.

The air forces of the world have tended to establish three major missions for themselves. First and foremost, are those designed to gain and maintain air superiority, that is, the control of the air through the destruction of the enemy air force and denying the use of the air by an opposing air force. Second are those usually categorized by various names like the Royal Air Force's term "strike missions." These may range from long-range attacks against so-called "strategic" targets such as an opponents' industry or transportation network, to interdiction missions which usually are conducted with the idea of isolating the enemy's field armies from their logistical base. Finally, there are those missions directed against the enemy's field armies that are either engaged or soon to be engaged with one's own army--known as battlefield or close air support.(1)

Since the demise of the Soviet Union, other missions are being contemplated for airpower. These are often referred to as peacekeeping, peacemaking, or peace enforcement. In the unstable world of the mid-1990s these "new" missions are receiving ever more attention in the hope they may be able to reduce the overt violence in the world by using airpower to compel opposing groups to "behave." While this argument over the proper employment of airpower rages, all but a few military historians have forgotten that this discussion has occurred before--in the years between World War I and World War II. Overshadowed by the use of airpower in 1939-1945 and especially by the development of the nuclear delivery forces in the decades following World War II, airpower was used during the period 1919 to 1936 in many of the same ways and for the same reasons as are being contemplated today. The aim of this study is to examine how Great Britain and the United States used their air services in the period between the years of 1919 and 1936 and what insights can be discerned from these operations. It will review how the RAF was employed in "air control" operations during the inter-war period of 1920-1936 and in particular those in the Middle East and Afghanistan. Then it will investigate the US Army Air Service's operations along the Mexican-American border in 1919-1921. Following this examination of the "border patrol" operations, the paper turns to a survey of how US Marine Corps aviation operations supported their expeditionary forces in Latin America between 1920-1932. When the historical context has been set through these brief examinations, the study compares these operations in peripheral conflicts in an attempt to ascertain similarities of employment, success and failures, and the opinions of the practitioners towards the use of airpower in what was often termed "small wars." The paper will conclude with an analysis aimed at developing a "doctrine" for the employment of airpower in peripheral conflicts.

This is a survey of the western world conflicts of the period, with an emphasis on the insights that could have been learned and those actually noted by writers/commentators of the period. In these cases, the examination of the conflicts will be very limited--just enough to give the reader a flavor of what was done with airpower in the situation and not a detailed examination of every facet. I must also stress that the scope of this study is limited to English-language sources and to air operations by the RAF and the United States Army's and Marine Corps aviation units. However, exactly what is meant by a "lesson"? Does a "lesson" imply that there is a solution to a problem? In this situation do contradictory "lessons" exist between the way the RAF utilized airpower and the way the United States did? If a "lesson" is learned by the RAF in the remote, blistering desert of Iraq, will it be applicable in a similar environment somewhere else in the world?

Quite often, a "lesson" is one which "proves" accepted doctrine. Further, many airmen, have disregarded the ways airpower was used before World War II as something out of the "dark ages" and as applicable to them as the military forces of Germany, France and England thought the lessons of the American Civil war were applicable to them before World War I. Colonel John A. Warden III in *The Air Campaign: Planning for Combat*, ignored air operations before World War II, even though aviation historian Robin Higham argues the campaign in Palestine under the direction of Allenby during 1918 was as perfect an example of the proper application of air power for the time as was the Luftwaffe's during the German blitzkrieg of 1940.(2)

Does a "lesson" have a lifetime? Can it survive comprehensive changes in technology? If it can't, why should any airman be expected to read about how Slessor, Trenchard, Glubb, Patrick, and others used airpower seventy-five years later? Can it be that there are still "lessons" of practical value to be learned from any age, whether the practitioners were successful or not? The great philosopher of war, Clausewitz, assumed that anything which had happened before the introduction of the flintlock would be of much less use to soldiers of his own time than those events which had occurred in the years since 1740. And in the 1880s, another German, Friedrich von Bernhardi, insisted nothing could be learned from any conflict which happened before 1866.(3) If this is true, what happens to the lessons of the biplane era as they relate to the problems of peacemaking, peacekeeping, or border control? Do they have any applicability to today's faster-than-sound jets? Has the ability of the USAF to deliver precision-guided bombs by stealth aircraft completely invalidated any insights gained by the use of airpower prior to these technological advances? Or is highly advanced technology less useful in certain instances? While the USAF has accepted the theories of strategic bombing and offensive air operations and although these theories are based upon the experiences of aviators since the dawn of airpower, it has often ignored how aviation was used in any "limited" conflicts and in fact, does not even recognize what can be termed "special operations" as a separate role for airpower.(4)

What is the relationship between theory and the lessons of a conflict? Clausewitz in *On War*, questions if any theory based upon historical experience is valid. He argues that a purely philosophical inquiry would rapidly become very confused if it tried to discover some sort of historical theory which transcends the period it is set in. In this case, Clausewitz contends, philosophy must turn to experience, and consider those situations which have been noted in previous wars. But, he feels any theory which emerges from the pages of the past must necessarily be limited, and any "such limitation is in any event unavoidable for any theory, because any theory is constrained by virtue of its own construction, either because it will be an abstraction from the history of war, or, at lest, because it has to be compared with actual historical experience."(5) The analytical part of the theory must provide the concepts used to examine history. Experience is the yardstick by which principles or lessons developed through a blend of abstract reasoning and concrete observation are measured. Yet, the term "lesson" or "lessons learned" implies there is a quick fix, a list of solutions, which can be discovered. A more rational term might be insight. Insight suggests an imaginative ability to see into and understand a situation. Is there a way to institutionalize the insights from history without them becoming dogma?(6) Two excellent examples of such a methodology are Colonel George F. Robert Henderson's *The Campaign of Fredericksburg* (1886) and his *Stonewall Jackson and the American Civil War* (1898). The later is an especially persuasive set of observations which was

more of a look at the American Civil War through the eyes of Jackson that allowed the reader to gain insight into the how and the why of the war rather than the what.(7)

Thus, the insights this study intends to present from the biplane era are not specific means of applying airpower to today's situations, nor are they meant to be. They are instead, examples of how airpower has been used in the past and how it might perhaps be applied in today's world. This study does not intend to produce a manual of action, nor a checklist, but rather insights into how biplane were employed in the peripheral conflicts of the day. These may then be scrutinized and perhaps provide a broad scheme of how airpower might be employed in today's situations.(8)

The first chapter will detail the methodology used to examine each of the situations. Chapter two will examine five case of air control operations conducted by the RAF, while chapter three will analyze five situations involving United States' military aviation. The fourth chapter will compare and analyze these experiences to ascertain what similarities and differences existed in the use of airpower in these cases. The final chapter will strive to determine what, if any, insights into the development of a theory of airpower in peripheral conflicts can be drawn from this probe into the biplane era.

CHAPTER ONE
METHODOLOGY

Since the end of World War II, and the development of nuclear-armed forces, military aviation in the pre-World War II era has been considered a mere sideshow, an interesting event in the history of airpower but of little or no use to the modern-day airman. The attitude that current airpower roles, missions, and doctrines grew directly out of the cauldron of World War II has become intrinsic in doctrine, thought, and theory. The roles and missions of today's military aviation were investigated, expounded, confirmed, and undertaken during the biplane era of 1914-1936. By the end of 1936, military aviation had implemented British and American foreign policy decisions using all of the diverse roles and missions seen in the employment theories of today's Western air forces. Although the trends established in the dawn of airpower have been elaborated upon since then, the real difference between a De Haviland D.H. 9 and a F-117 stealth fighter seems to be one of technology, rather than one of employment. Although there are almost as many ways to study the employment of airpower as there are authors and historians, the method of choice for this monograph is a combination of the historical-descriptive case study and a review of selected literature from the era to attempt to ascertain insights into the employment of airpower in "small wars" or peripheral conflicts.

The literature of what has been variously termed "low-intensity conflict", "small wars", and "peripheral conflicts" is a vast treasure trove for the investigator. However, for this study, the eight situations were selected from a narrow definition of what was termed air control operations and also those conflicts which could be termed small wars. The former refers to operations which were undertaken by the RAF to defend a particular part of the British Empire. Small wars, for the purposes of this paper are any conflicts which occurred either on the periphery of the Empire or are not necessarily vital to national interests.(9)

Within this context, a series of questions will be applied to the individual situations. Although these questions may seem at first glance to be a checklist for the employment of airpower in any situation, they are intended to function as conceptual tools to discover the limits of airpower within the context of these case studies. They are not listed in any kind of an attempt to prioritize nor is it intended to be exhaustive.

Organization

How was the operation organized? Was this a single service operation? Was military aviation simply a part of a larger organization?

The aim of this question is to ascertain if the military aviation organization was responsible for the entire scope of the operation including perhaps exercising direct command authority over subordinate ground units. The alternative condition would be that the aviation unit was subordinate to a ground forces commander who was exerting direct command authority over air units assigned to his command.

Environment

What was the environment? What impact did nonmilitary influences have?

No military force operates within a vacuum without external factors such as geography, political constraints, and public opinion impacting upon it. This question is intended to discover what these factors were in each situation and, if possible to ascertain what impact they had upon the use of military aviation to achieve the objective(s) set for it.

Limitations

What limits were put upon airpower's use? Was this done by national policy makers or by local military commanders? What were these limitations?

This expands the previous question into the realm of the specific constraints put upon military aviation's activities. That is, were the airmen restricted to attacks on specific targets or types of targets, or were they free to employ their weapons upon any target they felt was worth the effort? Ascertaining who instituted the limits should provide clues as to how well airpower was understood by the decision-makers.

Command and Control

Who planned the operations? Were they airmen, or were they ground force commanders? Were they experienced or inexperienced?

A continual issue in the employment of airpower, especially for British and American aviators, has been the argument over who should control aviation units in a specific situation. Both the U.S. Air Force and the British Royal Air Force argue that only an airman can fully appreciate what military aviation is capable of accomplishing. They contend that if ground force

commanders are allowed to decide how military aviation is to be used, it will never be employed as effectively. Such misuse may arguably lead to defeat. The flip side of this coin is that airmen do not appreciate the problems of ground force commanders and will not provide the airpower necessary for the ground components to achieve their goals.

Objectives

What specific objectives were intended to be achieved by using airpower? What was it supposed/expected to do? Was there a clear concept of what military aviation could accomplish? At both the local level and the national level?

A popular question today, and perhaps more overlooked in the interwar years, is the question of just exactly what was airpower supposed to do? That is, was there a clear concept of what capabilities military aviation was bringing to a specific situation? Did those who were intending to use the airplane have a clear idea of what it could do? Was there a clear understanding of this by those using aviation and those desiring to use it to achieve their national objectives?

Important Factors

What factors did the participants consider to be most important to the success or failure of their operations?

Many variables impact upon whether or not aviation can be successful in a given situation. A few of these include geography, climate, availability of good intelligence, and availability of supply. During the early years of aviation, these factors were less understood. However, consideration of what were considered most important may provide some insight into proper uses of aviation. Today's planners tend to bring a lot of preconceived notions along with them, while perhaps in these earlier days, the lack of experience and reference may have caused them to examine a wider range of variables.

Least Important Factors

What factors did the participants consider to be the least important to the success or failure of their operation?

Again, these are the same as those discussed briefly in the previous question. These may become instructive if a specific factor that the participants decided was unimportant can be seen to have caused the operation to be either successful or a failure. Such a situation may well be similar to that of a nation which, having lost a war or an operation, completely reviews its outlook.

Success or Failure?

Was the campaign/operation considered a success or failure? By whom?

Again many variables impact into this question. If the national leaders are being considered, public opinion may have had considerable impact in the declaration of success or failure. The

attitudes of the national leadership may also be more important in the overall scheme of whether they will consider using airpower in similar or dissimilar situations. The attitude of the military leadership towards the operation is also important, since this can decide if airpower is used effectively. For example, the success of the early model Stukas during the Spanish Civil War led the Luftwaffe to concentrate upon the employment of dive bombing because of its greater accuracy. Although this did not completely exclude other forms of offensive airpower, it did color their outlook in the years immediately preceding the invasion of Poland.

Hindsight

What surprises developed? What factors in retrospect should have been considered and what was their relative importance?

This relates directly to the earlier questions considering the factors the participants considered to be either important or less important. It may indicate that a particular person or group may have had into the value of airpower in these early years.

Employment

How was air power employed?

This specifically refers to the method used. For example, reconnaissance, strategic attack, close air support, supply/transport, interdiction, psychological operations, surveillance, or against an opponents' air organization.

CHAPTER TWO

COLONIAL CONTROL ON A SHOESTRING -- THE RAF EXPERIENCE

Following World War I, Britain was confronted with the task of incorporating the mandated territories of the defeated German and Ottoman Empires into its newly expanded empire. But, weakened by years of war, and interested in demobilization and monetary savings, the government was forced to look afresh at ways to "police" this new territory. The concept of "air control" did not spring forth in full blossom in 1920, but rather slowly developed throughout the early 1920s in response to situations on India's Northwest Frontier, uprisings and banditry in Iraq, unrest in Aden, and revolt in Palestine and Transjordan.

The use of the airplane in the inter-war years spawned new terms which have become integral in any discussion of the RAF and its operations. The first, *air control*, refers to those operations undertaken to defend a particular region of the Empire by the Air Ministry. *Air policing* is the employment of RAF aircraft to provide internal security for a particular region. The last, *air substitution*, is the use of aircraft to replace other types of military forces in the role of imperial defense.[10]

The Third Afghan War and the Northwest Frontier, 1919-1920

The Third Afghan War broke out along India's Northwest border in 1919. At the time, there were only two RAF units stationed in India, but they were quickly reinforced by three more sent in from Germany.(11) These five squadrons joined hundreds of British and Indian Army troops in the field along the India-Afghanistan border. In this instance, the RAF was merely a part of the larger British forces and were used to support the operations of the columns. The first major aerial action took place in May 1919 in support of ground force operations against the Afghan army's positions in Dakka.

While the RAF's squadrons were initially used in an independent role to bomb the military targets in the Afghan cities, when the Mahsud rebellion added its ferment to the Afghan troubles, aircraft were attached to the punitive column and flew not only close support bombing and strafing missions against tribesmen, but also reconnaissance and resupply missions. In addition, they continued to carry out bombing missions against Mahsud villages and flocks, mainly for the psychological impact these missions would cause.(12)

These first five squadrons were equipped with Bristol F.2B fighters, DeHaviland (D.H.) 9A and DeHaviland (D.H.) 10 bombers.(13) In addition, there was one Handley Page V.1500 four-engine bomber (only three of these were built during WWI) available for long-range bombing missions.(14) The environment these aircrews and aircraft faced was, to say the least, unhospitable. The squadrons quickly discovered that the D.H.9A's performance was severely restricted in the high mountain air of the Frontier. Although the aircraft supposedly had a service ceiling of 15,000-18,000 feet fully loaded with bombs, fuel, and crew, this was impossible to reach. Not only were operations difficult due to the altitude, but dust storms were ferocious. One Handley Page V.400 bomber was flown to Risalpur to carry out a bombing mission against Kabul. However, a strong storm blew in, and when the dust had settled, the bomber (which had been tied down) was on its back, crushed and broken. These storms were not only a threat on the ground, but also proved a menace in the air, when one such storm forced two aircraft to abandon an attempt to bomb Jalalabad in March 1920. Atmospheric turbulence was also a problem, and by mid-May, aircraft were grounded after 9:30 a.m. because of this hazard.(15) Other problems were shortages of aircraft and spare parts which a student at the RAF Staff College reported in that school's annual journal made "effective co-operation with the Army against the Mahsuds and Wazirs...very difficult." At times, only fifty per cent of No. 31 Squadron was servicable.(16)

Initially, the RAF began independent operations in November 1919, bombing the Mahsuds at Kaniguram, Narobi, and Makin. However, even though some of the tribesmen did surrender, by December, the Officer Commanding Waziristan Force, General Climo, concluded that the Mashuds would not be likely to surrender until troops were put into action. Once the ground force got underway in December, the RAF came under the direct control of the army.(17)

These early actions along the frontier do not appear to have had any type of limitations put upon them. The bombing of towns and cities (including the capitol of Kabul) was undertaken without there having been much discussion--at least none appears either in contemporary accounts nor in the few histories of air control--of limits upon aerial attacks. The rules of engagement appear to have been to simply "get the tribesmen to come to terms." An example of this was the attack by three fighter aircraft upon a riot in Amritsar in 1919, which, if contemporary accounts are accurate, killed and injured a number of innocent civilians. These operations along the Northwest

Frontier were among the first attempts at air policing/control operations and as yet, there seems to have been little idea of just what could and could not be accomplished by aircraft. A pilot's experience with No. 31 Squadron while flying operations against the Mahsuds in 1920 (reported in the RAF Staff College's annual journal), tends to confirm this conclusion. Although they were directed to operate in support of the punitive column by flying reconnaissance, bombing and machine-gun attacks against those Mahsud who opposed the column, the flying officer was of the opinion "that the use of aircraft had not been all that it might have." There was no thought of using aircraft as ambulances to fly out the wounded even though at one of the pilots felt it was very practicable.[18] This was obviously a time of experimentation, testing and trial to see if the RAF was capable of doing the things Hugh Trenchard was saying it could.

The major concern of the aircrews involved in these operations appears to have been a concern with the numbers of aircraft that were servicable and maintaining an adequate flow of supplies in order to operate the aircraft. Probably the least important factor in the entire operation were the decisions on who or what should be considered a target. A pilot wrote in the *Hawk* of concentrating attacks against the Mahsud's flocks where possible, not because of any condern for the villagers, but because the village huts were built of mud and wattle and the twenty pound Cooper bombs the DeHavilands carried did not seem to have much effect. The concept of a deliberate targeting policy seems to have been completely missing in any deliberations and the aircraft atacked any likely target.[19]

The RAF was surprised not only by how quickly the Mahsud tribemen adapted to aerial attacks, but by the effectiveness of their rifle fire against the low-flying aircraft. One flying officer wrote that "their rifle fire...was uncomfortably like that of a machine-gun, and almost as effective."[20] The flyers also seem to have been surprised by the ineffectiveness of their bombing against the Mahsud villages, although the bombing of Kabul may well have induced the desired panic among the citizens.

These early operations are probably the most difficult of all to evaluate. Although the RAF never did become as involved in India as it was in the Middle East--because the Army was thoroughly entrenched on the sub-continent--some of the Army commanders felt aircraft played a valuable role in their operations. Historian David Omissi's research at the Air MInistry and Records Office indicates General Climo was convinced that the airplanes were very helpful when used with ground troops, but of less use when bombing villages. For example, after the town of Kaniguram fell to the British, it was discovered that the twenty pound Cooper bombs had little or no effect and only 230 pound bombs could destroy a building. The General also noted that bombing was highly inaccurate and that although sixteen tons of bombs had been dropped on the town, there was very little damage. However, he felt that air policing had potential. On the other hand, Air-Commodore Webb-Bowen, who commanded the RAF during the operation, was absolutely convinced that "the RAF acting alone will never overcome a courageous people."[21] Back in London, the Air Staff argued that the the RAF alone had made the campaign successful. They were convinced that the bombing of Kabul by the Handley Page in May 1919, the attacks by No. 31 Squadron on Jalalabad, and the contribution of aircraft to raising the siege of Thal had proved that air power alone could deter the Afghans. The argument over whether air power was decisive on the Northwest Frontier continued throughout the 1920s, into the 1930s, and was finally silenced only by the beginning of World War II.[22] Although the Third Afghan War was

but a short chapter in the RAF's history, its significance at the time cannot be understated. Here, on the Northwest Frontier, the RAF showed it could be an effective force when used to help solve internal security problems. This contribution paved the way for the RAF's contention that it could resolve a decades old situation in Somaliland.

Z Squadron, Somalia, and the Selling of Air Control

Although the RAF was used in India to assist the army in controlling unrest, it was in Somaliland that the RAF claimed they conclusively proved that aircraft could independently and effectively crush native rebellions. The operation against the "Mad Mullah," more than any other, provided the springboard for the subsequent air control campaigns in Iraq and elsewhere.

Mohammed bin Abdulla Hassan began leading his Dervishes in open, armed rebellion against British colonial authority in the Horn of Africa as early as the 1890s. With the coming of war in 1914, the "Mad Mullah" and his Dervishes took a decidedly "back burner" position in the scheme of things. In 1918, after the Mullah seized a coastal fort, the Colonial Governor, Geoffrey Archer, decided that it was time to do something and requested assistance through the Colonial Office.(23) By January 1919, General Sir Arthur Hoskins, sent by the War Office to help plan a campaign, reported to the Colonial Office that it would require an expedition of 900 mounted camel troops, two 3.7 inch guns, and a flight of Handley Page bombers to quell the rebellion. This was rejected by the Colonial Office because it was considered to be too costly at a time when the government was reducing both the size of its military services and their budgets.

Into this storm caused by fiscal constraints flew the RAF. In May 1919, the Colonial Secretary, Lord Milner, asked the Chief of the Air Staff (CAS), Hugh Trenchard, to suggest another (and implicitly a less costly) solution.(24) Trenchard recommended the idea of air policing. Initially this recommendation was rejected by Field Marshal Sir Henry Wilson, Chief of the Imperial General Staff (CIGS), and here story could have ended. However, Winston Churchill, as the Minister for War and Air, had been advocating the increased use of technology to reduce the costs of policing the imperial periphery, and in a conference, with the support of the Colonial Office, overruled the CIGS. These budgetary, social, and political influences clearly converged to create a situation where the RAF was able to convincingly argue that it could accomplish the desired results at much less cost than ground forces could by themselves.

Geographically, the region could not have been better if the RAF had picked it themselves. The Horn of Africa was flat, locations of Dervish forts and strongholds were known, and the Dervish forces themselves were readily identifiable. This would be the first of the Middle Eastern desert air control operations which may well have owed their success to the geography perhaps as much as the airplane.

By December 1919, a self-contained RAF organization, known as "Z Unit" arrived at Berbera on HMS *Ark Royal*. Composed of twelve De Haviland 9A biplanes, ten Ford trucks, two Ford ambulances, six trailers, two motorcycles, two Crosley light trucks, thirty-six officers, and 183 other ranks, the unit established itself at Berbera, built an air base (under the pretext of prospecting for oil), and on January 20th, had the aircraft ready to begin operations.(25) Z Unit would be responsible for the major aspects of the action, although they would attempt to force

the Mullah and his Dervishes towards resident ground forces already in the area. Thus, while the RAF was responsible for the operation, it would be a coordinated air and ground campaign.

Flight Lieutenant Skoulding, when recalling the operation ten years later, did not indicate there were any specific limitations put upon the RAF--they were to simply stop the Mullah and eliminate him as a threat in the region. The RAF's plan was a simple one--bomb the Mullah and his forces out of the forts they were occupying and pursue them until they could be attacked by the resident camel corps forces in the area.

Although Winston Churchill had declared in December 1919 that the "first duty of the RAF is to garrison the British Empire," this broad political objective was even more simply translated--success would go a long ways towards assuring the RAF's continued existence as a separate service. Hugh Trenchard seems to have been convinced that air control operations would work, but as of yet, there really was not a clear concept of just how to go about it.

From the evident care that the RAF took to disguise their intentions--using the pretext of oil exploration as a "cover" for the construction of the air base at Berbera--they seemed intent to initiate their operations with as much surprise as possible. Z Unit also evidently wanted to be as mobile as possible, designing portable hangers out of scaffolding, rope, branches, and rushes, which could be carried by camel. Field maintenance shops were also improvised from matting and empty petrol cases. Intelligence also ranked high on their list of important factors. Photographic reconnaissance was carried out to identify exactly which forts were occupied by the Dervishes.(26) There is even evidence that the RAF managed to somehow suggest to the Mullah and his followers that they could "blow" the aircraft back out to sea, and thus, the Dervishes were totally unprepared for the first bombs. By these activities, it is obvious that accurate intelligence and deception activities were considered to be among the most improtant aspects of the planning and early stages of the operation.

This campaign saw the RAF's biplanes used in almost every concievable role. They began with aerial reconnaissance over the Mullah's fortresses, continued with bombing attacks against these and any Dervish forces, conducted resupply and aerial ambulance operations, and, if the Flight Lieutenant's memory serves him correctly, even conducted psychological operations to add to the possibility of success.

Beginning on January 21, 1920, and lasting only a few weeks, the Mullah and his Dervishes were bombed out of their forts, attacked and pursued into the borderlands and eventually hounded into the Ogaden, where the Mullah died later in the year. Threnchard's argument that the RAF could do it cheaper, easier, and quicker seems to have been clearly vindicated. The operation lasted only a few weeks, cost 77,000 pounds sterling for the RAF portion of the campaign and a total of only 150,000 pounds for the combined ground and air campaign. Although the Governor of the Protectorate was convinced that the Mullah's demise was "primarily due to the Royal Air Force, who were the main instrument of attack and the decisive factor," and in *The Aeroplane*, a writer claimed that the RAF's triumph was evidence that "infantrymen [were no longer] the first line of attack," others saw things differently. The War Office argued that it was the Camel Corps that contributed the most to the defeat of the Mullah

and his followers, and that the RAF would have been more properly employed in closer combined operations with the ground forces.[27]

But, either way, it was this single operation that set the stage for the RAF to take on the mission of "policing" the empire. Malcolm Smith, in his study of Britain's air strategy between the wars, argues convincingly that the RAF's survival was assured by the success in Somaliland and the apparently indisputable "proof" that the airplane could be more economical than ground forces. But, even more important, was the impact of the campaign upon the decision of what to do with the rebellious natives of Mesopotamia (Iraq).

Iraq and the Realization of Air Control

Originally a part of the Ottoman Empire, Mesopotamia was put under British Mandate by the League of Nations in July 1920. The sheer size and geography of the new mandate was daunting (Sir John Salmond, the first AOC, estimated Iraq covered some 207,000 square miles). It featured arid desert in the west, some developed urban areas in the region around the Tigris and Euphrates rivers, and highlands around Mosul in the north. To a war-weary public, this and the other new mandated territories appeared to promise little except increased military spending.[28] Because of these fiscal constraints, interservice politics began to appear as early as February 1920, when an official in the Air Ministry sent a memorandum to Hugh Trenchard:

Secretary of State [Winston Churchill] tells me today that the General Staff professes themselves unable to garrison Mesopotamia. . . . the General Staff now proposes complete evacuation of the country. He wishes to know whether you are prepared to take on Mesopotamia.[29]

Before any decision could be made, the formal awarding of the mandate for Mesopotamia in July 1920 to Great Britain ignited a massive rebellion by the natives who had thought they would be granted independence. The RAF's aircraft were used to support the Army with a multitude of missions, which ranged from strafing rebel troops beseiging Rumaithah, to dropping ammunition and supplies to garrisons throughout the countryside. However, even with these successes behind them, the RAF found that after the rebellion had been crushed by ground forces, Arnold Wilson, the Civil Commissioner of Iraq, was insisting the RAF's biplanes had caused resentment among the natives and were even one of the reasons for the rebellion.

The main consequence of this rebellion was that it highlighted the cost of policing these newly acquired territories to the British public. In the four months of the summer of 1920, it took 60,000 troops (who suffered 2,000 casualties) and cost the already war-weary public 100,000,000 pounds sterling to put down the uprising. Editorials in the press raised a hue and cry against the costly undertaking and demanded the mandate be returned to the League of Nations. In this volitile atmosphere, the new Secretary of State for the Colonies, Winston Churchill, chaired a conference in Cairo during March 1921. Well prepared, Hugh Trenchard presented his "Scheme for the Control of Mesopotamia by the Royal Air Force" to the conference members. Not surprisingly, Churchill favored the concept as did most of the other members. At the conclusion, the RAF found itself responsible for instituting air control in Mesopotamia. Thus, it was the nonmilitary influences--especially economic factors and public opinion--that put the RAF into the position of being allowed to test its theory without ciming under the control of the

War Ministry as it had been in both India and Somaliland.[30] Without these external influences, it is unlikely that the RAF would have been able to "sell" its idea of air control over the War Ministry's objections.

Final control of Mesopotamia would be in the RAF's hands. They officially took control on October 1, 1921 and by the end of the month, Air Vice-Marshal Sir John Salmond became the first Air Officer Commanding, Iraq. Not only would the RAF employ aircraft (eight squadrons), they were also authorized to raise four armored car units (to act as both air base defense forces and as patrols into the countryside), four infantry battalions, one "pack battery," and 15,000 irregular (native) troops to support the air control operations. When Sir John assumed the post of General Officer Commanding (GOC) all British forces in Iraq, he became the first commander of an independent peacetime RAF command. Although the CIGS, Sir Henry Wilson, refused to provide troops for the armored car units, Sir John avoided the issue by staffing them with RAF personnel and raising local Assyrian levies for the other ground force units. By 1925, the RAF commanded Assyrian armored-car detachments, a British-officered Camel Corps, Iraqi Levies, and local constabulary units.[31] Melded together, this air and ground operation became the air control scheme.

While the RAF had managed to secure for itself the authority to undertake the replacement of military ground forces and demonstrate its air control precepts, it entered the task with very little concrete notion of how to proceed. While there had been much discussion and bold assertations concerning the ability of air power to replace ground force garrisons, in 1922 there really was not a firm grasp of just how this could be accomplished. During a Februrary 1921 Royal United Services Institute lecture, Wing-Commander Gossage presented a notional scheme to replace military garrisons with the air force. Using Iraq as the basis for his argument, he claimed that the RAF could:

> (1) Be everywhere and show the Flag.
>
> (2) Provide a show of force to back up the Civil Administration and nip disturbances in the bud.
>
> (3) Insure there would be no delays--when aircraft are requested they are available. The disturbance can then be "nipped in the bud" either by a show of force or by the immediate application of force itself.
>
> (4) Cover the same area with a few aircraft as many ground military detachments.
> (5) Employ only ten squadrons and 7,000 fighting men to keep internal order as well as or better than ground forces--at half the cost.[32]

If these were the notional concepts of just what the RAF could accomplish, what limits did they put upon themselves, or what limits were put upon them by external factors? Early 1920s writings and lectures, some appearing in the pages of the *Journal of the Royal United Services Institute*, seem to indicate that there really was not an established concept of just how much, or when force should be employed. One early lecturer, suggested that in order to

. . . establish a tradition, which will prove effective,if only as a threat of what is to follow afterwards, is displayed, the Air Force must, if called upon to administer punishment, do it with all its might and in the proper manner.[33]

However, the pertinent aspect of his recommendations followed a few sentences later:

> One objective must be selected--preferably the most inaccessible village of the most prominent tribe which it is desired to punish. All available aircraft must be collected at a base from which they can function with all their maintenance and repair facilities at hand. The attack with bombs and machine guns must be relentless and unremitting and carried on continuously by day and night, on houses, inhabitants, crops and cattle.... The objective may be changed if it does not spread quickly enough.... This sounds brutal, but it must be made brutal to start with. The threat alone in the future will prove effacious if the lesson is once properly learnt.[34]

Whatever the RAF's attitude towards the limits it should put upon itself, as early as August 1921, questions concerning the bombing of villages was raised by Winston Churchill's replacement at the War Office, Sir Laming Worthington-Evans. Even in 1921, public and administration attention was becoming a factor in establishing the limits of what the RAF would be allowed to do. The argument began in 1921, and was still an issue years later when Sir John Slessor wrote his memoirs. The reality, as it usually is, was somewhere in between the two camps. It is apparent, that in the early period of the air control operations, the RAF employed admittedly massive air attacks with the objective of demoralizing tribesmen who might consider rebelling against British authority. It does not seem to have been Salmond's purpose to simply bomb for the sake of bombing, but rather to, as Wing-Commander Gossage put it--to demonstrate to these tribesmen just what the RAF could do and establish a reputation which might, in future operations, actually limit casualties among the tribes.[35] However severe the attacks actually were, it could not have been pleasant for the "policed" tribes.

As time elasped, the RAF settled upon a technique of what was called "inverted blockade." This, based upon the demonstrations in the early months of air control, was effectively an air equivalent of a naval blockade. A recalcitrant tribe would be called to a meeting with the local civil administration officer, given a warning or be told to pay a fine for it's trangressions. If the tribe refused, they would be warned they faced bombing attacks and were given an ultimatium. If this went unheeded, shortly after the ultimatium expired, the RAF would attack a previously designated target as well as the tribal leader's dwelling. Following this demonstration of intent, the bombing would be continued without letup until the tribe gave in to the government's wishes. A key factor in the entire procedure, was that the tribe was never asked to do something that was not in its power to do.[36]

Iraq was entirely under the direction of the RAF. However, as Sir John Glubb and other have indicated, it was not strictly an RAF show. The civil adminstrators played an important role, not necessarily in the planning, but in the exectution of the plans. Basic operational planning seems to have been developed first by Sir John Salmond and his staff and these procedures were continued by his successors until the RAF withdrew from Iraq. This was an airman's show--they

had managed to separate themselves from Army control and not only directed the air operations--they planned and directed ground force operations in conjunction with those air operations.

It is apparent that there were two factors most, if not all of the participants, considered absolutely vital for the success of the air control operation. First, was the clear demonstration to the tribes of what the RAF could do. And secondly, in order to be able to carry out the "inverted blockade," the RAF had to have very good intelligence. Lieutenant-General Glubb, when a sub-altern, was seconded to the RAF and Iraq, years later clearly explained the problem:

> When ground forces moved against an enemy,. . . there was rarely much difficulty in knowing who was a friend and who an enemy. In the case of aircraft, however, the reverse was likely to be the case. Air forces, arriving over a target area from a remote cantonment hundreds of miles away, would see below them a country dotted with villages, flocks or tents. How were they to be certain which of them was hostile and which friendly?(37)

To alieviate this problem, the RAF hit upon the system of establishing posts throughout the country under the control of junior officers who were responsible to the district political officer. They were to "familiarize themselves with the district to which they were accreditied in such a manner that, should air operations suddenly be required, they would be enabled to make such arrangements as were necessary to ensure that aircraft found their correct targets."(38)

While intelligence and a fear of the "inverted blockade" were obviously important factors, public opinion about bombing increasingly came to be a very important issue. By 1924, when the Labour party came to power, the question had become a serious issue and the Colonial Secretary, James Thomas, felt compelled to present *Notes on the method of employment of the air arm in Iraq*, to Parliament. In this paper, the RAF stressed that the aim of air control was neither to destroy homes nor kill people, but to interrupt the daily course of activities of a rebellious tribe. Although this and other Air Staff presentations may have dampened the fires somewhat at the time, the question of just how humane air control was still remains an issue. Perhaps it would be best to let Sir John Salmond have the last word on this issue. During a 1925 lecture to the Royal United Services Institute, Sir John remarked:

> Is Air Warfare humane? No. Because that is a paradox. But it is quicker, more efficient and is accompanied by infinitely less suffering than the older methods of waging war in semi-civilised countries.(39)

The RAF ultimately settled on this argument and dismissed the issue of humanity as one of the least important factors it considered in air control operations. Perhaps the best measure of the success or failure of the operations in Iraq can be found in the testimony of some of the civil servants in the Colonial Office, charged with administering the mandate.

It is undeniable that the decision to control Iraq by means of the Royal Air Force made it possible to retain the Mandate: under any other system the cost of the garrison, however reduced in numbers, would have been prohibitive, and its efforts ineffectual owing to the great length of communication involved.(40)

After the mid-1920s, the RAF's involvement in Iraq was slowly reduced and by 1929, the RAF began abandoning its bases in the coutry. A treaty was signed with King Feisal's government in 1930 and Iraq became an independent nation in 1932. Air control seems to have proved itself.

The RAF and its supporters did not appear to have registered surprise either at the success of the operation, nor in the fact that it really lasted only six years. Perhaps because of their continual harping on the lack of humanity in air control, the Army was the most surprised with the success of air control. With the climate of budgetary cuts, the notorious "Ten-Year Rule," and their dislike for an independent RAF, it's not surprising that the Army would feel threatended by a successful air control project.

The RAF does not seem to have discovered anything new during the course of these operations, they already knew of the target identification difficulty and damaging them--from the 1920 Northwest Frontier. They seemed to have expected to have difficulties with operating in the Middle East-- they had acquired some experience in desert flying conditions during the Palestine campaign in the Great War. But importantly, they did not expect to fail.

In Iraq, the RAF employed air power in a great variety of ways. The typical missions were reconnaissance, support of ground forces, photography, and attacks against ground targets. In addition, they provided communications between columns in the field and the advance headquarters, did mapping, transported the mail, and surveyed routes to be used in the future by civil airlines. For example, in June of 1921, DH.9As of 30 and 47 Squadrons initiated the Cairo to Baghdad mail run. They also conducted supply drops to outposts and columns, and evacuated 200 dysentery and diarrhoea cases from the field to the hospital in Baghdad while ground forces were conducting operations in northern Iraq during a threatened Turkish invasion. They conducted psychological operations against rebellious tribes, dropping messages which gave warning of the dire consequences if the tribe did not behave.[41]

While Iraq seemed especially well-suited for air control operations, when the RAF attempted to expand its application into other parts of the Empire, the Air Ministry discovered that airplanes could not function as a replacement for ground forces. In the Transjordan and Aden, the RAF found that since these areas had geographical features similar to those of Iraq, air control could be used successfully. However, in the more densely populated region of Palestine, the role of aircraft was decidedly much more limited.

The Unsuitability of Air Control: Palestine

Also a League of Nations mandate, Palestine erupted in an Arab rebellion in May 1921 as a reaction to the reaffirmation of the Balfour Declaration's pledge to establish a Jewish homeland during the 1920 Allied Powers Conference in San Remo, Italy. The RAF became involved in May 1921 when DH 9s stationed in Palestine bombed Arab rioters attacking Jewish settlements.

By all appearances, the decision to use the RAF in Palestine was strictly a political one, not sought out by the Air Ministry. In fact, Sir John Slessor, in later years, would go to great lengths in his autobiography to argue that the RAF was well aware air control would not be a viable option in Palestine. It would seem that the Air Staff was aware that the nature of urbanized

setting and the problem of forcing a majority population to acquiese to the aspirations of a minority was beyond the capabilities of aircraft.(42)

Churchill's decision in December 1921 to turn over the problem of Palestine to the RAF seems to have been based not upon the suitability of air control techniques, but rather upon the fact that the Army was unwanted by either the civil authorities or the Jews. Trenchard may have privately welcomed the opportunity, since it would provide yet another example of how the RAF was suited for the problems of Empire control. It would also help in the annual budgetary battles being waged in the years of financial retrenchment following the Great War. It is also apparent he felt that the scope of the RAF's operations would be too severely limited by the urban situation.

When the RAF assumed control, there were virtually no armed forces in the country except the police. They were able to deploy a single armored car squadron, but without infantry support, it appears that the cars were no more effective in urban areas than aircraft. By the end of another round of riots in August 1929, the government decided the only solution was to move two infantry battalions into the country to support the armored car squadron and also greatly strengthen the police force.(43)

After extensive research into air control, David Omissi argues when the RAF was given command of the mandate, it did not evoke political infighting between the Army and the Air Ministries. This was because the scale of the operation in Palestine was so small and since it was unimportant strategically, success or failure would neither ensure the RAF's continued existence nor would it lead to their abolition as a separate service.

By and large, after the RAF assumed command, the situation in Palestine remained quiet, although riots did break out again in 1929. While aircraft were at times useful during the riots, the short-comings of using airpower and armored cars without the support of infantry forces in an urban setting quickly became apparent. Following the riots, the policy was reviewed, and the Chiefs of Staff agreed that it would be more useful to contain future incidents by developing an efficient intelligence organization, an improved police force, and strengthen the latter with two battalions of infantry. Another uprising in 1936 led to the deployment of two infantry divisions to the troublespot. And early in 1937, the mandate reverted to army command. The RAF remained to drop supplies and provide close support to ground forces.

Palestine seems to be the crucial example of how air control should not be used. If, this was an air control operation simply because the RAF was in command of the mandate, then it was a dismal failure. However, the evidence does not indicate that the RAF did operate in the classic Iraq-style air control method. Sir Arthur Harris, while the senior air officer in Palestine, argued that the only way to solve the problem was to drop "one 250-pound or 500-pound bomb in each village that speaks out of turn . . . the only thing the Arab understands is the heavy hand, and sooner or later it will have to be applied."(44) Whether Harris was right or not, such a response was never attempted and neither ground nor air forces solved the problem of the Arab Rebellion. Ultimately, the question of success or failure of air control in Palestine rests upon this single question--was the system ever employed systematically? Or, as Sir John Slessor contends, "the

system of air control was never tried there, because the Air Staff were always aware that the conditions were entirely unsuitable for its use."[45]

The Palestine operations were in actually an attempt at air control on the "cheap." When the second round of rioting broke out in 1929, it is obviously apparent that the manpower available to the RAF "in country" was entirely too little to make a difference and only the emergency airlift of two infantry platoons from Egypt to Jerusalem managed to "save the day" from the rampaging mobs. However, given the progressive tightening of the governmental "purse-strings," which limited the forces available, it is not only the RAF who is to blame for the failure. The intelligence network was faulty and failed to warn the authorities of the possibility of rioting. And when the riots did break out, the High Commissioner, Sir John Chancellor, refused the RAF permission to bomb the Arab villages where the mobs were gathering (this action was standard procedure). Thus, the singular aspect of air control that seems to have made it work in Iraq, Transjordan, and Aden, was not allowed to be used in this instance. Aircraft did in fact fail to control the situation, and it is likely that the reason for failure lay not only with the RAF, but also with a failure of the civil administration to provide adequate intelligence and authorize the bombing that appears to have been one of the keys to a successful air control operation.

Conclusion

In 1926, John B. Glubb, then a Captain fresh from his experience with air policing in Iraq, published an excellent summary of conclusions based on the RAF's use of aircraft in peripheral conflicts. In his eyes:

> 1. Aircraft could be used as an independent force which could attack a rapid blow from a great distance which meant that a rebellion might be stopped before it could gain strength and that this also brought about economies in both time and money.
>
> 2. Air forces can be concentrated in a few locations from which they can attack distant targets.
>
> 3. Aircraft reduce native morale because the natives have no way to combat them and thus loose their main reasons for fighting--excitement and loot.
>
> 4. Advanced petrol dumps can be used to extend the range of the aircraft.
>
> 5. Aircraft allow the Government to broadcast its terms over a considerable area and can transport officials to negotiate with rebellious tribesmen.
>
> 6. In most instances, the limited number of available aircraft means that time for mechanical overhauls must be planned for.
>
> 7. Aircraft effectiveness depends to a great degree upon the geography of the region and the attitude of the inhabitants. Wooded and mountainous terrain limits

the effecdtiveness of aerial attacks. This also applies to those tribes who subsist on agriculture--crops make poor targets.

8. A major problem of using aircraft in policing operations is the identification of friends and foes and this means carefuyl preparation and accurate intelligence is vital.

9. When possible, an ultimatium should be dropped from the air to avoid unnecessary casualties.

10. Aerial attacks will often cause the surrender of tribes who are simply fighting for amusement or loot, but only an infantryman's rifle and bayonet will be able to overcome "fanatics or disciplined troops."[46]

The RAF's experience with air control operations in the inter-war years certainly was a "mixed bag." Where the geography and political climates converged to produce an environment such as that found in Iraq, Aden, Somaliland, and Transjordan, the experiment seems to have been remarkably successful. However, when the RAF was constrained either by urban demographics as in Palestine, or by army perversity as on the Northwest Frontier, air control was much less successful and could even, in the case of Palestine be considered a failure.

Either way, the RAF's survival in the early years following the Great War was intimately tied to the success of air control. In no other place was this so apparent as in Iraq. The development of air control was a vital aspect of Trenchard's campaign to prove the usefulness of the RAF as a separate service and its ability to contribute to the stability of the Empire. Trenchard believed the successes of air control were the "greatest civilizing influence these countries have ever known, owing to its process of rapid communications. Air methods are, in short, the reverse of the old punitive column, Our policy is one of prevention."[47] In the final analysis, the employment of air power to maintain order in the British Empire must be judged within the context of imperialism. Sir John Glubb was probably more sympathetic to the Arabs than any other, and although he sometimes felt the RAF's actions were sometimes excessive, on the whole, he argued that the operations were in fact beneficial.[48]

CHAPTER THREE
CHASING BANDITS AND GUERRILLAS -- THE AMERICANS

While it is readily apparent that the RAF pursued the concept of air control as a matter of institutional survival, this was not the case westward across the Atlantic Ocean. Neither the Army nor the Marine Corps aviation units were independent arms, nor were they concerned with institutional survival as a separate service. While they, like their RAF brethren, also faced post-war budget cuts and force reductions, the operations they conducted either along the long United States - Mexican border or in support of Marine Corps expeditions into the Caribbean region were not considered necessary for survival. In fact, some seventy years later, these operations are all but forgotten, their records gathering dust and ignored on archive and library shelves. In 1919, the Aviation Branch of the Signal Corps found itself flying south to the border with Mexico. American air power had flown south of this border before, in 1917, and their Curtiss Jennys had

compiled a singularly undistinguished and unremarkable record. In fact, just two years before, in support of General Pershing's Punitive Expedition, the Signal Corps' Jennys had literally crashed in their attempt to support an army ground operation.[49] This would be their second attempt. This time, they had the experience garnered from their previous attempt, plus the experience from their short involvement in the Great War which had just ended.

Aerial Border Patrol: U.S.-Mexican Border, 1919-1921

Immediately following the Great War, the Air Service responded to the need to patrol the southern border of the United States against incursions and smuggling. In June 1919, rebellion again erupted in Mexico. During the weekend of June 14-16, Pancho Villa's troops attacked the Mexican Army's garrison at Juarez, Mexico. The same day, U.S. Army troops stationed at Fort Bliss crossed the border to help the Mexican Federal Government troops repulse the rebels. In addition, Chief of the Army Air Service, Maj Gen Charles T. Menhor, ordered two units to proceed to Fort Bliss to form an Aerial Border Patrol.

The Air Services' DH.4s began the aerial border patrol operations with a flight on the 19th of June. This first patrol unit consisted of five squadrons--three bombardment, one surveillance, and one observation--and were responsible for patrolling the border from San Diego, California to Brownsville, Texas. The operation was controlled by the commander of the Air Terminal at Fort Bliss. Although responsible to his Army seniors for the operation, he was in charge of the planning and execution of the patrol. The operation had come about through the insistence of General "Billy" Mitchell that the air service could aid the Army's cavalry and infantry units in their operations to keep the border secure through armed reconnaissance. Originally designated the Ist Bombardment Group, the entire organization was redesignated the 1st Surveillance Group in Nov 1919 in recognition of the group's real duties of surveillance, observation, and troop liaison.[50]

The environment along this border was as physically unfriendly as that in Mesopotamia. One lieutenant described his tour of duty as "a life of hardship, possible death, starvation pay, and a lonely life without social contacts, in hot, barren desert wastes, tortured by sun wind, and sand."[51] Although the patrols began operations with some of the best aircraft in the Air Service inventory, the DH.4s and Jennys were not equipped for field service. They lacked bomb racks, machine guns, cameras, their compasses were unreliable, there were no accurate maps of the region, and the country was wild, unpopulated, and extremely inhospitable if an emergency landing was necessary and the pilot survived.

The often rocky political environment between the United States and Mexico colored much of the operation and directly influenced the very limited rules of engagement the flyers had to deal with. The deteriorating relations between the two nations was to a great extent the result of the Mexican government's attempts to implement their Constitution of 1917. This document called for the implementation of restrictions on American concessions in Mexico, and especially those involving oil and oil exploration rights.[52] Interservice rivalry did not cause friction like that found between the Army and RAF over budgetary matters. In a great part this was because the Air Service was neither a separate organization, nor was this a case of replacing ground forces--

the air units were operating in conjunction with and in support of the Army units deployed in the border posts.

As suggested, these operations were limited in their purpose. They were designed to search out bands of men along the border, fly low enough to observe them and what they were doing, determine how many were in the group, decide if there were stolen horses and cattle (how the airmen were to do this is uncertain), determine which direction the group was moving, and then write up a report and drop this and a sketch of the location at the nearest cavalry post. The flyers were ordered to especially avoid crossing the border.

Although this was literally a support operation, the few accounts available indicate that the Air Service by and large did its own planning of the specific operations. The Air Service established seven patrol districts which extended from the Gulf of Mexico to the Pacific Ocean at San Diego, California. This 2,000 miles of border ultimately required seven squadrons and 85 aircraft.

While the objectives these air units were supposed to accomplish were clearly stated, much of the requirements were beyond the capabilities of either the men or the equipment. For example, the radio installed in some of the aircraft could only send in code, the cavalry units were often unfamiliar with operating in conjunction with air units, and Texaco road maps were used to navigate with.(53) It would seem that while there was a clear concept of what was wanted, there was not a clear concept of what the available technology was capable of accomplishing.

When the border patrol operations began on June 19th, the primary responsibility was to establish the actual patrols. However, the absolutely next most important thing was to locate, prepare, and install facilities at the seven border stations. Until that was accomplished, the patrol would not be able to continue operations. At each of these patrol headquarters, mobile motor maintenance, armament, radio, and engineering shops were established. These would be responsible for the day-to-day maintenance while major repairs would be conducted at either Kelley or Rockwell Field.(54) Another major problem was the lack of communications capability between the air and ground forces. While the Dh.4s did have radios installed, these were for air to ground use only and had a range of about 25 miles (when they were worked). Communications continued to bedevil the operations until a panel signaling system was developed late in October 1919.

With all the difficulties of attempting to establish an operation which the Air Service had never contemplated, it seems that about the only possible factors the participants ignored was the aircraft themselves. Even though the DH.4s were difficult aircraft to operate (at least nine aircraft were lost to crashes or due to running out of fuel) and could not land on rough ground (the axle was only about a foot off the ground and would catch on anything and cause the aircraft to "nose over"), the aviators considered themselves to have the best of the situation. "We'll stick with the wings of the Air Service. We might have farther to fall with our planes than they do off their horses [the cavalry patrols], but until we fall, we will be up in the blue, where it is cool, clean, and exhilarating."(55)

During testimony before the House Rules Committee on August 20, 1919, General Mitchell claimed that "every foot of the United States-Mexican border from San Diego, California to

Brownsville, Texas is being patrolled from the air daily; and there has nbot been a single invasion by armed forces [revolutionaries] since the Border Air Patrol was started." While the general could be accused of overstatement, in one respect he was correct. Since the patrols had begun, there had been no serious cross-border incidents from the Mexican side. However, by the time the aerial patrols had begun, the threat of raids by Pancho Villa had diminished following his defeat at Juarez. As a deterrent, the patrol may have been successful, but its actual utility was in the training activities that developed with the infantry, cavalry, and artillery units also stationed along the border. By the autumn of 1920, the daily patrols had been reduced to twice a week and these were frequently cancelled whenever there were exercises with ground forces or other activities deemed to be more important. The need for men and aircraft for the Virginia Capes bombing tests in June 1921 effectively closed this chapter of Air Service operations.(56)

The Air Service gained valuable insight into operations over unknown territory, establishment of semi-mobile bases and operations, and air-to-ground communications. When it is considered that such individuals as then Major Henry "Hap" Arnold were involved in the operations, the insights may well have had more impact than can be readily evaluated. This was the first major operation by the Air Service following the Armistice and involved both pilots and aircraft that had taken part in that conflict.(57)

The Second Punitive Expedition into Mexico: August 1919

The second Punitive Expedition launched into Mexico by the U.S. Army was directly related to the Border Aerial Patrol operations then flying along the Rio Grande. Due to the lack of maps, inaccurate compasses in the Air Services' D.H.4s, two flyers set out on patrol from the field at Marfa, Texas, on August 10th, confused the Rio Conchos with the Rio Grande river, and disappeared into Mexico. Search flights along the Rio Grande began the next day and when these proved fruitless, the Army authorized flights into Mexico along the Rio Conchos. Seven days later, the Mexican government finally gave official permission to fly search missions into Mexico. However, on the 17th of August, a ransom demand arrived from Mexican bandits who wanted $15,000 for the two airmen. Although part of the ransom was paid (local ranchers and businessmen raised the cash), and one airman was returned, the other was taken away from the bandits by the Army officer charged with delivering the second part of the ransom.(58)

Secretary of War, Newton D. Baker, ordered the Army to initiate a pursuit of the bandits on August 18th, and Stacey Hinkle, then an Air Service lietentant, wrote that planning was done at Fort Bliss and by the next morning, troops were in place and three separate columns were prepared to enter Mexico in pursuit. The Air Service's DH.4s were to fly with the three columns scouting ahead, looking for bandits. In these two-man aircraft, the observers would make sketches of the terrain ahead of the ground forces (cavalry and pack trains), and then drop this information to the column commanders by weighted message bags. For this operation, the Air Service took on a decidely secondary, although very important role. The intent of the operation was to employ the ground forces to capture or kill the bandits while air was devoted to scouting duties. The ground forces were specifically ordered to avoid any combative encounters with Mexican government troops.

Physically the geography was no different from that which the fliers had been operating over along the border. Usually called "high desert," it is a hot, dry, inhospitable, rugged country with few sutiable places for aircraft to land. With the exception of an emergency landing strip established by one of the columns, all operations were conducted from either Marfa or the small field at Presidio.[59] Politically, the atmosphere could not have been more confusing. On one hand, the Mexican commander of the district gave permission for the U.S. troops to enter Mexico in pursuit of the bandits under the provisions of the Treaty of 1882. However, shortly after the force withdrew, the Carranza goverment declared that "no foreign force has any right to enter Mexico."[60] These political implications seemed to have had little effect upon the operation, since it would seem that the U.S. was determined to pursue the bandits and felt they had permission through the 1882 treaty which had not been revoked.

The records do not indicate specific rules of engagement. But, it would be safe to assume that the aircrews continued to operate under the same limitations as had been established for the aerial border patrol. That is, they were not to fire upon someone on the ground unless they shot first. However, this was very loosely interpreted. Stacey Hinkle, while flying in search of the bandits reports:

> I saw only one group of men. . . I shot a few rounds at them from about 1,000 feet altitude (too high to hit them), to see if they would return the fire. Since they dashed into the high brush without responding, I concluded they were not bandits, but Mexican cowboys. The only way to tell a bandit from a cowboy was to use such a test. A bandit would probably fire at you with his rifle, while a cowboy or rancher would not--most likely he did not even carry a rifle.

This points out the difficulty in identifying targets from the air and even more obviously, indicates a certain niavete among the airmen--who wouldn't flee if they were shot at? However, the main purpose of the aerial activity was to be in scouting for the ground forces in this unmapped territory, watching for ambushes and locating water holes.

The aerial aspects of the operation seem to have been planned and directed from the headquarters operating at Marfa. The officer, a colonel commanding the cavalry border patrol, was in charge of all aspects of the operations including the aerial operations supporting the ground force columns. However, the commander of the Border Aerial Patrol was also present at this headquarters and coordinated the aerial aspects of the operation. In this instance, air power was to be employed in those activities for which its available technology was best suited--scouting and reconnaissance. However, the expectation that an airman could identify specific people on the ground was too much to ask and most of the aircrews seemed to have responded much like Stacey Hinkle did--shoot at "suspicious" groups and see if they shot back.

As seems to be the case in both this operation and the Border Aerial Patrol operations in general, the aircrews were most concerned with the capabilities of thier aircraft. The DH.4s were prone to using up all of their oil before using up their gasoline and then forced landings would result because the engines would quit when this happened. This, plus the lack of adequate maps of the region were the two major factors concerning the aerial operators. But, regardless of these

problems, they were quite happy to be operating in the air rather than with the cavalry troops in the heat and dust.

If the operation is to be measured by whether they captured the bandits and retireved the $7,500 paid in ransom, then the operation was a failure. However, on the first day of the move south, two airmen came across three horsemen (the number involved in the kidnapping) including one who may have been the leader. In an ensuing exchange of rifle and machine-gun fire, the aircrew reported they had killed the one believed to be the leader (and the white horse he was riding). Even so, the expedition continued for several more days before being withdrawn. With its conclusion, the ground forces field commander included in his after action report an evaluation of the performance of the aerial operations:

> The airplanes worked well with the troops and furnished valuable information as to the movements of Mexican troops, located water and camping places, and furnished a quick means of communication with Headquarters at Marfa. Much was learned by both branches regarding co-operation and the needs of each other.(61)

While the expedition was not fully successful in its attempt to capture the kidnappers, as a tactical operation involving both air and ground forces, it seems to have been a marked success. Both the air component (who had members attached to the cavalry columns as observers and coordinators) and the cavalry forces learned more of the capabilities of the other and how to work together towards a single objective.

Haiti/Santo Domingo - U.S. Marine Corps 1919-1934

The Marine Corps deployed ground force brigades into Haiti (1915) and the Santo Domingo (1916) where they were joined in 1919 by small aviation contingents. Attached to the ground forces, the aircraft squadrons were intended to assist these forces in their small-scale anti-bandit operations. In both expeditions, the squadrons were attached to the ground force brigades, although they did operate under the direction of their own commanders, they performed missions as requested by the brigade commanders.

In both of these operations, external political influences seem to have had very little impact on the use of aircraft, perhaps because of the historical record of U.S. intervention into the Caribbean region. This time, the Marine Corps were sent into Haiti and Santo Domingo to restore order and protect U.S. interests. The operations were intended to eliminate the rebel threat to and establish a working government. These rebels were referred to as "bandits." The aircrews faced difficult flying conditions over unmapped mountainous and jungle-covered countryside with few acceptable places for emergency landings. Emergency landings in the countryside were full of risks not only from the crash landing itself, but also from the natives, who if they were "bandits" would be understandably upset with the aircrews. However, by 1922 those towns with Marine Corps garrison detachments usually had landing fields and the aircraft would roam the country criss-crossing the jungle and mountains flying into these fields.(62)

There seem to have been very few limits placed upon these flyers--they operated in support of the ground forces and either bombed or straffed those targets pointed out by the men on the ground. The Rules of Engagement, if any, appear to have been very broad, especially since the opposing forces were considered to be bandits and as a criminal element, not necessarily eligible for treatment under the rules of warfare.

The squadrons were deployed to Haiti and Santo Domingo without clear concepts of doctrine, or any real idea of what could be done with air power in these circumstances. In this evironment, experimentation seems to have been encouraged. In Haiti, Curtiss HS-2L seaplanes and Jenny trainers flown into the country in 1919 and used for coastal patrols. Later, other aircraft in both Haiti and Santo Domingo were used for reconnaissance, re-supply, medical evacuation, and a very primitive form of close air support for the Marine ground forces. These operations were directed by the aviation squadron commanders in response to requests by the ground force brigade commanders.

As mentioned, this was a time of experimentation, of discovering what could really be done with aircraft in these situations. Broadly, put, the aircraft were to support the ground forces in their attempts to pursue bandits and help restore order. To do this they conducted the operations mentioned above. During the operations in Haiti, it is likely that the Marines first began to develop dive-bombing techniques necessary to deliver their small bombs more accurately through the jungle cover. In 1919, Lieutenant L.H.M. Sanderson of squadron VO-9M may well have begun the development of this technique. He discovered his bombs would hit their target more accurately if he dove towards the target a about a 45-degree angle and released the bomb at a fairly low level (about 250 feet). However, it was not until the Marines began their operations in Nicaragua that the technique began to be refined. The very primitive state of ground-to-air communications at this point in time as well as the limited capabilities of the aircraft restricted these early attempts.(63)

These two Caribbean nations, along with Nicaragua, became something of a training ground for the men who became the senior Marine Corps aviators during World War II. The men involved, both in the air and on the ground, were interested in aviation in all of its aspects and the majority of the missions in these two countries were devoted to reconaissance, flying mail and supplies to garrisons, and evacuating patients in a specially designed ambulance plane.(64) These operations were successful, given the limited capabilities available to both the air and ground forces. In both cases, the bandits were killed and their groups broken up. However, this was done, not by aircraft, but by ground forces which the aviation units were supporting. The first aerial operations began in 1919, and the squadrons remained until the ground forces were withdrawn from Santo Domingo in 1924 and then from Haiti in 1934.

Nicaragua Again: US Marine Corps 1926-1933

The Marine Coprs began thier second campaign in Nicaragua in 1927 as a result of a civil war which was threatening the "lives and property of American citizens."(65) Although Marine Corps ground forces had been involved in Nicaragua from 1912 to 1925, avaition units had not been included in the operation. When the decision was made to dispatch the Marines again in 1927, an air unit composed of six aircraft was shipped aboard the aircraft tender *Melville* to "reinforce

Rear Admiral Latimer," who was the commander of "the special service squadron in Central American waters."[66] From the beginning, the Marine air units were intended to perform operations in support of the Navy and Marine expeditionary forces operating in Nicaragua. This was a single service operation, the U.S. Navy was in overall command, and the Marine Corps ground forces planned and directed the operations. The air units were designated as squadrons assigned to the ground force brigade, with their own commanding officer, maintenance organization, and headquarters detachment responsible for the necessary communication, administration and supply details of the aviation units.[67]

The Nicaraguan campaign was much more challenging both in terms of the geographical setting, the combat operations, and the impact of the political sphere, than either of the previously discussed American expeditions. Physically, the countryside was somewhat similar to that encountered by the Marines forty years later in Southeast Asia. By 1928, many of the aerial operations were being conducted in the area of the Nueva Segovia near the border with Honduras. That year, a *New York Times* correspondent, after flying over the region, described it as "thickly wooded . . . tortured into a patternless wildernes of peaks, ridges, and rock-strewn cliffs. . . . Its infrequent trails are almost invisible from the air." Not only was the terrain difficult from the air, supply movements on the ground were also torturous. In the same article, he also reported that ground movements were no easier, since the supply trains of "bull carts, the normal means of transportation, often make [only] three to six miles a day."[68]

When Marine ground forces landed in 1927, the political situtation in Nicaragua was one of open rebellion against the Consevative Party government. In December 1926, the Nicaraguan Minister of Foreign Affairs had sent a note to the United States government asking for help in restoring "peace and order in the country." Then, early in 1927, Great Britain, Italy, Spain, and other nations protested to the United States that the lives and properties of their citizens in Nicaragua were threatened by the revolution which had flared in the country. These nations indicationed that they expected the United States to take the steps necessary to protect their citizens.[69] By May 1927, with 5400 Marine ground forces in all of the principle cities, Henry L. Stimson, then Secretary of State, managed to convince the opposing sides to sign an agreement which became known as the Tipitapa Agreement. This, would guarantee a presidental election in 1928 which would be supervised by the United States. However, while it effectivly ended the Conservative-Liberal conflict, a former leader in the Liberal party, Augustino Sandino, refused to disarm. He felt that his party had sold out to the United States. When he attacked the Marine and constabulary garrison in the town of Ocotal in July 1927, the Marines were no longer observers and peacekeepers.[70]

In the United States, even the original deployment of the Marine Corps in 1927 caused a political reaction. By January 1928, debate over the Coolidge Administration's policy of keeping the Marines in Nicaragua was raging in the Senate. One Senator argued that "never in the history of the country has a President sent armed forces to a country and kept them there a year without the authority of Congress."[71] Questions over the propriety of the intervention were raised not only in the U.S. Senate, but also during the 6th International Conference of American States which began meeting in Havana, Cuba in February 1928. The delegates at the conference, went even further, when one committees writing and then presenting for adoption by the conference a resolution for consideration by the conference which laid out the following policy:

> No State may intervene in the internal affairs of another.

A government is to be recognized whenever it fulfills the following conditions:

> 1. Effective authority with a probability of stability and consolidation, the orders of which Government, particularly as regards taxes and military service, are accepted by the inhabitants.
>
> 2. Capacity to discharge pre-existing internatinal obligations, to contract others, and to respect the principles established by international law.(72)

Concurrently, the State Department declared that "the Government of the United States fully intends to cooperate with the constabulary of the Nicaragua effectively to establish order throughout the country, and make possible the holding throughout the country of a free and fair election, which we have undertaken to supervise."(73) By July 1930, the on-going debate, combined with the election of Herbert Hoover as President (Who, in the mind of at least one recent analyst, was more concerned with the opinions of the Latin American nations than his predecessor.), had ordered the Marine ground forces to be concentrated in the larger towns and cities while the offensive operations against Sandino's forces were put in the hands of the American-officered Guardia Nacional.(74) The situation continued in this manner until Congress restricted the numbers of American forces that could be sent to Nicaragua. Then in December 1932, all Marine tactical flying was suspended, and by mid-January 1933, the last of the Marine aviation units had left the country.(75)

Political influences certainly played a large role, not only from the beginning of the involvement, but became an increasingly greater influence the longer the intervention continued. It certainly played a role in the decision to withdraw the Marine ground forces from active operations in the countryside in 1932, and was a factor in the decision to conclude the intervention and withdraw in 1933.

Official explanations in February 1927 stated that the newly dispatched aviation unit (six De Haviland 4s) were intended to be used for observation in the interior and for communications between the east and west coasts of Nicaragua. The observation missions were intended to provide a means of monitoring the neutral zones established by the United States with the agreement of the Conservative government then in power in Nicaragua.(76) Before the signing of the Tipitapa Agreement these air units were tasked with guarding the neutral zone and preventing either Conservative or Liberal troops from fighting in the area. To do this, they were authorized to use force as necessary. Capt Mulcahy, who commanded the Marine aviation units from July 1931 to January 1933, wrote that the mission of the aircraft squadrons quickly evolved into support of ground troops through observation, ground attack, and transport. The first commander, Major Ross Rowell reported that even though he and his men had the authority to fire is fired upon, he had extended these politically established restrictions, and directed "all pilots to avoid hositilities and to return fire only when necessary to save their own lives." In this period before open warfare, the aircraft of the unit were hit twenty-three times by rifle fire.(77) By 1932, the rules of engagement had further evolved and airborne patrols were to "take all care of the security and safety of the civilian population and . . . bomb only when they feel perfectly sure

certain groups are really bandits--if they are carrying guns, if they are in the vicinity of a recent hold-up, or give themselves away by running to cover."[78]

Although the aviation units were subordinate to the ground forces, they were responsible for developing the plans for daily aircraft missions: observation, transport and resupply. They also designed specific plans in response to requests for support by ground force units that were under attack. For example, when a ground force column was beseiged in the town of Quilal, Major Rowell was asked by headquarters to develop a plan that would get the forces out of the town. After the wounded were evacuated by air, the decision was made to move the column under air escort. During the movement of the ground column, they were under the complete control of the air patrols escorting them. The pilots would direct the column when to move, what direction to take, and when to halt for the night. This operation continued for two days until the column was met by a larger force. Within the context of being attached to the brigade, these avaition units enjoyed considerable amounts of freedom in their operational planning. This is further supported by the fact that soon after operations began in earnst against Sandino, the original six aircraft were supplemented by an observation squadron of landplanes, and a utility squadron of transports and amphibians along with the headquarters detachment necessary for administration and other activities.[79]

The original objective for both the air and ground forces was to provide protection for the neutral zone established in the country. After the Tipitapa agreeement, the aircraft protected the movements of small detachments of Marines who moved out into the departments of Esteli, Jinotega,and Nueva Segovia who were charged with protecting small towns from attacks by outlaws. Once these garrisons were in place, the aircraft visited them daily providing reconnaissance and liaison. This changed in July 1927, when Sandino refused to acknowledge the agreement to disarm and on the 16th attacked the Marine and Guardia garrison at Ocotal. Throughout the later part of 1928 and throughout 1929, they were charged with destroying bandits and supervising the Presidential elections of 1928.[80]

When the aviation unit arrived in Nicaragua, their capabilities were almost unkinown. Although the DH.4s were capable of bombing, during their early patrols over the neutral zone they had only fixed machine guns in the front and carrried no bombs. They had very little experience operating over this type of terrain and they were unsure of just what they could accomplish. In the non-combat patrolling months, they discovered they could avoid rifle fire and gathered intelligence by observing the rebels' tactical methods, how they deployed, where they put their command posts, and how they dug in. They deliberately attempted to give Sandino the idea that they had only two airplanes by not allowing more than two to overfly rebel positions at any one time. During the first close support mission of the ground forces in Ocatal, Major Rowell later confessed that the ground forces "did not know how much assistance we could give them, and we ourselves were none to sure."[81] By the time operations concluded in 1932, the officer commanding the aviation squadrons felt that the campaign had proven the value of aircraft to an expeditionary force.

When the first air squadron and its six DH.4s arrived in Nicasragua, they were used for support of the ground troops by providing ground attack, observation, and transport duties. However, it quickly became apparent that these few aircraft were incapable of fulfilling all these tasks, so the

original squadron was augmented with additional landplanes, amphibians, and three-motored transports. The aviation units were engaged in reconnaissance, liasion, communications, dropping of supplies to columns and garrisons (including payrolls), medical evacuation, ground attack, bombardment, interdiction, aerial resupply operations, psychological operations (by dropping propaganda leaflets), search and rescue operations, support of electoral missions, and transport of troops.(82)

The first squadron commander, Major Rowell was most concerned with the ability of his aircraft to carry out the mission they had been assigned. It is evident from his writings that he felt unsure of the capability of the aircraft to do the ground attack mission. However, following the relief of the garrison at Ocatal, these misgivings gave way, and confidence in both the aircraft and their own abilities developed. Even though they began operations out of extremely primitive airfields--the main field at Managua was nothing more than a field and there were no permanent shelters for the aircraft--this caused more concern about how it would affect the airplanes. However, the aviators were well aware that despite the operations they carried on in Haiti, they had not proven their ability to effectively support ground combat units when these were in contact with the enemy.

Although the Marines never did capture Sandino--the Guardia finally killed him after the Marines were withdrawn--the campaign seems to have been considered a success by most of the participants. Captain Mulcahy in 1933 offered the following evaluation:

> The second Nicaraguan campaign conclusively proved the great value of aircraft to an expeditionary force. With operations being conducted in a sparsely settled country, extensive in area, where roads are unknown and even the trails traversing thickly wooded areas passable only with the greatest difficulty, aircraft were of vital assistance to the commanders in Nicaragua. They helped in the supply and administration of far-flung patrols and detachments; they furnished information and assisted at tim,es in beating off enemy ambushes that threatened their progress and safety; they brought information to higher command; and dropped supplies that helped maintain morale when confronted with most trying conditions.(83)

While it could be argued that this evaluation may be somewhat overstated, the aviation units obviously did contribute materially to the efforts of the Marine ground forces in their operations to capture Sandino and control the countryside. Although it is quite possible that the forces involved were not capable of accomplishing their mission of restoring law and order to Nicaragua, it is obvious from the many opeations the aviation units conducted to rescue ambushed columns and beseiged garrisons that without them the ground forces were incapable of even attempting to prosecute their mission. The aviation units were the only one capable of hampering Sandino's movements, attack his strongholds without warning, detect ambushes, and concentrate heavy bombardment upon specific targets (the ground forces did not have artillery). But perhaps more importantly, the aviation units proved to themselves and the ground forces that they were capable of carrying out close support missions.(84)

Conclusions

Like the RAF the American air services entered into these operations without a firm grasp of exactly what airpower was capable of doing. The operations were qualified successes, in that they never fully accomplished exactly what they set out to do. These operations were more of a success in that they proved at least to the aviators that they actually were capable of performing valuable services to ground forces. In pasrticular, and in Nicaragua especially, these services went far beyond what would normally be expected of military aircraft of the period and great inegenuity was employed to accomplish some of these missions. For example, when the Marines found they could not communicate with the ground forces readily, a method of using panels to direct air strikes was developed and messages came to be collected literaly "on the fly" by aircraft. In this later instance, messages were hung on a wire suspended between two poles and the aircraft would snag it by means of a line hung from the fuselage.(85) Both the Army and Marine aviators had the opprotunity to learn invaluable lessons from these experiences. Perhaps *New York Times* correspondent Harold Denny summed up all four episodes best when he pointed out in one of his columns that the aerial operations "furnish the first practical laboratory for the development of postwar aviation in coordination with ground troops."(86)

Although the Border Aerial Patrol can be said to have pre-staged the aerial operations of the Border Patrol of today, its impact on the aerial opeartions and thinking of the U.S. Army had much less impact than the Latin American campaigns in Haiti, Santo Domingo, and especially Nicaragua had on the Marine Corps. Throughout the 1930s, the Marine Corps put a strong emphasis on the tactics and techniques of fighting what they termed "small wars." This reached its apex in 1940 with the publication of the *Small Wars Manual: United states Marine Corps* which in addition to eight detailed chapters on the employment of ground forces in these "small wars," devoted a chapter to the employment of aviation which included the selecdtion of bases, general conduct of operations, how these forces were to be composed and organized, and how reconnaissance, combat support and transport aircraft were to be employed.(87) But, if all of these campaigns had an impact upon the Marine Corps, it was in Nicaragua that military aviation faced two of the most common factors of late Twentieth Century warfare--the guerrilla demagogue and necessity of air-ground warfare.

CHAPTER FOUR
DID IT WORK? AIRPOWER AND PERIPHERAL CONFLICTS

The purpose of this study is to not only attempt to discover some sort of "insight" into the employment of airpower in what is loosely termed "peripheral conflicts", but to also attempt to discover if there are any consistencies in the effectiveness or ineffectiveness of airpower in these situations. Although it may be argued that airpower may only be useful in a specific instance--RAF air control operations in the Middle East--if airpower was used in a similar fashion with similar results in other locations, then it may be applicable in other places and other times. If it can be demonstrated that airpower was of use in these different yet similar, situations, it would be a much more valid argument that the insights gained from an examination of these situations would be more likely to be applicable across a broad spectrum of peripheral conflicts. It is the purpose of this chapter to analyze the preceding case studies to discern similarities in the employment of airpower. These similarities may be either successful or unsuccessful uses of airpower--this is an attempt to discover the limits of airpower in peripheral conflicts.

While only the operations carried out by the RAF were referred to as air control or air policing by the RAF, those conducted by both the US Army and Marine Corps can be considered to be attempts at the sort of operation. The purpose of the RAF's air control operations was to reduce the economic burden of policing the Empire as well as perpetuate the RAF as an independent service, and this was a driving factor in its inception. The American operations were conceived not out of economic necessity, but because it was thought that airpower could be of assistance to the ground forces as they attempted to counter either bandits or guerrillas. In practice, the operations were very similar. However, one apparent difference in thought must be stressed. While it seems as though the RAF began their operations with the intent to do a great deal of damage to the tribes in order to establish their ability to do what they threatened to the tribesmen, as time went on, they seem to have decided almost unconsciously (although the continuing debate over the humanity of air control in the press may well have had a greater impact than can be realized from today's vantage point) to rely more upon causing the rebellious tribes inconvience rather than bombing them into submission.(88) American use of airpower never seems to have considered the notion of the "humanity" of air operations. Perhaps this was because the conflicts the Americans faced in Haiti, Santo Domingo, and Nicaragua were substantially different than those the RAF faced in the Middle East. The Border Air Patrol operations not only were very short in duration, but they also did not feature what could be termed "indiscriminate bombing" operations. On the other hand, in Nicaragua, the Sandinistas waged a particularly nasty war against their enemies. which included several rather painful and well-advertised methods of execution. In addition, their treatment of prisoners was well-known, especially after photographs of an executed Marine aviator appeared in the pages of Mexican and Honduran newspapers.(89) Furthermore, the conflicts the Marines waged in the Caribbean regions were much closer to today's insurgent warfare than anything faced by the RAF except perhaps on the Northwest Frontier. The British, and the RAF in particular, continually stressed not only in public, but in their writings, that air control was a much more humane method of controlling rebellious tribes than the alternative ground force operations. This subject rarely was mentioned in the American press or by the participants. When the subject of humanity did come up, it was in a negative fashion--that is, the inhumanity of the use of airpower. This was especially prevalent in the reports sent to *The Nation* by a correspondent who was travelling with the Sandinistas. The humanity issue aside, the development of how airpower was used in these situations is strikingly similar.

Several factors have emerged from these case studies. Primarily, and of particular importance to the employment of the airpower, was the fact that the aviation units involved in these peripheral conflicts faced an active, but usually ineffective, air-defense threat from the enemy forces. Secondly, successful operations relied not only upon the use of aircraft, but also close coordination and effective communications between ground and air forces. This was an absolutely necessary for either to be effective. Third, it quickly became apparent that good, accurate intelligence was vital in order to effectively attack the enemy. Fourth, although early operations were characterized by the use of "left-overs" from the Great War, airpower became somewhat more effective when better equipped aircraft became available. Even more important was the ability of the aviators to adapt their aircraft to tasks they were not designed for. Fifth, operations in urban areas were usually markedly less successful than those which occurred in less settled regions. Sixth, the weapons the aircraft could carry and employ were often ineffective against the targets the aviators attempted to attack. And finally, it was realized that the decision

to use airpower must take into account the political impact these operations had upon both domestic and international politics. These seven themes recurred in all of the case studies and as will be shown in the following comparison, the practitioners devised remarkably similar solutions.

Anti-Air Defense

From the beginning, the aviators faced very active, and in at least one case, very imaginative anti-air defenses. Although they were by and large ineffective, ground fire was a continual concern to the airmen. Even though several RAF aircraft were lost during air policing operations, these appear to have gone down not due to enemy ground fire, but rather to mechanical problems in the aircraft themselves. RAF aviators on the Northwest Frontier commented that "[the native's] rifle fire . . . was uncomfortably like that of a machine- gun." This seems to have had little impact upon their operations. However, in Nicaragua, Marine aviators appear to have lost at least one aircraft to Sandinista ground fire. This occurred while both air and ground forces were searching for the elusive Sandinista fortress of El Chipote. During a patrol, a two Marine patrol planes attacked a Sandinista pack train. One of the aircraft was hit by rifle fire and crashed a few minutes later while attempting to return to its base.(90) To counter the aerial threat, the Sandinistas became more inventive, and attempted to develop an early surface-to-air missile to shoot down their Marine antagonists. Major Rowell encountered these during the attacks on El Chipote:

> The first thing I saw was a barrage of skyrockets. Eight or ten of them rose from the sector I was covering. Later I heard it claimed that each of these rockets was equipped with a stick of dynamite that would destroy a plane. However, no one was hit, and I did not see any of them explode. Nevertheless, they did annoy some the pilots considerably.(91)

Although this and the other attempts by the Sandinista forces were usually unsuccessful, they did cause the aviators some degree of worry, but in the end, did not preclude them from completing their attacks. This fact, plus the fact that none of these operations faced any kind of air-to-air opposition, practically guaranteed that the aviators would be able to provide the most effective air support for the ground forces and also meant they could press their attacks without being forced to divert already often very scarce resources to air patrols designed to intercept enemy aircraft. This ability to freely operate whenever and wherever they wished is possibly the most important and most often ignored aspect of these type of operations. Any effective ground-to-air opposition or air-to-air opposition would have caused not only the effectiveness (such as it was) to diminish, but would have also increased the cost of the operations. And it must always be remembered, that for the RAF at least, it was the economy of air control that was its most important feature. Increased aircraft losses would likely have had political implications as well--especially in Nicaragua. In one official response to the loss of the Marines aircraft at El Chipote, Senator Hiram Johnson demanded in 1928 that the United States either send in enough troops to finish the job or withdraw the Marines before any more were killed.(92)

Air-Ground Coordination, Communications, and Control

Whether they were RAF operations on the Northwest Frontier or US Army operations along the Mexican-American border, these successful campaigns were controlled either by an aviation officer, or by a ground officer who either understood aerial operations, or was willing to take the advice of an aviator subordinate who did understand. For example, although a US Army cavalry colonel was in overall control of the Second Punitive Expedition into Mexico, it was obvious that he allowed the air officer attached to his headquarters to control the air operations aspect of the expedition.(93) The Marine Corps is perhaps the most striking example of effective coordination and control. Even though attached directly to the ground force brigades, the Marine aviation squadrons had their own headquarters organization which was directly responsible for the employment of the aviation assets assigned to Nicaragua.(94)

A lack of effective air-to-ground and ground-to-air communications systems bedeviled all of the operations. Operations during the Great War had brought about the development of many different methods for aircraft to communicate with ground forces and vice versa. For example, aircraft could readily pass messages to ground forces by dropping them in weighted bags with colored streamers attached. However, in the frequently rugged or heavily forested terrains these operations faced, retrieving dropped message bags was often very difficult. In most instances the aircraft were equipped with rudimentary radio systems, in the case of the US Army troops during the Border Patrol operations, the troops could not understand or receive the radio code messages sent from the planes, these early airborne communication systems did not work very well. Marine Corps aviators and ground forces seemed to have been the most imaginative in solving their communications problems. In the garrison towns deep in the Nicaraguan jungles, the Marine and national guard troops developed the imaginative procedure of stringing a wire between two poles which the daily aircraft patrols would then swoop down on and snag with a wire from the aircraft which could be then reeled in by the observer. In this fashion, the garrison could report not only Sandinista activities, but also could request either air drops of supplies or evacuation of medical cases by aircraft. The aviators would respond to the garrisons by dropping acknowledging messages back to the ground using weighted message containers. The RAF developed a similar "on the fly" system in Iraq, but this appears to have been used more to transmit information between the ground forces rather than to direct air attacks on ground targets.(95)

Other improvisations included the use of cloth panels by the US Army and Marine Corps ground forces to direct aircraft attacks against enemy positions. Major Rowell reported that the Marine Corps' first use of this method was made at Ocatal. In this instance, the countryside was so heavily wooded that the aviators could not see the enemy and dropped a message to the Marine ground forces who responded with laying out cloth panels directing the air bombardment. This was a satisfactory expedient, so the Marines developed a system of conducting aircraft bombardment which was very similar to the methods by which artillery bombardment was directed.(96) Perhaps one of the most important tasks the aircraft carried out in relation to the ground forces they operated with was that of providing transportation. Even as early as the operations on the Northwest Frontier, aviators were imaginatively thinking of uses for their aircraft. While the use of airplanes to evacuate sick or wounded soldiers was a thought during the first operations in India, by the time the RAF took over in Iraq, they routinely evacuated the sick and wounded to hospitals in the rear. During one operation in northern Iraq in 1923, the RAF

evacuated 200 dysentery cases the 200 miles to Baghdad (which would have taken at least six days to travel by the normal donkey journey).[97]

In Nicaragua, the Marine Corps undertook similar medical evacuation operations, in one instance flying out wounded men from the center of a besieged town in a two-place Corsair biplane. This method was institutionalized when the Navy's aircraft factory developed a DeHaviland with a covered Stokes litter attached to the top of the aircraft's fuselage behind the observer's position.[98]

In addition to medical evacuations, both the RAF and Marines developed very efficient aerial resupply methods. In Nicaragua, the Marine Corps utilized Fokker and Ford tri-motor transport aircraft to move supplies. At the height of the operations, these aircraft moved 50,000 to 60,000 pounds of freight every week. The combination of air-dropped supplies and landings provided the ground forces with rations, clothing, ammunition, medical supplies and even pay.[99] The RAF conducted similar operations, although an early attempt at air-dropping grain to one of the columns in northern Iraq was less than successful--a day's ration of four tons of barley was scattered over the ground. However, Sir John Salmond was certain that "when this method of supplying has been more fully investigated and a cheap form of parachute has been properly tried out, this method of emergency supply will prove a valuable asset."[100]

In addition to supplies, the transports occasionally, and in the case of the Marines in Nicaragua, frequently, carried troops. Although the RAF airlifted troops from Egypt into Palestine in 1929 to provide infantry support to operate with the beleaguered RAF armored cars in the Arab riots this did not seem to be standard procedure. However, in India, where the RAF operated in cooperation with the Army, they more frequently transported troops in their Vickers transports. Because of the nature of the operations, (specifically the reduction in the numbers of Marines and the corresponding greater reliance upon the *guardia* for ground operations) the Marines in Nicaragua made extensive use of this capability. For example, in the last two months of 1931, Marine transports moved more than 200 guardia troops from location to location so they could concentrate against Sandinista groups.[101]

Other imaginative uses of airpower by both the American and British airmen were what we today would consider psychological operations. Both the RAF and the Marine Corps used aircraft to drop what, for the lack of a better term, can be called propaganda leaflets. While the RAF's leaflets were couched in terms of a warning of what would happen if the tribesmen did not cooperate with the government, the Marines were purely propaganda. Partly in response to Sandino's very effective anti-Marine, anti-imperialism propaganda, the Marines decided to attempt their own operation. Thus, in late 1928, the aircrews dumped thousands of leaflets over the jungle around Sandino's supposed headquarters. What the effect of the Marine operations were, it is unknown, but Sir John Slessor was convinced that the RAF warnings often obtained the desired results without have to resort to bombing the tribes. The RAF was somewhat more sophisticated in these operations in that not only were proclamations dropped from the air, but they were also delivered by agents and, when there was doubts that the tribesmen could read, by loudspeakers from aircraft flying over the supposed offenders.[102]

Both the RAF and the Marine Corps discovered that aircraft were very effective in providing support for ground forces that had come into contact with enemy forces. This capability was especially well-developed by the Marine Corps in Nicaragua and is usually considered to have laid the ground-work for the very successful close air support operations the Marine Corps became famous for during their operations in the Pacific in World War II. For the ground forces, the most important support the aviation units provided was that of reconnaissance and observation. With the exception of Palestine, where the RAF was limited by the urban nature of the countryside, aircraft became the eyes of the ground forces, locating concentrations of the enemy, detecting ambushes, and escorting columns. The Marine Corps aviators frequently met with the greatest difficulty in carrying out these missions due to the jungle nature of the terrain in Haiti, Santo Domingo, and Nicaragua. Like their brethren on the Northwest Frontier, the Sandinistas quickly learned the limitations of the aircraft and adjusted their own movements to avoid detection. Learning where the enemy was located was one of the most difficult problems all of the units faced. The need for accurate intelligence became an on-going problem.

Intelligence

To be able to employ airpower effectively, even if this meant the ability to bomb the right village, group of tents, or hilltop, this meant that accurate intelligence was absolutely essential. The RAF frequently faced this problem, and on the Northwest Frontier in 1932, they surveyed and photographed over 1,000 square miles of territory and issued thousands of pictures to the aircrews flying missions over the region. Here, as in Iraq, the interplay between the military and political authorities was frequent and close and improved the ability of the aircrews to make sure they attacked the right target. In all of the cases surveyed, this was one of the single greatest problems the aircrews faced in employing their aircraft effectively, whether in support of ground forces, or by themselves.

In Nicaragua, the Marines faced the great difficulty in ascertaining the intentions and whereabouts of the Sandinistas. Primarily, this was due to the fact that the conflict there quickly evolved into a civil war between the Sandinistas and the governing party. In Iraq, on the other hand, the RAF developed perhaps the best possible intelligence system seen in any of these operations. They recognized early on that they needed to be able to identify who was who on the ground and in response, established posts throughout the countryside manned by junior officers who were to "familiarize themselves with the district to which they were accredited in such a manner that, should air operations suddenly be required, they would be enabled to make such arrangements as were necessary to ensure that aircraft found their correct targets."[(103)] This network seems to have been very effective when combined with the roving armored car patrols and reconnaissance by aircraft searching for armed bands of tribesmen. However, it must be remembered that the RAF faced an entirely different situation. In Iraq, the tribesmen were interested in raiding neighboring tribes for loot and glory, and were not particularly interested in forcing the British to leave the country. In Nicaragua, Sandino's purpose was to get rid of the Marines and replace those he thought were merely puppets of the United States.

Aircraft Technology

Both the RAF and the Americans quickly found that the aircraft left over from the Great War were not particularly suitable for the new tasks they were being called on to perform. Over the Northwest Frontier, the RAF discovered that the D.H.4s were underpowered for the altitude and the loads they were required to carry. In Iraq, they discovered the dry desert air combined with the heat quickly caused the wood of the DeHavilands to crack and split. Further, without pumps to refuel the aircraft, the ground crews were forced to pour the gasoline into the aircraft's tanks by hand and the continual wind frequently caused the gas to splash over the men.

Along the border, the Army's aviators discovered they faced many the same problems with the additional problem that the Curtiss Jenny's engines burned a tank of oil faster than they burned a tank of gasoline. This unfortunate situation was the direct cause of several emergency landings when an engine ran out of oil, seized up, and forced the aviators to land wherever they happened to find themselves. In the Caribbean's heat and humidity, Marine aviators found their wooden and fabric aircraft did not hold up well and until the new OU-1s and OU-2s with metal fuselages and frames arrived, the serviceability of the aircraft was always a problem.(104)

Until the 1930s when newer aircraft became available, the operations had to make do with leftovers from the Great War. These aircraft were never designed for the tasks they faced, but through ingenuity of the men operating them, they became useful tools. With advances in aircraft construction and design, especially in relation to transport aircraft, aerial operations improved quickly. This is especially apparent in the transportation and supply operations conducted both in Nicaragua, and in the Middle East.

Urban Ineffectiveness

The RAF experience in Palestine (arguments of whether air control was applied there or not aside), points out the difficulty of, if not the outright inappropriateness of airpower in attempting to control unrest in an urban setting. This seems to be especially true if ground forces are not available to work with the aircraft. The armored car and aircraft combination which had worked so well in the deserts of Iraq and Transjordan could not repeat their success in Palestine.

In Nicaragua, where airpower was sometimes utilized in an urban environment, the results are somewhat more mixed. Usually, the Marine aviators avoided bombing towns, not from any reasons of humanity, but rather from a mix of political impact in the media, and also because the Sandinistas rarely occupied towns for lengthy periods. When they did, aircraft were often used to bomb what were supposedly Sandinista-occupied buildings. However, aircraft were used when the Sandinistas attacked a town's garrison. The key factor in this instance appears to have been the fact that the garrison could direct the attacks of the aircraft and thus greater accuracy could be achieved. For example, at the battle of Ocatal, Major Rowell's aircraft are credited with destroying the Sandinista attack and saving the garrison. This capability was frequently demonstrated throughout the war in Nicaragua and the garrisons were convinced that if they could "hold out" until the daily air patrol flew over, they would survive a Sandinista attack.(105)

Callous as it may seem, the key to whether aircraft were successful in an urban environment seems to have been whether there were friendly ground forces "in contact" with enemy forces in

a town. If they were, they could direct the aircraft to bomb and strafe targets in and around the town with great effectiveness--at least in Nicaragua.

Weapons' Effectiveness

The Marines found that the small bombs their aircraft were capable of carrying had ". . . a very small lethal radius, and were practically innocuous in heavily wooded areas."[106] They were not the only ones--the RAF discovered much the same when they attempted to bomb the mud huts of tribesmen in Iraq and on the Northwest Frontier.[107]

However, in the case of either unprotected tribesmen in the desert of Iraq or Sandinista guerrillas caught in the open in Nicaragua, the story was much different. In the case of the airstrikes at Ocatal, the combined bombing and strafing of the Marine aircraft was extremely effective, destroying the Sandinista attack and routing the guerrillas. Against tribesmen caught in the open desert, aircraft were extremely effective.

As long as the aircrews and the ground forces kept in mind the limits of the weapons the aircraft could carry, they were effective. But, when they were used improperly, such as in bombing Kaniguram on the Northwest Frontier, where the RAF dropped sixteen tons of bombs, by the time British forces finally occupied it, General Climo (who commanded the ground forces), noted that there was very little damage.[108] However, the claims offered by both the British and Americans that aircraft were precise instruments more than stretches the truth. During Northwest Frontier bombing raids in 1928, at least 102 of 182 bombs dropped on dissident villages from 4,000 feet missed their target. Hardly a precise "pickle barrel" attack. Specific targets could be destroyed, but this required low level diving attacks. While the Marine aviators in Nicaragua employed "dive" bombing almost exclusively, the RAF rarely carried out this type of attack because they considered them to be "seldom justifiable" because of the risks to the aircraft and aircrews from ground fire.[109]

Political Influences

With the exception of the American Border Air Patrol, these operations could very well be called some of the first media wars. This was especially true in Nicaragua, where Sandino enjoyed the ability to effectively propagandize his operations not only in Latin American newspapers, but also, courtesy Carleton Beals (a correspondent travelling with Sandino) in the American periodical, *The Nation*. Political considerations impacted directly upon all of the operations, including those in and along the Mexican border with the United States. The political implications of using aircraft to control not only unruly tribesmen, but to combat guerrillas or bandits in the Latin American region, became primary considerations. The debate over the "humanity" of air control began early in the RAF's operations and continues today, while the political implications of American involvement in what was for all intents and purposes a civil war in Nicaragua, finally led to the withdrawal of the Marines there.

Since it was difficult for the opponents of air policing to attack it from the standpoint of cost, effectiveness, and speed, they directed their thrusts from the standpoint of ethics. The Air Ministry frequently put forth the claim that air policing was much more humane and *economical*

than its ground forces counterpart, as if to say that the only was it was more humane was because it was cheaper. These arguments over the ethics of air policing (especially after they became a topic at the Geneva Disarmament Conference), were conducted in the atmosphere of a political battle between the services for the sake of prestige, funding, and power.(110)

The political leadership in both Great Britain and the United States were sensitive to accusations of indiscriminate bombing and opponents of either air policing or intervention were quick to seize upon the ethical argument to attempt to make their point. This was not successful in the case of the RAF and was less so in either Haiti or Santo Domingo, however, it may well have been a decisive factor in the final decision to withdraw the Marines from Nicaragua.

Conclusions

There does not seem to have been any interplay between the RAF and the American services concerning the uses of aviation in these peripheral conflicts. On both sides of the Atlantic the services developed very similar tactics and techniques to deal with these new situations. Political implications of aviation in these conflicts seem to have been one of the more important external factors.

CHAPTER FIVE
CONCLUSIONS

This admittedly brief examination of how military aviation contributed to the peripheral conflicts of the United States and Great Britain during the period between the world wars, has indicated that there were a great many similarities between how these air forces used the new aircraft technology. In many ways modern technology would make the application of airpower to peripheral conflicts much easier. These early practitioners faced a great many problems which modern technology would tend to alleviate. Modern communications and navigation technologies would eradicate two of the most difficult problems faced by both the RAF and the American aviators. As an example, the navigational error which was the root cause of the U.S. Army's second expedition into Mexico would in all likelihood not happen today, and if it did, the aviators would be able to communicate with their headquarters. The technology issue aside, several consistencies have appeared in this examination. These consistent factors in the employment of airpower in peripheral conflicts indicate that there are possible "insights" which may well be applicable to the employment of airpower in these types of conflicts regardless of the period or the technologies involved.

Thus it is possible to attempt to consolidate these "insights" into a doctrine of employment of airpower in peripheral conflicts. This list in neither all-inclusive, nor is it in a priority order, because all of these factors are of importance when airpower is used in peripheral conflicts:

1. Good intelligence is vital. Accurate, timely intelligence is absolutely necessary to enable aircraft to make telling attacks against an enemy. The best means of obtaining this intelligence is through a combination of means, but the agent on the ground is extremely important.

2. Aircraft do not have to be specifically designed for peripheral conflicts, but they must be capable of operating in austere conditions, and should be adaptable to a variety of tasks--reconnaissance, attack, communications

3. Politics whether interservice, intraservice, national, or international will have an impact. This will be increased if the opponents are skilled at "getting their story out."

4. Aircraft are best employed when they are controlled by an aviator, or if not, if the overall commander is willing to follow the advice of an aviation subordinate.

5. Surprise is essential.

6. If an attack must be made, then the assault must be overwhelming.

7. When operations begin, the enemy must not be given an opportunity to rest and regroup.

8. Operations in urban settings should be avoided unless they are to assist a garrison that is under siege.

9. Bombing must be deliberate, targeted against specific known objectives and above all, it must be accurate.

10. Against guerrillas aerial operations must be considered a part of the overall campaign--ground forces will almost always be essential to force the enemy to surrender.

11. Propaganda operations--especially leaflets or other warnings of impending operations if the government's terms are not followed--are very useful. However, propaganda in any form, including news releases can be very important in countering adverse reports from the enemy.

12. Aircraft should be concentrated, patrol frequently and at irregular intervals and times, and be prepared to conduct attack operations with little notice.

13. Geography is an important factor in the conduct of aerial operations--jungle and mountainous terrain are the most difficult types of country to plan and execute effective operations.

14. While the enemy will not likely possess an air force of its own, care must be taken because they will be capable of countering aerial attacks with ground fire.

By 1936, allthough the more vocal airpower theorists were claiming an unproven capacity for strategic bombing in future wars, the attitude seems to have been articulated for two main purposes: the campaign for an independent air force and a larger share of diminished defense

budgets. This highlights the importance of studying interwar military aviation and its development. The realities of shrinking defense budgets and increased interservice competition for these reduced defense funds seems to have led American and British military aviation leaders to promote doctrine and employment based on an institutionalized, optimistic view of strategic bombing. This gave the Army Air Force a doctrine which still presents the U.S. Air Force with a dilemma in 1993. This monograph has ventured to argue that the diversity of military aviation's accomplishments during the twenty year interwar period are vitally important to the development of an understanding of how airpower can be employed in peripheral conflicts. The American and British air services laid the foundation of the theory and it is in this period of time where airmen must look for insights into the employment of airpower in today's world.

ESSAY ON SOURCES

The use of the airplane for military purposes in the interwar years to 1936, is often ignored by both historians and practitioners. Frequently thought of as a sideshow--if comes to mind at all--the biplane era has been ignored; relegated to dusty archives and library shelves. Ignorance has fostered the conviction, especially in the U.S. Air Force, that modern military aviation's roles and missions developed out of the crucible of World War Two. This argument asserts that any experience before 1939 is only a historical note and has nothing of importance to offer today's student of airpower. David MacIssac, "Voices from the Central Blue: The Air Power Theorists," in Peter Paret, ed. *Makers of Modern Strategy From Machiavelli to the Nuclear Age*, (Princeton, 1986), a proponent of this dialectic, wrote that while airpower played a sometimes spectacular, and an increasingly important role, it was largely unessential to the outcome of the Great War. An earlier student of airpower, Edward Warner, writing in "Douhet, Mitchell, Seversky: Theories of Air Warfare," in Edward Meade Earle, ed. *Makers of Modern Strategy: From Machiavelli to Hitler* (Princeton, 1943), went a step further during the Second World War years. He argued that a theory of airpower can be discussed in only a very limited manner. He was convinced that the Douhets and Mitchells of the 1920s were not proposing theories of airpower, but instead were concerned with the acceptance or rejection of a theory of the use of air power, i.e. a doctrine. Airpower in Warner's view is unique, with the fundamental advantages of speed and altitude, capability to destroy objects on the earth's surface, but could also remain fairly safe from effective reprisal from the ground. These factors made it different from any other means of waging war. For a different view, see the many works of J.F.C. Fuller and Liddell Hart written in the interwar years. Both authors were very important to the inauguration of a framework for air-land cooperation in warfare. In the years between the wars, theories of how to use military aviation did not come from a set of commonly accepted principles of airpower. Instead, they developed out of the separate choices made by each nation to either integrate the airplane into operations with land and sea forces or keep them independent. It was the drive for independence that became pre-eminent in the U.S. in the mid-1930s, although the national choice was to integrate military aviation with land and sea operations. As a result, the pre-eminent doctrines developed in America were only suited for independent operations, while those suggesting cooperation with ground forces were largely ignored except in the Marine Corps.

The focus of this study is an inquiry into how the air weapon was used during the period 1919 to 1936. Most of the material for this study is drawn from published sources, whether written for the general public, or for use in a military service school. Texts from the Air Corps Tactical

School are especially indicative of the lessons learned (or not learned) by American aviators from other aviator's experiences. The rest of the sources are taken from the correspondence, staff reports, memorandums, and studies found in the archives of the Air Force's Historical Research Agency at Maxwell AFB, Alabama. Although the sources appear in the notes in each chapter, the abundance of sources--and sometimes their scarcity--demands comment.

BIBLIOGRAPHIC AIDS

There is a vast accumulation of materials, but they are not particularly well catalogued. The periodical literature for the entire period is an especially lucrative source, and there is a singularly good guide to the aeronautical literature in the *Bibliography of Aeronautics*, edited by Paul Brockett for the National Advisory Committee on Aeronautics from 1909 to 1932. However, the one drawback to this guide is its international scope that makes the researcher face the sometimes daunting task of wading through a multitude of non-English entries. However, the *Air University Library Index to Military Periodicals* (1949-), which references English-language articles on aeronautics is a valuable bibliographic guide, but it is limited to articles appearing after 1949 in those journals it indexes. To date, a convenient guide to the articles in recent popular journals that have emerged to quench the thirst for information about the biplane era does not exist. Some examples of these periodicals are: The *Cross and Cockade* (1960-85); *Over the Front* (1986-); *1919-1939 Air Wars* (1987-); and *WWI Aero* (1986-). Professional historians usually do not write these articles, but most of them seem to be well researched. Their value lay in the backgrounds and bibliographies they provided to subjects that usually do not get examined in detail in most of the major works. For U.S.Marine Corps activities in Nicaragua, James S. Santelli, *An Annotated Bibliography of The United States Marine Corps' Concept of Close Air Support* (1968), though short, provided some contemporary periodical articles. A second source for United States' involvement in small wars during the interwar years was Benjamin R. Beede, *Intervention and Counterinsurgency: An Annotated Bibliography of the Small Wars of the United States, 1898-1984* (1985). This volume separated the listings for each of the small wars during the period and then provided an entry for air power involvement in each of these conflicts. Again, these were limited in number. A final source was the U.S. Air Force Academy Library's Special Bibliographic Series No. 59, *Air Power and Warfare* (September 1978), which has separate headings for the years between the two wars. However, it is limited by the fact it covers only the materials in the USAFA Library. Bibliographic sources for the interwar period, and particularly the Royal Air Force's air control operations are absent. To remedy this problem, the bibliographies and citations of David E. Omissi, *Air Power and Colonial Control: The Royal Air Force, 1919-1939* (1990) and Philip Anthony Towle, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare, 1918-1988*, (1989) were reviewed. They provided extensive compilations of both primary and secondary sources, although most of these come from Great Britain. The Air Force Historical Research Agency, Maxwell AFB has many oral histories and personal papers in its collection. Two guides were of inestimable help in researching these documents: Maurice Maryanow, *Catalog of the United States Air Force Oral History Collection*, (1989) and Richard E. Morse, *Personal Papers in the United States Air Force Historical Research Center*, (1990).

MEMOIRS, BIOGRAPHY, AND AUTOBIOGRAPHY

Between the Wars: 1919-1936

The interwar participants in air power operations have not often told their stories, and unfortunately, they have also only rarely been the subject of the biographer's pen. However, one exception is Sir John Bagot Glubb, *War in the Desert: An RAF Frontier Campaign*, (1961) who provided a very readable insider's account of the RAF's air policing operations in Iraq. Another is Sir John Slessor, *The Central Blue: Recollections and Reflections*, (1956), who devoted quite a bit of ink to a critical examination of the activities of the squadron he commanded in India between the wars and to the subject of air control. Andrew Boyle's biography of the first of Great Britain's air leaders, *Trenchard: Man of Vision,* (1962), not only gives the commander's view of the war but also helps to grasp British airmen's attitudes in the interwar era.

American Aerial Activities: 1919-1936

American aviation activities are recounted in *From the Wright Brothers to the Astronauts: The Memoirs of Benjamin D. Foulois*, (1968) written by Benjamin Foulois and Carroll V. Glines that tries to prove his actions in the 1930s were appropriate. Henry H. Arnold's *Global Mission*, (1949) was mainly concerned with creating a separate air service, while Claire L. Chennault's pen reflected the rancor he still held towards the Army Air Corps of the 1930s in *Way of a Fighter: The Memoirs of Claire Lee Chennault*, (1949). No examination of interwar US Army aviation and the development of aviation theory would be complete without considering William Mitchell. The best study is Alfred Hurley's *Billy Mitchell: Crusader for Air Power*, (1964) developed out of the author's Princeton University doctoral dissertation, "The Aeronautical Ideas of General William Mitchell," (1961). He convincingly proves Mitchell was the leading American of the time in understanding aviation's potential.

BOOKS AND MONOGRAPHS

Developments During the War -- General Histories

Since developments during the war directly influenced thinking about air power between the wars, the starting point for any study of air power in the interwar era is its use during the First World War. Luckily, there are many "general" histories, some available almost before the guns stopped firing. One of the earliest single-volume works is Charles Cyril Turner, *The Struggle In The Air, 1914-1918*, (1919) which has the failing most contemporary "histories" have--that is, being too close to the subject to be truly analytical. The two best single-volume academic studies of the air war were written 73 and 75 years after the war. Lee B. Kennett, *The First Air War: 1914-1918*, (1991) and John Howard Morrow, Jr. *The Great War In the Air: Military Aviation From 1909 to 1921*, (1993) both provide an excellent view of the air war and should be read as background material for any study of the period. Kennett's volume contains a particularly good critical bibliographic essay although Morrow's standard bibliographic listing is much more comprehensive. Fighter aircraft developments receive scholarly study in Richard Hallion, *Rise of the Fighter Aircraft, 1914-1918*, (1984).

The RAF and Air Control: 1919-1936

In the few general histories of interwar airpower, most concentrate upon either spectacular record-making flights or the use of the bomber. Even John Morrow (cited above) falls into this trap, arguing that the RAF, to survive, stressed strategic bombing. However, The RAF, under the direction of Sir Hugh Trenchard--whose years of leadership are admirably recounted by Andrew Boyle (cited above)--with the willing assistance of Winston Churchill, found a new mission for the RAF: "air control." Long ignored, air control is the subject of two very recent works: Philip Anthony Towell, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare, 1918-1988,* (London, 1989) and David E. Omissi, *Air Power and Colonial Control, The Royal Air Force, 1919-1939*, (Manchester, 1990). Both volumes stress the importance of air control in the survival of the RAF as a separate service. David Omissi's is probably the best single-volume analytical study of the subject available to date since Philip Towell's volume is mainly devoted to the period after 1945. Although most of the accounts by the participants can only be found in sources such as the *Journal of the Royal United Services Institute* or *The Hawk: The Annual Journal of the RAF Staff College*, a valuable exception is Sir John Bagot Glubb's book, *War in the Desert: An RAF Frontier Campaign*, (N.Y., 1961). "Pasha" Glubb provides a very readable insider's account of the RAF's air policing operations in Iraq through the eyes of an Army officer "seconded" to the RAF. He is one of the few who point out the problem of deciding who was the "bad guy" from two or three thousand feet. Another is Sir John Slessor, *The Central Blue: Recollections and Reflections*, (N.Y., 1956), who devotes some time to a critical examination of the activities of the squadron he commanded in India between the wars and air control policies in general. The essays published by Squadron Leader E.J. Kingston-McCloughry, *Winged Warfare: Air Problems of Peace and War*, (London, 1937) is a contemporary's views on such varied air power subjects as Trenchard's policies in World War I, air policing, and air operations in India. Andrew Boyle's biography of the first of Great Britain's air leaders, *Trenchard: Man of Vision*, (N.Y., 1962), helps the reader to grasp the attitudes of British policymakers towards military aviation in the interwar era.

Other recent studies of British thought and policies that also tend to argue for the importance of air control include: Malcolm S. Smith, *British Air Strategy Between the Wars*, (Oxford, 1984); Clayton, Anthony, *The British Empire as a Superpower: 1919-1939*, (Basingstroke, 1986); Barry D. Power, *Strategy Without Slide Rule: British Air Strategy, 1914-1939*, (N.Y., 1976); and Hilary Aidan St. George Saunders, *Per Ardua: The Rise of British Air Power, 1911-1939*, (London, 1971). This last is a single-volume history of British air power that emphasizes tactical operations over critical analysis, and devotes the first 280 pages to WWI.

Many monographs are like Bruce Hoffman's, *British Air Power in Peripheral Conflict, 1919-1976*, (Los Angles, 1989) a RAND project based solely upon secondary sources, designed to prove the usefulness of air power in the "limited war context." It has some value as a short background reading.

The RAF and air control is the subject of two very recent works: Philip Anthony Towell, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare, 1918-1988,* (1989) and David E. *Omissi, Air Power and Colonial Control, The Royal Air Force, 1919-1939*, (1990). The Omissi work is probably the single best study of the subject available presently. The Towell volume is very good. But its usefulness is limited by its 70-year coverage. However, the subject of air control has recently become the topic for academic studies. Wing Commander Michael B.M.

Canavan, "The Royal Air Force and Air control to 1939," (Unpublished Masters paper, University of Alabama, 1993) is a very good example. A review of the development of RAF air control in Middle East 1920-1936, the author includes suggestions for the application of air control today. The author also enumerated his idea of RAF air control doctrine. This is the only known source for such a listing. A good background reading.

American Military Aviation: 1919-1936

American aviation operations in the interwar era received little attention until the appearance of Maurer Maurer, *Aviation in the U.S. Army, 1919-1939*, (1987). This is an excellent scholarly study, based on both primary and secondary sources, which includes both careful documentation and a very good critical bibliographic essay. United States Marine Corps' aviation between the wars still awaits its historian, although two generalized histories briefly cover operations in Nicaragua: Robert Sherrod, *History of Marine Corps Aviation in World War II*, (1952) and Peter B. Mersky, *U.S. Marine Corps Aviation: 1912 to the Present*, (1983).

Army aviation's operations along the United States-Mexico border from 1919-1921 are admirably covered in two monographs from a person with firsthand experience: Stacy C. Hinkle, *Wings and Saddles: The Air and Cavalry Punitive Expedition of 1919,* (Southwestern Studies Monograph No. 19, 1967) and *Wings Over the Border: The Army Air Service Armed Patrol of the United States-Mexico Border, 1919-1921*, (Southwestern Studies, Monograph 26, 1970). The former is a detailed examination of the late 1919 expedition into Mexico to ransom two Air Service fliers, while the latter is a concise history of the operation from its beginning to end. Although the Border Air Patrol was discontinued in 1921, it was briefly resumed in 1926. Kenneth Baxter Ragsdale, *Wings Over the Mexican Border: Pioneer Military Aviation in the Big Bend*, (1984) examines the second with particular emphasis upon Texas' Big Bend airfield at the Johnson Ranch. Most of the author's sources is correspondence or interviews with participants and unfortunately many of the incidents described cannot be verified through other sources. Wesley Phillips Newton, *The Perilous Sky: United States Aviation Diplomacy and Latin America, 1919-1931*, (1978) and "The Role of Aviation in Mexican-United States Relations, 1912-1929," in Eugene R. Huck and Edward H. Moseley, eds, *Militarists, Merchants, and Missionaries: United States Expansion in Middle America*, (1970) briefly look at the commercial aspects of American aviation in Latin America. This era has been neglected and still offers much for the historian.

British Interwar Theorizing

The British airmen and their supporters were especially prolific. An early British defense of the status quo for air power was Rear Admiral Murray Fraser Sueter, *Airmen or Noahs, Fair Play for Our Airmen, The Great "Neon" Air Myth Exposed*, (1928). This was a reply to *The Great Delusion* by "Neon" (Mrs. Marion Whiteford Ackworth) which had sharply criticized interwar British air policy concerning air defense. Sueter supported his arguments about air power's value through his own experiences as the Director of the Admiralty Air Department from 1912-1915; and Commanding Officer, Royal Naval Air Service units in Southern Italy 1917-1918. It is a very good summary (with a special emphasis on the often forgotten naval side) of the accomplishments of the British air weapon during WWI. A secondary source study of

organization of British air power emphasizing supply, design and administration is James Moloney Spaight, *The Beginnings of Organized Air Power, A Historical Study*, (1927). This volume from a very prolific author on various aspects of aviation is mostly concerned with political and administrative decisions during WWI. Another volume by James M. Spaight, *Air Power in the Next War*, (1938) is a look at what war might be like with a wider use of the aerial weapon. Some of the best contemporary volumes detailing the British stance during the interwar era include John Cotesworth Slessor, *Air Power and Armies*, (1936). This volume, by one of the most eloquent of the British theorists, is based on the author's lectures describing the lessons of the WWI air effort that he delivered at the Staff College at Camberley between 1931 and 1934. The Army view of imperial policing is detailed through the examination of several situations in the decade following the war in Major-General Sir Charles W. Gwynn, *Imperial Policing*, (1936) and should be read to understand the "other side's" view.

American Interwar Theorizing

Turning to America and the uses made of military aviation between the wars, the researcher is immediately struck by the lack of definitive scholarly studies of the period. The majority focus upon the oft-repeated story of the rise of strategic bombing and the subjects of Douhet and Mitchell. Edward Warner (cited above) argues that Mitchell and Douhet were the leading protagonists of airpower until the mid-1920s. However, he ignores Lord Trenchard. He also argues Douhet's writings were not widely known and were not available until 1933 to US Army Air Corps officers. In the Air Corps Tactical School (ACTS) materials now available at the Air Force Historical Research Agency (AFHRA), is a mimeographed copy of Douhet's writings dating from 1923. It was Douhet, and not Mitchell who likely had the greatest impact upon American air power theorizing. This thesis is carefully examined by Raymond Richard Flugel, "United States Air Power Doctrine: A Study of the Influence of William Mitchell and Giulio Douhet at the Air Corps Tactical School, 1921-1935," (Unpublished dissertation Univ. of Oklahoma, 1965). The author includes many quotes from primary sources, especially ACTS textbooks and studies to examine the subject.

Gen. William Mitchell's pen was as prolific as he was outspoken, and he argued in the early 1920s not for strategic bombing per se, but rather for the command and control of all aviation under a single, independent organization. David MacIssac (cited above) argues that Mitchell preeminently wanted centralized coordination of all air assets under autonomous air force command free of any dependence upon the army. Mitchell's ideas were taken almost directly from Sir Hugh Trenchard's as well as the 1918 Smuts Report that both gave the RFC its independence and founded the RAF as the first independent air force. Alfred F. Hurley, "The Aeronautical Ideas of General William Mitchell," (Doctoral dissertation, Princeton, 1961) contends that Mitchell was a borrower of ideas from "the community of airmen which he joined in WWI."

William Mitchell and Henry Arnold were not the only American authors during the interwar period. "Air Tactics," (N.Y., 1921), written first as an Air Service manual in early 1919 on air doctrine by William C. Sherman while assigned as Chief of Staff of the First Army Air Service in France. It was used as a text at the Field Officer's School in 1922, and then published in book form as *Air Warfare*, (N.Y., 1926). This is a very good "insider's" view of how military aviation

should be employed. Disappointing is the best way to describe Mason M. Patrick, *The United States in the Air*, (Garden City, 1928) which dwells mostly upon personalities and offers very little in critical comment on air power. George F. Eliot, *Bombs Bursting in Air: The Influence of Air Power on International Relations*, (N.Y., 1939) is an early attempt by an air power advocate to write the air version of Alfred T. Mahan's *The Influence of Seapower Upon History*.

Some of the most important sources for an understanding of air power's theoretical and operational development in the United States during the interwar era are: Robert Futrell, *Ideas, Concepts, and Doctrine: A History of Basic Thinking in the U.S. Air Force, 1907-1964*, (Washington, D.C., 1971); Robert T. Finney, *History of the Air Corps Tactical School*, (Washington, D.C., 1955); Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington, D.C., 1987); John F. Shiner, *Foulois and the U.S. Army Air Corps, 1931-1935* (Washington, D.C., 1983); and Thomas H. Greer, *The Development of Doctrine in the Army Air Arm, 1917-1941* (Maxwell AFB, 1955). Thomas Greer argues that the development of airpower doctrine is dynamic and the ideas of 1941 will not serve in the present (1955) nor into the future. Ideas of theory must be continually searched for to keep pace with continuous technological and strategic changes.

However, except for short commentaries in the Shiner and Maurer volumes cited above, these works ignore such American activities as the Army's Border Air Patrol and the Mexican Punitive Expeditions of 1919. Frequently ignored by airpower histories, are the U.S. Marine Corps' aerial operations in Nicaragua, the Dominican Republic, and Haiti between 1919 and 1934. Mention is made in Robert E. Sherrod, *History of Marine Corps Aviation in World War II* (Washington, D.C., 1952) and Peter B. Mersky, *U.S. Marine Corps Aviation: 1912 to the Present* (Annapolis, 1983), although most of the information available about the Marine's use of aerial ambulances, air supply, support of ground forces, and airpower in jungle warfare is to be found in contemporary journal articles (the New York Times is an frequent source) and such professional journals as the *Marine Corps Gazette, Leatherneck,* and *United States Naval Institute Proceedings*. These journals often take a very parochial view and do little analysis.

Any researcher who intends to examine the development of air power theories in the American army between the wars will find a field that has been only barely plowed. Some studies of the development of interwar air power theory include: Lester H. Brune, "The Foundations of American Air Power Doctrine Aviation and National Defense, 1919-1933; A Study of the Relationship Between Force Weapons, Power Concepts, and Foreign Policy (Unpublished Doctoral dissertation, University of Rochester, 1959; Thomas A. Fabyanic, *Strategic Air Attack in the United States Air Force: A Case Study* (Manhattan, Kan, 1977); and James P. Tate, "The Army and Its Air Corps: A Study of the Evolution of Army Policy Towards Aviation, 1919-1941," (Unpublished Doctoral dissertation, Indiana University, 1976).

MAGAZINES, JOURNALS, AND NEWSPAPERS

Contemporary articles appearing in newspapers, magazines, and journals were the best sources for many firsthand accounts of events by the participants. Especially valuable for accounts by RAF members is the *Journal of The Royal United Services Institute, Hawk: The Journal of the RAF Staff College*, the *RAF Quarterly*, and *The Air Annual of the British Empire* (1929-1936).

The *Marine Corps Gazette* and especially the *United States Naval Institute Proceedings* were useful for accounts and thoughts of Marine Corps operations in Nicaragua.

The *New York Times* proved to be a very useful source for aviation matters during the period. This is especially true of the regular Sunday section that covers both military and civilian developments in aviation. Another useful contemporary source is the *Army and Navy Journal* as was the *News Letter* of the Division of Military Aeronautics.

Other contemporary publications include: *Aero Digest; Aeronautical Digest; Aeronautical World; Aeronautics; Aerial Age Weekly; The Aeroplane; Air; Air Power; Aircraft; Airway Age; Airways; Flying; National Geographic; Popular Aviation; Slipstream; U.S. Air Service(s);* and *The Nation.*

More recently, several magazines and journals have appeared which pertain to this period: *Aerospace Historian; Air Progress; Air Power Historian; American Aviation Historical Society Journal; Cross and Cockade (American); Flying; 1919-1939 Air Wars;* and *Over the Front*. Many articles appear in these sources, however, the majority of them are secondary sources. Most are well written and appear carefully researched even when not written by historians. In particular, *Over the Front* and *Cross and Cockade* included several articles concerning the air war in Mesopotamia and Palestine. These articles proved to be good references for some primary sources, especially articles in *RUSI*. Another valuable secondary source journal was the *1919-1939 Air Wars* that led to primary sources through a two-part series on U.S. Marine Corps air operations in Nicaragua.

GOVERNMENT DOCUMENTS

Useful for insight into how air policing operations impacted upon official RAF and Army doctrine was the War Office Manual 1076: *The Employment of Air Forces With The Army in the Field* (1932). The U.S. Marine Corps' *Small Wars Manual* and *Marine Corps Aviation General, 1940* were especially useful as indicatiors of the "insights" the participants gained from their experiences in the Caribbean.

HISTORICAL ARCHIVE RECORDS

The unpublished materials used to prepare this study were drawn exclusively from the collections of the United States Air Force's Historical Research Agency, Maxwell Air Force Base, Alabama. These materials are the really only certain means of deciding just what the ACTS's position was regarding the use of air power during this period. They also provide a glimpse of the intense discussions concerning the use of strategic bombing, pursuit, and the question of what the air power's major mission should include. Of particular use were the Historical Research Agency's collections from the various sections of the Air Corps Tactical School (ACTS). The collection of the school's curriculum contains a wide variety of addresses by Army officers at the school; textbooks, 1929-1935; manuals from the school's library collection; lectures, 1929-1935; map exercises from 1929-1935; faculty studies by Army officers serving as instructions at the school; and student studies on many air power topics. Of particular value is the material from the Department of Air Tactics and Strategy. These materials

encompass a wide variety of topics, but of particular interest were the materials collected by the instructors in the preparation of their lectures and studies from such diverse sources as the British Air Ministry; lectures from the Army War College at Fort Leavenworth, Kansas; material gathered from the Marine Corps School at Quantico, Virginia; and various studies prepared by ACTS and often submitted to the Chief of Air Corps. The collection filed under the 248 series (which includes the materials from the ACTS Department of Air Tactics and Strategy) were the most useful, particularly in the examination of the impact aerial operations from the 1914-1936 period had upon thinking at what was literally the source of doctrine for the interwar Army Air Force. One especially interesting manuscript came from the Army Air Forces' War Plans Division files titled: *Doctrine for the Employment of the GHQ Air Force*, 17 October 1934. It contributed valuable information on Plans Division thinking about the employment of the air weapon and especially the insights recommended not only by U.S. experiences, but also by those of other nations. In addition, unit histories contributed particulars of the operations by those units involved in the 1919-1926 Border Air Patrol. Their usefulness varied considerably between each organization. *A Text on the Employment of Marine Corps Aviation*, (1935) suggests thinking of USMC in mid-1930s concerning employment of air in landing operations and small wars.

PERSONAL PAPERS AND ORAL HISTORIES

Also useful for its insight was the Oral History Interview with Benjamin D. Foulois that included his recollections of the 1916 Mexican Punitive Expedition. It especially sheds light upon the employment thoughts of prewar Army aviators and provides a basis of comparison with the ideas that developed out of the WWI and interwar experiences. Other collections with useful information for this era include the papers of Orvil A. Anderson, Muir S, Fairchild, Ernest L. Jones, William E. Kepner, and Oscar Westover. However, again, these sources must be used with care and need verification through other primary sources because of potential problems with deliberate bias and poor memory.

AAF/USAF HISTORICAL STUDIES

These studies were produced by the U.S. Army Air Forces and U.S. Air Force historical programs. As additional secondary sources, they were particularly valuable as bibliographic sources. Helpful monographs were: Jean H. Dubuque and Robert F. Gleckner, *The Development of the Heavy Bomber, 1918 to 1944*, Study 6, (1951); Irving B. Holley, *Evolution of the Liaison-Type Airplane, 1917-1944*, Study 44, (1946); and Edward O. Purtee, *History of the Army Air Service, 1907-1926*, (1948). These provided insight into American air power thinking in the interwar period.

NOTES

1. For examples of current doctrines, see U.S. Air Force Manual 1-1 *Basic Doctrine of the United States Air Force* (Washington, D.C.: GPO, 1992); AP3000 *Royal Air Force Air Power Doctrine* (London: HMSO, 1993); AAP 100 *Royal Australian Air Force Air Power Manual* (Victoria, Australia: Aristoc Offset, 1990). The western (non-Soviet Union inspired/trained) tend to be very similar in their basic concepts on the use of air power.

2. Robin Higham, *Air Power: A Concise History* (N.Y.: St. Martin's Press, 1972), 41.

3. Karl von Clausewitz, *On War*, trans. Peter Paret and Michael Howard, (Princeton, N.J.: Princeton University Press, 1984),172-173; Friedrich von Bernhardi, *On War of Today*, trans. Karl von Donat, 2 vols. (London: Hugh Rees, 1912-13), I:49.

4. The basic doctrine manual of the USAF, Air Force Manual 1-1, mentions "special operations" as a mission within the force enhancement (that is, a mission which enhances the capability of other aspects of military power--ground forces--for example) role and does not recognize it as a means of applying force in the same manner as strategic attack, air interdiction, or close air support.

5. Clausewitz, 141.

6. Jay Luvaas, "Lessons and Lessons Learned: A Historical Perspective," *The Lessons of Recent Wars in the Third World*, ed. Robert E. Harkavy and Stephanie G. Neuman, 2 vols. (Lexington, Mass.: Lexington Books, 1985), I: 53-72.

7. Jay Luvaas, *The Military Legacy of the Civil War: The European Legacy*, (Lawrence, Kan.: University Press of Kansas, 1988), 181.

8. The concept of "insight" was inspired by and is explained in Jay Luvaas, *The Military Legacy of the Civil War*, cited above.

9. Alan Stephens, *The Transformation of Low Intensity Conflict*, (Fairbairn, Australia: Air Power Studies Centre, 1993), 1-5.

10. Omissi, David E. *Air Power and Colonial Control: The Royal Air Force, 1919-1939* (New York: St. Martin's Press, 1990), xv.

11. Cain, Charles W., ed. *Aircraft in Profile*, Vol 14 (New York: Doubleday & Company, 1975), 30-31.

12. See David Omissi, Squadron-Leader Kingston-McCloughry, Philip Towle, and Bruce Hoffman. Each of these provided many examples of the uses the RAF squadrons were put to.

13. Cain, *Aircraft in Profile*, 31.

14. Omissi, *Air Power and Colonial Contol*, 10.

15. Omissi, *Air Power and Colonial Control*, 9-11 and Cain, *Aircraft in Profile*, 31-32.

16. _____ *The Hawk: The Annual Journal of the RAF Staff College*, "The Mahsud Operations, 1920 (No. 31 Squadron)," Vol 1, No. 1, 1928, 128.

17. Omissi, *Air Power and Colonial Control*, 12.

18. _____. *Hawk*, Vol 1, No. 1, 125-128.

19. ibid., 126-127.

20. _____, *Hawk*, Vol. 1, No. 1, 127.

21. Omissi, *Air Power and Colonial Control*, 13.

22. Towle, Philip Anthony. *Pilots and Rebels: The Use of Aircraft in Unconventional Warare, 1918-1988* (London: Brassey's, 1989), 37-38. This is perhaps one of the most balanced evaluation of the use of air power in India. A contemporary, Squadron-Leader E.J. Kingston-McCloughry, *Winged Warfare: Air Problems of Peace and War* (London: Jonathan Cape, 1937), presents the RAF view.

23. Malcolm Smith, *British Air Strategy Between the Wars*, (Oxford: Clarendon Press, 1984), 28.

24. Towle, *Pilots and Rebels*, 12 and Omissi, *Air Power and Colonial Control*, 15.

25. Flight Lieutenant F.A. Skoulding, "With Z Unit in Somaliland," *The Royal Air Force Quarterly*, July 1930, 390-392; Omissi, *Air Power and Colonial Control*, 14-15.

26. Omissi, *Air Power and Colonial Control*, 15; Towle, *Pilots and Rebels*, 12; and Randal Gray "Bombing the Mad Mullah" *Royal United Service Institution Journal*, December 1980.

27. Omissi, *Air Power and Colonial Control*, 15.

28. Charles Townsend *Britain's Civil Wars: Counterinsurgency in the Twentieth Century* (London & Boston, Faber & Faber, 1986), 93-94 and Dudley Saward *Bomber Harris: The Story of Sir Arthur Harris, Marshal of the Royal Air Force* (New York: Doubleday, 1985).

29. Towle, *Pilots and Rebels*, 11.

30. Barry D. Powers. *Strategy Without Slide-Rule: British Air Strategy, 1914-1939* (London: Croom Helm, Ltd, 1976),171-172 and Sir John Slessor *The Central Blue: Recollections and Reflections* (London: Cassell, 1956), 52.

31. Slessor, *The Central Blue*, 52; Saward, *Bomber Harris*, 24; Townshend, *Britain's Civil Wars*, 98; and Sir John Salmond, Air Marshal, "The Air Force In Iraq," *Journal of the Royal United Services Institute*, 70, (Aug 1925), 497.

32. J.A. Chamier, Wing-Commander. "The Use of the Air Force for Replacing Military Garrisons," *Journal of the Royal United Services Institute*, 66, (Feb 1921), 207-208. This is perhaps the clearest early elucitation of just what the RAF thought it could accomplish.

33. Ibid., 210.

34. Ibid., 210.

35. Slessor, *The Central Blue*, 66; Townsend, *Britain's Civil Wars*, 98-99; and C.F.A. Portal, Air-Commodore "Air Force Co-Operation in Policing the Empire," *Royal United Services Institute Journal*, 82 (May 1937), 351-354.

36. Sir John Glubb *War in the Desert: An R.A.F. Frontier Campaign* (London: Hodder & Stoughton, 1960), 76-79.

37. Ibid, 69-70.

38. Ibid, 70.

39. Salmond, "The Air Force in Iraq," 497.

40. Sir Arnold Wilson, Lt Col, *Mesopotamia: 1917-1920* (London: Oxford University Press, 1931), 239.

41. Salmond, "The Air Force in Iraq," 494-495 and Cain, *Aircraft in Profile*, 39-41.

42. Slessor, *The Central Blue*, 52.

43. Townshend, *Britain's Civil Wars*, 99-101 and Slessor, *The Central Blue*, 52.

44. Townshend, *Britain's Civil Wars*, 110.

45. Slessor, *The Central Blue*, 52.

46. John B. Glubb, Captain. "Air and Ground Forces in Punitive Expeditions," *Journal of the Royal United SErvices Institute*, 71, no. 484 (Nov 1926), 783-784.

47. Smith, *Britian's Air Strategy Between the Wars*, 30.

48. Glubb, *War in the Desert*.

49. Calvin W. Hines "First Aero Squadron in Mexico," *American Aviation Historical Society Journal*, 10, no. 3 (Fall 1965); Juliette A. Hennessy, *The United States Army Air Arm: April 1861 to April 1917* (Washington, D.C.: Office of Air Force History, 1985) and John C. Thompson, "Pershing's Punitive Expedition: An Overview with Suggestions for Further Study," (Unpublished thesis, U.S. Army Command and General Staff College, Ft Leavenworth, Kan., 1975).

50. Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington, D.C.: Office of Air Force History, 1987), 100 and Stacy C. Hinkle, *Wings Over the Border: The Army Air Service Armed Patrol of the United States-Mexico Border, 1919-1921*, Southwestern Studies Monograph No. 26, (University of Texas at El Paso, Texas: Texas Western Press, 1970), 6-9.

51. Hinkle, *Wings Over the Border*, 8.

52. Wesley Phillips Newton, "The Role of Aviation in Mexican-United States Relations, 1912-1929," in *Militarists, Merchants and Missionaries: United States Expansion in Middle America*, Eugene R. Huck and Edward H. Moseley, eds. (University, Alabama: University of Alabama Press, 1970), 115.

53. Hinkle, *Wings Over the Border*, 17.

54. Hinkle, *Wings Over the Border*, 13.

55. Hinkle, *Wings Over the Border, 38-41*.

56. Maurer, *Aviation in the US Army*, 108 and Hinkle, *Wings Over the Border*, 36-42.

57. Stacey C. Hinkle, *Wings and Saddles: The Air & Cavalry Punitive Expedition of 1919*, Southwestern Studies Monograph No. 19, (El Paso, Texas: Texas Western Press, 1967), 4-7.

58. *New York Times*, August 18, 19, 20. and 21, 1919; and Hinkle, *Wings and Saddles*, 8-38.

59. Hinkle, *Wings and Saddles*, 38.

60. Newton, "The Role of Aviation in Mexican-United States Relations," 115.

61. Hinkle, *Wings and Saddles*, 36-38.

62. Robert Sherrod *History of Marine Corps Aviation in World War II*, (Baltimore, Md: Nautical & Aviation Publishing Company, 1987), 22-23 and William L. Roper, "Air Action In Nicaragua," *Marine Corps Gazette* Vol 56, no 11 (Nov 1972), 58-59. Recalling his first cross country flight when assigned to Marine Squadron VO-1M in Santo Domingo, Brig Gen Hayne D. Boyden, then a lieutenant, recorded his thoughts when the aircraft he was riding in crash-landed. Although he was concerned with the crash, he seemed more worried about the memory of the sergeant-observer in Haiti, who was reportedly killed and eaten by the natives after a crash.

63. Sherrod, 23; Graham A. Cosmas, "The Formative Years of Marine Corps Aviation, 1912-1939," *Aerospace Historian*, Vol 24, No 3 (June 1977), 91; William T. Larkins, *U.S. Marine Corps Aircraft: 1914-1959* (Concord, Calif: Aviation History Publications, 1959), 3-15; and Peter B. Mersky *U.S. Marine Corps Aviation: 1912 to the Present* (Annapolis, Md: Nautical & Aviation Publishing Company, 1983), 20.

64. This was a specially modified DeHaviland, which the Naval Aircraft Factory in Philadelphia had built in 1922. It had a covered Stokes stretcher attached to the top of the fuselage behind the rear cockpit and was reportedly capable of carrying two patients--one reclining and one sitting up. Sherrod, note pg 22.

65. Francis P. Mulcahy, Capt, USMC, "Marine Corps Aviation in Second Nicaraguan Campaign," *United States Naval Institute Proceedings*, vol 59, no 8 (August 1933), 1121.

66. _____, "Planes and Marines Sent To Nicaragua," *New York Times*; February 17, 1927, sec. 1, 6.

67. Mulcahy, "Marine Corps Aviation in Second Nicaraguan Campaign," 1122.

68. Harold N. Denny, "Marines Push Drive in Nicaragua Wilds," *New York Times*, 25 May 1928, section 9, 16.

69. L.C. Speers, "What Lies Behind The Nicaraguan Crisis?," *Nerw York Times*, January 15, 1929, Sec. 9, 1. This is an in-depth report by Speers analyzing the reasons for the U.S. involvement in Nicaragua, and is perhaps one of the better sources of evidence for how divided the official reaction was to the continuing situation.

70. Mulcahy, 1121-1122; and L.C. Speers, "What Lies Behind The Nicaraguan Crisis," *New York Times*, January 15, 1928; sec. 9, 1.

71. _____, "Democrats Argue in the Senate," *New York Times*, January 21, 1928, Section 1, 3.

72. Richard V. Oulahan, "Curb on Our Policy Sought as Foes of Intervention Come to Fore at Havana," *New York Times*, January 21, 1928, Section 1, 3.

73. Speers, "What LIes Behind the Nicaraguan Crisis?" sec 9, 1.

74. Neill Macaulay, *The Sandino Affair* (Durham, N.C.: Duke University Press, 1985), 134. This is one of the more detailed and perhaps the least biased histories of the Second Nicaraguan Campaign.

75. Mulcahy, op cit, 1131-1132 and H.C. Major, Captain, USMC, "Bringing the `Ducks' From Nicaragua," *United States Naval Institute Proceedings*, 59, no 2 (December 1933), 1727.

76.. _____, "Planes and Marines sent to Nicaragua," *New York Times*, February 17, 1927, sec. 1, 6.

77. Ross E. Rowell, Major, USMC, "The Air Service in Minor Warfare," *United States Naval Institute Proceedings*, 55, no. 10 (Oct 1929), 871-872.

78. _____, "Marine Aviators in Nicaragua Furnish Proof of the Practicability of Aviation and Make Lasting Contributions to Its Development," *Leatherneck*, 15, no. 10 (October 1932), 14.

79. Mulcahy, "Marine Corps Aviation in the Second Nicaraguan Campaign,", 1122 and Rowell, "The Air Service in Minor Warfare", 875.

80. Mulcahy, "Marine Corps Aviation in Second Nicaraguan Campaign", 1122-1127.

81. Rowell, "The Air Service in Minor Warfare", 872-873.

82. Mulcahy, "Marine Corps Aviation in the Second Nicaraguan Campaign", 1121-1129.

83. Ibid, 1121.

84. Mulcahy, "Marine Corps Aviation in the Second Nicaraguan Campaign", 1121-1132; Rowell, "The Air Service In Minor Warfare", 871-877; Major, "Bringing the `Ducks' From Nicaragua", 1727-1731, Harold R. Denny, "Five Marines are Killed and 23 Wounded in Battle With Nicaraguan Rebels," *New York Times*, January 2, 1928, Sec 1, 1 & 20; Harold R. Denny, "Sandino Directed Men From Fox Hole," *New York Times* (January 10, 1928) Sec 1, 33; Harold R. Denny, "Plane Brings Out Wounded Marines Under Enemy Fire," *New York Times*, (January 8, 1928) Sec 1, 1; and Harold R. Denny, "Marines Push Drive In Nicaragua Wilds," *New York Times* (January 21, 1928), Sec 1, 1.

85. Denny, "Five Marines are Killed and 23 Wounded in Battle with Nicaraguan Rebels," Sec. 1, 20.

86. Denny, "Marines Push Drive in Nicaragua Wilds," Sec. 1, 3.

87. U.S. Marine Corps *Small Wars Manual: United States Marine Corps, 1940* (Washington, D.C.: Government Printing Office, 1940), Chapter IX, 1-24.

88. Chamier, "The Use of the Air Force for Replacing Military Garrisons," 210.

89. Macaulay, *The Sandino Affair*, 103 & 212. The Sandinistas resorted to several gruesome methods to execute offenders whom their courts found to be guilty. For example, in 1930, they instituted a new method, called *corte de cumbo*, in which a machete was used to slice off a part of the victim's skull, exposing the brain, and causing intense agony until death came some hours later.

90. Ibid, 93.

91. Rowell, "The Air Service in Minor Warfare," 874.

92. Speers, "What Lies Behind the Nicaraguan Crisis?, 1.

93. Hinkle, *Wings and Saddles*, 7.

94. Mulcahy, "Marine Corps Aviation in Second Nicaraguan Campaign," 1121.

95. Salmond, "The Air Force In Iraq", 498.

96. Rowell, op cit, 875.

97. _____. *Hawk*, Vol 1, No. 1, 125-126 and Salmond, "The Air force in Iraq", 494.

98. Mulcahy, "Marine Corps Aviation in the Second Nicaraguan Campaign", 1121-1129.

99. Ibid, 1128.

100. Salmond, "The Air Force in Iraq", 494.

101. Townsend, *Pilots and Rebels*, 99-101 and Mulcahy, "Marine Corps Aviation in the Second Nicaraguan Campaign", 1129.

102. Macaulay, *The Sandino Affair*, 131-132 and Slessor, *The Central Blue*, 62-63.

103. Glubb, *War in the Desert*, 69-70.

104. Salmond, "The Air Force in Iraq", 494-495; Cain, *Aircraft in Profile*, 39-41; Hinkle, *Wings Over the Border*, 36-42.

105. Townshend, *Britain's Civil Wars*, 99-101; Slessor, *The Central Blue*, 52; Rowell, "Air Service in Minor Warfare", 871-872; Denny, "Plane Brings Out Wounded Marines Under Enemy Fire," 1; Mulcahy, "Marine Corps Aviation in the SEcond Nicaraguan Campaign", 1121-1129.

106. Second Brigade Summary of Operations, February 9, 1928, quoted in Macaulay, *The Sandino Affair*, 96.

107. Omissi, *Air Power and Colonial Control*, 13.

108. Ibid, 13.

109. Ibid, 166-67.

110. Roger A. Beaumont, "A New Lease on Empire: Air Policing, 1919-1939," *Aerospace Historian*, Vol 26, no 2 (June 1979), 85-88.
