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Airpower and the Cult of the Offensive

Carter

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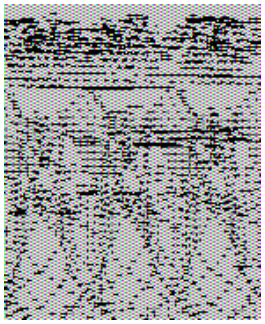

Airpower and the Cult of the Offensive

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Foreword

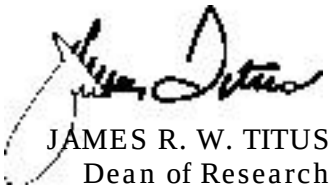
Dogmatic belief in the dominance of the land offensive influenced decisions that resulted in years of futile blood-letting on the Western Front in World War I. Termed *the cult of the offensive* by scholars of the Great War, faith in the offense became so unshakable in pre-1914 Europe that military organizations dismissed as irrelevant numerous indications of its waning power in the face of technological developments favoring the defense. As we know, the belief that airpower is inherently offensive is a recurrent theme in airpower history and doctrine. Given the predilections of airmen for offensive operations, could a cult of the offensive perniciously trap airpower doctrine and lead to similarly disastrous consequences?

By drawing on selected historical experiences of the air forces of Great Britain, Israel, and the United States, Maj John R. Carter Jr. employs a comparative perspective and rigorous case study methodology to offer a detailed examination of that question. He begins by establishing the theoretical background necessary for case study analysis. Airpower defense is defined as those operations conducted to deny another force's air operations in a designated airspace. Airpower offense consists of those operations in the airspace defended by another, or operations conducted outside of one's own actively defended airspace. Major Carter dissects the relationship between offense and defense to discover that airpower defense enjoys neither an advantage of position nor of time. He thus concludes that traditional Clausewitzian views relative to the power of the defense do not apply to airpower. The author next describes those factors that may inject or reinforce a preferential bias for offense into airpower strategy and doctrine. Major Carter defines a cult of the offensive as an organizational belief in the power of the offense so compelling that a military organization no longer evaluates its offensive doctrine objectively, which leads to his examination of the ramifications postulated to result from an offensive ideology.

Drawing on the histories of three services—Great Britain's Royal Air Force from 1918 to 1938, the Israeli Air Force from

1967 to 1973, and the United States Air Force from 1953 to 1965—Major Carter offers three case studies to determine if the cult of the offensive applies to air forces. He concludes that cults of the offensive have indeed influenced airpower doctrine in the past, and that detailed offensive planning and a critical evaluation of capabilities provide two methods for avoiding this potential trap.

Originally prepared as a thesis for Air University's School of Advanced Airpower Studies (SAAS), *Airpower and the Cult of the Offensive* was subsequently selected by the Air Force Historical Foundation as the best SAAS thesis for academic year 1996–97. Major Carter's work represents a significant contribution to the growing body of scholarly literature on military aviation, and we are pleased to make it available to a wider audience of airpower thinkers and practitioners.



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About the Author

Maj John R. Carter Jr. (BS, Duke University; MAS, Embry–Riddle Aeronautical University), a senior pilot with 2,700 hours in O-2 and A-10 aircraft, is director, Commander's Action Group, Headquarters Air Combat Command at Langley Air Force Base (AFB), Virginia. A distinguished graduate of the Reserve Officer Training Corps program, he was commissioned a second lieutenant in the Air Force in May 1982. After completing undergraduate pilot training at Laughlin AFB, Texas, he was assigned to Shaw AFB, South Carolina, as an O-2 pilot and forward air controller. In 1986 he was reassigned to the 354th Tactical Fighter Wing (TFW), Myrtle Beach AFB, South Carolina, as an A-10 pilot. He graduated from the USAF Fighter Weapons School in 1990 and returned to the 354th TFW as a squadron weapons officer. After deploying to Operation Desert Shield, he was reassigned to the 10th TFW, Royal Air Force Alconbury, United Kingdom. He returned to Operation Desert Shield as his squadron's weapons officer and subsequently led 41 combat missions during Operation Desert Storm. He was assigned to Nellis AFB, Nevada, in 1991 as an instructor pilot in the A-10 Division of the USAF Weapons School, where he completed his tour in 1995 as the operations officer.

Major Carter is a graduate of the USAF Weapon School (where he received the Robbie Risner Award), Air Command and Staff College, and in 1997 the School of Advanced Airpower Studies, Maxwell AFB, Alabama. He is married to the former Melissa Kline, and they have two children, Robert and Hannah.

Introduction

> *I am tempted indeed to declare dogmatically that whatever doctrine the armed forces are working on now, they have got it wrong. . . . Still it is the task of military science in an age of peace to prevent the doctrines from being too badly wrong.*
>
> —Sir Michael Howard
> Chesney Memorial Gold Medal Lecture
> 3 October 1973

Since a complete understanding of the conditions of future conflict lies beyond the horizon of any strategist, those called upon in the future to execute doctrine formulated today will likely find it lacking. The degree to which doctrine fails to anticipate the actual conditions of combat may spell the difference between victory and defeat. That military organizations entrusted with the preservation of national security will strive to develop usable doctrine appears self-evident, as does the assertion that future conflict will hold some surprises despite the best efforts of planners, especially if a nation enters an unexpected conflict. It is surprising that doctrine sometimes turns out to be thoroughly inappropriate for even an anticipated, foreseen conflict. Obviously no organization sets out to develop a flawed doctrine, but despite the best of intentions, some doctrines lead to tragedy for the armed forces employing them. To help avert such future tragedies, *Airpower and the Cult of the Offensive* offers insights about how to avoid one possible cause of "badly wrong" doctrine.

The military doctrines of the European powers in 1914 erred terribly by underestimating the power of the defense. Several authors, notably Stephen Van Evera and Jack Snyder, have examined the antebellum characteristics of the major European powers' World War I military organizations. They label the myriad causes and effects of their extreme faith in offense over defense in spite of contrary evidence "the cult (or ideology) of the offensive."[1] The experience of World War I

appears to demonstrate that one way to get doctrine badly wrong is to overestimate the power of the offense.

The relationship between offense and defense has long intrigued military theorists. Antoine Henri Jomini and Carl von Clausewitz addressed the relative strengths and weaknesses of offense and defense in their major works.[2] One of the first airpower theorists, Giulio Douhet, claimed that no defense against aircraft was possible.[3] While acknowledging the possibility of defense, both Air Force Manual (AFM) 1-2, *United States Air Force Basic Doctrine*, the US Air Force's (USAF) first doctrine publication, and Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, its current version of its basic doctrine, assert that airpower is inherently offensive.[4] Can the cult of the offensive perniciously trap airpower doctrine, and, if so, what are the identifiable symptoms that an offensive bias may have skewed one's airpower doctrine? Answering that question is central to this study. This thesis provides a theoretical background and examines three cases to test the hypothesis that the ideology of the offensive can trap airpower doctrine. After examining the nature of offense and defense as they apply to airpower, the author offers reasons military organizations may prefer offensive doctrines. He identifies the elements and implications of the cult of the offensive and investigates a historical case to determine if the airpower doctrine under study was trapped by the cult of the offensive. The author infers from the case study data symptoms strategists may use as indicators that their doctrine properly, or improperly, estimates the effectiveness of the offense. He reviews the empirical findings and discusses the implications.

The use of evocative words such as *trap* and *cult* requires some additional explanation, lest the reader be misled by the choice of terminology. This thesis discusses some implications of organizational theory for military organizations, in particular the influence organizational forces can exert on the formulation of military doctrine. For comprehensible, logically justifiable reasons military organizations usually prefer offensive doctrines, and such natural attraction to offense is not what is meant by a cult of the offensive. Where exactly one draws the line between the customary, militarily useful appeal of the offense and a cult of the offensive are necessarily vague.

However, the difference is important. The use of cult is meant to describe, not indict. When doctrine depends on immediate offense for success either without regard to observable improvements which have significantly strengthened the defense, or when known political limitations prevent the use of the offense, one perceives a critical discontinuity between offensive doctrine and reality. It is this discontinuity, which occurs when offensive preference continues, or even strengthens, in the face of known limitations or obstacles to offensive action, that is investigated as being possibly attributable to a cult of the offensive. A cultic belief in the success of the chosen offense, despite readily available evidence to the contrary, characterizes such instances.

Similarly, the use of trap indicates that preference for offense could make one's doctrine susceptible to a cult of the offensive. As demonstrated in 1914, belief in the efficacy of offense can become so compelling that defensive improvements are ignored as irrelevant, and the ability and requirement to conduct a successful offensive are no longer questioned. This dynamic becomes self-reinforcing, and once acting a powerful offensive preference begets more offense. It is in this sense that a cult of the offensive can trap doctrine. Robert Jervis asserts that it is possible to ameliorate the effects of the security dilemma by first recognizing that it exists.[5] The author likewise asserts that one may avoid the potential trap of a cult of the offensive by acknowledging the spiraling tendency of offensive doctrines, then remaining alert for symptoms which indicate that such a spiral may be occurring.

The proper use of evidence is critical to drawing any useful conclusions. One should not fault planners for underestimating the power of the defense when defensive improvements occur secretly or result from an unanticipated technological improvement. For example, Luftwaffe planners did not fully comprehend how the Royal Air Force's (RAF) fighter direction net incorporated radar to increase the power of the defense in the Battle of Britain. While their intelligence methods may merit criticism, the Germans did not ignore the influence of

new technology for the defense; they simply did not have adequate information to judge its importance.[6]

It also becomes much easier to find signs that accurately predicted the nature of a conflict in hindsight. The historical record may preserve the prognostications of those who correctly anticipated how a conflict would unfold, while not preserving other guesses which, though just as powerful at the time, turned out to be as wrong as the preferred doctrine. This phenomenon could lead one to conclude, erroneously, that strategists made a clear choice to reject the correct doctrine for the incorrect one. To demonstrate both the power and the danger of the ideology of the offensive, the evidence must show that the potential deficiencies of the offensive doctrine were apparent, that the organization under study had the opportunity to consider the data portending the ineffectiveness of its planned offense, and that the military organization nevertheless rejected doctrinal reform in favor of continued emphasis on the offense.

The case studies considered here, the doctrines of the RAF in the interwar period through 1938, of the Israeli Air Force (IAF) from 1967 to 1973, and of the USAF from 1953 to 1965, are specifically bounded to test the hypothesis. Changing the boundaries could lead to different conclusions. For instance, the Israeli case begins after the remarkable success of 1967, the British case does not include World War II, and the US case examines only the period before extensive bombing began in Vietnam. The cases were selected for this study because they have important similarities. In each case, the airpower doctrine was offensive. During the time periods under study, airpower employment conditions changed, which leads one to question the appropriateness of the offensive doctrine by the end of the period. Each case considers a relatively large, well-funded military organization that had sufficient flexibility to alter its doctrine, if leaders had decided that doctrinal reform was necessary. Finally, the lessons gleaned appear to have applicability to today's airpower doctrinal development.

The Nature of Offense and Defense for Airpower

In summary, the speed, range and flexibility of air power grant it ubiquity, and this in turn imbues it with an offensive capability. Because success in war is generally attained while on the offensive, the adage, "the best defense is a good offense," is almost always true in air war.

—Col Phillip S. Meilinger
10 Propositions Regarding Air Power

To analyze the potential influence of offensive ideologies on the development of airpower doctrines, it is first necessary to clarify the definitions of offense and defense as they apply to airpower. Once the definitions are established, an accurate description of the relationship between offense and defense for airpower is possible.

Traditional Definitions of Offense and Defense

Interest in the relationship between offense and defense has increased with the growing importance of offense-defense theory in international security studies.[7] Because some elements of this theory are useful for explaining the relationship of offense and defense in airpower, portions merit a brief review in this study. Offense-defense theory defines offense and defense traditionally in terms of the ability to take or protect territory.[8] The offensive-defensive balance is expressed as the relative cost of offense and defense. While several variations of the definition of balance are in use, the key idea is that the offense has an advantage when it consumes fewer resources to take territory than to defend it. The theory expresses offense-defense balance as the ratio of the investment required in offense to offset an opponent's investment in defense.[9] For example, if it requires a $3 investment in offense to offset a $1 investment in defense, then the offense-defense balance is expressed as 3:1. The larger this ratio, the greater the balance favors the defense. Defense has more of an advantage in a system, like the one cited above as an example, with a balance ratio of 3:1 than in another system where a $1 investment in defense can be

offset by a $2 investment in offense, giving a balance ratio of 2:1. Still, in both of these systems, the defense has an advantage. The idea of defense-dominance or offense-dominance used to describe ratios other than 1:1 should be more accurately expressed as advantage. The ability to compare two systems with different balance ratios and identify movement of the ratio along a continuum provides more utility than making an absolute binary determination.[10] This definition of offense-defense balance avoids the contentious classification of weapons as inherently offensive or defensive by their characteristics, instead focusing on the net effect new technologies have on the overall security system.

Offense-defense theory has demonstrated plausible explanatory power for understanding the causes of wars, the potential for arms races, and the nature of the security dilemma at the strategic level. While the theory incorporates the strategic effects of airpower, it sheds little light on the nature of the offense-defense relationship for operational airpower forces. Even a definition of tactical offensive advantage still refers to the ability to seize or protect territory.[11] Limiting one's definition of offense to the ability to seize or secure territory implies that airpower acts only as a supporting arm for forces which can take and occupy territory. While supporting ground forces in the conquest of territory is one significant role for airpower, it is not the only way airpower influences national security. Further analysis requires a more refined definition of offense and defense as they apply to airpower.

Airpower Perspective

The first problem in defining offense and defense concerns the matter of perspective. To illustrate, imagine that a fighter aircraft engages an attack aircraft flying to a target. Initially, one likely would label the initiator or the fighter offensive and the reactor or the attack aircraft defensive. Suppose that the attack aircraft negates the fighter's initial weapons delivery attempts and turns to engage the fighter. If the basis for applying the labels of offense and defense depend on flying characteristics, air-to-air weapons capabilities, and the spatial

relationship of the aircraft, the roles reverse if the attack aircraft attempts to shoot down the fighter, which must now defend. As the engagement continues, the roles of offense and defense may cycle back and forth with each transitory advantage of altitude or position. Obviously the nature of the engagement does not change based on whether the fight occurs over friendly or enemy territory. While one may dismiss this dilemma as pertinent only to the most tactical level of war, it illustrates how the perspective of air warfare can differ from that of ground warfare.[12]

To resolve the assignment of offensive and defensive roles, several possibilities exist. One method defines engagement roles by assigning each opponent the first role held. Thus, the fighter aircraft that initiated the attack bears the offensive role for the entire engagement, even though the roles may switch later. Another common convention acknowledges the exchange of roles by labeling the defender's attempt to shoot the attacker as a counteroffensive. A third method characterizes tactical engagements by the nature of the higher operational-level strategy they support. In this case, roles at the operational level of war derive from the overall position of forces on the map; one considers the prebattle status quo to categorize tactical moves as offensive or defensive. All of these conventions, however, stem from a ground combat perspective in which roles do not change as quickly as they often do in air combat.

Adopting a territorial approach to offense and defense increases the definitional difficulties for operational airpower. If one flies close air support (CAS) sorties in support of an entrenched force attempting to repel an enemy advance, are the CAS operations defensive or offensive? From one point of view they are defensive, just as one considers the supporting artillery fires defensive. On the other hand, such sorties appear offensive because they must penetrate enemy airspace and attack enemy positions. Suppose one resolves this perplexity by categorizing air support in the same way as artillery support in relation to the operations of the supported ground force. If the ground force is defensive then the air operations are defensive, and similarly, air support of offensive ground force operations are offensive. This solution

seems reasonable at first, but the problem compounds as one considers air missions other than CAS. If one uses this methodology, the sorties expended to establish air superiority over the battlefield so the defensive CAS can proceed are themselves defensive. Defense now also may include interdiction sorties flown against bridges or against supply convoys hundreds of miles from the ground fighting. Most absurdly, using this convention forces one to label strategic attack missions flown against an aggressor's national-level command and control systems, perhaps in the enemy's capital itself, as defensive.

To overcome this logical incongruence, the definitions of offense and defense for air combat must allow categorization of air operations with consideration of the characteristics of airpower, while allowing the definitions to remain somewhat intuitive given the common, traditional usage of the terms. First, one should categorize air operations independently of ground operations to avoid the absurdities discussed above. A theater commander may choose to conduct offensive air operations while ground forces remain in defensive positions, as Gen H. Norman Schwarzkopf employed coalition airpower during most of the 1991 Gulf War. Second, the definitions must recognize the key characteristic of airpower: its ability to strike targets throughout the depth of the theater of operations rapidly, nonlinearly, and without regard to physical obstacles. Third, the definitions must recognize that proactive operations taken on one's own initiative, independent of enemy action, are intuitively offensive, while reactive operations, taken in response to enemy action, are intuitively defensive.

Some common uses of offense and defense confuse rather than clarify the issue. The relationship between offense and defense in strategic nuclear theory is often described with respect to the destabilizing or stabilizing influence weapons exert on nuclear deterrence. If stability is automatically equated with the term *defensive,* then some counterintuitive descriptions of capability can result, such as labeling strategic missile defense systems offensive because they could facilitate a nuclear first-strike option. Use of terms such as *anti-deterrent* or *destabilizing* can help to avoid such confusion.[13]

Likewise, international law, custom, or treaty may specifically recognize certain acts as hostile or offensive and authorize aggressive responses termed self-defense. Political leaders who attempt to secure popular support may deliberately avoid the use of the term offense, instead they choose to frame actions in terms of defending something. Some may even categorize preventive war or preemptive attacks as defensive. Such considerations are critically important at the strategic level. To develop definitions useful for the analysis of operational doctrine, however, the inclusion of these broader strategic uses of the labels offense and defense adds confusion. Therefore, the definitions that follow should be considered applicable at the operational level of military operations and doctrine.

Definitions

With these caveats in mind, then, one can define defense and offense in the airpower context. Air defensive operations are those operations conducted to deny another force's air operations in a defined airspace. Defensive operations include any effort to ensure that the enemy cannot use the air to successfully attack targets existing either in the air, on the ground, or on or under the sea. Defensive operations can be further categorized into two types: active and passive. Active defenses attempt to deny attacks by destroying or interfering with the attacker or the attacker's munitions. Examples of active defenses include fighter aircraft, surface-to-air missiles (SAM), antiaircraft artillery (AAA), theater ballistic missile defenses, or electronic countermeasures (ECM). Passive defenses attempt to deny weapons employment without assaulting the attacker or the munitions. Camouflage, buried bunkers, and hardened shelters are examples of passive defenses. A defender conducts all of these operations to deny an attacker the opportunity to engage targets from the air successfully. Implicit in this definition of defense is the need for continuous denial, since the defender must repulse an attack which occurs at a time and place of the attacker's choosing. The definitional stipulation to designate a defined area for the defense eliminates potential confusion concerning

the current USAF offensive counterair (OCA) mission. One conducts OCA missions against airfields or aircraft in an attempt to destroy the enemy's capability to operate anywhere, not just in a specified area. So this definition recognizes such OCA sorties as offensive even though they are designed to prevent the enemy from conducting air operations.

Air offensive operations include both those operations conducted inside of the airspace defended by another and those conducted outside of one's actively defended airspace. No matter who controls the airspace, the offense must always employ measures required to defeat passive defenses. The consideration of who controls the airspace recognizes that offense comes in two distinct types.

For the first type of offense, operations inside airspace defended by another, the offensive force must expect that the defenders may choose to oppose the airspace penetration. To counter the defense, the offensive force may use active measures such as escort fighters, SAM suppression aircraft, ECM, and infrared countermeasures (IRCM) or passive measures such as camouflage or stealth. The offensive force may have such effective countermeasures that they appear to negate anything the defender can muster, exemplified by the use of stealth fighters over Baghdad in the Gulf War. Yet, the defender had other options available to negate or degrade the use of stealth fighters, such as dispersal of critical nodes or laser countermeasures.

The second type of offensive operations, those occurring outside of one's actively defended airspace, is included to recognize the offensive nature of operations in contested airspace, as well as operations in an area an opponent does not actively defend. For example, US pilots flew high-altitude reconnaissance sorties over Cuba in July 1961 at an altitude unreachable by Cuban defenses. But such passive defenses as camouflage were still available to the Cubans. When the Soviets deployed a SAM system capable of reaching the overflying aircraft, the notion of air superiority above a given altitude may have changed, but the essential character of the operation had not. In both instances the U-2 overflights were offensive.

It is possible for two belligerents to actively defend the same airspace. Two nations sharing a border could station SAM batteries close to their shared boundary. When hostilities commence, both activate their SAMs, which are able to defend airspace across the other's border. Any aircraft attempting to penetrate the enemy's SAM coverage would have to treat such operations as offensive, even though the actions occur inside airspace simultaneously under friendly defense. The fact that one's own SAMs cover the area may allow friendly aircraft to operate without fear of engagement by enemy fighters, but the nature of the operations are still offensive and friendly aircraft must pursue measures to negate enemy defenses.

The use of the term *air superiority* can confuse the issue of offense and defense. The official US military definition comes from Joint Publication (Joint Pub) 1-02, *Department of Defense Dictionary of Military and Associated Terms*. That definition is "that degree of dominance in the airbattle of one force over another which permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force."[14] The establishment of air superiority, while possibly reducing aircraft escort requirements, does not alter the offensive or defensive nature of operations. Coalition aircraft operating in the Kuwaiti theater of operations after 17 January 1991 functioned under a condition of air superiority.[15] The Iraqis attempted to defend this airspace with SAMs and AAA after that date, but coalition attacks continued without prohibitive interference. Coalition air operations were still offensive since they were conducted in airspace defended by an opponent. As coalition ground forces advanced and swept away the remaining SAMs and AAA pieces, the airspace defended by the Iraqis contracted. Air superiority can also mislead because it ignores the effectiveness of passive defenses, which may hinder offensive operations as well as, or better than, active ones. Because a force has established air superiority over an area does not imply that the force is defending the area. The condition of air superiority implies that one can successfully conduct operations at the time of one's choosing, not necessarily all of the time. There is a subtle difference between this and

defense, since effective defense implies that the enemy can never choose a time to conduct significant air operations without meeting resistance. Air superiority does not guarantee the success of offensive operations, as the relative lack of success of US interdiction operations over the Ho Chi Minh Trail for the majority of the Vietnam War demonstrates.

These definitions help to concentrate attention on the entire spectrum of air combat. Rather than focusing on the battle between air forces or the battle between air forces and ground defenses, these definitions ensure that one can correctly categorize all measures which influence the employment of airpower. The definitions will prove useful for analyzing the relative power of the offensive and defensive in the case studies that follow.

Offensive-Defensive Relationship for Airpower

With the definitions of offense and defense thus established for airpower, the next issue concerns the relationship between the two. Naturally, the considerably longer history of ground warfare colors expectations and abstractions concerning the power of defense. For ground forces, once a force occupies the battlefield, a rival must annihilate that force, or cause it to retreat or surrender, before its forces can occupy the ground. The attacking force may choose a direct attack method, such as the use of firepower against the defender, or an indirect attack method, such as severing lines of communication, to force the defender to retreat or surrender. When viewing airpower as an adjunct or merely as a supporting force for ground operations, then the same offense-defense considerations apply of direct attack by firepower or indirect attack on supply lines. To consider air warfare, which occurs in a realm that no one can feasibly occupy, calls for a reevaluation of the relationship between offense and defense.

Airpower theorists have long questioned the applicability to air warfare of Clausewitz's dictum "that defense is the stronger form of waging war."[16] Douhet believed that no defense against aircraft was possible.[17] USAF published doctrine has repeatedly asserted that airpower is inherently offensive.[18] Col Phillip S. Meilinger's third proposition about

airpower states “air power is primarily an offensive weapon.”[19] According to these authors, offensive preference derives from airpower’s ability to concentrate decisive combat power anywhere in a theater without regard to physical boundaries.

The theoretical relationship between offense and defense for airpower rests on three defining influences: the combat medium, time, and the ability to concentrate. First, the air, the combat medium for airpower, is always neutral, as airpower theorists emphasized.[20] In ground battle a defender can choose an engagement area to maximize terrain advantages. By looking at a map or studying the terrain, one can declare an area good or bad for defense. Air engagements, however, always occur in a neutral medium that provides neither cover nor advantage to a defender. One could argue that clouds or sun position may provide cover, but this argument ignores another certitude about air engagements. Air engagements always occur on the move. A defender cannot seek cover in a cloud or hide in the sun forever. Eventually an aircraft must move on, either to perform its mission or to land and refuel.

Second, in air war at the operational level, time accrues to the detriment of both offense and defense, because one must expend resources simply to enter airpower’s medium, the air. Once operating in the air, an aircraft has a finite sortie duration, then it must return to base for refueling and maintenance. Airpower suffers from a constant, significant resource drain even if no combat occurs. Ground forces not engaged in combat consume significantly fewer resources than forces engaged with the enemy. A tank sitting in a defensive position uses fewer resources than a tank on the move. An airplane flown on a training flight consumes the same resources, excluding weapons, as a comparable combat sortie. Furthermore, a parked tank can perform a defensive mission because it can still employ its weapons. An aircraft must fly to perform its mission. It defends nothing sitting on the ground. The range and flexibility of airpower allow one to conserve resources by holding aircraft on the ground, then scrambling to intercept an attacker. If an aircraft does not get airborne, however, it cannot execute its mission, even with all of its firepower capabilities intact. A tank unable to move but

still able to fire may have a short life on the modern battlefield, but it can still perform its mission until it is destroyed or bypassed. An airplane on the ground has no mission, other than possibly functioning as a part of a "fleet in being," resulting in a strong impetus to launch aircraft. Every minute of flight costs resources and brings the aircraft one minute closer to having to recover to the base where it remains unusable until it can be refurbished for takeoff.

Third, the ability to concentrate air forces rapidly allows an offensive force the capability to overwhelm a defensive one. While the neutrality of the aerial medium and the detrimental effects of time impart no advantage to the offense, a connection exists between airpower's key characteristics—speed, range, and flexibility—and the offense. These characteristics, by themselves, favor neither offense nor defense. Yet, for two forces of approximately equal speed, range, and flexibility, it is easier to conduct offense than defense. The offense can mass, at a chosen time and place, forces sufficient to overwhelm the defense, which must attempt to defend everywhere. Moreover, as noted above, aircraft consume resources to fly. To keep a defense of aircraft airborne in sufficient numbers to ward off an attack, given that the attacker can employ mass and concentration at the time of his choosing, requires a tremendous expenditure of assets. Thus, the defender must rely on alert aircraft and early warning to scramble sufficient numbers of aircraft to defend. One cannot escape the eroding effect of time, however. If the enemy does not come into contact with the defense, but instead only feints, the resources are already spent to launch the defenders. They must land and refuel. The enemy has forced the defender to expend resources at near combat levels, without engagement. Such tactics exact a toll on the defense. An attacker with superior resources can exhaust the defender without firing a shot. If the defender fails to react, the attacker can press the attack, possibly catching the defender's forces on the ground. To defend successfully, one must counter the offense's ability to mass overwhelming forces. The airpower offensive-defensive relationship hinges on the amount of time the defender requires to mass sufficient force to blunt an attack.

Clausewitz's proposition about the power of the defense does not apply to airpower since his proposition stems from "the advantages of waiting and the advantages of position."[21] Because the aerial medium is neutral, there cannot be an advantage of position, and because time has a decaying effect for both offense and defense, there cannot be an advantage of waiting. At the strategic level there may be benefits to fighting over friendly territory such as simpler recovery of downed aircrews and damaged aircraft, or proximity to friendly bases, but there is no such positional advantage for the air battle itself except that created by mutually supporting firepower.

The ease with which the offense can concentrate and overwhelm the defense is a product of current technology. A more general understanding of the relationship between offense and defense for airpower can be obtained by employing abstract notions to describe airpower's characteristics. For example, coverage can be defined as the area over which an airpower platform can employ its effects (whether discretely as with firepower or continuously as in electronic jamming) and reaction can be defined as the time required to employ a platform after notification. Using these definitions a general proposition can be derived: as coverage increases and reaction improves, the ability to use airpower defensively increases. The efforts of the offense to concentrate enough force to overwhelm the defense can take the guise of superior weaponry or sheer numbers. When coverage is small and reaction slow, airpower offensive forces appear to derive an insurmountable advantage from the ease with which airpower can concentrate force. When quick reaction and large coverage permit a defensive force to concentrate as well, then the offensive advantage is negated. Theory does not convey an advantage upon either the airpower offense or the defense, but the technology of the day might.

Both the offense and the defense can turn to passive measures in an attempt to gain the advantage. If the defender can conceal targets, it matters little that the attacker can penetrate enemy airspace; the attacker is prevented from employing his weapons. If the attacker can develop passive countermeasures, such as jammers or stealth, which deny the defender any possibility of engagement, the offense gains an

advantage. Such advantages may be limited to certain times of day or apply only in certain weather conditions. Weather conditions that deny weapon launches from long ranges or force attackers to low altitude to stay below an overcast may negate an attacker's advantage. Reliance on such passive countermeasures as radar absorbent material may restrict attacker operations to the hours of darkness. Air planners must recognize or create the conditions necessary for success.

The offensive-defensive relationship for airpower does not function like a scale. Rather, it operates more like a chaotic pendulum, varying from absolute balance derived from system characteristics to swings between degrees of superiority determined by local conditions. The airpower offensive-defensive advantage can shift as one moves across an area of operations, creating areas where either offense or defense enjoys superiority based on the time of day, or on the local weather. The difference between modeling the offensive-defensive balance as a scale and modeling it accurately is like the difference between using the orbital model of the atom and the quantum model. One can predict whether offense or defense has an advantage under a given set of conditions, but one may have little control over the conditions existing at the time of the operation.

This sensitivity of the offensive-defensive balance to local or transient conditions profoundly affects airpower strategy. Certainly weather has always affected military strategy. No one can deny the impact the early arrival of the Russian winter had on Germany's advancing forces in the fall of 1941. Such events slow the movement of forces, thereby thwarting the strategy of those requiring rapid mobility to conduct an offensive. To have an operational or strategic level impact, such events must affect large regions of the theater for a considerable period of time. For airpower strategy, however, even a small, short-lived event may have far-reaching operational or strategic effect.

Since airpower forces may operate over long distances without occupying the enemy airspace covered in transit, the only payoff for airpower is the mission result. Whether that result is destruction of a target, delivery of a logistical payload, or collection of an image, airpower employment reaps no

benefit, other than perhaps a psychological one, from the intermediate ability to operate through intervening territory. A ground offensive may grind to a halt short of the objective, but presumably one can use the resources gained short of the objective to bolster one's operational position. An aircraft that arrives over its target only to find the target shrouded by a late-lifting fog or that is forced to abort its mission because of a system error gains no such limited success in return for the effort expended.

Airpower forces have sought technical solutions to permit successful employment during the transitory periods of inclement weather or darkness. Interestingly, such improvements to date have increased airpower's need for mission support, either in terms of intelligence or imagery. This solution has served only to shift the overall airpower mission's sensitivity to small inputs from the target area to the support area. A technologically dependent mission may fail because of a lack of information about an enemy leader's exact position, or an imaging parallax misinterpretation leading to use of a desired mean point of impact that is in error by 15 feet. Even as technology has infused airpower's offensive forces with the ability to negate enemy defenses, the balance between them increasingly hinges on the proper functioning of complex machinery. A rash of ECM built-in test faults or targeting radar failures may rapidly shift the operational balance in favor of the defender. Because of its dependence on technology, the relationship between offense and defense for airpower appears to be much more sensitive to initial conditions and small events than the relationship between offense and defense for military forces in general. The discussion of offense and defense in airpower cannot be divorced from an analysis of the circumstances postulated to exist during the employment of airpower forces.

Summary

These definitions of airpower offense and defense allow the categorization of doctrinal and strategic postures. The development of strategy, techniques, and equipment to conduct airpower operations in the airspace defended by

another or outside of airspace defended by friendly forces is, by definition, offensive. The development of strategy, techniques, and equipment to deny another force's air operations in a defined airspace is, by definition, defensive.

Due to its attributes, the traditional view of the relationship between offense and defense is altered for airpower. Because airpower defense has no advantage of position and time accrues to the detriment of both offense and defense, airpower defense enjoys no inherent advantage. The success of airpower defense is measured by the ability to thwart the concentrated force of the offense. Airpower's dependence on technology also makes its employment more sensitive to local conditions and small inputs.

Airpower and the Ideology of the Offensive

> *The importance of strategic attack and the fragility of states at the strategic level of war: Countries are inverted pyramids that rest precariously on their strategic innards—their leadership, communications, key production, infrastructure, and population. If a country is paralyzed strategically, it is defeated and cannot sustain its fielded forces though they be fully intact.*
>
> —Col John A. Warden III

At the most basic level, military organizations prefer offensive doctrines for the reason that offense works. As Clausewitz noted, defense may be the strongest form of war, but as soon as strength allows, defense must give way to offense in order to pursue the objective.[22] Upon closer examination, however, it becomes apparent that not every offensive works. Because airpower operations outside of friendly defended airspace or through airspace defended by another are offensive regardless of the ground position of forces or borders, a majority of airpower operations involves offense, including many of those executed in pursuit of a strategically defensive policy. Airpower strategists, for whom offense is already the norm, should remain especially wary of any factors that might exaggerate offensive preference. This discussion considers such factors that can reinforce and

perhaps skew a military organization's preference for the offense. The author explores the application of the ideology of the offensive to airpower and the ramifications of preference for offensive doctrine postulated to apply to armed forces in general and to airpower in particular.

The Appeal of Offensive Doctrines

Military organizations promulgate doctrine to guide the development of strategy for a particular military event. Doctrine attempts to capture the accumulated lessons of previous conflicts and combine them with the implications of theory to provide a "best-approach" guide for strategists.[23] The strategy chosen for any specific conflict should doctrinally employ the means available to accomplish the stated objectives. Thus, doctrine provides guidance for some future conflict while strategy guides the disposition or employment of forces for a specified time or in a particular conflict, accounting for the contextual elements applicable to the situation. Since doctrine is based upon the perceived applicability of historical lessons to the current period, the writers and reviewers of doctrine must judge two key elements: what lessons history teaches and what circumstances make those lessons applicable, or irrelevant, to the current situation. Understanding the sources of doctrine involves accounting for the factors that influence these two judgments.

Existing literature does not enforce a rigorous definitional separation of strategy and doctrine. The difference between strategy and doctrine is certainly important in some contexts. For instance, current US joint doctrine is authoritative but allows the military commander's strategy to deviate from doctrine should unusual circumstances warrant. This study focuses on the principles that guide military decisions, the sources of those principles, and the likely implications of choosing offensive principles over defensive ones. Whether those principles are expressed as doctrine, strategy, or both in a particular case does not alter the substance of this discussion, obviating the need for a technically strict application of the definitions here.

To help explain why military organizations choose particular doctrines, it is useful to describe how organizations assimilate inputs from the external world to produce military doctrine or strategy. Graham T. Allison's work on strategic decision processes offers a starting point for analyzing how military organizations process inputs. Allison offers three different models to explain the behavior of governments: the Rational Actor Model (Model I), the Organizational Process Model (Model II), and the Bureaucratic Politics Model (Model III).[24] Applying Allison's models to a military organization instead of a government provides some insights into the development of doctrine.

Suppose one takes Allison's Model I view and considers military doctrine as if it were the output of a rational, unitary actor.[25] Published US doctrine easily fits the unitary actor portion of this paradigm, at least superficially, since the service chief signs service doctrine, granting it an official seal of personal approval. The other aspect of this model, rationality, poses a more vexing problem. Allison defines rationality as the "consistent, value-maximizing choice within specified constraints."[26] A rational actor objectively examines alternative courses, evaluates the consequences of choosing the various alternatives, then selects the course of action which maximizes the payoff determined by applying the same value function to each alternate outcome. Applying this model to the armed forces, a rational doctrine results from an objective consideration of the lessons of history and the capabilities and limitations of military power. A rational strategy results from the objective consideration of the available courses of action and the objective evaluation of the expected results of pursuing each alternative. Errors may arise from incomplete information or unpredictable consequences of actions, but such mistakes do not invalidate the determination that the doctrine was rational. The rational actor view has tremendous intuitive appeal, and it forms the basis for predicting how an opponent will react in an interactive contest such as military action. Planners can forecast several military moves ahead based on the assumption that the opponent will usually choose the best option available given the circumstances.[27]

Experience has shown that organizations do not always select the best option. If an organization does not pursue the doctrine or strategy with the highest expected payoff, whether due to less than objective evaluation, incomplete consideration of alternatives, or biased determination of the value function, its doctrinal or strategic choice fails the test of rationality. It is in this sense that one can label a strategic choice irrational.

Irrational choice is a logical contradiction for a model that assumes rational action, thus Allison provides as alternatives Models II and III, which can account for apparently irrational actions. While Model III also has application for explaining the actions of military organizations, Model II provides the best instrument for dissecting the forces that can shape military doctrine and strategy. Instead of considering an action as a logical, conscious choice, Model II frames action in terms of organizational output resulting from the interactions of the organization's constituent parts.[28] Allison states that action results from the continuous functioning of standardized routines possessing seven identifying characteristics: pursuit of organizational goals, sequential attention to goals, implementation of standard operating procedures, construction of programs and repertoires, uncertainty avoidance, limited problem solving, and adaptation resistance (unless an organization is forced to change by budget feast, budget famine, or spectacular failure).[29]

The foremost organizational goal, according to this model, is to guarantee the continued well-being of the organization. The primary purpose of military organizations is to ensure national security. It follows that if a military organization can pursue national security and organizational goals simultaneously, there will be a powerful impetus to do so. For armed forces in general, pursuit of offensive doctrine justifies a larger, better-equipped organization, thus increasingly satisfying the primary organizational goal. To conduct an offense, forces must be raised, trained, equipped, and positioned for combat. Defensive doctrine allows one to economize on combat-ready forces, perhaps relying on fortifications or obstacles to slow an enemy's advance while less expensive reserves mobilize.

This offense-defense relationship is somewhat problematic for air forces since airpower defense enjoys no advantage of position. To the extent that some defensive measure, such as SAMs, can be employed to secure airspace from intrusion, a state might buy time to mobilize offensive air forces. If, however, air platforms must be used to defend, by the definition of defense established previously, then large numbers of platforms must be immediately available. The organizational issue for air forces is not so much one of pure size, since airpower defense also demands a relatively large, well-equipped, standing force, but of the composition of the force. Large numbers of solely air-to-air capable fighters are useful for defense, and useful for offense as long as the enemy contends air superiority, but are useless for conducting missions against surface targets. Air forces vigorously pursuing offense seek equipment, munitions, and counter-measures improvements predicted to increase the number of aircraft that will successfully penetrate defenses to strike enemy targets. To the extent increases in offensive capability lead to increases in organizational wealth above the level required to field a large defensive force, airpower organizations also profit from escalating the pursuit of offensive doctrine.

While Allison's general model is adaptable to describe a military organization, several authors have examined how military organizations particularly develop strategy and doctrine. Jack Snyder, in his book, *The Ideology of the Offensive*, claims that the factors affecting "military strategy are many, but they can all be considered under three headings: rational calculation, motivated bias, and doctrinal simplification."[30] Snyder's category of rational calculation, like Allison's Model I, demands an accurate perception of the contextual elements of a situation, such as political objective, technology, geography, and relative military balance.[31] Realistically, a strategist cannot expect to have completely accurate information when developing strategy. Some data relating to the situation will remain ambiguous, and the interpretation of the ambiguous data depends upon the bias of the strategist. The more ambiguous the data used in the

rational calculation, the greater the potential effect of one's bias on the result.[32]

Snyder describes two sources of bias, motivational bias and simplification bias. Motivational bias stems from the motivation of the strategist, the strongest of which is organizational interests. The strength of motivational bias varies directly with the perceived severity of the threat posed to a military organization. The more an action threatens organizational essence or fundamental organizational beliefs, the stronger the motivational bias against taking that action.[33] Military organizations often derive prestige from either the success of previous offenses or the promise of future quick victory via the offense.[34] Strategists from such organizations will likely exhibit a motivational bias for the offense. The more closely organizational prestige is linked to offensive action, the stronger the motivational bias for the offense. A particularly dangerous motivational bias occurs when strategists view the "necessary" as "possible," primarily because strategists believe no other alternative exists. The German decision to execute the Moltke version of the Schlieffen Plan in 1914 may exemplify this phenomenon.[35] Some have argued that Field Marshal Helmuth von Moltke's poor execution led to the failure of the plan. In an airpower example, this bias could have contributed to the decision to attempt an aerial resupply of the German Sixth Army trapped in the Stalingrad perimeter from November 1942 to February 1943.[36]

The other type of bias, simplification bias, results from the needs to focus organizational attention, inculcate a common organizational belief system, assist strategy calculations, and reduce uncertainty.[37] The first two simplification elements serve to exaggerate any existing systemic bias. As doctrine is distilled to ease its transmission and assimilation throughout an organization, simplified rules of thumb colored by any existing bias replace the more complex processes that reflect the nuances inherent in actual employment. Offensive doctrines address the latter two needs because, in general, offense permits more detailed planning than defense. It is easier to forecast requirements after seizing the initiative than while reacting to an opponent's moves. Although it is generally true that offense lends itself more readily to advance planning

than defense, this relationship does not always hold. The defense simply may not require much planning, as is the case in some defense advantage situations. For example, the defense required less planning than the offense in World War I, though it was still true that offense could be planned far in advance. As offensive advantage increases, however, the ability to plan increasingly favors the offense. During Operation Desert Storm, the first 72 hours of the offensive air campaign could be planned in great detail far in advance of the beginning of the war. Thus, two elements of the simplification bias tend to promote offense, while the other two tend to exaggerate any existing bias.

In Snyder's model, the choice between an offensive or defensive strategy arises from the interaction of these three forces: rational calculation, motivational bias, and simplification bias. When these variables lead to conflicting doctrinal choices, the one with the strongest case dominates. If the organizational ethos is at stake, motivational bias dominates. If the military has powerful, centralized institutions, simplification bias dominates. If incontrovertible evidence of the efficacy of either offense or defense exists, rational calculation dominates. If no single force dominates, doctrine results from a synthesis of all three.[38] From Snyder's work, it follows that if a military organization believes offense is more powerful than defense, the forces which shape the choice of strategy should tend to preserve and intensify that offensive preference.

Barry R. Posen's analysis of the doctrinal preferences of military organizations in his book, *The Sources of Military Doctrine*, concludes "from specialists in victory, defense turns soldiers into specialists in attrition, and deterrence makes them specialists in slaughter."[39] Posen examines organizational theory and civil-military relations literature to defend his assertion that militaries prefer offensive doctrines. Organizationally, offensive doctrines tend to reduce uncertainty, confer initiative, and increase size and wealth. With respect to civil-military relations, offensive doctrine grants a military organization more autonomy than either defense or deterrence.[40] Offensive doctrine appeals to policy makers outside of the military because such doctrines

promise quick, decisive victory. They appeal to military organizations because policy makers will continue to fund organizations that promise cheap victory.[41]

Many of Posen's arguments about military preference for the offensive parallel arguments made by Van Evera. Van Evera's research provides a more detailed analysis of military organizations that can help to account for offensive preference. He begins with an organizational approach which ranks, from most important to least important, the goals that any organization seeks: increased size and wealth, autonomy, preservation of organizational essence, control over the "task environment," prestige, and homogeneity. By integrating these organizational needs with two organizational characteristics, poor self-evaluation and bounded rationality, Van Evera derives several assertions about the direction of military bias.[42]

Military organizations can exaggerate both security threats and the capabilities of potential enemies through the use of worst-case scenarios and conservative estimates of friendly capabilities.[43] An example, which had far-reaching consequences, was the overestimation of Luftwaffe capabilities when England and France appeased Hitler at Munich.[44] On the other hand, every failed offensive provides another possible data point for those who would point out the danger of underestimating the enemy. When the price of military failure is high, the need for worst-case planning is understandable. The cost of military failure increases as it becomes easier to conquer opponents, in other words, as offensive advantage increases. Coincidentally, a system of offensive advantage allows a military organization to justify, through worst-case scenarios, larger, more powerful military organizations, even for states that seek security instead of conquest. Thus, the security dilemma operates to the organizational advantage of the armed forces. This advantage does not imply that a military organization promotes a security dilemma for organizational gain, only that the security dilemma reinforces the organizational goals of the armed forces. Offensive advantage, however, provides both the spark and the fuel that feed the security dilemma. Military organizations have a stake in propagating belief in the power

of the offense because a belief in defensive advantage less adequately fulfills the organizational needs of size and wealth, control, and prestige. Defense advantage can actually threaten the organizational goals of promoting essence and increasing autonomy.

Van Evera concludes from his research that military organizations generally prefer offensive strategies. Even in cases where strategists acknowledge that the defender maintains an advantage, offensive preference can lead to a rationalization phenomenon he describes as the sharp rap.[45] Those advocating the sharp rap claim that the defense will rapidly collapse, even though it possesses superior forces, because of the violence and shock of the attack. The sharp rap succeeds not by defeating the majority of the enemy's forces but by destroying the enemy's leadership, communications, and morale.[46] Belief in offensive advantage leads military organizations to emphasize "the importance of striking first, the requirement for massive forces in-being, the hostility toward limited war and the emphasis on intensely violent wartime operations."[47]

From this analysis of international relations literature come two important propositions about military doctrine. First, offensive doctrines hold a powerful appeal for military organizations because such doctrines further organizational goals, heighten prestige, and increase power. Second, once adopted, offensive doctrines can easily become dogmatic because the pursuit of offense promotes organizational growth and survival.

One must avoid exaggerating the implications of these two propositions. First, military preference for offensive doctrines neither implies that all offensive doctrines are inappropriate nor that they are adopted merely to satisfy primarily self-serving interests. The success of the Israeli Defense Force (IDF) in 1967 illustrates a well-executed offensive strategy. The rapid collapse of the French in 1940 lends some credence even to the efficacy of the sharp rap. Second, military organizations sometimes adopt defensive doctrines, so while the allure of the offense may be powerful, it is not irresistible. In the aftermath of World War I, the United States, France, and the United Kingdom all believed in the ascendancy of defense.[48]

The critical inference to draw from these conclusions is that for logical, justifiable, comprehensible reasons, military organizations tend to prefer offensive doctrines. This preference is self-reinforcing and can result in a steadily increasing offensive bias. Since ambiguities abound in the national security environment, a reinforced offensive bias may cause a military organization to pursue an offensive strategy past the point of apparent rationality. Recognition of a military organization's natural proclivity for the offense is the first step to inoculation against its potential ill effects. The next step is to recognize how irrational belief in the power of the offense can lead to disastrous consequences.

The Cult of the Offensive

The term *cult of the offensive* describes the condition that occurs when an organization believes so strongly in the supremacy of offense that it no longer develops and evaluates its doctrine rationally. The word *rationally*, used here in the very narrow, technical sense discussed above, refers to the reasonably objective examination, evaluation, and selection of the best course of action from the available alternatives. *Irrational* is used here in a specifically defined manner to describe doctrine or strategy that fails to meet this test of rationality. All military strategists make estimates about the ability of forces to conduct assigned missions in the face of enemy resistance. The strategist's perception of the relationship between offensive and defensive power underlies each estimate. Relational perceptions are manifested in such assertions as a three-to-one advantage in personnel at the point of attack will permit an offensive breakthrough or stealth fighters can penetrate enemy airspace without extensive suppression of enemy air defenses. When these underlying assumptions are objectively verifiable by the available test data, exercise results, or wartime experiences, belief in the offensive is rational, even if the assumptions prove false. When these assumptions arise from bias, cite unverifiable sources, ignore disconfirming evidence of the power of the defense, or rely on insupportable claims, one must consider the possibility that continued

preference for offensive action is irrational and may be attributable to a cult of the offensive.

The cult of the offensive probably explains why some conflicts may result in war. Snyder claims that a cult of the offensive, exacerbated by the absence of sound civil-military relations, gripped the major military organizations of Europe in 1914, and this combination of factors helps explain why the July crisis erupted into war.[49] Van Evera attributes both the initial cause and the uncontrollable nature of the events precipitating World War I to the cult of the offensive.[50] On the other hand, not all analysts agree that the cult of the offensive adequately explains the causes of World War I. Scott D. Sagan argues that the consequences of the cult of the offensive were "necessary, but not sufficient" to have caused the war.[51] He offers the political objectives of the belligerents and the nature of their alliance commitments as rational explanations for their militaries' offensive doctrines.[52] Whether the cult of the offensive substantially accounts for the occurrence of World War I, there is potentially great explanatory power in the idea that an offensive bias can so grip military organizations that apparently irrational strategy results.

Previous works on the ramifications of offensive preference and cults of the offensive have focused on effects at the highest level of national security strategy. To gain additional insight, however, one can apply the same type of analysis to a single aspect of military employment, in this case, airpower. The requisite organizational theory applies to airpower forces since most military organizations have a large, self-contained airpower arm, if not an independent air force. Airpower doctrine and strategy, even if a subset of a larger joint strategy, is distinct enough from its larger context to permit its separate study. Finally, since airpower strategy affects the overall strategy it supports, a misplaced faith in the power of offensive airpower could have dire consequences for the larger military organization and for national security.

Implications of Being Trapped by an Offensive Ideology

By considering the effects of offensive advantage on military forces in general, one can derive six effects which result from

offense advantage for airpower.[53] First, airpower becomes cheaper to use as the danger of losing aircraft decreases. This action implies that policy makers in such situations may employ an airpower strategy with little risk of negative consequences. Second, the advantage of striking first grows. When offense has the advantage, the ability to defend one's own airpower assets decreases, and the imperative to use one's airpower before it is lost to an enemy strike strengthens. Third, windows of vulnerability to airpower attack and windows of opportunity to attack open wider and more frequently. When one has either a quantitative or qualitative advantage, the pressure to attack increases before one's enemy can marshal defenses. The rapid mobility of airpower assets exacerbates this situation, further increasing pressure to take action. Fourth, secrecy grows which increases the danger of miscalculation. Announcing one's policy to use airpower to destroy some enemy capability, for example, a weapons of mass destruction storage facility, alerts the enemy. Since this knowledge may cause the enemy to employ such weapons before they are destroyed, notification will not occur. Conversely, the target state's incentives for secrecy increase to foil any potential attacker. This awareness lessens the probability that diplomacy might resolve such a situation as one dares not make the alerting threat. Fifth, if offense has the advantage, states will keep air forces in a state of readiness so they can launch before they are destroyed. This action might fuel the security dilemma because keeping forces in constant readiness can be perceived as a threat. Sixth, arms races between airpower forces will result as competitors seek to maintain sufficient forces to close windows of vulnerability.

If one believes that offense has an advantage for airpower when, in fact, it has less of an advantage than one believes, the effects described above will have further negative consequences. First, suppose that one employs airpower thinking losses and risks will be minimal. When losses are higher than expected, the objective will not have been worth the cost, or the conflict may escalate either to avenge the losses or to achieve an objective that is worth the cost already invested. The loss of US helicopters in Somalia led to a

reexamination of policy and the subsequent withdrawal of forces.[54] Second, a first strike executed in the belief that it would produce a significant advantage could start a conflict in which neither side has an advantage or the attacker is doomed to defeat. When the Japanese attack on Pearl Harbor failed to sink the US aircraft carriers, much of the anticipated advantage of the attack was lost. Third, the perception that windows of opportunity and vulnerability open wider and more frequently places additional stress on those coordinating other instruments of power, thus constantly forcing planners into a crisis reaction mode. If the perception concerning such windows proves false, one loses the opportunity to react in a more controlled manner, perhaps reducing the chances of discovering a more peaceful solution. The US reaction in the *Mayaguez* incident off the coast of Cambodia in 1975 demonstrates how a perceived window of opportunity can affect airpower planning.[55] Fourth, as the need for secrecy grows, the chances of resolving a problem with other nonmilitary instruments of power decreases. Finally, one pays a tremendous opportunity cost both to maintain forces in constant readiness and to respond to arms races caused by a misplaced belief in the power of offense.

Implications

The appeal of offensive doctrine and the ramifications of a misplaced belief in offensive advantage hold significant importance for airpower strategists. Such strategists, based on solid historical evidence, traditionally laud the offensive. Since pursuit of offensive capability coincides with the fulfillment of organizational goals and needs, airpower strategists can easily acquire an offensive bias. Once manifested, organizational forces tend to strengthen an offensive bias over time. Barring the occurrence of a significant event that clearly illustrates the need to revise strategy, offensive preference is likely to intensify, possibly displacing objective strategy determination. History has shown that a mistaken belief in the advantages of offense can have disastrous consequences, as it did for the major European powers of 1914. A strident caution must be

sounded if airpower strategy is susceptible to entrapment by a cult of the offensive, which could similarly spell disaster for the air forces and nations involved. Offensive ideology may hold the promise of peacetime organizational success but could sow the seeds of wartime organizational failure.

Royal Air Force, 1918–38

> *Since its very earliest days the belief in the offensive rôle of the Service had possessed religious force, with Bomber Command as the priesthood.*
>
> —John Terraine
> *A Time for Courage*

In his 1937 report to the RAF Air Ministry, Air Chief Marshal Sir Edgar Ludlow-Hewitt, air officer commanding in chief of Bomber Command, stated that his command could not execute even a modest air offensive against Germany without risking the loss of his entire force.[56] He indicated just how severe the problems were when he reported in December 1938 that Bomber Command remained deficient in almost every area after a year of work.[57] It must have been shocking to hear such reports coming from a command whose staunchest advocates, such as Hugh M. Trenchard, Arthur Harris, and Arthur Tedder, had promised for years that airpower would make armies and navies obsolete.[58] The RAF commander, on the eve of World War II, evaluated its potential for combat, and found it lacking. As Max Hastings noted in his history of Bomber Command, "seldom in the history of warfare has a force been so sure of the end it sought—fulfillment of the Trenchard doctrine—and yet so ignorant of how this might be achieved, as the RAF between the wars."[59] The next discussion examines the RAF's doctrine, explores some of the reasons leading to the RAF's poor state of preparedness, and then tests the hypothesis that a cult of the offensive may have gripped RAF planners.

Lord Hugh M. Trenchard *(left)* and Maj Gen William E. Kepner

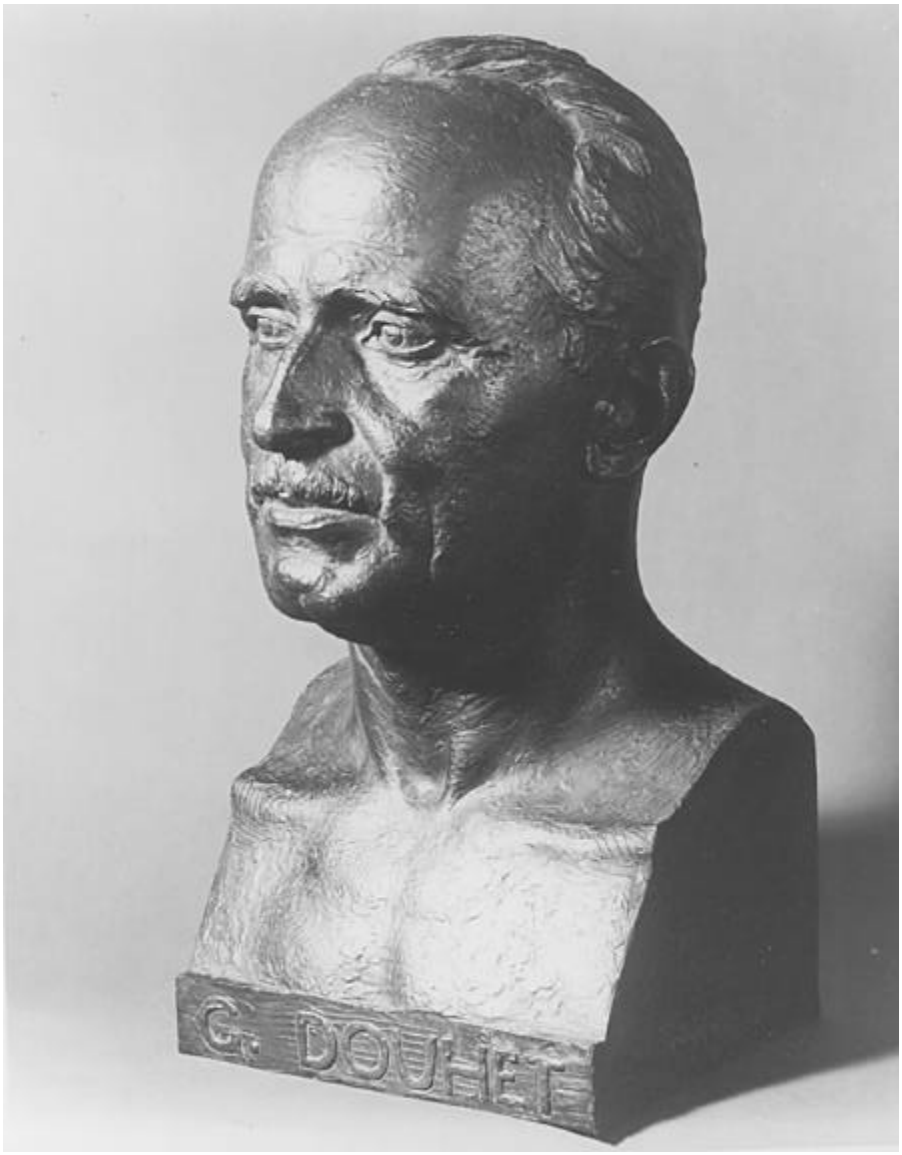
These leaders—Lord Trenchard and the commander of the US VIII Fighter Command—are seen at the time of the climax of the Combined Bomber Offensive in World War II.

RAF Doctrine

The report that led to the establishment of the RAF as a separate service also laid the cornerstone of RAF doctrine. The Smuts report of August 1917, written for the War Cabinet, stated that "an air service can be used as an independent means of war operations. . . . As far as can at present be foreseen there is absolutely no limit to the scale of its future independent war use. And the day may not be far off when aerial operations with their devastation of enemy lands and destruction of industrial and populous centres on a vast scale may become the principal operations of war, to which the older forms of military and naval operations may become secondary and subordinate."[60] From the RAF's very beginning, the mission of strategic bombing became inextricably linked with the justification for an independent air service. As the RAF fought for bureaucratic survival in the 1920s after World War I, its chief of staff, Air Marshal (later Lord) Trenchard, used the promised effects of strategic bombing to secure the RAF's position against the other services.[61] Such claims further fueled interservice rivalry, which caused Trenchard to claim even more significance for the RAF's mission. The resulting dynamic of interservice assault and defense led to distrust and exaggerated claims.[62]

Trenchard believed that RAF bombers could destroy Britain's enemies from the air. From this basic premise rose the remainder of the Trenchard doctrine over the next 10 years. When Basil H. Liddell Hart published *Paris; Or, The Future of War,* in 1925, Trenchard felt so strongly that it conveyed the essence of airpower employment that he required all RAF officers to read it.[63] In the book, Liddell Hart identified an enemy population's will to continue as the key to victory in war. Furthermore, he claimed that an air campaign offered a method to attack enemy will directly, quickly, and with fewer casualties than a land or sea campaign.[64]

Around the same time, the Committee of Imperial Defence (CID) established the Air Raid Precautions Committee to study the problem of air defense. In its first report in July 1925, the committee concluded that there existed only a slim chance of defending against air attack and that air attacks would



Giulio Douhet

He is the earliest of the classical airpower theorists, and his influence is reputed as definitive for both the Royal Air Force and the United States Air Force. Douhet asserted strongly that the bomber attack will always get through, and the only real defense against bombing would be to mount an offensive against the enemy's vital targets before he can cripple one's own.

negatively affect British morale.[65] To the RAF, defense appeared inefficient, perhaps futile, so Trenchard promoted an RAF doctrine employing an offensive strategy to provide defensive security.[66] This offensive strategy aimed at destroying an enemy's morale, and thus will to fight, by dislocating normal life, stopping trade, and convincing the enemy's population of the hopelessness of winning, all through strategic bombing. By the end of the 1920s, Trenchard and the Air Ministry espoused a doctrine that excluded practically every mission except strategic bombing.[67] Explaining the preponderance of bombers in the RAF, Trenchard said, "although it is necessary to have some defence to keep up the morale of your own people, it is infinitely more necessary to lower the morale of the people against you by *attacking* them wherever they may be."[68]

RAF doctrine entered the 1930s resting on four assumptions. First, air war would be horrible for civilian populations. Second, Britain was the European power most vulnerable to air attack. Third, no defense against air attack was possible. Fourth, no international restrictions regarding limits on bombers were enforceable.[69] Proponents of the Trenchard doctrine believed that the next war would start with an air attack, that the key to victory would be enemy morale, and that one could destroy enemy morale through strategic air attack; therefore, the RAF must have a large, constantly alert, offensive force.[70]

Doctrinal Discord

Not everyone agreed with Ludlow-Hewitt's assessment of Bomber Command in 1938. Never popular with the Air Ministry, Ludlow-Hewitt was replaced in April 1940, just before World War II began in earnest. When his successor, Sir Charles Portal, took over, Trenchard wrote a congratulatory note to Portal and complained that the RAF was already bypassing the chance to win the war through strategic bombing.[71] John Slessor, future chief of the Air Staff, wrote just four days before World War II started that "the lessons of history prove that victory does not always go to the big battalions. At present we [the RAF] have the initiative. If we seize

it now we may gain important results; if we lose it by waiting we shall probably lose more than we gain."[72] After the war, Slessor would admit that he was wrong; luckily, few in Bomber Command tried to follow his advice.[73] He also allowed that the RAF's claims to possess the ability to deliver a "knockout blow" before the war had been greatly exaggerated.[74]

Lord Hugh M. Trenchard and Maj Gen Ira C. Eaker

Pictured is their arrival at 303d Bomb Group base in England for an inspection tour.

The contemporary assessment by Ludlow-Hewitt of Bomber Command continues to be confirmed by those who analyze in hindsight the RAF. Williamson Murray notes that by 1939 the RAF possessed a bomber force that could not survive in daylight operations, could not find targets at night, had no

capacity for missions other than strategic bombing, and only had a fighter force because of the civilian government's interference.[75] Hastings points out that the RAF failed to develop night bombing techniques, to provide for navigation methods for use in poor weather, to improve weather forecasting techniques, or to gather intelligence on potential German strategic targets.[76] Finally, the official history of the RAF states "when war came in 1939 Bomber Command was not trained or equipped either to penetrate into enemy territory by day or to find its target areas, let alone its targets, by night."[77]

World War I as the Basis for RAF Doctrine

The RAF's strategic bombing doctrine grew from the British experience in World War I. German Zeppelin and Gotha raids against London profoundly affected the opinions of politicians and citizens alike, as exemplified by speeches before parliament in which members claimed airpower could bring the war to a rapid conclusion with long-range bombing operations.[78] In the doctrinal debates of the 1920s and 1930s, supporters of the RAF's strategic bombing doctrine often cited World War I experience as evidence to support their claims for both the effects of bombing on morale and the inefficiency of defense. Unfortunately for the RAF of the late 1930s, no one conducted a scientific study of World War I bombing results;[79] thus, both of these claims rested on dubious evidence.

There is no question that the German bombs which struck London in World War I caused panic and public outcry for reprisals, but it is debatable whether such reactions equaled a loss of morale or decreased the public's will to continue the war. During the war Britain suffered a total of 52 Zeppelin raids that killed 556 and wounded 1,357, and 27 bomber aircraft raids that killed 836 and injured 1,994.[80] For a report to the 1925 committee on air defense, RAF planners extrapolated from these figures a casualty estimate for an air attack against London. The RAF report informed the committee that in just the first three days of air attacks London would suffer twice the number of casualties as Germany and Britain combined sustained in the entire four

Caproni Aircraft

One Italian influence on American offensive air thinking resulted from US pilots being sent to Italy for training on Caproni bombers that were used against Austrian cities before the end of World War I.

years of the last war. Obviously, according to the RAF report, such attacks would likely lead to a morale collapse, especially since no defense was possible against them.[81]

The linkage between civilian casualties and the collapse of morale was, and remains, contentious. The RAF's casualty estimates, however, clearly rested on skewed analysis. At the time of the London Gotha bombings, Winston Churchill disagreed with the claim that public morale sagged.[82] In the annual air estimate debates of the 1920s, those who pointed to evidence that Londoners' morale stiffened, not waned, during the bombings were silenced by bombing advocates' claims that new technology would make bombing much more lethal in the future.[83] When developing the casualty estimates, RAF planners based their calculations solely on the 27 bomber raids against London as World War I ended. They ignored both the earlier Zeppelin raids and the RAF's own results of 746 Germans killed and 1,843 injured in 242 raids. The planners also made allowances for increased lethality to arrive at the often repeated figure of 50 expected casualties for each ton of bombs dropped.[84] The importance of this questionable figure should not be underestimated since it formed the basis for practically all RAF planning, both defensive and offensive, from 1923 until 1940.[85] Because this linear relationship between bombs and casualties was accepted, as the ability to deliver bomb tonnage increased, so did the casualty estimates. With such a high expectation of casualties, only a few enemy bombers had to get through friendly defenses to inflict catastrophic damage. Thus, one could argue, since no defense could prevent every enemy bomber from getting through, aircraft would be employed most efficiently not as a defensive shield, but as an offensive hammer to threaten the enemy's "fragile" morale.[86]

In addition to choosing carefully which World War I data were used to support casualty estimates, it is certain that the airpower advocates' claims for the RAF's wartime effectiveness selectively ignored portions of the historical record. True, the first strategic raids by the Royal Flying Corps against German targets in the fall of 1917 prompted a group of Rhineland mayors to petition the German government to stop bombing Britain so that raids against their cities would stop.[87] These raids actually inflicted little damage, however. To continue attacks against Germany, Trenchard, as commander of the Independent Force in France, had to expend increasingly more

effort to suppress German defenses. Eventually Trenchard had to devote 50 percent of his sorties to attacking German airfields in an attempt to prevent German fighters from interfering with his bombers. He also had to assign fighters to escort the bombers during daylight raids.[88] None of this experience apparently dampened the RAF's postwar praise for the decisiveness of strategic bombing. In the RAF's official report to parliament on its conduct of World War I, its authors claimed that the 1918 attacks had significantly affected German materiel and morale. The RAF also lamented that the war ended before the Handley Page V/1500 heavy bomber could begin attacks against Berlin and conclusively demonstrate the efficacy of strategic bombing.[89]

Handley Page Bomber

One of the Handley Page bombers that was designed for the offensive in World War I. Hugh M. Trenchard, who led the British Royal Flying Corps in France and later the Royal Air Force, was a firm believer in the notion that airpower is inherently offensive. The United States built some Handley Pages under license during the war but not in time to use them in combat.

Prediction versus Performance

The comment that the RAF could have proven its strategic bombing concept if the war had lasted longer, or if its planned aircraft had arrived earlier, highlights one of the most important characteristics of the interwar period's airpower doctrinal debates. Since World War I occurred during the infancy of airpower, many of the interwar claims of the Air Ministry rested on extrapolated predictions of the RAF's future performance, allowing for increased aircraft capabilities rather than on demonstrable evidence of past accomplishments. Given the rapid pace of aeronautical advancement throughout this period, one could dismiss the lessons of only a few years past as irrelevant to either the current or the future environment. This dismissal would profoundly affect the RAF's doctrine by focusing the staff's attention on planned, rather than current, capabilities.

Bureaucratic battles—first for the RAF's survival, then for funding under the constraints of the Ten-Year Rule—dominated the agenda of the RAF's leadership from the end of World War I until the mid-1930s.* The RAF's senior leaders, attempting to secure funding, made claims for the utility of airpower based not so much on evidence but on optimistic projections of future capability. The British Air Staff then had to expend tremendous time and effort defending the RAF's claims to various government committees. The CID held annual hearings to evaluate the roles and missions of the three services. During the 1920s, Trenchard often appeared before the committee. He argued that airpower could directly strike an enemy's heartland, that Britain was likewise exposed to such attacks, and that the economical answer to Britain's security woes was to bolster the RAF and its offensive power at the expense of the other services. Naturally the other services voiced different views of the utility of airpower. As a result of the constant battle against critics, the Air Staff may have begun to believe its own rhetoric and that its claims for future performance were not only predictions but also realities.[90]

*Employed as a planning and budgeting device by successive British governments during the interwar period, the Ten-Year Rule assumed that Great Britain would not be engaged in a major war for the next 10 years, thus obviating the need for any sizable defense expenditures.

A Cult of the Offensive?

To attribute the RAF's 1938 offensive doctrine to a cult of the offensive, it is necessary to show that the RAF's leaders permitted faith in the offensive to so distort their judgment that their offensive doctrine appears irrational. Comparing the interwar statements of RAF leaders about the impracticality of air defense to the results of the 1940 Battle of Britain does not prove the case a priori. One should not expect the air planners of the 1920s to have foreseen the invention of radar, a component critical to that successful defense. Instead, the examination at this point turns to the RAF's considerations of defense, which in turn influenced the development of aircraft self-protection measures and the evolution of employment, equipment, and techniques.

The RAF Concept of Defense

The RAF maintained the position from 1920 to 1937 that air defense was impractical and even a waste of resources.[91] This powerful idea influenced the construction of British air defenses, the justification for offensive doctrine, and the development of bomber aircraft.

The RAF began its dismantling of British air defenses as soon as it received responsibility for the mission after World War I. By 1920 the RAF had placed all searchlights and AAA pieces in storage, dismantled every air defense control center, and reassigned every fighter squadron previously committed to air defense.[92] These actions may have been the result of an increasingly pacifist public's desire to remove weapons of war from sight, especially when no threat appeared visible on the horizon.

Some elements in the British defense establishment still considered defense a viable option. During the early 1920s, various boards considered the matter of British air defense, postulating France as a potential enemy. Some speakers testified that fighter aircraft could possibly provide a defense against daylight bombers, but such aircraft could not defend at night, and so would prove worthless. Nevertheless, a result of this process was the creation, in 1925, of the Air Defence of Great Britain Command, which built on an earlier plan integrating fighters, warning systems, and AAA in a joint structure. While these

efforts did little to change the RAF's view of defense, they did establish the framework of the air defense system that would conduct the Battle of Britain 15 years later.[93]

The focus of attention on air defense in the mid-1920s resulted from the British public's growing fear of air attack. The proximate cause of this long brewing public perception was a series of widely read articles published in 1922 by P. R. C. Groves, the British air representative at Versailles, in which he detailed the expected use of airpower against cities in any future conflict. Groves asserted that the only possible defense against such an attack was the maintenance of an independent air force to threaten any potential enemy's cities in return.[94] RAF leaders, whether wittingly or not, encouraged the public's perception that British civilization could end in a massive exchange of air attacks through its exaggerated casualty estimates. The first Air Raid Precautions Committee's acceptance of the RAF's casualty estimates in 1925 without comment demonstrates the persuasiveness of the RAF's 50 casualties per ton of bombs multiplier. The theme of the tremendous destructiveness of airpower continued to influence British government and public debate during the 1920s, contributing to the rise of a movement to ban aircraft because of their potential as a holocaust weapon.[95] The RAF's penchant for portraying bombing casualties in the worst light continued in the 1930s.[96] In an October 1936 report to the Joint Planning Committee of the Chiefs of Staff, RAF representative Harris predicted 150,000 casualties in London from a German first air strike, possibly resulting in a popular revolt against the government.[97] A 1937 RAF report stated that the Luftwaffe would be able to inflict 10 times as many casualties in 1939 as it could in 1937, and pointed out that defense against such an attack would be impossible.[98]

The Impetus behind Offensive Doctrine

The convergence of opinion among "the airmen, the alarmists, and the disarmers"[99] on the expected effects of strategic bombing may have contributed to the RAF's offensive bent. Whether one or the other of these groups began the trend of exaggeration, the idea that airpower would have a decisive impact on any future conflict was constantly

reinforced. The epithet, “the bomber will always get through,” came not from an airpower advocate but from an airpower disarmament supporter. It was used in a 1932 speech to the House of Commons delivered by former British Prime Minister (then cabinet member) Stanley Baldwin.[100] “I think it is well for the man in the street to realize that there is no power on earth that can protect him from being bombed. Whatever people may tell him, the bomber will always get through. The only defence is in offence, which means that you have to kill more women and children more quickly than the enemy if you want to save yourselves.”[101]

Baldwin’s assertion that no defense could stop an air attack had long been an element of RAF doctrine, though the chief of Air Staff dismissed his reference to targeting women and children.[102] A 1922 Air Ministry memorandum written for the Standing Defence Sub-Committee of the CID, one of the first written statements on RAF air doctrine, noted that “in war in the air, even more than in other forms of warfare, it is accepted that a vigorous offensive against the enemy is the surest form of defence, for in a medium of three dimensions passive defence is more than ordinarily inefficient and only by means of an offensive can the air forces of the enemy be satisfactorily contained; in addition such offensive is a powerful means of influencing the morale of the enemy population, who may compel their Government, as a result, to sue for peace in order to secure relief from the constant presence of hostile aircraft.”[103]

The RAF’s doctrinal belief that defense was impossible influenced the design of self-protection measures for its bomber aircraft. The RAF set low aircraft performance standards, contracting for bombers that were “slow, unarmored, and possessed little in the way of defensive armament.”[104] Tail guns, first proposed in 1918, did not appear in an RAF aircraft design requirement until 1933. While the armament of potential enemy fighters improved, the RAF continued to purchase the dependable, but relatively short-range, Browning .303-inch machine gun developed for its aircraft in World War I. Sticking with the smaller gun allowed enemy fighters armed with heavier weapons to shoot RAF bombers while remaining out of range of the bombers’

defenses. In one concession to the possibility of defense, RAF planners opted to fly aircraft in mutually supportive defensive formations to compensate for the lack of firepower of a single bomber. A major design requirement for RAF bombers, then, became the ability to fly formation, as opposed to heavier armor or more firepower. Requested aircraft specifications for speed and range lagged behind those of existing commercial aircraft, and additional military requirements hardly excused this disparity since the RAF's expressed need for aircraft armor or armament practically disappeared.[105] It was not until late 1936 that the Air Ministry developed aircraft specifications for long-range heavy bombers equipped with powered gun turrets for self-defense.[106]

In addition to slighting the self-defense aspects of its aircraft, the RAF also neglected to develop the equipment and employment methods required to execute offensive missions. To succeed, a bomber must find its target and hit it with a weapon capable of achieving the desired effect. The RAF failed to procure aircraft systems that could perform any of these tasks in sustained combat conditions. In an age when civilian airliners flew at night and in bad weather, the RAF did not have the navigation equipment necessary to permit either type of operation. The RAF had experienced the negative effects of bad weather on bomber operations during World War I, but took no action to remedy the situation during the interwar years.[107] During his tour of duty in Iraq in 1923–24, Harris developed night bombing techniques, as well as pathfinding and target marking procedures, but none of these innovations appeared in general RAF procedures until just prior to the war.[108] If an RAF bomber crew could find its target, it did not have the bombsights or mastery of the delivery techniques necessary to enable it to hit the target reliably.[109] The RAF also failed to develop ordnance capable of inflicting the type of destruction advertised by its advocates. RAF bomb dumps in 1938 still contained a majority of small, 200-pound bombs left over from World War I, and even many of the newly produced bombs proved worthless due to poor fuses and low-quality explosive fills.[110]

RAF leaders had access to evidence that their offensive strategy might require modification. A review of the *R.A.F.*

Quarterly during this period provides some interesting insights into the issues debated in the service, both in the topics covered in articles and those avoided. First produced in January 1930 and "devoted to the interests of the Royal Air Force . . . to encourage thought and discussion and the free expression of opinion," the journal published articles on service life, travel, and sports as well as articles "of definite historical and Service value."[111] From 1930 to 1937, professional topics ranged from airpower doctrine, to advantages and disadvantages of various aircraft types, to technical recommendations. Thus the journal addressed many of the issues RAF policies ignored. The need for RAF cooperation with the British Army and Royal Navy in executing missions other than strategic bombing was addressed several times during this period.[112] Some articles acknowledged the power of the defense, either advocating home defense forces for Britain, or recommending methods to increase the penetration capabilities of RAF bombers.[113] Others tackled more specific deficiencies, like the need for navigation aids,[114] weather broadcasts to aircraft,[115] armament improvements,[116] enhanced relationships between the aircraft industry and the RAF,[117] and the requirement for detailed intelligence support for air campaign planning.[118] Of the few articles which, in hindsight, offered recommendations which missed the mark, only one was outlandish: a proposal to replace single-engine fighter aircraft with "ramming" aircraft.[119] Still, many articles largely reaffirmed such major tenets of the RAF's offensive doctrine as the belief that self-defending bomber formations needed no fighter escort, that airpower would play the decisive role in the next conflict, and that the ultimate target for airpower was enemy morale.[120]

In 1936 the journal presented two airpower theories which articulated opposing views of the value of offense. Excerpts from Douhet's theory[121] were published in the same issue as the first three chapters of N. N. Golovine's *Air Strategy*.[122] After the last four chapters of his book were published in the next issue, Golovine became a frequent contributor to the journal. His balanced view of offense and defense and his advocacy of several types of specialized combat aircraft

contrasted sharply with the RAF and Douhet's offensively centered doctrine.

While descriptions of the use of airpower in empire policing activities appeared frequently, only one article published during the first seven years of the journal analyzed a major power's air operations: a study of the Italian campaign in Ethiopia.[123] Noticeably absent from the *R.A.F. Quarterly* is any mention of the Spanish Civil War, where data on the effects of bombing on civilian morale could have been gathered.[124] From August to December 1936, both the Nationalists and the Loyalists bombed Spanish cities hoping to destroy the enemy population's morale. When these bombing campaigns proved relatively quickly to have little appreciable effect on morale, both sides shifted their bombing missions to more traditional military targets.[125] In October 1939 the journal published an article that assessed the performance of airpower on both sides of the Spanish Civil War. Reasonably balanced, the report covered most aspects of the conflict, highlighted that the majority of air attacks were against entrenched enemy troops, and concluded that "the effect of air attacks on the morale of the population is less than sometimes supposed."[126]

The reasons for the RAF's inability to perform its professed mission stem, in part, from a lack of detailed operational planning and rigorous testing. The temptation exists to blame these faults on insufficient funding during the exigencies of the declining defense budgets of the 1920s and early 1930s. The RAF's official history offers as possible explanations for poor preparedness the lack of adequate training airspace and the pressure of the rapid force expansion that began in 1934. The pace of rearmament, according to Sir Charles Webster and Noble Frankland, might have led to a staff preoccupation with aircraft procurement and basic flying training, as well as a misprioritization of equipment acquisition.[127] Scot Robertson attributed the RAF's shortcomings to its failure to realize that its strategic bombing concept, as developed, was neither a theory nor a doctrine, but a hypothesis in desperate need of testing.[128] While Robertson's explanation satisfies more than Webster and Frankland's official history, it still falls short of offering a reason for the failure to recognize strategic bombing as an untested proposal. Neville Jones

Hugh M. Trenchard and Col Edward J. Timberlake

During his inspection of a US Bomber Command base, Lord Trenchard, father of the RAF, examines the tail of a 93d Bomb Group Consolidated B-24 at Hardwick, England. Col (later Lt Gen) Timberlake of San Antonio, Texas, is seen in the background. He served as commander of Continental Air Command from 1962 until 1966.

observed "during this period the doctrine of the offensive hardened into the dogma . . . that the bomber would always get through. . . . Events were soon to prove that the effectiveness of air defence had been seriously underestimated, while the power of the offensive had been equally seriously over-estimated."[129] The idea that an offensive ideology gripped RAF planners might help to explain why they did not question the efficacy of their planned offensive operations or account for the myriad employment details. If one truly believed the contemporary rhetoric that the power of the bomber offensive was irresistible, then matters such as precise target location, navigation techniques, or development of improved munitions

might begin to lose their relevance. Such rhetoric was promulgated by the RAF and amplified by both government speeches and the popular press.

The fact that the RAF on the eve of World War II could not conduct the operations it had ostensibly prepared to execute for more than 20 years prompts a search for plausible explanations. Convinced of the futility of defense, RAF planners procured lightly armed, lightly armored aircraft. Belief in the exaggerated destructive power of aerial attack left the RAF in possession of a bomber fleet that could not find its intended targets, hit them, or destroy them if it could accomplish the first two tasks. Because the RAF's interwar offensive doctrine failed to consider objectively bomber aircraft capabilities and limitations, the RAF could not perform its planned offensive mission. A misplaced faith in offensive ideology trapped RAF leaders during the interwar period and contributed to their 1938 dilemma.

To say that the RAF was trapped by a cult of the offensive is not equivalent to saying that offensive action was impossible or that any offensive doctrine was doomed to failure. It does imply that, by 1938, the offensive strategic bombing doctrine pursued by Bomber Command appeared irrational and that the firm grip of an offensive ideology may account for this doctrinal failure.

Symptoms

Three symptoms indicate the RAF's drift toward offensive ideology. First, the RAF neglected both experimental testing and detailed planning of its strategic bombing concepts. The RAF did not sufficiently test its bombing accuracy under simulated combat conditions.[130] To illustrate, RAF planners divided targets into two categories, precise and group. The former category required high accuracy, and since the RAF had previously rejected dive-bombing, these targets demanded a level pass at low altitude. The group targets, which evolved into area targets during the war, did not require the same accuracy since there were many desired impact points within close proximity of each other. These targets could be struck from high-altitude deliveries. All of the testing of these

deliveries, however, was done in good weather without any compensation for enemy defenses. Neither these tests, nor other objective evaluations, adequately addressed night or bad weather techniques, or the avoidance of enemy defenses and the inaccuracies this would induce.[131]

Even in the exercises the RAF conducted, the results were often skewed to support existing doctrine or ignored if the result did not affirm preconceived notions. In a series of exercises conducted between 1927 and 1933, the Air Staff arbitrarily assigned bombers twice the killing power of the defensive fighters. When the fighters still achieved a 50 percent successful interception rate, the data were ignored. The Air Staff also disregarded information from the 1927 and 1928 exercises on the effectiveness of AAA. Notably, the 1932 exercise highlighted the needs for procedures for flying in bad weather, illumination of targets at night, and an improved target intelligence system. All of these deficiencies remained uncorrected in 1937.[132]

The RAF's failure to develop operational plans delayed the recognition that a mismatch existed between projected employment concepts and actual capabilities. When planners started developing the RAF's first operational plans, known as the Western Air Plans, for war against Germany in late 1937, many of the service's deficiencies came to light.[133] Had RAF planners begun this process earlier, even if against a notional foe, they might have uncovered many of the RAF's faults and avoided the cult of the offensive.

Second, the RAF selected one mission, strategic bombing, as its reason for existence, inhibited the development of other missions, and squelched dissent.[134] While the perceived importance of this mission to securing RAF independence has been highlighted, the pursuit of a single mission above all others clearly led to a dangerous single-mindedness among RAF leaders. The RAF dismissed the defensive mission, an opinion which persisted through 1938 with the Air Ministry's objections to Sir Thomas Inskip's emphasis on fighter production.[135] The Air Staff even rejected other offensive missions such as interdiction, close air support, and reconnaissance.[136] When the Experimental Mechanized Force began to exercise with RAF units in 1927, the Air Ministry

responded by warning "the War Office against allowing Army officers to encourage Air Force officers to violate official Air policy."[137] The Air Staff also attempted to suppress or refute negative comments about strategic bombing.[138]

Third, the RAF concept of strategic bombing remained vague, long on predicted effects but short on quantifiable objectives. Robertson attributed some of the aircraft priority shifts when the RAF began rebuilding in 1934 to this lack of a clear RAF doctrine. "What is important here, however, is why the Air Staff were unable to articulate exactly what was meant by equality in air power [with Germany]. The answer stems largely from the fact that the Air Staff were unable to point to precise target objectives for the air striking force. Even when they could, those target objectives were related to the morale argument that had sustained their theories for the better part of fifteen years. Yet morale as an objective was virtually unquantifiable. No one knew, truthfully, what scale of effort would be required to produce victory through that form of air attack."[139]

Conclusion

There are other possible explanations for the RAF's continued pursuit of offensive doctrine. Many of the factors identified previously as reasons military organizations might prefer offense to defense are present in this case. These reasons help to explain why the RAF preferred offense, but not why the RAF failed to test the required concepts, write the necessary plans, or procure aircraft properly equipped to execute the offensive. One also has to wonder why the RAF chose an offensive strategy to protect a security-seeking nation that identified itself as the most vulnerable in Europe to the consequences of an air attack. Rather than offer to construct a defensive shield—which might have led to even bigger budgets based on constructing a fighter aircraft force sufficient to the task—the RAF instead denigrated the power of defense against airpower, and claimed that only through offense could Britain achieve security. The RAF's leaders obviously believed in offense. Because that offensive faith persisted despite evidence that the RAF could no longer

execute an offensive, a cult of the offensive is one of the plausible explanations for the doctrinal failures of the RAF before World War II. As Hastings noted "the RAF trained for more than two decades guided only by Trenchardian faith that it would somehow be 'all right on the night.'" [140]

Israeli Air Force, 1967–73

> *We played the game by our rules and suddenly we didn't know the rules or how to play them. . . . During the Yom Kippur War the systems that were supposed to support the pilot and help him do his job didn't exist. These were the ECM and intelligence systems. We came in to fight like we did in 1967 but the conditions were different.*
>
> —N. Merchavi
> Israeli Air Force A-4 and F-4 pilot

A stark contrast appears between the performance of the Israeli Air Force on 5 June 1967 and its performance on 6 October 1973. On the former, the first day of the Six-Day War, the IAF immediately established air superiority when it struck 25 Egyptian airfields, damaging or destroying approximately 350 enemy aircraft.[141] On the latter, the first day of the Yom Kippur War, the IAF lost 30 aircraft, 65 percent of the total lost during the entire previous war, by attempting to stop enemy advances in the Sinai and the Golan Heights.[142] The major difference between these two air battles was the employment of integrated, mobile SAM defenses by the Arab forces. While the IAF knew its enemy possessed these SAMs, the IAF was surprised by the magnitude of their effect on air operations. The defensive capabilities of the Arabs changed considerably between the two conflicts, but IAF doctrine changed very little, remaining offensive. The next section traces the roots of the IAF's doctrine and its development between these two wars and describes some of the changed conditions that may have led to the different outcome in 1973.

IAF Offensive Doctrine

The doctrine of the Israeli Defense Force, the parent organization of the IAF, arises from conditions unique to

Israel's geographic and political position. Surrounded by potential enemies, an attack could occur with little warning. A desire for economic growth limits the size of the standing army; the IDF relies upon a rapid mobilization of reserves to bring forces up to combat strength. Even with its reserves, the IDF expects to fight greatly outnumbered by its enemies. The IDF also anticipates that the international community will intervene and force a rapid termination to any conflict in the region. These imperatives dictate an IDF operational doctrine based on offense, preemption, speed, indirect approach, exploitation of "superior macro-competence," and combined arms warfare.[143]

The doctrine of the IAF derives from that of the IDF. The IAF must guarantee air superiority over Israel to prevent enemy aircraft from interdicting the mobilization of reserves.[144] The IAF's fourth commander, Dan Tolkowsky, who assumed command of the IAF in 1953 during its fifth year of existence, determined the approach the IAF would pursue to establish air superiority. The IDF General Staff of the period advocated the use of airpower in a defensive role, citing the Royal Air Force's performance in the Battle of Britain as a successful employment of defensive airpower. Tolkowsky, however, believed that airpower could best succeed through offensive action, primarily by destroying enemy aircraft on the ground. He also cited the Battle of Britain to bolster his case, claiming that the Luftwaffe might have prevailed had the Germans continued attacks on RAF airfields rather than shifting to targets around London.[145] Tolkowsky won the debate, and the IAF doctrinal tenet of securing air superiority through offensive action persisted through the Yom Kippur War. Attacking preemptively increased the probability that the IAF could destroy most of the enemy's aircraft before they launched or dispersed. With air superiority swiftly established at the outset of a conflict, the IAF could focus its efforts on supporting ground and naval forces in combined arms warfare.

During the Six-Day War of 5–11 June 1967, the IAF validated every tenet of its doctrine. The IAF destroyed most of the Egyptian Air Force in a preemptive attack, then likewise struck the Syrian Air Force. With air superiority thus ensured,

the IAF's fighter-bombers switched to a ground support role and assisted the Israeli Army in pushing the frontiers of Israel to the Suez Canal in the west and the Jordan River in the east. The IAF's astounding success resulted from achievement of surprise, commitment of all resources to the attack, and a paucity of both active and passive defenses around enemy airfields.[146] In October 1973, the IAF would realize only one of these three conditions, the total commitment of resources to the attack. The failure to account for a lack of surprise and the greatly increased level of Arab defenses doomed many of the initial attackers to destruction.

Failure to Achieve Surprise

A successful surprise attack, by definition, hinges on striking an unprepared enemy. Even an enemy possessing considerable means to counter an attack may be unable to employ them effectively if caught unaware.[147] Two considerations prevented the IAF from conducting a surprise attack in October 1973: a political prohibition against preemption and a fully alerted enemy. The former is often blamed for the IAF's initially disjointed performance, but the latter negated any opportunity for a successful surprise attack.

The Israelis seriously considered preemption during the last hours before the war began. The first publicly documented call for an IAF preemptive attack came from the IDF chief of staff, Lt Gen David Elazar, on Saturday, 6 October, at an early morning cabinet meeting but was denied by Prime Minister Golda Meir based on Minister of Defense Moshe Dayan's negative recommendation.[148] Maj Gen Benny Peled, the IAF commander, had advised Elazar in a discussion before the meeting that the IAF could strike Syrian SAM batteries at 1100. While preparing for these missions, planners informed Peled that low clouds would prevent attacks on most of the SAM targets, so he switched the targets to airfields in Syria. These airfield targets were cancelled when the cabinet denied Elazar's request for a preemptive attack.[149] When the war began around 1400, many of the scrambled IAF fighters had first to jettison the bombs uploaded for the cancelled airfield missions before turning to meet attacking Arab aircraft.

Considering the results of later IAF attacks on Syrian SAMs, one must question whether the planned preemptive attack on 6 October would have succeeded even if the weather and the cabinet had permitted it. The Arab forces, having been surprised in 1967, must have been at a high state of alert during the hours before they initiated the 1973 war, and the IAF had little success subsequently against alerted SAMs.[150] On 7 October, an F-4 squadron launched 15 aircraft on Operation Dugman 5 to destroy Syrian SAMs. The fighters only identified three of Syria's 31 active SAM batteries, and lost six aircraft while inflicting only marginal damage on the few SAMs they found. The IAF did not attempt another mass operation against SAMs for the remainder of the conflict. By the end of the war the IAF had only managed to destroy three of 31 SAM systems and damage five others.[151]

Failure to Account for Increased Defenses

The Arab forces greatly increased both their passive and active defenses against air attack between 1967 and 1973. The Soviet Union enhanced Arab active defenses by furnishing updated SAMs and new radar-directed AAA. The mobile SA-6 Gainful SAM and the mechanized ZSU-23-4 Shilka AAA proved the most deadly of these systems. By tightly integrating the AAA and the SAMs, the Arabs intensified the lethality of their defensive system. Tactics useful against the SAMs made aircraft more vulnerable to the AAA. As a result, the IAF lost approximately 109 aircraft in the Yom Kippur War to surface-to-air weapons, split approximately evenly between SAMs and AAA. Fifty-four of those aircraft, almost half of the total, were lost in the first four days of the war.[152]

The Egyptian forces made great strides in increasing their passive defenses as well. They constructed decoy missile sites along the Suez Canal to distract attackers.[153] They also modified their airfields to make them more survivable. Egyptian airfield improvements included construction of both hardened and underground aircraft shelters, addition of multiple runways to allow operations if one runway was hit, and even emplacement of highway landing strips near airfields to launch and recover aircraft in case damaged runways were

not repaired quickly enough.[154] On 7 October the IAF struck many Egyptian airfields, but achieved little lasting damage due to the protection afforded by aircraft revetments and the rapid response of runway damage repair units.[155]

The IAF's First-Strike Assumptions

By the time Generals Peled and Elazar considered a preemptive attack on 5 and 6 October, the attack would not have surprised the Arab forces preparing for their own offensive and likely wary of such an IAF attack. Even without achieving complete surprise, one could argue that a preemptive attack would have had value because it might have given the initiative to the Israeli forces. General Peled, for one, blamed the IAF's poor performance during the first four days of the October war on the cabinet's decision ruling out preemption, claiming the initial days of the war would have gone much better had the IAF initiated action rather than reacted to Arab moves.[156] General Peled's remark reflects the IAF planning assumption that the IAF's first attacks would destroy, or at least significantly degrade, enemy SAM coverage, thus giving the IAF air superiority to conduct ground support missions. To understand the likelihood of achieving this initial offensive goal, one can break the question into two parts, analyzing first the likelihood of the cabinet approving a preemptive attack, and second, the likelihood of gaining air superiority in a first strike.

Preemption has long been a tenet of IAF doctrine and Israeli policy. The IAF formulated plans to attack the Egyptian Air Force preemptively as early as 1952, prior to the Sinai campaign of 1956.[157] The incredible success of the opening attack of the Six-Day War in 1967 served to validate the notion of preemption and increased the prestige of the IAF to the point that it became the premier arm of the IDF.[158] From a policy standpoint, Israel has maintained that, due to its precarious position, certain actions on the part of her neighbors, such as moving large numbers of troops close to Israel's borders, pose particular danger to the nation. In an effort to marshal international support for actions and preclude the start of an accidental war, Israel has publicly

declared which of these actions are causus belli and justify preemptive attacks. Israeli policy makers see this declared policy of preemption as an aid to Israel's deterrence posture vis-à-vis her potential enemies.[159]

While preemption has been a major part of Israeli strategy through the years, IAF planners should have realized that preemption actually was a more remote possibility for the IAF in the early 1970s. After the 1967 war, Israel turned to the United States to replace the aging French equipment in its air fleet. The United States began delivering A-4 Skyhawks to the IAF in August 1968, then F-4E Phantoms in September 1969.[160] With the United States as its major aircraft supplier, Israel found its ability to use aircraft in preemptive attacks somewhat curtailed. Beginning in March 1969 Egyptian forces conducted a number of attacks across the Suez Canal. In June Egyptian President Gamal Abdel Nasser's declared the War of Attrition. Responding to these events Gen Ezer Weizman, the head of the General Staff Operations Branch and former commander of the IAF, advocated a large airpower effort against the Egyptians. The remainder of the General Staff argued against this use of the IAF, opting instead for responses in kind. This situation created a tension which continued throughout the War of Attrition, with Weizman and the IAF arguing for more vigorous action on the part of the IAF, and Minister of Defense Dayan refusing because of the perceived risk of escalating the conflict.[161] The conflict escalated, however, and the IAF began using newly delivered F-4 aircraft to bomb targets deep in Egypt beginning in January 1970. At this point the IAF's use of airpower began to cause substantive political difficulties with its primary arms supplier. The US State Department warned that it viewed Israel's use of airpower in the conflict as escalatory. The United States continued to pressure Israel diplomatically to refrain from the deep bombing raids until finally, in March 1970, the United States withheld shipment of 25 F-4s and 100 A-4s to Israel.[162]

When the War of Attrition ended in August 1970, due in large part to US pressure,[163] IAF planners should have recognized that superpower interest in the region would likely restrain future operations and might prevent cabinet approval

of a preemptive attack in the future. Some IAF leaders had expressed an understanding of the delicate nature of the relationship between Israel and her most significant arms supplier as early as the spring of 1969.[164] The need both to ensure US support and to avoid international censure as an aggressor led Prime Minister Meir to rule out either preventive war or a preemptive attack in response to the various incidents in January, May, and September of 1973, each of which appeared to be precursors of an Arab attack.[165]

Evidence that Arab Defenses Had Increased

The IAF's experience in the War of Attrition also should have presaged the difficulty of disabling a Soviet-style integrated air defense system composed of modern SAMs and AAA. While using airpower as "flying artillery" to strike Egyptian targets along the Suez Canal, the IAF destroyed the enemy SAMs, radars, and AAA to the point that by September 1969 IAF aircraft could bomb targets with little threat of resistance. The IAF began bombing targets deep in Egyptian territory in January 1970 and destroyed the remaining defenses from the Suez Canal to Cairo. The Egyptian Air Force fared no better than the surface-to-air units, losing 32 fighters while only downing four of the IAF's.[166]

Then, in March and April 1970, the Soviet Union responded to the IAF's deep attacks by rebuilding Egyptian defenses. The Soviets began delivery of the SA-3 SAM, which had a much better low-altitude capability than the SA-2, and the improved MiG-21MF Fishbed J flown by Soviet pilots.[167] By the end of June, the Soviets had 120 MiG-21s and 55 SA-3 batteries manned by Soviet troops stationed in Egypt. Israel, choosing to avoid conflict with a superpower, restricted its attacks to the Suez Canal region.[168] The Egyptians and their Soviet allies began pushing the defensive belt of SAMs and AAA towards the Suez Canal. As the defenses strengthened, IAF losses mounted. A pivotal period began on 1 July, with estimates of IAF losses to the Egyptian integrated defense system ranging between seven and 20 aircraft during the subsequent five weeks until the cease-fire on 7 August.[169]

By the end of the War of Attrition, the IAF had flown against all of the defensive systems it would face three years later in the Yom Kippur War. Even the SA-6 made an appearance just before the cease-fire, shooting down an F-4 on 3 August 1970.[170] The combination of radar-guided SAMs, man-portable SA-7s, and radar-directed AAA such as the ZSU-23-4 made the airspace over the Suez Canal especially deadly for attacking aircraft, as indicated by the IAF's sharply increased loss rate during the last weeks of the conflict. The SA-6, however, made the most significant impression. An Israeli officer outlined the IAF's perception of the SA-6.

> The War of Attrition concluded in Israel with a feeling of discomfort, largely because of the SA-6. We had no response to the overlapping missile systems, which complemented each other. . . . This was no longer a missile fired from a bunker but one fired from a vehicle, something tiny, seeing but unseen, with almost unlimited range of operation. . . . The pilot's response time is reduced to almost nothing. A lot of time passes before the aircraft's radar detects the location of the firing and until the opposition missile homes in on the target. In this time, the mobile missile carrier can turn and run, and it is not worth wasting ammunition chasing it.[171]

The IAF pursued several measures to counter the increased defensive capability of an integrated air defense system. The IAF acquired US Shrike antiradiation missiles, developed intelligence systems to detect SAMs, and purchased updated electronic warfare gear.[172] Still, despite the evidence of the lethality of an integrated defense system, the magnitude of losses to Egyptian and Syrian SAMs and AAA three years later in the first days of the Yom Kippur War shocked IAF leaders.[173]

A Cult of the Offensive?

In this case, the claim that the IAF was captivated by offensive ideology rests on three points: the mistaken belief that the IAF could eliminate the Arab integrated defense systems in a large first strike, the failure to adequately provide aircraft with self-protection measures to negate defenses, and the lack of munitions appropriate to counter the Arab passive airfield defenses.

In the two years following the War of Attrition, the IAF began working on methods to destroy SAMs and to operate in airspace protected by SAMs. Efforts were undertaken to collect information on missiles and to develop ECM to aid in launch detection and missile avoidance. Based on observance of Egyptian and Syrian war exercises in 1972, the IAF developed a series of plans called the Scratch File to destroy Syrian and Egyptian SAMs in the event of a coordinated Arab attack. These plans required additional refinement before implementation, but over the next year most of the personnel working on the plans moved to other positions in the IDF. In August 1973, only four months after taking over the IAF from Moti Hod, General Peled reviewed the Scratch File. He critiqued the plan for its complexity and its reliance on events beyond the control of the IAF.[174] The existing plans to destroy enemy SAMs in a large first strike apparently had some potential flaws. Still, Peled had enough faith in the plan in the early hours of 6 October to recommend an IAF preemptive strike against Syrian SAMs.

To execute the IAF's plan would require a large effort from a relatively small air force, similar to the successful airfield attacks of the Six-Day War. The effort to destroy enemy SAMs would have to come either before hostilities, in the form of a preemptive attack à la 1967, or in response to an attack by the enemy. The reasons for the IAF to doubt that the cabinet would approve a preemptive strike were noted above. The reasons the IAF should have doubted it would be allowed to devote a large portion of its force to a SAM strike after the Egyptians and Syrians attacked lay in the foundations of the IDF defense strategy.

The IDF strategy in 1973 rested on three elements: advance warning provided by the intelligence organization, use of the standing army and air forces to block any enemy advance and hold territory, and the rapid mobilization of the reserve forces to conduct a counterattack.[175] In addition to securing air superiority over Israel to permit mobilization of the reserve, this strategy also called on the IAF to provide sufficient numbers of aircraft to assist the standing army in holding positions under assault. Other commanders in the IDF General Staff believed that the IAF could, and would, provide

the airpower necessary to both cover friendly positions and stop a surprise invasion.[176] So the IAF's continued pursuit of a strategy calling for a large first strike against enemy SAMs when such a strike was not likely to be approved either before or after hostilities highlights a serious discontinuity between IAF offensive strategy and reality.

A second disparity between IAF doctrine and reality occurred in the overestimation of the IAF's ability to operate, with acceptable attrition, in the high-threat environment created by enemy integrated air defenses. The IAF had experienced significant losses to Egyptian defenses in the closing weeks of the War of Attrition. While efforts were undertaken to develop countermeasures against the SAMs, they had not reached fruition at the time of the Yom Kippur War. In other words, the IAF advertised a capability to operate in a SAM environment that, at best, existed only on a handful of aircraft or, at worst, existed only on paper. Part of the explanation for the lack of adequate ECM gear lay with US restrictions on sales of such equipment due to security concerns. Edward N. Luttwak and Daniel Horowitz noted that "there also seems to have been a strong bias in the [Israeli] Air Force against the technological 'high road' solution, and a measure of overconfidence in the ability of Israeli pilots to improvise defensive tactics in the face of new weapons."[177] Another glaring example of the failure to institute relatively cheap countermeasures solutions was the lack of chaff dispensers on most IAF aircraft.[178] To compensate for these deficiencies once the war started, the IAF improvised chaff dispensers for F-4s, used helicopter spotters to warn aircraft of missile launches (until several of these helicopters were shot down), attempted to negate missiles through various aircraft maneuver profiles, and tried to determine the locations of Egyptian "safe passage" corridors. While these innovations speak highly of the ingenuity of the IAF, none of them adequately addressed the basic problem of insufficient preparation for the type of battle to be fought.[179]

When the planned offensive first strike against the enemy's missiles failed to materialize, the IAF was forced to fly close air support and interdiction missions in a high-threat environment. Even if the first strike had gone as planned, one

of the lessons of the War of Attrition was that the enemy could usually recover from damage and quickly have the missile systems back on line. The IAF had to relearn this lesson in the Yom Kippur War.[180] Col Eliezer Cohen notes that "tricks developed [to defeat SAMs] during the War of Attrition were forgotten for some reason during the first stage of the Yom Kippur War."[181] Even many of the targets struck by the IAF demonstrated a certain lack of attention to the CAS and air interdiction problem. Numerous sorties attacked, and successfully hit, the bridging equipment used by the Egyptians to cross the Suez Canal. These sorties actually had little effect because the Egyptians could quickly repair damaged bridges by replacing the destroyed sections.[182]

The final discontinuity in the IAF's offensive strategy was its failure to compensate for the passive defensive measures taken by the Egyptians to protect their airfields. Unlike the opening attack of the Six-Day War, when every impact point and every weapon were meticulously matched to ensure maximum utilization,[183] the airfield attacks in the Yom Kippur War proved ineffective because of the lack of penetrating munitions to destroy sheltered aircraft. The purchase or indigenous development of precision-guided munitions in sufficient quantities to attack the airfields might have solved this problem.

The IAF based its doctrine around a first strike against SAMs that was not likely to be approved, failed to adequately provide for self-protection measures against SAMs, and did not acquire the munitions necessary to overcome airfield passive defenses. The hypothesis that the IAF was trapped by a cult of the offensive may account for these shortcomings. Lessons about the power of the defense were readily available from the IAF's own combat experience in the War of Attrition. The IAF devoted some resources to negating the threat posed by an integrated defense network. Yet, at the time of the Yom Kippur War, the IAF's attempts to defeat the defenses still focused on limiting an attacker's time over target, altering attack angles, and increasing pilot skills. To truly negate the defenses, the IAF required different weapons, better electronic warfare equipment, and enhanced intelligence support.[184] Perhaps most telling in this regard is the self-assessment of

the participants, as Cohen points out. “What was the source of the self-confidence that the commanders of the IAF displayed prior to the war, when they claimed the ability to destroy the missiles? Here as well, in their retrospective wisdom, IAF commanders admitted in debriefings and closed inner-circle meetings that the estimations regarding their response capabilities were unrealistic.”[185]

Perhaps the IAF’s overestimation of its ability to overcome the enemy’s defenses, despite the abundance of evidence to the contrary, stemmed from the rapid collapse of the enemy in 1967. Minister of Defense Dayan apparently believed in a version of the sharp rap termed the Collapse Theory. Dayan believed that the combination of IAF and armor attacks against any Egyptian forces penetrating the Sinai would disrupt their plans so completely that the entire offensive would collapse.[186] By “believing the enemy’s forces to be essentially fragile, trusting in the ability of the [Israeli] Air Force to overcome the missile barrier, and in the ability of the tank forces to defeat Egyptian forces on the ground, Dayan and his associates felt secure with the very thin defence that would itself collapse in October 1973.”[187]

Symptoms

From this analysis of the IAF, three items emerge as possible indicators that the IAF’s doctrine was caught by an *unreasonably* offensive ideology. First, IAF doctrine apparently evolved independently of the other IDF forces’ doctrine. Most of the IDF General Staff counted on the IAF to provide the forces necessary to blunt an enemy surprise advance and to secure the time to mobilize the reserves. The IAF, however, persisted in believing that its initial strikes would be used to roll back enemy SAM defenses. Resolving this difference in strategy at the joint IDF level could have clarified the IAF’s initial mission focus and forced IAF planners to address the problems of conducting close air support and interdiction in a high threat area protected by an integrated SAM and AAA network.

Second, the plans to attack SAMs were not adequately examined for fundamental weaknesses until just before the

war began. Even if the cabinet had approved a preemptive attack, IAF commanders later admitted that the attack plan contained serious flaws, especially in intelligence and targeting. The difficult problem of locating mobile, tactical SAM vehicles on a dynamic battlefield required more thought. Any plan must be exercised and realistically evaluated before it is accepted, especially before other plans are made on the assumption that the first plan will set the necessary conditions. The IAF obviously learned from this experience as its successful performance against Syrian SAMs in the Bekaa Valley in 1982 proved.[188]

Third, the weapons the IAF intended to employ failed to evolve as passive and active defenses strengthened. When the war began, the IAF possessed few weapons that allowed the shooter to remain outside of the lethal threat envelope, such as the AGM-65 Maverick missile. The IAF did not have weapons with the combination of accuracy and penetration capability to destroy revetted aircraft. All of the development of tactics and acquisition of self-protection equipment in the world is worthless if the weapon employed cannot deliver the desired effect on the target.

Conclusion

The IAF continued to pursue an offensive airpower doctrine through the beginning of the Yom Kippur War without adequately accounting for the improved defensive capabilities of the Egyptians and Syrians. Enamored with an ideology of the offensive, the IAF ignored the unpleasant lessons of the War of Attrition and attempted to repeat its offensive success of 1967 without instituting the planning or equipment updates necessary to cope with the improvements of the Arab defenses. The pursuit of an improperly developed offensive doctrine was manifested in three areas. The IAF overestimated the likelihood of a successful first strike against the enemy's SAMs, lacked the preparation required to conduct missions against targets protected by SAMs, and failed to acquire weapons capable of offsetting the enemy's passive airfield defenses. A misplaced faith in its ability to conduct the offense contributed to the IAF's loss of almost 18 percent of its aircraft

in the first four days of the war.[189] The symptoms of the IAF's offensive ideology included unilateral doctrine formulation, inadequately critiqued offensive plans, and stagnant weapons development. It is a tribute to the resourcefulness and skill of the IDF, including the IAF, that Israel ultimately triumphed in the Yom Kippur War.

United States Air Force, 1953–65

There is no question that a nuclear war can be "won," as wars of the past have been won—by the side which is best prepared to fight it. This preparation of which I speak includes as top-priority items civil defense measures as well as military offensive and defensive power.

—Gen Nathan F. Twining
Neither Liberty nor Safety

Courtesy of Boeing Airplane Company

B-47

This bomber, which entered the inventory in the early 1950s, was one of the main instruments of the US offensive strategy for deterrence in that decade and beyond.

In 1965 the USAF's Strategic Air Command (SAC) operated 807 nuclear-capable bombers, 600 B-52s, 114 B-47s, and 93 B-58s, as well as 880 nuclear intercontinental ballistic missiles (ICBM), 59 Titans I and II, and 821 Minutemen I and II.[190] On 1 February 1965, Gen Curtis E. LeMay retired as the USAF's chief of staff (CSAF), the last of the major commanders from World War II to leave USAF active duty.[191] Four months later, B-52 bombers executed their first conventional bombing missions in Vietnam.[192] Thus, 1965 marked the end of an era. SAC's predominance among the Air Force's major commands began to dwindle in light of two changing world conditions, the growth of the Soviet Union's (USSR) nuclear arsenal, and the increasing US involvement in Vietnam. The USAF's strategic doctrine through 1965, primarily under the auspices of SAC, centered on the maintenance of a predominantly offensive nuclear capability. The author next examines the development of the Air Force's strategic nuclear doctrine in the years after the end of the Korean War in 1953 to determine the feasibility of the offensive nuclear doctrine pursued in 1965.

USAF Nuclear Strategy

The United States pursued three different approaches to grand nuclear strategy during this period: massive retaliation, second-strike counterforce, and the combination of assured destruction and damage limitation. Massive retaliation, the US security policy announced by Secretary of State John Foster Dulles in January 1954, sprang from the belief that the threat of nuclear war could deter communist aggression, like that which had occurred in Korea, worldwide.[193] When ordered, US nuclear forces would launch a massive campaign to destroy the Soviet military and the urban economic and industrial base that supported military production.[194]

A clear shift in US nuclear strategy occurred when the Kennedy administration took office in January 1961. In his first weeks in office, Secretary of Defense Robert S. McNamara received a briefing on the nuclear single integrated operational plan (SIOP), a report from a Pentagon weapons evaluation group critical of nuclear force structure, and a RAND briefing

Brig Gen (later Maj Gen) Haywood S. Hansell Jr.

Famous in the genesis of the Combined Bomber Offensive against Germany, Hansell was a teacher at the Air Corps Tactical School and a principal planner who constructed AWPD-1. He flew with then Capt Claire Lee Chennault in the predecessor unit to the Thunderbirds. General Hansell preached the gospel of the offensive throughout his career and a long postwar retirement.

on a proposal to adopt a "no-cities" nuclear strategy. This combination of briefings energized McNamara's demand for a more flexible strategy than massive retaliation.[195] These efforts culminated in McNamara's initial no-cities doctrine (also called second-strike counterforce). The strategy remained

retaliatory, thus second strike, but initially targeted nuclear and other military forces rather than cities. Soviet cities would be targeted by subsequent forces, providing negotiating leverage to end the conflict.[196] As budgetary pressures mounted over the next 18 months, McNamara first attempted to control military spending on nuclear forces by forbidding the services to cite the counterforce mission as a justification for weapons. Then, in November 1963, he changed the US nuclear strategy to one based on the combination of assured destruction and damage limitation.[197] The first capability, assured destruction, provided a rationale for limiting the size of the US nuclear arsenal. The second, damage limitation, described the capability of US forces to strike unlaunched enemy nuclear forces, and thereby decrease the amount of damage the United States would suffer in subsequent nuclear exchanges. McNamara described the first capability as essential, regardless of cost, and the second as optional, dependent upon the threat and the available budget.[198] In effect, McNamara's new policy was to use assured destruction as a method to size US forces properly and damage limitation as a strategy for the employment of that force.[199]

USAF nuclear strategy between 1953 and 1965 sometimes led and sometimes lagged behind the grand strategy outlined above. During the massive retaliation era, the Air Force planned to use nuclear forces in much the same way that conventional bomber forces had been employed in World War II. Targets included enemy military forces, transportation nodes crucial to the movement of those forces, and the industries and elements of the enemy economy, such as electricity and raw materials processing plants, which fed war production. The first lurch toward a new targeting strategy emerged in the early 1950s. In 1953 while incumbent CSAF Hoyt S. Vandenberg favored the continuance of the previous industrial targeting emphasis for nuclear forces, LeMay, as SAC commander, and Nathan F. Twining, the next CSAF, advocated changing the planned majority of effort from industrial targets to military targets.[200] This strategy shift was supportable because the development of the hydrogen bomb in 1953 made weapons simultaneously smaller and vastly more potent, and because of the continuing growth of the US

Left to right: **Generals Hoyt S. Vandenberg, Matthew B. Ridgway, and Lauris Norstad**

General Vandenberg never served on a bomber crew but commanded the greatest tactical air force in history during World War II, the Ninth Air Force. He presided over the Air Force from 1948 to 1953 as it was building the Strategic Air Command into a formidable nuclear offensive force. Commander Ridgway, as a result of his Korean War experience, was skeptical of the value of air-power in general, and while supreme commander of NATO, General Norstad was one of the earliest advocates of flexible response.

nuclear arsenal.[201] The USAF focus on military targets gained momentum when the United States began to receive intelligence data from U-2 overflights of the Soviet Union in the mid-1950s. The transformation continued in fits and starts throughout the latter years of the 1950s and was enhanced by periodic technological improvements, such as increases in weapon delivery accuracy, and by the deployment of new weapon systems, such as nuclear-armed ballistic missiles, nuclear weapon-capable fighter aircraft, and the

B-52 bomber. Air Force strategy remained consistent with President Dwight D. Eisenhower's policy of massive retaliation, even though it included many military targets, because it would still inflict tremendous casualties.[202]

The USAF's somewhat schizophrenic approach to a nuclear strategy caught between military and industrial targets reached its culmination in the "optimum mix" strategy of 1959 to 1961. The optimum mix strategy targeted both military and industrial targets and sought to achieve maximum destruction with the available force. The exact detonation points of weapons aimed at military targets were sometimes slightly adjusted to achieve greater casualties in a nearby city, as had been the targeting technique since the mid-1950s.[203] A change was brewing, however, instigated by USAF interest in what would happen if deterrence failed and propelled by the work of Herman Kahn and William W. Kaufmann, which called for a strategy with less emphasis on countervalue targeting.[204]

Beginning in 1960, Air Force strategy increasingly ignored countervalue targets and emphasized the need for counter-force strikes. Some blamed interservice battles over the utility of minimum deterrence, in particular the debate with the Navy over acquisition of the submarine-launched Polaris missile system, for this strategy shift.[205] Regardless of the cause, USAF leaders would emphasize the ability of nuclear forces to target the enemy's military forces, both conventional and nuclear, for the remainder of the period under study.[206]

The roots of the "new" USAF strategy actually stemmed from an often-expressed Air Force interest in counterforce targeting. As early as 1953, former Secretary of the Air Force Thomas K. Finletter recommended that the Air Force move toward "anti-force" targeting and away from "anti-industry."[207] General LeMay stated in 1955 that the USAF's first mission should be to destroy Soviet atomic capability.[208] General Twining, speaking as CSAF, claimed in 1956 that the USAF's primary mission was to destroy the USSR's capability to strike the United States.[209] In December 1957 Maj Gen James H. Walsh, director of Air Force intelligence, declared that the USAF was moving away from Douhet's airpower theory based on massive destruction of cities and back toward Clausewitz's

Maj Gen (later Gen) Nathan F. Twining

General Twining held vital positions during the heyday of the air offensive strategy. He commanded the Fifteenth Air Force during the Combined Bomber Offensive against Germany and became USAF chief of staff in 1953. Later in the decade he served as chairman of the Joint Chiefs of Staff.

ideas of focusing attacks on enemy forces.[210] While quick to recognize the positive attributes of counterforce strategy, the Air Force was slow to implement it, citing insufficient force size and inadequate intelligence capabilities as reasons for the

delay at the time.[211] All of this provided the background for the USAF counterforce emphasis of the early 1960s which claimed such a strategy could not only deter war but also successfully prosecute nuclear war should deterrence fail.

A Cult of the Offensive?

To demonstrate that Air Force doctrine between the Korean and Vietnam Wars was trapped by a cult of the offensive, one must show that the USAF ignored evidence of the power of the defense and pursued offensive doctrine without a complete understanding of the possibilities and limitations of the offense. This argument, then, hinges on two things. First, how did the USAF treat evidence of the power of the defense? Second, how rational was the USAF's decision to pursue an offensive doctrine in the 1960s?

USAF Reactions to Defensive Improvements

Military aerospace technology advanced rapidly during the period under study. The proliferation of missiles had one of the most significant impacts on air operations. Missiles provided much greater engagement ranges and promised improved probability of kill compared to guns for both air-to-air and surface-to-air applications. Intermediate range and intercontinental ballistic missiles threatened to replace bomber aircraft as the primary nuclear weapon delivery system. In fact, the last day the Air Force had as many bombers on nuclear alert as missiles was 21 April 1964. After that, the number of alert missiles always exceeded the number of alert bombers.[212] Examining equipment changes, preparation of its own defenses, and nuclear mission planning, reveals the USAF's estimation of the power of the defense as conditions evolved in the late 1950s and early 1960s.

The first equipment change, as already noted, was the acquisition of ICBMs to augment bombers as nuclear weapons delivery platforms. A raucous debate ensued between those who believed the ICBM should completely replace the piloted bomber and those supporting the USAF's position that a force containing a mix of bombers and missiles provided the optimum offensive capability.[213] A

B-52

The core instrument of the US offensive strategy in the late 1950s and used in combat in the Gulf War, the B-52 is a long-lived bomber.

complete exposition of the missile/bomber debate lies beyond the scope of this study. One aspect of the debate is important, however, because it centered around the defenses an enemy could erect against bombers and missiles. ICBM advocates initially asserted that no defense was possible against the missile, while improved antiaircraft defenses were making it less likely that a bomber could survive to reach the target.[214] As technology progressed and antiballistic missile (ABM) defenses became theoretically feasible, ICBM advocates cited the greater relative expense of ABM systems compared to ICBM systems to support their case. Quoting a Department of Defense study, they claimed that for every dollar an enemy spent on ICBMs, the United States would have to spend $3.20 on ABM systems to offset the offensive improvement. This, in their view, made defense impractical and unaffordable for either side.[215] The offensive-defensive aspect of this debate forced Air Force leaders, who

advocated a mixed force of bombers and ICBMs, to defend their assertion that the manned bomber could successfully negate enemy defenses. As a result, USAF leaders consistently emphasized bomber survivability, funding the research, development, and purchase of such penetration aids for bombers as electronic countermeasure suites and decoys.[216] The USAF purchased the Hound Dog nuclear air-to-surface missile to allow B-52 bombers to employ nuclear ordnance from outside the range of enemy defenses and proposed production of the B-70 bomber to counter future Soviet defensive improvements.[217]

USAF Employment of Defense

The USAF's appreciation for defense is revealed in its efforts to ensure the survival of its own forces in the face of an enemy attack. SAC pursued various passive defensive measures to counter the perceived Soviet offensive threat. Albert Wohlstetter led several RAND studies in this period, which were not always well received by the Air Force, that focused on the vulnerability of SAC's forces, and recommended various defensive measures to alleviate the problems he identified.[218] General LeMay undertook to eliminate SAC's dependency on vulnerable overseas bases in 1954 by accelerating development of the B-52 and concomitantly acquiring an air refueling capability to allow bombers stationed in the United States to fly to their targets in the Soviet Union nonstop. Even while implementing defensive measures to increase survivability, some still believed in offense as the answer to vulnerability. Instead of absorbing a Soviet first strike, SAC planners of the early 1950s advocated launching on warning of an attack "to get in a better, faster, preemptive strike."[219]

RAND's 1954 report on vulnerability considered the threat of attack posed by Soviet long-range bombers. A 1956 RAND study, *Protecting U.S. Power to Strike Back in the 1950s and 1960s,* again headed by Wohlstetter, highlighted SAC's continued vulnerability to a surprise attack, which could only worsen given the possibility that the Soviets would soon deploy an ICBM. Among other items, this report

Courtesy of Consolidated Vultee Aircraft Corporation

B-36

Though some Air Force officers favored a balanced air arm after World War II, the imperatives of politics and economics gradually compelled the USAF to adopt a force structure built around a strategic nuclear bombing capability. The B-36 was the leading instrument of that strategy until the great jet bombers were ready.

recommended the construction of giant hardened shelters to protect SAC bombers.[220] SAC's leaders still believed in aircraft dispersal as a viable defensive counter to an impending Soviet attack, but they failed to provide either nuclear weapons transport or loading facilities at the dispersed bases. The Gaither Committee, appointed by President Eisenhower in 1957 to study the vulnerability problem, discovered that SAC could not get a single nuclear-loaded aircraft airborne within the attack warning time generated by the distant early warning (DEW) line's radar. General LeMay responded that he had access to highly classified intelligence from aircraft constantly flying over the Soviet Union intercepting military communications

and that SAC would act on strategic, not just tactical, warning. Furthermore, LeMay stated he would order a preemptive attack if he received warning of a massing of Soviet offensive forces, so he claimed that the Gaither Committee's test proved nothing of significance.[221]

By the time the mythical bomber gap of the 1950s evolved into the imaginary missile gap of the 1960 presidential campaign, SAC had begun to implement passive measures to protect its nuclear forces. Gen Thomas S. Power, the new SAC commander, implemented Eisenhower's direction to have one-third of SAC's bombers on 15-minute ground alert in October 1957 after testing the concept to discover and correct deficiencies in the ground alert scheme.[222] As perceived threat capabilities increased, the number of passive measures undertaken increased as well. In July 1961 President John F. Kennedy increased the size of SAC's ground alert commitment to 50 percent of the bomber force.[223] Six months later SAC began to maintain a number of B-52 aircraft constantly on airborne alert.[224] SAC also implemented passive protection for its ICBMs, constructing hardened, underground silos for missiles. Still, the primary passive defensive measures remained alert and dispersal, and SAC refused to build hardened shelters for bombers.[225]

In addition to passive countermeasures, the USAF also pursued active defenses against Soviet offensive forces. Air (Aerospace) Defense Command (ADC) received attention as a shield against possible Soviet attack beginning in the early 1950s. The Air Force sought superior interceptor aircraft, radar detection networks capable of providing warning, fighter control systems that could direct air battles between jet aircraft, and sophisticated surface-to-air systems to provide area coverage to complement the Army's Nike point defense SAM. These efforts led to the deployment of the F-101/102/104/106 interceptors, the DEW line of radars, the semiautomatic ground environment system to direct aircraft intercepts, and the Bomarc SAM. When analysts predicted that the Soviets were developing a standoff missile capability for their bombers, similar to the US Hound Dog, the USAF responded in 1957 by requesting a new interceptor. The proposed F-108 required Mach 3 speed to permit it to engage enemy bombers before they could

First Launch of the Minuteman Solid-Propellant Missile

The Minuteman was a main instrument of the land-based missile leg of the strategic triad, which was designed to deter through the maintenance of an invulnerable offensive capability.

launch their missiles, given the time constraints dictated by radar warning.[226]

As USAF leaders became increasingly convinced in the early 1960s that the Soviets preferred missiles over bombers for offensive action, the service's desire to field defensive systems waned. When the 1961 budget deliberations forced the USAF to choose between the offensive B-70 bomber and

the defensive F-108 interceptor, its leadership opted for the former, over the objections of Gen Laurence S. Kuter (then North American Air Defense commander).[227] USAF interest in defensive measures did not completely end with the cancellation of the F-108 but continued to be expressed in the form of support for development of an ABM defense.[228] Even the F-108 proposal reappeared in subsequent budget debates but was never developed. As late as 1965 General LeMay, then CSAF, attempted to insert a long-range, high-altitude interceptor program back into the budget, but the proposal had to be modified after Secretary McNamara's disclosure of the previously classified A-11 program and his statement that an interceptor version could be developed, if required.[229] The interceptor version of the A-11, designated the YF-12A, was repeatedly sought by the Air Force, but was never produced. The reconnaissance version of the aircraft entered USAF service as the SR-71.[230]

USAF Appreciation of the Difficulty of Offense

Perhaps nowhere was the USAF's appreciation for both the power of the defense and the problems of the offense more apparent than in its plans for nuclear warfare. Evolving from the SAC targeting plans of the 1950s and the US Emergency War Plan, detailed planning for nuclear war reached its ultimate expression with the publication of the SIOP. The SIOP, first published in December 1960,[231] matched specific weapons with individual targets and contained the detailed coordination required to deconflict the strikes of all US nuclear systems, regardless of service or command of origin.[232] Producing the SIOP forced planners to consider the feasibility of thousands of coordinated offensive actions. Planners developed target intelligence, prioritized targets, established a desired probability of target destruction, orchestrated the timing of missile strikes against surface-to-air missile sites to permit bomber penetrations, and deconflicted aircraft ingress routes. The SIOP planners assumed high attrition and failure rates for attackers, with causes ranging from the destruction of employment vehicles by enemy defenses to failure of weapons to function properly.

Brig Gen William "Billy" Mitchell

In the early twenties, General Mitchell supported a balanced air force containing both offensive and defensive capabilities but gradually became more offensively oriented. He was court-martialed in 1925 and left the service early in 1926. Billy Mitchell continues to have great influence on the thought of the USAF.

The high attrition assumptions required the tasking of a large number of offensive weapons to execute the plan.[233] The establishment of high confidence levels of target destruction also fueled demands for more offensive weapons since planners tasked multiple system and warhead combinations against the same target to achieve the desired probability that the target would be destroyed.[234] General Power, SAC commander from 1957 to 1964, explained the programming of several weapons against the same target by saying, "we are playing for the highest stakes there are, the survival of our nation and we cannot afford to leave the success of the most important military factor in our Deterrent System to chance and wishful thinking."[235]

While the SIOP may have forced US planners to seriously address many of the problems inherent in a large-scale nuclear offensive, the SIOP also spawned severe criticism. First, it was driven by capabilities, not requirements.[236] Air Force leaders admitted that the SIOP called for the launch of every available weapon against the enemy in the shortest possible time.[237] Even the designation of enemy was somewhat vague, as the first SIOP called for strikes against targets in China and several Eastern European countries, as well as targets in the Soviet Union.[238] The SIOP attempted to deliver the maximum target destruction, in the minimum amount of time, given the available arsenal.

Second, some of the planners' assumptions appeared questionable. Daniel Ellsberg, when reviewing the SIOP as a RAND analyst in 1961, believed the most basic assumption of the plan, simultaneous worldwide execution, was flawed. Ellsberg claimed, for one thing, that execute orders arrived at different times at different bases, fatally disrupting the execution timing so diligently deconflicted by the planners.[239] Others noted that SAC planners had increased the expected probability of destruction on designated key targets from the directed 75 percent to as high as 97 percent in some cases. Overall, 812 targets in the first SIOP required a probability of destruction of 90 percent or higher. Additionally, planners based the effective damage figures used to determine the number of weapons required only on the blast effects of nuclear weapons, disregarding the effects due to heat, fire, and radiation. Critics postulated that if every target on the SIOP received only one nuclear weapon, the resulting radiation would adversely affect several European and Asian allied countries.[240]

Third, the SIOP provided no employment options. The planners wove each individual item so completely into the plan that its execution demanded an all or nothing effort; it was impossible to execute the SIOP in stages. The parallel between World War I's intricately planned mobilization schedules and inflexible nuclear employment plans had become apparent to Secretary McNamara after he listened to a 10 February 1961 RAND briefing on a no-cities nuclear strategy.[241] McNamara had received his first SIOP briefing

Maj Gen Frank M. Andrews

General Andrews was the first commander of the GHQ Air Force and was an apostle, if not the high priest, of the Air Corps offensive preference. He was at the controls of a B-24 Liberator when it crashed into a mountain in Iceland in the spring of 1943.

only one week earlier, and this combination of events led to his demands both for more execution flexibility and for the development of alternative courses in the nuclear war plan.[242]

The Rationality of Offense

With these important problems about the offensive war plan identified, one must question whether the offensive strategy pursued by the USAF through 1965 was rational. Some would argue that no victory was possible in nuclear war, so any plan advocating a nuclear offensive must be irrational.[243] One cannot dismiss either the pure counterforce strategy or that of second-strike counterforce so easily, though. US grand

strategy for this entire period was nuclear deterrence. The two prevailing deterrent views focused on either countervalue or counterforce targets.[244] The countervalue strategists believed that threatening to destroy an enemy's cities would deter aggression, even though one's own cities were sure to be lost as well in an ensuing nuclear exchange. The counterforce group, which included the Air Force, thought that if deterrence fails, the United States should have an executable military strategy that sought to deny the enemy the means to secure its military objectives. The Soviets might realize that the Americans spared Soviet cities in a counterforce nuclear attack, and likewise, they might avoid US cities in a nuclear counterattack. As General Power commented, a counterforce strategy "places greater importance on saving American lives than on destroying an aggressor's cities," while admitting that there was no guarantee that a Soviet counterstrike would spare US cities.[245] A counterforce deterrent also appeared more credible as an extended deterrent strategy for NATO and as an answer to possible Soviet "salami tactics."[246] During a 1962 speech to NATO ministers in Athens, Secretary McNamara officially announced the change in US strategy from one of massive retaliation to one of flexible response. With its heavy emphasis on counterforce targeting, the new strategy appeared to affirm the counterforce targeting position.[247] However, as the US National Command Authorities eschewed preemptive attacks,[248] the number of counterforce targets grew so large that a counterforce strike became virtually indistinguishable from a countervalue attack.[249] Also, as the desire to contain spending on nuclear forces grew,[250] the McNamara policy began to drift more toward the assured destruction side of the deterrent scale.[251] Still, the USAF sought to maintain a war-winning strategy both as a deterrent and as a hedge against deterrence failure; 82 percent of the nuclear force committed to the SIOP in 1963 was tasked against counterforce targets.[252] General Twining summed up the USAF position, as quoted earlier in this section, by saying nuclear war was winnable if the Air Force approached it like a conventional military problem.[253] So the USAF counterforce doctrine of 1965 appears logical and consistent with grand nuclear strategy. Independent of the

evaluation of whether offensive counterforce was the best or "correct" strategy, one must admit at least that the strategy appears rational given the balance of forces at the time.

The evidence presented so far has demonstrated that the USAF pursued a rational counterforce nuclear offensive doctrine. USAF planners also considered how evolving defenses would affect offense. The Air Force's leadership emphasized technological innovation to improve the penetration capabilities of bombers, advocated a mixed bomber and missile force to hedge against Soviet deployment of an ABM system, and procured standoff air-to-surface missiles to prolong the usefulness of piloted bombers against growing Soviet defense capabilities. In addition, AF leadership planned thoroughly by anticipating and compensating for losses inflicted on attacking forces and pursued a mix of active and passive defenses to protect US forces. The USAF respected the power of the defense and its SIOP planning factors likely underestimated the ability of its own offensive forces to conduct operations. Because the USAF's offensive nuclear strategy was logical, consistent with national strategy, and recognized the myriad obstacles which had to be overcome for offense to succeed, it appears that, despite its obvious preference for offense, the USAF was not trapped by a cult of the offensive.

The Air Force unquestionably preferred offense to defense, as its leaders and observers consistently noted. Bernard B. Brodie was appalled at the atomic targeting plans of the early 1950s which, reminiscent of the sharp rap myth, "hinged on the notion that somehow the bombing campaign would, just like that, force the Soviet Union to collapse."[254] The USAF's first basic doctrine manual, AFM 1-2 published in 1953, acknowledged the possibility of defense, but asserted that airpower was inherently offensive.[255] General LeMay defined a deterrent force in 1955 as "an effective nuclear offensive force which is secure from destruction by the enemy regardless of what offensive and defensive action he takes against it."[256] In 1956 Gen Earle E. Partridge, ADC commander, stated, "we believe that the best defense is a good offense, and we believe that our primary mission in the Air Defense Command is to defend the bases from which Strategic Air Command is going

Gen Curtis E. LeMay

General LeMay is best known in association with US strategic bombing. He built SAC into a formidable force including two legs of the strategic triad. He is shown here as a young officer and *(next page)* in Vietnam in 1962 when he was chief of staff of the USAF.

to operate."[257] Fred Kaplan, commenting on USAF reluctance to build hardened shelters for bomber aircraft, observed that "to spend money on offense, not defense, was practically dogma in Air Force circles."[258] Gen Thomas D. White, while testifying before Congress as CSAF in 1960, outlined his view that "of course, our philosophy is based on the fact that offense is the best defense. . . . I am perfectly certain that . . . air defense could absorb the national budget, and still could not guarantee 100-percent defense."[259] Writing in 1964, former SAC commander General Power said, "with all other factors being equal, the nation which takes the initiative in nuclear war automatically assumes military superiority."[260] Despite this consistent predilection for offense, however, Air Force actions demonstrate that the understanding of the requirements for successful offense matured and evolved from the dangerously cultic view Brodie decried in the early 1950s. By the mid-1960s, nuclear offense was still revered but not imbued with a mystical, irresistible quality. The numerous

projects pursued to ensure the survival of its attacking forces substantiate the USAF's recognition of the power of the defense. General LeMay's remarks before Congress in 1963 reveal some of the tension that respect for the defense caused. "We now have the capability of taking a portion of the penetrating force and putting it on the defense system and destroying it so you can go in without opposition. We have the weapons to do this. And we plan on doing it. I sometimes think that we have given the defense system too much credit."[261]

Symptoms

Three factors indicate how the Air Force largely avoided the trap of offensive ideology: detailed planning, realistic exercises and testing, and constant challenges from outside the organization. The first of these, detailed planning, resulted from the task of producing the SIOP. Centralized control of airpower had long been a tenet of USAF doctrine. The SIOP covered every aspect of nuclear employment and left little room for innovation at lower echelons. The combination of security requirements and the desire to centralize control of operations drove the USAF to pool its resources and create a tremendous planning engine. By exploring the employment plan in great detail, planners could uncover force deficiencies and highlight them for correction. Any plan, no matter how detailed, is built around assumptions, and some of the assumptions of the SIOP were probably flawed. The SIOP, complex instrument that it was, would have suffered in execution like any other plan when it came into contact with a reacting enemy. None of these defects, however, detracts from the fact that producing the SIOP forced planners to specifically address the power of the defense. Specifically addressing the defense may have helped the USAF to avoid the cultic trap characterized by the belief that somehow, at the point of enemy contact, the offense would mystically prevail.

The second issue, realistic training and thorough testing, forced USAF planners to consider actual capabilities, not predicted performance. One of the reasons cited for Air Force resistance to a rapid, massive conversion to missiles was the lack of full-scale operational missile testing.[262] SAC pursued a

policy of not accepting weapons into the SAC inventory until they were operational, to avoid the construction of a force based on promise instead of capability.[263] Training for the delivery of nuclear weapons became such an Air Force fixation that it took priority over all other training, even for fighter aircraft in some commands.[264] SAC also professed that nuclear employment required more than just the proper weapons. It included the combined output of the entire organizational system. The command's definition of weapon system, according to General Power, encompassed the weapon plus the facilities, support equipment, personnel, and training facilities to exercise them all.[265]

The third factor, challenge from outside sources, provided a relentless force that may have prevented the USAF from fixating on an undeveloped notion of offensive capability. Nuclear strategy was a constant subject of attention by civilian theorists throughout the period. One can see RAND's influence on Air Force strategy in the measures taken to reduce force vulnerability and in the development and pursuit of a nuclear war-fighting strategy.[266] The advent of the Polaris system forced the Air Force to support the feasibility of its offensive plans against those who claimed that a countervalue strategy could deter nuclear war at substantially lower cost.[267] The Air Force arguments against Polaris centered on the technical problems of developing the fleet ballistic missile system and on the limited utility of its "fractional megaton" warhead for counterforce targeting.[268] Finally, the bomber-missile debate repeatedly forced the USAF to justify the survivability of its bomber force and to consider seriously the air defense capabilities of the Soviets. General LeMay's previously cited congressional testimony indicates that even the offensive-minded CSAF reacted to the pressure to make a full allowance for enemy defensive capability.

Conclusion

Several of the factors that lead military organizations to prefer offensive doctrines are evident in this case. Air Force attempts to build a credible counterforce capability, in addition to providing for national security, furthered

organizational growth and power. Switching to a counterforce strategy allowed planners to link the size of USAF nuclear forces to the size of enemy forces, which provided a rationale for increasing the USAF's nuclear arsenal as the Soviet arsenal grew. Recognition of the power of the defense also permitted planners to develop and procure new systems to counter projected Soviet defensive enhancements. Finally, pessimistic estimates of reliability and survivability of offensive systems justified the purchase of additional weapon systems to compensate for worst-case scenarios.

Regardless of the impetus, USAF planners recognized the potential power of the defense and attempted to compensate for the difficulties inherent in executing a nuclear offense. Furthermore, they pursued measures to increase the probability that their planned nuclear offensive would succeed. Air Force offensive strategy in Vietnam during the remainder of the 1960s, not considered in this study, may have lacked much of this rationality and merits future examination as a separate case. In the early 1960s, the USAF's pursuit of a nuclear counterforce capability may have been inappropriate, too expensive, or incapable of achieving all of the desired results had it been executed. The reasons for failure, however, would not have been attributable to a seriously misplaced faith in the power of the offensive. Because of its acknowledgment of both the power of the defense and the difficulties of offense, the USAF of the late 1950s and early 1960s avoided a potential cult of the offensive.

Implications

Offensive doctrine held tremendous appeal for all three of the airpower organizations considered in this study. The interwar RAF viewed offensive strategic bombing as the most economical means to guarantee British security against potential threats from the continent. This belief allowed the RAF's leaders to secure the organization's funding and autonomy during the drastic British defense cuts after World War I. The IAF enjoyed tremendous prestige, much of which derived from the devastatingly successful offensive air strikes of the 1967 Six-Day War. Israel's defense policy emphasized

Polaris Submarine

During the late 1950s and early 1960s, US Navy condemnation of strategic nuclear attack lessened as submarine launched ballistic missiles proved practical.

quick victory and encouraged preemption. The leaders of the USAF after the Korean War saw the offensive employment of nuclear weapons as a true military strategy, useful should the more politically oriented strategy of deterrence fail. Pursuit of an offensive strategy also provided a rationale for increasing the size and power of USAF and SAC organizations relative to those of the other armed services. Offensive doctrine in each

of these cases appeared to meet organizational and national security goals simultaneously.

For the RAF and the IAF, however, offense became an article of faith. These organizations were trapped by a cult of the offensive in the sense that their offensive doctrines were accepted without serious challenge to the notion that airpower could execute the planned offense given the existing conditions. Offensive ideology, in turn, contributed to the ineffectiveness of the force. The RAF's self-evaluation of its offensive forces on the eve of World War II revealed that its touted offensive capability did not exist. Israel's political leadership did not allow the IAF to preemptively strike enemy SAMs, and once the war started, ground support requirements forced the IAF to operate against a strong defense. Even if the IAF had devoted its first strikes to SAMs, preemptively or not, it is debatable whether the strikes would have eliminated the missile threat.

While not the only factor at work in these cases, the fact that an offensive ideology gripped the RAF and the IAF helps to explain why their doctrines failed to produce the expected military success. Apparent in both cases is a cultic acceptance of the belief that offense would triumph despite enemy countermeasures. And that the benefits accrued from taking the initiative would compensate for the operational risks. The RAF, reflecting the views of many in British society and government, believed that offensive airpower was so destructive that society would unravel and governments collapse soon after air strikes began. This belief in the omnipotence of airpower offense could account for the lack of emphasis on developing the equipment and procedures required to strike individual targets. The IAF deservedly enjoyed the rewards of a successfully executed massive offensive strike in 1967. During the subsequent years, few questioned that the IAF would repeat its offensive performance at the beginning of the next conflict.

Yet, in both cases, strong evidence existed, and was ignored, that the envisioned offensive would not unfold as expected. The RAF first discovered in World War I the need for navigation aids, all-weather capability, larger explosives, better intelligence, and protection from enemy defenses.

During the interwar period, employment exercises repeatedly showed the need for these improvements. The RAF's leadership, however, ignored this evidence. The IAF first encountered the increased capabilities of a Soviet-style integrated air defense system of SAMs and AAA during the War of Attrition. While the IAF initiated programs to counter these defensive improvements, they were not pursued vigorously and few adjustments were made to compensate for identified deficiencies before October 1973. The IAF's leaders persisted in the belief that their planned offensive would succeed, disregarding both the contrary evidence and the probable political limitations. An unshakable faith in the power of offense propelled the doctrines of both the RAF and the IAF past the point of objective evaluation of capability and limitations, which led to a doctrinal failure.

The USAF case lacks the dramatic finale of the RAF and IAF cases. USAF strategy supported the national strategy of deterrence, and no nuclear war occurred, but it is too large an inferential leap to conclude that the USAF offensive doctrine was therefore successful. Until more information becomes available about Soviet perceptions and reactions during the period under study, one can only conclude that the strategy did not fail. Whether the USAF offensive strategy is deemed a failure or success, though, does not affect the conclusion that the Air Force avoided a cult of the offensive in its nuclear strategy. This determination rests upon the evidence that Air Force planners admitted the power of the defense and attempted to compensate for many of the difficulties likely to arise in offensive execution.

From the analysis of these cases, it appears that detailed planning and critical evaluation may provide two keys to avoiding the trap of the cult of the offensive. Detailed planning reveals the shortcomings of an intricate offensive campaign. Both the RAF and the IAF failed to plan their offensive operations to the level of detail that the USAF did in its SIOP or the IAF did in 1967. When the strategist must decide how a crew locates a target, who dictates which targets to hit, which munitions can achieve the planned effects, or how aircraft will survive in the existing threat environment, the differences between war on paper and actual war become evident. To plan

a large airpower offensive, one may have to delegate tasks among different organizations. At some point, however, the strategist must gather all of the organizations' inputs for analysis to determine the feasibility of an offensive strategy. This synthesis of detailed planning information serves to replace the cultic faith that airpower can perform a task with the hard evidence necessary to support the claim.

While detailed campaign planning may confirm that an airpower offensive is executable, it does not completely address the issue of effectiveness. Strategists must also evaluate the mechanism through which they anticipate employment of offensive airpower will lead to achievement of an objective. A cult of the offensive can occur at this level as well, for instance, if a strategist falls victim to the sharp rap myth and believes that the enemy will crumble as soon as airpower employment begins. In some cases an opponent's system may be that fragile, but the strategist must diligently identify the mechanism which will lead to this rapid collapse, and not accept fragility to air attack as an element of cultic faith.

Strategists must always closely examine assumptions, since they provide an avenue for the imperceptible insertion of cultic beliefs into any plan, whether offensive or defensive. Assumptions allow the strategist to posit tasks as completed. Accepting as an assumption that the bomber will always get through may lead to the development of lightly armed bombers, de-emphasis of escort-capable fighters, or the elimination of defensive antiaircraft systems. Assumptions blur the primary difference between theory and fact. Theory must always be tested when confronting new conditions. Turning a theoretical assertion into an unquestioned assumption gives it the status of fact and exempts it from proof.

Most importantly, the strategist's planning synthesis must rest on data obtained through a critical evaluation of airpower's capabilities and limitations. Whether critical analysis results from internal organizational dynamics or from defending one's capabilities against external challenges, airpower strategists must understand the true competencies and weaknesses of their military instrument. Organizational

theory predicts that self-evaluation will be a difficult task for any organization. The USAF case demonstrates the possible utility of external challenges to organizationally accepted strategy as a means to mitigate the influence of offensive ideology. Realistic training, testing, and evaluation of current and developing capabilities, both offensive and defensive, should provide the information necessary for rational strategy development. This research has shown that strategy resting on projected capabilities rather than on demonstrated performance may be more susceptible to entrapment by an offensive ideology.

Further investigation in several areas may help clarify the influence of offensive ideology on airpower strategy. In addition to the RAF case study presented here, the interwar period offers several other instructive cases.[269] France tied its airpower directly to army support by decentralizing control of its offensive air forces to ground commanders and emphasizing short-range missions.[270] German offensive airpower doctrine simultaneously recognized the promise of strategic bombing and linked airpower to the support of ground forces.[271] The USAF, like the RAF, emphasized strategic bombing and developed its industrial web theory at the Air Corps Tactical School to guide targeting.[272] Soviet offensive airpower doctrine during the interwar period alternated between strategic bombing, with the fielding of a large force of four-engined bombers in the early 1930s, and ground support.[273] These four cases are interesting because, with access to roughly similar technology and exposure to similar bodies of airpower theory, each service implemented an offensive strategy with different characteristics. After World War II, the IAF's offensive successes of 1967 and 1982 provide an intriguing counterpoint to the 1973 case presented here. Finally, offensive ideology may have had some influence on USAF strategy in the Vietnam War. Further research can help clarify the effects of offensive ideology on airpower strategy and discover additional methods airpower strategists can use to identify and avoid the trap of the cult of the offensive.

The most important and cautionary lesson to glean from this study is that it is possible for an airpower organization to become ensnared by a cult of the offensive. Once caught, the

factors that make offensive doctrines naturally attractive for military organizations will persist, and this persistence will cause a spiraling preference for more offense, which increasingly tightens the noose. If the efficacy of offense becomes incontestable, the questions critical to the development of an effective offensive strategy may never be asked. The ultimate result can be a strategy completely inappropriate for the conflict at hand. Recognizing the potential trap provides one useful method of avoiding it. Recognized or not, detailed planning and critical evaluation will assist in the development of a strategy, whether defensive or offensive, devoid of cultic faith. While the cult of the offensive is not the only possible cause for poor doctrine, just as it was not the only cause of doctrinal failure in the RAF or IAF cases, it is one that can be avoided.

The caution that airpower doctrine is susceptible to a cult of the offensive holds particular relevance for the US Air Force today. The accomplishments of offensive airpower in Operation Desert Storm have raised the expectations of success for future US air operations. The continuing acquisition of stealth platforms and precision munitions will lead to an arsenal of weapons increasingly well-suited for offensive action. When combined with the belief that any enemy is a fragile system, susceptible to manipulation by the delivery of a small number of well-placed munitions,[274] the trap of offensive ideology is set. USAF strategists should be able to avoid the trap by conducting detailed operations planning and by critically evaluating capabilities and limitations. Neither of these recommended actions will necessarily drive planners to adopt a defensive strategy. These measures should, however, help to prevent the adoption of a faulty offensive strategy based on a cultic belief in the power of the offense. No claim can be made, based on the studies presented here, that defense is, or has been, more powerful than offense for airpower, only that a flawed pursuit of offense can lead to unexpected operational and potentially strategic failure.

The recognition that airpower doctrine can be trapped by a cult of the offensive may also inform policy. If trapped by the cult, planners are likely to overlook defensive uses for

airpower and ignore technological developments that enhance the power of the defense. Because organizational imperatives tend to reinforce offensive preference, any serious challenge to the neglect of the defense may have to come from outside of the organization, either directly or indirectly as support for the heretics within the organization who recognize the need for reform. Again, the knowledge that offensive ideology can entrap airpower doctrine provides a means to avoid the snare. For example, USAF planners should bear in mind that the same characteristics often cited as offensive enhancements for the F-22, namely speed, stealth, range, and targeting capability, may greatly enhance its capability to perform defensive missions as well.

For fundamentally sound reasons, offensive doctrine has always held great appeal for military organizations and will continue to do so. Pursuit of inappropriately offensive doctrine, however, can spell disaster for any airpower organization. Cults of the offensive have perniciously trapped airpower doctrine and strategy in the past, increasing the human costs of conflict for the offensive air forces dependent upon them. The cult of the offensive, deriving from a blind belief that offense will prevail, helps to explain the roots of some past doctrinal failures of airpower organizations. Detailed planning and critical evaluation of capabilities may allow an organization to escape the trap of offensive ideology, and ensure that the organization's strategy and doctrine remain appropriate to the most critical conflict, the one not yet fought.

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46. Ibid., 545. Van Evera cites Hitler's "kick in the door" strategy against the Soviets, the US Central Intelligence Agency estimation of Castro's forces prior to the Bay of Pigs invasion in 1961, and Israeli assertions about Nasser's reaction to air strikes in 1970 as examples of "sharp rap" failures.

47. Ibid., 538.

48. Robert Allan Doughty, *The Breaking Point: Sedan and the Fall of France, 1940* (Hamden, Conn.: Archon Books, 1990), 8–18; Mearsheimer, 70–98; and Posen, 20.

49. Jack Snyder, "Civil-Military Relations," 108–10.

50. Van Evera, "The Cult of the Offensive," 58.

51. Scott D. Sagan, "1914 Revisited: Allies, Offense, and Instability," *International Security* 11, no. 2 (Fall 1986): 154.

52. Ibid., 153.

53. Van Evera, "Causes of War," 78–79. Van Evera proposes 10 direct effects of offense-dominance: (1) Conquest becomes cheaper so even status-quo powers attempt it; (2) Aggressive wars of self-defense occur because of "cumulative" resource availability; (3) States grow more aggressive, which promotes defensive aggression, which raises the total level of aggression; (4) First strike advantage grows; (5) Windows grow bigger and more numerous; (6) States use more dangerous diplomacy like faits accomplis; (7) States negotiate less, and negotiation more likely to fail; (8) Secrecy grows which raises the danger of miscalculation; (9) States assume more offensive force postures; and (10) Arms races intensify.

54. Chester A. Crocker, "The Lessons of Somalia: Not Everything Went Wrong," *Foreign Affairs* 74, no. 3 (May/June 1995): 2–8.

55. David R. Mets, *Land-Based Air Power in Third World Crises* (Maxwell AFB, Ala.: Air University Press, 1986), 35–63.

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57. Ibid., 89.

58. Barry D. Powers, *Strategy without Slide-rule: British Air Strategy, 1914–1939* (New York: Holmes and Meier, 1976), 91–92; and H. Montgomery Hyde, *British Air Policy between the Wars: 1918–1939* (London: Heinemann, 1976), 392. Powers cites written passages where each of these men voiced their agreement with the Smuts report prophecy that airpower would replace the others. Hyde claims that no RAF officer ever said that air action alone would win a major war.

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60. Ibid., 38.

61. Powers, 166–67.

62. Ibid., 178.

63. Ibid., 128–29.

64. Sir Basil Henry Liddell Hart, *Paris; Or, The Future of War* (1925; reprint, New York: Garland Publishing, 1972), 19–22, 53–56.

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68. Quoted in Powers, 188. Italics in original.

69. Powers, 154.

70. Ibid., 192–206.

71. Hastings, 54–57.

72. Ibid., 54–55.

73. Ibid.

74. Powers, 207.

75. Murray, "British and German Air Doctrine," 49; and Posen, 225.

76. Hastings, 44–45.

77. Charles Webster and Noble Frankland, *The Strategic Air Offensive against Germany: 1939–1945*, vol. 1, *Preparation*, ed. Sir James Butler (London: Her Majesty's Stationery Office, 1961), 125.

78. Powers, 78–79.

79. Hastings, 47.

80. John Terraine, *A Time for Courage: The Royal Air Force in the European War, 1939–1945* (New York: Macmillan, 1985), 9–10.

81. Ibid., 11.

82. Robertson, 20–23.

83. Powers, 144–45, 57–62.

84. Terraine, 10–11; and Powers, 122–23.

85. Posen, 145.

86. Robertson, 43.

87. Powers, 103–4.

88. Ibid., 105.

89. Ibid., 159–60; and George K. Williams, "Statistics and Strategic Bombardment: Operations and Records of the British Long-Range Bombing Force during World War I and Their Implications for the Development of the Post-War Royal Air Force, 1917–1923" (PhD diss., Oxford University, 1987; also published as *Statistics and Strategic Bombing* [Maxwell AFB, Ala.: Air University Press, 1999]). Williams gives a detailed evaluation of the actual effectiveness of bombing efforts in World War I which concludes that the RAF ignored its own data to make exaggerated claims of success.

90. Robertson, 5, 37–38.

91. Posen, 173; Murray, "British and German Air Doctrine," 46; Robertson, 46, 97, 159; Powers, 123, 130, 206; and Terraine, 11.

92. Powers, 170.

93. Ibid., 189.

94. Ibid., 129–31.

95. Ibid., 147; and Bialer. Bialer discusses the air disarmament movement and its influence on British policy.

96. Bialer, 12–13.

97. Terraine, 49; and Hyde, 391.

98. Murray, "British and German Air Doctrine," 46.

99. Terraine, 13.

100. Hyde, 280.

101. Quoted in Hastings, 43. Also quoted in Terraine, 13, with the difference that Terraine has the word *prevent* instead of *protect*. Also quoted by Hyde, 284, who wrote a biography of Baldwin. Hyde's agrees with Hasting's version except for the addition of the word *also* after *well*, and deletion of *in* before *offence*. In a later speech in the House of Commons, 30 July 1934, Baldwin clarified his statement to say that he did not mean to imply that no defense should be attempted, only that no defense would be totally impenetrable. See "Armaments," *R.A.F. Quarterly* 5, no. 4 (October 1934): 361–62.

102. Hyde, 285–86.

103. Quoted in Robertson, 46.

104. Robertson, 160; and David Divine, *The Broken Wing* (London: Hutchinson and Co., 1966), 177–81.

105. Robertson, 81–85, 66–67.

106. Jones, 106–7.

107. Robertson, 87–88; and Terraine, 88–89.

108. Robertson, 33–34.

109. Ibid., 87–88; and Terraine, 89–90.

110. Robertson, 85–86; Terraine, 88; and Divine, 190–91.

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237. Power, 191; and Kaplan, 269.
238. Kaplan, 269.
239. Ibid., 276–77.
240. Ibid., 268.
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243. Kaplan, 299–310. Among President Kennedy's aides, Ted Sorensen, Paul Nitze, and Dean Acheson all rejected the consideration of a counterforce first strike, no matter how plausible it looked on paper, during the fall of 1961.
244. Friedberg, 39.
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260. Power, 39.

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266. Kaplan, 203–10; and Friedberg, 48–49. Kaplan traces the origins of the "no-cities," or nuclear war-fighting, strategy to RAND in the early 1950s, but the USAF had long planned to attack counterforce targets. The RAND strategy definitely influenced USAF counterforce thought, if it did not originate there, because McNamara employed many RAND analysts in his organization.

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