The Development of Royal Air Force Strategic Bombing Doctrine between the Wars

A Revolution in Military Affairs?

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The strategy and operations of any war can be understood only in the light of conditions of the ten or twenty years before its beginning. Technology, organization, doctrine, training, command and staff appointments—all the essentials of action in war—are put in place and developed in peacetime. The testing experience of combat will bring about change, but prewar elements continue to affect many events throughout the longest of conflicts.

—Peter Paret

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> [The military] is like a sailor navigating by dead reckoning. You have left the terra firma of the last war and are extrapolating from the experiences of that war. The greater the distance from the last war, the greater become the chances of error in this extrapolation. Occasionally there is a break in the clouds: a small-scale conflict occurs somewhere and gives you a "fix" by showing whether certain weapons and techniques are effective or not: but it is always a doubtful mix. . . . For the most part you have to sail on in a fog of peace until at the last moment. Then, probably when it is too late, the clouds lift and there is land immediately ahead; breakers, probably, and rocks. Then you find out rather late in the day whether your calculations have been right or not.
>
> —Sir Michael Howard

PETER PARET'S COMMENT regarding the factors that affect strategy and operations in war—the idea that they have their roots in one or two preceding decades—is particularly apropos today. From Vancouver to Vladivostok and from Tallinn to Tirana, military establishments are wrestling with complex factors that will influence the way armed forces organize, plan, and equip themselves to fight future battles.

This planning environment is shaped by two competing, some might even say contradictory, considerations. The first is the aftermath of the cold war, which brought with it an understandable desire to reduce the expense associated with large and technologically sophisticated armed forces. This desire is neither new nor even remarkable. It has been a hallmark of the aftermath of most modern conflicts. The second shaping consideration arose from the conduct of the Persian Gulf War. Military establishments around the world watched the performance of the coalition force in awe. This performance was characterized by a degree of technological sophistication, married to doctrinal and operational concepts, that resulted in a new vision of what high-intensity, fast-paced operations of the future might entail.

This planning environment, with its twin imperatives of demobilization and modernization, which now occupies the collective minds of armed forces across the world, is not new. In fact, it is a theme that has been played out many times before. Following the conclusion of most major conflicts of the past few centuries, armed forces have confronted the two problems of reducing their establishments and at the same time adjusting to new realities.

In the contemporary United States and elsewhere, we are witnessing a vigorous debate, driven by the desire to master the problems of reduction in force structure, while at the same time assuring that armed forces make the best use of technological and doctrinal changes brought to light in the Persian Gulf War. This debate turns on the prospects for what has come to be termed a revolution in military affairs (RMA), defined as "a major change in the nature of warfare brought about by the innovative application of technologies which, combined with dramatic changes in military doctrine, and organizational concepts, fundamentally alters the character and conduct of operations."[1] So far, however, the debate has not reached definitive conclusions. As Jacob Kipp noted recently, "the exchanges have become increasingly intense. The two positions, pitting advocates against doubting Thomas's, contrast a revolutionary interpretation as opposed to an evolutionary one."[2] Undoubtedly, this debate will continue in the years to come.[3] Given the ongoing debate and the uncertainty regarding its resolution, we would

be wise to pause and consider the factors that will drive the debate, and that will come together to influence its outcome. For this purpose, it may be instructive to draw on historical experience, whose record is at least somewhat clearer.

Such a use—or perhaps misuse—of history may be frowned upon in some quarters. To a certain extent, this is a valid criticism. As Sir Michael Howard has observed, "It is safer to start with the assumption that history, whatever its value in educating the judgement, teaches no 'lessons,' and the professional historians will be as sceptical of those who claim that it does as professional doctors are of their colleagues who peddle patent medicines guaranteeing instant cures."[4] Although this is a sound cautionary proscription, Sir Michael recognized that in the military context, there are unique circumstances in which historical study can prove not only helpful but perhaps indispensable. He characterized the situation confronting the military profession as one in which "there are two great difficulties with which the professional soldier, sailor, or airman has to contend in equipping himself as a commander. First, his profession is almost unique in that he may only have to exercise it once in a life time, if indeed that often. . . . Secondly the complex problem of running a [military service] at all is liable to occupy his mind and skill so completely that it is easy to forget what it is being run for."[5]

Faced with this enigmatic situation, armed services find it difficult to consider future requirements removed from the hurly-burly of day-to-day problems. In the absence of the opportunity to hone skills and judgement on the battlefield, military services need to look to their equivalent of the laboratory, which in some cases is derived from the body of past experience—that is, history. The study of history can suggest relevant questions to ask, enumerate certain principles worthy of further investigation, and—perhaps most importantly—sharpen the ability to make judgements regarding complicated and incomplete information. One can examine numerous historical instances for insights into the problems associated with an RMA. One such historical case study is that of the development of strategic bombing doctrine in the Royal Air Force (RAF) between the two world wars.

Development of Strategic Bombing Doctrine

The day may not be far off when aerial operations, with their devastation of enemy lands and destruction of the industrial and populace centres on a vast scale, may become the principal operations of war, to which the older forms of military operations may become secondary and subordinate.

—Smuts Committee Report, 1917

Future weapons will be able to strike enemy forces at great distances. In mid- or high-intensity combat, it may not always be necessary to physically occupy key terrain on the ground, vital airspace, or critical chokepoints at sea in order to control them. While wars will still be won only when soldiers occupy the enemy's territory, it may not be necessary in every case to "close with" the enemy in order to destroy him.

—Adm David Jeremiah, 1993

From the last months of the Great War, down to the outbreak of the Second World War, the notion of strategic bombing had held out great prospect and at the same time had cast a pall. On the one hand, the development of strategic bombing forces had apparently heralded a new era in which war would become a simpler task. Extensive land and naval forces were no longer considered necessary. Victory would go to the side that could master the skies and take the war to the very heart of the enemy nation. On the other hand, fear of a strategic bombing duel exercised a paralyzing restraint on British foreign policy.[6] That fear, furthermore, weighed heavily on the minds of British politicians and the public alike. Once it became evident that war loomed on the horizon, air war terrified people most. They would have to make preparations, both to prosecute and endure a strategic bombing duel.

At the outbreak of the Great War, expectations of what aircraft might contribute were modest. The general consensus was that aircraft could best serve as observation platforms, but beyond that, little was expected.

Even though Bomber Command eventually undertook a massive nighttime area bombing campaign against Germany during the Second World War, the results of that campaign were neither decisive nor consistent with prewar expectations. How was it that this transpired? There are no short, simple answers to this question. What emerges from an examination of the development of the idea of strategic bombing in the British context is a complex web of competing explanations. Yet, when the many strands are unravelled, the pattern that remains is of a disjunction between theory and doctrine. In that sense, then, one might reasonably suggest that this was a case of a **revolution** gone awry.

This article focuses on the means by which the RAF sought to advance its **revolutionary** ideas regarding strategic bombing. It endeavors to consider the complex interrelationship of forces and factors that led the RAF to pursue its particular approach to strategic airpower. Prior to delving into this, however, one must set out a framework for this analysis. Without one, the overwhelming number of factors to consider would make the task very nearly impossible.

In a recent study on military innovation, Alan Beyerchen developed a simple schematic that can be extremely helpful in untangling the complex and often overlapping factors at play. This schematic seeks to establish a hierarchical framework that recognizes the relationships in the traditional strategy-operations-tactics trinity. However, rather than viewing it as a simple hierarchical framework, Beyerchen sees it—at least in the context of the process of military innovation and revolution—as a triangular relationship. In this relationship, each component has the potential to affect the other two. Moreover, Beyerchen proposes two additional ways of considering the process of military innovation and revolution. Although these are based on the traditional distinction among strategy, operations, and tactics, they may prove more useful in revealing the essence that underlies the process of innovation or revolution. The first of these sets out the triangular relationship among context, procedures, and equipment. The second alternative entails establishing the relationship among technological change, operational change, and technical change.[7]

The remainder of this article emphasizes the first of these triangular representations—namely, that among context, procedures, and equipment. In other words, it seeks to examine the context within which the RAF attempted to develop its revolutionary ideas about strategic air power, doctrinal considerations, and, although only fleetingly, equipment aspects. It is about the theory and development of an "idea" of war. It is an attempt to consider how those people responsible for the RAF as a collective professional body—the Air Staff—sought to prepare for a future war, for, in essence, the strategic bombing pundits were pushing the notion that the advent of airpower constituted an RMA.

Early strategic theorizing in the RAF drew heavily on the limited experience of "strategic" bombing in the First World War. That experience profoundly influenced much of what followed in the two decades leading up to the Second World War. One must note, however, that many of the conclusions regarding the potential future use of airpower were derived from a cursory examination of the historical record. In that sense, then, analysts flouted the Clausewitzian dictum regarding the search for first principles through rigorous historical examination and critical analysis to determine cause and effect. Although it is not necessary to delve deeply into the details of aerial operations during the First World War, one must review some of the important developments that emerged as the air weapon began to make its presence felt.

At the outbreak of the Great War, expectations of what aircraft might contribute remained modest. The general consensus was that aircraft could best serve as observation platforms, but beyond that, people expected little of them. With the emerging stalemate of trench warfare, the airplane began to show itself as a weapon of great potential. When it became obvious that aerial reconnaissance was invaluable for artillery spotting, and thus dangerous to troops on the ground, each side began to search for ways to drive off the enemy's observation aircraft. They did this first through ground fire and then by mounting machine guns on aircraft

themselves—hence, the development of the pursuit role for aircraft.

The next development involved employing aircraft as ground-support weapons. In this role, aircraft either operated directly against troops or slightly to the rear, attacking supply dumps and communications facilities. It was a short step from this—what is now termed close air support—to taking up longer-range operations, attacking targets far from the location of the fighting at the front. These operations that were directed further to the rear constituted the first attempts at "strategic" operations. Both Germany and Britain experimented with this use of airpower, but, in strictly operational terms, neither achieved a great deal of success.[8]

This situation changed when Germany undertook raids on the United Kingdom, first with zeppelins and then with Gothas. With this, Germany brought the war directly to London and the southeast. Up to then, with the war taking place across the English Channel, the British public had not been directly threatened with physical harm. In political terms, the German air raids against the British Isles produced a serious crisis of confidence that threatened to undermine the ability of Britain to carry on with the war effort. The public became alarmed and outraged, and the government reacted with panic. The prevailing feeling in political circles was that if the German raids continued unabated, the British will to continue the war would crumble. Hence, steps were taken to cope with the threat posed by German aerial raiders.[9]
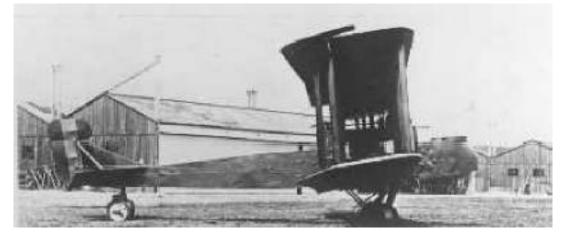
Again, telling this story in great detail is not necessary. In the first instance—the zeppelin raids—air defense measures had some limited success in dealing with the lumbering giants. Then with the appearance of the fixed-wing Gotha bombers, the situation deteriorated. In particular, two raids on London—the first on 13 June 1917 and the second on 7 July 1917—stand out as important landmarks. Both raids revealed the shortcomings of existing defensive measures. The British had too few antiaircraft guns and fighters, and the organization of the warning system left much to be desired. As Sir Charles Webster and Noble

Frankland noted, "These raids and the subsequent . . . attacks of the autumn did much to determine the future of the British Air Service."[10] A political hue and cry resulted, subjecting the air services to intense scrutiny and criticism. People branded the air defense measures as inefficient and ineffective, and questioned the overall direction of the air war. One must recall that at this juncture, the Cabinet and the High Command had engaged in a running battle with Sir Douglas Haig over the course of events on the western front. While politicians called for better defenses at home, Haig and his air advisor Maj Gen Hugh Trenchard, commander in chief of the Royal Flying Corps, resisted every request for the transfer of aircraft from the western front to the home front. Trenchard viewed defense as a misuse of aircraft, offense being their only proper role. Compromise took the form of the creation of the RAF.

At the end of the war, the unbridled hostility of the two older services and the equivocal attitude of the government towards the continued independence of the RAF seemed certain to assure that its existence as a separate service would be very short indeed. Despite this, Trenchard set out to protect the continued independence of the RAF. Perhaps recognizing the difficulty of arguing for independence on the basis of the importance of strategic bombing, he cast about for alternatives. This search was coloured by one major government policy designed to direct defense policy in the postwar period—the much vilified Ten-Year Rule,[11] which stated, "It should be assumed for framing revised estimates, that the British Empire will not be engaged in any great war during the next ten years, and that no Expeditionary Force is required for this purpose."[12]

Undoubtedly, the object of the Ten-Year Rule was financial. At a time of austerity, but also at a time when the responsibilities of the defense services had taken on even greater scope, the government had to find a formula to govern the financial call that the defense services could make on the budget. In the political atmosphere of the time, one in which the prevailing sentiment was to get back to business as usual, it was politically dangerous to adopt a policy that would sanction "high" defense spending. Against this backdrop, Trenchard set out to find new roles for the RAF, roles that would justify its continued existence.

Conscious of the need for financial restraint, Trenchard astutely shaped a policy that did not run afoul of the limits imposed by the Ten-Year Rule. In fact, Trenchard framed a policy that would yield the RAF new independent roles and save the government

The Gotha—Imperial Germany's strategic bomber. While the public was alarmed and outraged (by the zeppelin and Gotha raids), the government reacted with panic. The prevailing feeling in political circles was that if the German raids continued unabated, the British will to continue with the war would crumble.

money. He outlined his views on the future of the RAF in a memorandum of August 1919, writing that "hostilities ceased before the evolution of the independent Air Force had reached a point which enabled sure deductions to be drawn as to the value of independent aerial operations. . . . But there can be no doubt that we must be prepared for long distance aerial operations against an enemy's main source of supply and Naval ports."[13]

Such a statement contains little to which one can take exception. In fact, had Trenchard and the RAF adhered to its spirit, perhaps they would not have lost sight of what should have been their central concern—the preparation of an efficient and effective air force capable of undertaking long-range aerial operations. Trenchard did pay lip service to this objective in a later memorandum, published as a command paper, in which he outlined the steps needed to create such a force. Research and development in navigation, wireless telegraphy, photography, and engineering, along with the fostering of an "air force spirit" were accorded special emphasis, as was the need for staff and training colleges.[14] In the financially straitened circumstances of the time, however, Trenchard recognized that such projects remained beyond the meagre means of the first few peacetime budgets.

The long-term objective remained the creation of an air force capable of undertaking independent strategic operations, but the need of the moment called for blunting the attacks of the army and navy. Trenchard chose to employ the instruments of air control or imperial policing. Malcolm Smith has attributed the inception of the scheme for "air control" to Winston Churchill, who gave backing to the idea at the Cairo Conference in March 1921, but the idea itself had been mooted much earlier, in Trenchard's memo of 14 August 1919.[15] The memo stated that "since the Armistice . . . events in the near East and India have tended to show that against a semi-civilized enemy unprovided with aircraft, aerial operations alone may have such a deterrent effect as to be practically decisive."[16]

Air control took on ever-increasing importance as it became apparent that army and navy attacks on the independence of the RAF would not diminish over time. In air control, Trenchard saw the possibility of reducing the considerable cost of policing the empire and the newly acquired Mandated Territories, thereby demonstrating to the government the value of the RAF.

It is important to understand the nature of air-control operations, for in this sphere the RAF gained virtually all of its peacetime operational experience, and nearly all of the later senior RAF officers served at one time or another in areas where they gained some experience with air-control operations. It would be foolish to attempt to deny the initial importance of air-control operations, serving as they did to impress upon the government the importance of maintaining an independent air force. However, one might legitimately question the extent to which the operational experience gained in this role influenced later considerations of strategic theory and doctrine. It would seem that people in positions of responsibility within the RAF and the Air Ministry lost sight of the fact that air-control operations were, in the first instance, an administrative tool in a bureaucratic battle. Had they not lost sight of this fact, then the air-control experiment would have remained just that—an experiment and an expedient. Instead, the experience gained in air-control operations would unduly influence the theory and doctrine of strategic bombing in the larger sense.

Air control contributed markedly to the difficult and expensive task of policing the empire.[17] Moreover, it did so at a reduced cost to the government, which in itself was important. Be that as it may, the operational experience gained in air control was never likely to provide much in the way of guidance to the larger and more central question of how to develop the aerial weapon for service against a first-class power in any future war. Air control was carried out in what can only be described as an artificial environment, one that would hardly exemplify the environment that would confront the RAF in operations

An RAF Hawker Fury, one of the later models used in imperial policing. Since the Armistice, events in the near East and India tended to show that against a semicivilized enemy unprovided with aircraft, aerial operations alone may have such a deterrent effect as to be practically decisive.

against a major enemy. As Malcolm Smith has commented, "the success of Air Control lay in the fact that retaliation [against the British] was virtually impossible."[18]

This very fact should have limited the extent to which lessons were drawn regarding the efficacy of bombing. Bombing recalcitrant tribesmen who could mount no effective opposition was one thing, but it should have been obvious that undertaking bombing operations against an enemy capable of mounting some form of defense—either passive or active—would be a completely different thing. Over time, this essential difference became blurred, first as the RAF began to rearm in the early 1930s and then in the later 1930s as it undertook the arduous task of preparing Bomber Command for its role as a strategic force. One should not take this as a suggestion that air-control operations were completely devoid of value to the RAF, for that is not the case. Air-control missions provided a valuable opportunity to acquire operational experience during peacetime. Furthermore, they allowed for experimentation with equipment and methods of bombing, despite the meagre budget for research and development and the limited time available in an operational squadron.

It is important to understand the evolution of the Air Staff's theory, given that belief in the offensive power of the bomber provided the rationale—at least in the collective mind of the Air Staff—for the independence of the RAF. This becomes all the more vital in light of the fundamental impact that notions of airpower had on the overall approach to British security policy throughout the interwar period. Recent historical research has revealed the extent to which the bomber cast a long shadow over considerations of British security and foreign policy.[19] What remains to be considered is the extent to which this fear was self-generated. If one can argue that the Air Staff contributed to the process whereby exaggerated fears of the bomber served to unduly influence British security policy throughout the interwar period, then the Air Staff must bear considerable responsibility for the consequences of its actions.

Pursuing this line of inquiry is difficult for a number of reasons. In the first place, it is not really possible to speak of a uniform theory of airpower to which the Air Staff subscribed for most of the period in question. Rather, the

theory of the strategic offensive in Britain evolved over time. The entire British approach was, to an extent, reflected in the thinking of Hugh Trenchard while he was chief of the Air Staff from 1919 to 1929, and after his retirement when he continued to exert a powerful public and private influence. Trenchard's thinking evolved to such an extent that he soon became a Cassandra for the overwhelming power of the bomber. Unlike Giulio Douhet, however, Trenchard did not outline his theories of airpower in a single volume; furthermore, he altered them substantially over time. His claims regarding the power of the bomber grew ever more extreme because he had to press constantly for the right of the RAF to exist in the face of attacks by the Admiralty and War Office on the air force's independence.

Another factor complicating any discussion of the Air Staff's theory of the strategic offensive is the extent to which unofficial ideas concerning aerial warfare began to compete with the "official" theory. In part, the rise of nonmilitary ideas stemmed from the fact that during the early years of the interwar period, the Air Staff remained busily engaged in its internecine bureaucratic battles. Consequently, it had little time to devote to the task of developing a doctrine of strategic air power. Even so, nonservice commentators would undoubtedly have pressed their own views concerning the development of airpower, for it had apparently altered the entire basis of British security policy. The notion that Britain was vulnerable—that it was no longer an island—had a profound impact on the British people. Barry Powers wrote that "this cliche represented a generalised viewpoint; in this case that England's defensive security was lost with the development of the airplane and that England existed thereafter in grave jeopardy. This fundamental shift in England from confidence to insecurity about its defensive position was of major consequence during the interwar years."[20] Such a viewpoint pervaded British society. Malcolm Smith has commented that "the idea of aerial bombardment was almost as haunting an as-

pect of contemporary culture as nuclear weaponry was to become later."[21]

A final factor to consider is that development of the theory of the strategic offensive coincided with the RAF's early successes in air

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control throughout the empire. These operations were taken by the Air Staff as a vindication of its confidence in the overwhelming power of the bomber. This, coupled with the staff's interpretations and analysis of the contribution of airpower during the Great War, made the future seem clear—at least to the Air Staff. Airpower, particularly strategic offensive airpower, held the key. Defense against this new and potentially devastating weapon seemed impossible; thus, the only apparent recourse entailed relying upon the counteroffensive potential of the bomber.

In retrospect, these analyses were flawed. They failed to take account of the totality of the brief experience of airpower in the British context. Airpower advocates chose to focus only on those aspects that sustained their views. The inability or unwillingness to subject their notions regarding airpower to the kind of serious scrutiny suggested by Clausewitz was a major shortcoming that plagued the Air Staff's efforts. The role of strategic airpower during the Great War was marginal, and air-control operations, although providing a valuable opportunity to gain operational flying experience, resulted in a false understanding of the requirements for carrying out a strategic offensive.

Despite these limiting factors, Trenchard and the Air Staff felt justified in developing a rudimentary theory of the strategic offensive. This theory turned on the potential of independent air operations directed against the enemy's morale and economic resources. Its development was aided—even driven—by the desire to avoid the slaughter of trench warfare. Furthermore, the Air Staff emphasized that aerial operations would preclude the necessity for a "Continental" commitment. David MacIsaac wrote that the essence of the Air Staff's theory was that "air attacks aimed at the sources as opposed to the manifestations of an enemy's strength . . . would produce a much swifter and hence in the end more humane decision."[22]

Thus, the theory of the strategic offensive, with its roots in the final years of the Great War, flourished in the bureaucratic battles of the early 1920s. Although many things would change from the mid-to-late twenties down to the outbreak of the Second World War, the fundamental essence of the theory remained unchanged. What remains is to consider the means by which the Air Staff and the RAF sought to transform a theory of war into a doctrinal reality.

Understanding how the Air Staff came to its "theory" of airpower is useful, but one also needs to understand how it set out to create a doctrine for the application of airpower. In modern warfare, theory without doctrine is a dangerous proposition. Without doctrine, the application of a particular theory relies on vague general principles rather than on a previously worked out method. As Clausewitz noted, the role of theory is not to prescribe but to act as a guide in the study of war. Theory yields the fundamental truths that serve as a foundation for doctrine.

Given that the Air Staff placed its greatest emphasis on the offensive capabilities of strategic airpower—that is, the employment of the bomber force against targets such as enemy industry and civilian morale—one would have expected the Air Staff to devise and test the tactics necessary for such an offensive. But the consensus among historians is that tactics, by and large, were an underdeveloped facet of RAF policy during the interwar period. The official historians wrote that "until two years before the war the operational and technical problems of the strategic offensive had been neglected, and even later no real attempt was made to solve them by more realistic operational exercises. . . . The result was that as late as 1939 the Air Staff had little realization of the tactical problems raised by the strategic plans."[23]

It is of course true that only a major war could have provided the real test—not only of the tactics necessary for a strategic offensive but the very theory as well. Deprived of a major war and deprived even of operations against an opposing air force, the Air Staff was left to develop tactics through exercises. Yet, this was a curious aspect of the overall approach to airpower adopted by the RAF. The Air Staff expended considerable effort in defining the theory but almost no realistic effort in exploring the tactics necessary to translate the strategic hypothesis into sound doctrine.

Clearly, a revolutionary strategy such as the one expounded by Trenchard and his colleagues in the aftermath of the First World War demanded a thorough consideration of the tactics required to effect it. If the net result of Trenchard's strategic thundering was that traditional British defense policy was no longer sufficient and that British strategy would have to be remade to take account of the radical new threat from the air, then one would expect that the Air Staff would base its prescriptions for the future on more than mere hypothesis. Yet, in sum, that was what emerged from the interwar period! The concept or hypothesis based on the experience of the First World War was elevated to the level of dogma. As Williamson Murray put it,

> the myopia of the Air Staff hindered the development of a broadly based conception of air power in Great Britain. . . . Moreover . . . the evidence of World War I did not provide clear, unambiguous evidence on the impact of air power. But when all is said and done, too many of those in higher positions in the Air Staff between the wars allowed doctrine to become dogma and failed to examine the assumptions

on which they based their air strategy in light of the current capability and the difficulties that emerged just in peacetime flying.[24]

Once strategy became overborne by dogma, tactics became dogmatic as well. The net effect was that the rudimentary tactics designed to effect the strategic offensive fell far short of requirements.

How, then, did the Air Staff approach the development and testing of tactics? What were the parameters within which tactical development took place? What were the results? During peacetime, one can test a strategic theory only through exercises, which can take a number of forms. The most commonly understood type of exercise is a full-scale operational one involving large formations engaging in a mock battle. Yet, this is the rarest form of exercise, due to the expense and the disruption caused to the regular training program. Furthermore, exercises of this type are more often designed to confirm rather than test a theory.

Less ambitious exercises that have specific objectives, such as testing a particular tactic or the potential effect of a particular piece of equipment on existing doctrine, may have a greater influence on the development of tactics and doctrine. These forms of exercises and trials have, or should have, a more telling influence and as such are of greater utility than their more glamorous counterpart—the mock battle. One must sound a note of caution about the role and value of exercises. An exercise is fraught with many limitations, not the least of which is its inescapably artificial nature. It cannot replicate wartime conditions; hence, its value is limited by the degree of vision and foresight brought to the exercise by its planners. This being said, one should consider the tests, trials, and exercises undertaken by the RAF.

Between 1927 and 1935, the RAF undertook a series of large-scale exercises, the very nature of which revealed the state of Air Staff thinking and also served to confirm the latter's preconceptions. The stated objective of many of the exercises was to test arrangements for the air defense of the United King-

dom.[25] One must, however, adopt a cautious attitude when considering the "defensive" nature of the exercises. In the strategic vernacular of the Air Staff, the term defensive had

The myopia of the Air Staff hindered the development of a broadly based conception of airpower.

a rather complicated meaning. On one level, the object was to provide for the immediate defense of the country by engaging enemy attackers over Great Britain. This was not, however, viewed with favor, since the Air Staff believed it a misuse of airpower. That the Air Staff contemplated it at all was a response to public and governmental reaction to the prospect of a mutual bombing contest in which impairing civilian morale became the ultimate objective of both sides. In effect, defense of this kind sought to forestall collapse of the public's will to continue a future war in the face of anticipated casualties. The Air Staff accepted it as a political necessity, although not one that should swallow much of the staff's scarce resources.

The other level on which the Air Staff considered the "defensive" capability of airpower involved the notion of the "offensive-defensive" or the "counteroffensive"—what Malcolm Smith has termed the theory of strategic interception.[26] This form of defense relied upon the anticipated ability of the RAF to bring overwhelming pressure to bear upon the source of any enemy's offensive potential through aerial attack. The RAF would force the enemy from its own air attacks onto the defensive. This notion occupied the core of the Air Staff's strategic thinking, and the object of most of the large-scale exercises was to test the RAF's capability to implement such an "offensive-defensive."

It should surprise no one, then, that the results of the exercises were taken as evidence of the veracity of the Air Staff view, even

though exercise design exhibited numerous shortcomings, to say nothing of the interpretation of the results. Other doctrinal considerations also suffered from the tendency of theory to become dogma. Not the least of these were the capabilities and tactics of bomber formations. Carrying out a strategic offensive required the solution of a number of problems. Two stand out as fundamental to the "offensive." The first of these was the question of how the bomber force would reach the general target area intact. Assuming that the Air Staff could work out a solution to the first question, the second question involved a consideration of how to deliver the attack itself. For the Air Staff to give meaning to its theory, it had to come to grips with these issues. The means and extent to which it did so—or, more correctly, failed to do so—reveal just how far the Air Staff allowed theory to unduly influence doctrinal considerations.

It is possible to suggest a number of reasons why the RAF and the Air Staff failed to appreciate the difficulties and complexities of the doctrinal and planning processes. One explanation might be that the intellectual approach was fundamentally absent from the British experience. In fact, they lacked experience with the type of staff work that would have contributed to the development of an intellectually sound approach to air warfare. Thus, the Air Staff was incapable of making the linkage between "strategy" and "operations." It persistently failed to understand the importance of defining precise targets—hence its predilection for abstractions such as "Germany" rather than a "real" target such as a factory or even a city. Had the Air Staff been capable of progressing beyond this, it might have been in a position to formulate plans that addressed the specific requirements of operations.

Another possibility is that the Air Staff was so enamored with the apparent simplicity of its theory of strategic airpower that careful and detailed planning seemed unnecessary. A final possibility, one that may in fact be most instructive, is that very few of the people on the Air Staff possessed any degree of experi-

ence with planning at the strategic level. For the most part, those who made up the Air Staff during the first few years of the RAF's independent life possessed only operational experience. In effect, the Air Staff drew primarily from a pool of operational flyers. During the First World War, Royal Flying Corps, Royal Naval Air Service, and, later, RAF officers did not participate directly at the general-staff level. Rather, they acted as air advisors to the general staff. As such, they did not benefit from the evolution of the general staff as a body.

This was further compounded by the officers' preparation for Air Staff work. Attendance at the Staff College was determined, in part, by a qualifying exam in which candidates were required to consider the problems involved with large-scale air war. One recurring question concerned the "correct" policy or doctrine for the RAF. The examiners' reports make clear that they were seeking a particular answer—namely, that the only appropriate use for airpower lay in the offensive against enemy morale. If admission to the Staff College depended on an unquestioning acceptance of established doctrine, then the Staff College merely turned out staff officers unprepared to critically examine the central tenets of their profession.[27] One can say that this lack of planning experience at the strategic and operational levels contributed greatly to the deficiencies of the RAF in developing a realistic understanding of airpower and, consequently, a doctrine for prosecuting air warfare.

This article has attempted to suggest some of the underlying reasons for the RAF's flawed approach to strategic airpower. The central conclusion is that the RAF as a collective body never fully appreciated the fact that what emerged from the experiences of the First World War was only a theory—a hypothesis that required considerable effort to transform it into a doctrine of strategic airpower which could serve in operations. The belief that strategic airpower would be "decisive" became an article of faith. One is forced to conclude that in its eagerness to force the pace of the revolution, the RAF neglected to carefully consider

the means of transforming a revolutionary ideal into a practical reality.

Put simply, the RAF's theory of the strategic offensive was not a theory in the Clausewitzian sense. Rather, it was merely a hypothesis. In other words, the Air Staff failed to appreciate the importance of applying critical analysis to the matter of airpower and its place in the defense hierarchy. Instead, air-

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The Air Staff, as a collective body, lacked the intellectual rigor and insight to subject its hypothesis to test and experiment.

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power advocates seized upon the experience with "strategic" bombing during the First World War as a means of ensuring the survival of the air force as an independent service. This was not necessarily a negative factor, but in the absence of a thorough exploration of the record of airpower during the First World War, it led to unwarranted conclusions. For instance, no one paid much attention to the fact that British defenses had succeeded, ultimately, in coping with the German bombing offensive, albeit at tremendous cost and effort. In the absence of such consideration, it was a fairly straightforward step to the conclusion that the "offensive" application of air power was the only possible course to take.

From such an intellectual origin, the airpower pundits used their "theory" of strategic air power for all manner of purposes. They employed it as a tool in the fight against the army and navy, and developed the concept of air control to illustrate the power of aerial bombardment. Using crude calculations of the German offensive in the First World War, the experience of air control, and the "Continental" air menace, the RAF ensured that it would survive. Unfortunately, what first served as a tool in an administrative battle assumed the mantle of infallibility, and the suspect "theory" would ultimately have a pro-

The "fighter" that isn't. Of the several barriers to innovation, "perhaps the most obvious is a wilful desire to discard history or to twist its lessons to justify current doctrine and beliefs." The second is institutional rigidity.

foundly unsettling effect on British politicians and the public alike. It was, however, a theory that lacked substance.

The effect of this lack of substance is most obvious in the area of doctrinal development. The Air Staff failed to comprehend the simple fact that doctrine does not flow automatically from theory. Yet, from the moment that Trenchard declared that the "moral" effect of aerial bombardment was vastly superior to the physical, and that the only proper use of airpower lay in the strategic offensive, the Air Staff assumed it possessed a "doctrine" to carry out its vision of air warfare.

Upon reflection, however, those fiercely held convictions proved unfounded. Again, the Air Staff, as a collective body, lacked the intellectual rigor and insight to subject its hypothesis to test and experiment. Furthermore, it persistently failed to realize the deleterious effect its particular theory had on the development of the air force. The RAF was left with a hollow shell. Virtually every aspect of force development suffered. Doctrine in the true sense of the word was nonexistent. As a consequence, the more practical aspects of force development were not dealt with in a coherent and intelligent manner. Instead, when they were dealt with at all, they received the fleeting attention of an Air Staff not inclined to view the concept of strategic airpower critically and not prepared to come to grips with some of the more obvious shortcomings of its strategic thought.

The concrete manifestations of this uncritical approach revealed themselves in equipment policy, tactical development, and operational planning. In each case, the dogmatic and doctrinaire attitude of the Air Staff to the larger idea of "air power" resulted in entire avenues of inquiry, research, and development being overlooked, closed off, or ignored. For instance, the prevailing belief that defense against the bomber was, if not impossible, then a misuse of airpower, resulted in the design and production of bombing aircraft that were slow, lightly armored, and outgunned.

Furthermore, a review of the operational exercises undertaken by the RAF throughout the interwar period reveals how faulty assumptions led to a simplistic notion of what was necessary to undertake a strategic offensive. This created a spillover effect that impaired doctrinal and tactical development. Not only did it suffer under the crushing burden of strategic orthodoxy, but the operational and other exercises, which should have served as a test bed for doctrine, were used instead as a vehicle for the Air Staff to trumpet its own theory. This created the situation whereby neither the Air Staff nor Bomber Command was fully aware of the requirements for a strategic offensive. When they did turn—belatedly—to consider the specific requirements, the magnitude of the task was too great. The failure throughout the 1920s and early 1930s to take up the larger questions of airpower and examine them rigorously made itself felt during the period of rearmament and expansion, and well into the Second World War itself.

A Framework for Considering Revolutionary Developments

What insights might one draw from this historical example? In a recent study on military innovation during the interwar period, Williamson Murray notes that "to understand innovation . . . one must not lose track of the fact that the interplay among human factors, uncertain knowledge, misreadings of the past, [and] political and strategic parameters placed innovation on a complex playing field in which not only were the players uncertain of the future, but they were often more concerned with immediate problems than with long-range changes."[28] This observation is a trenchant statement of the problems confronting military planners. It is often difficult enough to sustain the current force, let alone attempt to envisage long-term influences that may affect the future nature of war through technological, doctrinal, or organizational developments. As Murray reflected, the problem is a case of military planners endeavoring to prepare for a war that will occur

1. at some indeterminate point in the future,
2. against an unidentified opponent,
3. in political conditions that cannot be accurately predicted, and
4. in an arena of brutality and violence which one cannot replicate.[29]

These obstacles are very real, and in every sense, they plagued the RAF between the wars. As such, it is possible to appreciate the magnitude of the problem that confronted the Air Staff as it sought to carve out a place for air power. Nevertheless, the Air Staff experienced relatively little success in translating a revolutionary idea into a force capable of capitalizing on the flexibility and power of strategic bombing. Thus, one may be justified in searching for some basic principles or touchstones when considering the prospects held out by reputed revolutionary developments. Although this may entail falling into the trap of "drawing lessons," there is really no other alternative.

What factors and influences are central to the process of translating a "revolutionary" development into a capable force structure? One may suggest a number of generalizations as being central to a successful revolution in military affairs. Williamson Murray and Allan Millett, as well as Stephen Rosen,[30] have addressed these matters on several occasions. Murray claims that revolutionary innovation "appears largely as a phenomenon of top-down leadership that is well informed about the technical as well as conceptual aspects of possible innovation."[31] He points out, however, that there are numerous examples in which top-down leadership, while certainly present, failed to deliver, citing as a case in point the RAF and strategic bomb-

ing. Murray noted that in this instance "top-down leadership had a disastrous impact on the process of innovation."[32]

A second general consideration is that of the military culture in which a revolution or innovation is being contemplated. "One of the most important components of successful innovation in the inter-war period had to do with the ability of officers to use their imaginations in examining potential innovations."[33] Clearly, in the case of the RAF between the wars, one cannot say that it lacked imagination in thinking about airpower. Apparently, however, this imaginative thinking was largely one-dimensional. Having succeeded in convincing many people of the potential power of the bomber, those charged with translating this potential power into real power stopped short. They did not follow through with the doctrinal and technical study necessary to make the idea of strategic bombing a reality.

Two final matters deserve consideration. Both are negative influences that contribute directly to the failure of a revolutionary development. One is the misuse of history. Murray has stated that of the several barriers to innovation, "perhaps the most obvious is a wilful desire to discard history or to twist its lessons to justify current doctrine and beliefs."[34] The second is institutional rigidity. "Rigidity is undoubtedly a fact of life in many military organizations—one which has exercised a consistent and baleful influence over institutional capacity to innovate."[35] In the case of the RAF between the wars, both of these factors exerted a considerable negative influence on the development of strategic bombing doctrine. ☐

Notes

1. This definition, developed by the Office of Net Assessment, US Department of Defense, is reproduced in Earl H. Tilford Jr., **The Revolution in Military Affairs: Prospects and Cautions** (Carlisle Barracks, Pa.: United States Army War College, Strategic Studies Institute, June 1995), 1.

2. Jacob W. Kipp, "The Revolution in Military Affairs and Its Interpreters: Implications for National and International Security Policy" (paper presented at a joint conference of the Foreign Military Studies Office and the Academy of State Management of the President of the Russian Federation, Moscow, September 1995), 1.

3. For a full discussion of the notion of a revolution in military affairs, see several of the papers presented at the Fifth Annual Conference on Strategy held at the US Army War College in April 1994: Paul Bracken and Raoul Henri Alcalá, "Whither the RMA: Two Perspectives on Tomorrow's Army" (Carlisle Barracks, Pa.: US Army War College, Strategic Studies Institute, July 1994); Jeffrey R. Cooper, "Another View of the Revolution in Military Affairs" (Carlisle Barracks, Pa.: US Army War College, Strategic

Studies Institute, July 1994); David Jablonsky, "The Owl of Minerva Flies at Twilight: Doctrinal Change and Continuity and the Revolution in Military Affairs," **Professional Readings in Military Strategy**, no. 10 (Carlisle Barracks, Pa.: US Army War College, Strategic Studies Institute, May 1994); and Michael J. Mazarr, "The Revolution in Military Affairs: A Framework for Defense Planning" (Carlisle Barracks, Pa.: US Army War College, Strategic Studies Institute, June 1994).

4. Sir Michael Howard, "The Lessons of History," in **The Lessons of History** (New Haven, Conn.: Yale University Press, 1991), 11.

5. Sir Michael Howard, "The Use and Abuse of Military History," **Journal of the Royal United Services Institute for Defence Studies** 107 (February 1962): 6.

6. See Uri Bialer, **The Shadow of the Bomber: The Fear of Air Attack and British Politics, 1932–1939** (London: Royal Historical Society, 1980).

7. Alan Beyerchen, "From Radio to Radar: Interwar Military Adaptation to Technological Change in Germany, the United Kingdom and the United States," in Williamson Murray and Allan R. Millett, **Military Innovation in the Interwar Period** (Cambridge: Cambridge University Press, 1996), 265–99. See, in particular, 267–68 for an overview of the parallel means of examining the problem of military innovation and revolution.

8. There are numerous accounts of the development of British airpower during the Great War. See, for instance, Sir Walter A. Raleigh and H. A. Jones, **The War in the Air: Being the Story of the Part Played in the Great War by the Royal Air Force** (Oxford: Clarendon Press, 1937); Neville Jones, **The Origins of Strategic Bombing** (London: Frank Cass, 1973); and Sir Maurice Dean, **The Royal Air Force and Two World Wars** (London: Cassell, 1979).

9. Readers seeking greater detail on this should consult any of the following: Andrew Boyle, **Trenchard** (London: Collins, 1962); Raleigh and Jones; Sir Charles Webster and Noble Frankland, **The Strategic Air Offensive against Germany, 1939–1945**, vol. 1 (London: Her Majesty's Stationery Office, 1961); Dean; Malcolm Cooper, **The Birth of Independent Air Power: British Air Policy in the First World War** (London: Allen & Unwin, 1986); idem, "Blueprint for Confusion: The Administrative Background to the Formation of the Royal Air Force, 1912–1919," **Journal of Contemporary History** 22, no. 3 (1987): 437–53; and John Sweetman, "The Smuts Report: Merely Political Window Dressing?" **Journal of Strategic Studies** 4, no. 1 (1981): 152–74.

10. Webster and Frankland, 35.

11. Perhaps the best single account of the Ten-Year Rule is John R. Ferris, **Men, Money and Diplomacy: The Evolution of British Strategic Foreign Policy, 1919–1926** (Ithaca, N.Y.: Cornell University Press, 1989).

12. CAB-23, War Cabinet minutes, "A" series, 616A.

13. Chief of the Air Staff, AIR 8/2, memorandum, subject: Status of the RAF, 14 August 1919.

14. Chief of the Air Staff, Comd. 467, memorandum, 25 November 1919.

15. Malcolm Smith, **British Air Strategy between the Wars** (Oxford: Clarendon Press, 1984), 22–23.

16. AIR 8/2 memorandum.

17. For details of some of the operations, see Dudley Saward, **Bomber Harris** (London: Sphere Books, 1984); Air Marshal Sir Robert Saundby, **Air Bombardment: The Story of Its Development** (London: Harper, 1961); H. M. Hyde, **British Air Policy between the Wars** (London: Heinemann, 1976); and Jaffna L. Cox, "A Splendid Training Ground: The Importance to the Royal Air Force of Its Role in Iraq, 1919–1932," **Journal of Commonwealth and Imperial History** 13, no. 2 (January 1985): 157–84.

18. Smith, 29.

19. See Bialer.

20. Barry Powers, **Strategy without Slide-Rule: British Air Strategy, 1914–1939** (New York: Holmes & Meier, 1976), 110.

21. Smith, 1.

22. David MacIsaac, "Voices from the Central Blue," in Peter Paret, ed., **Makers of Modern Strategy: From Machiavelli to the Nuclear Age** (Princeton, N.J.: Princeton University Press, 1986), 633.

23. Webster and Frankland, 107.

24. Williamson Murray, **Strategy for Defeat: The Luftwaffe, 1933–1935** (Maxwell AFB, Ala.: Air University Press, 1983), 330.

25. See, for instance, the report on the 1927 exercise by Flt Lt W. T. S. Williams, "Air Exercises, 1927," **RUSI Journal** 72 (November 1927): 741.

26. See Smith, 44–75.

27. For a full discussion of the recruitment of officers to the Staff College, see A. D. English, "The RAF Staff College and the Evolution of the RAF Strategic Bombing Policy, 1922–1929" (MA thesis, Royal Military College, Kingston, Ontario, 1987), particularly chap. 4.

28. Williamson Murray, "Innovation: Past and Future," in Murray and Millett, 303–4.

29. Ibid., 301.

30. Stephen Peter Rosen, **Winning the Next War: Innovation and the Modern Military** (Ithaca, N.Y.: Cornell University Press, 1991).

31. Murray, "Innovation," 306.

32. Ibid., 308.

33. Ibid., 312.

34. Ibid., 320.

35. Ibid., 322.

The radical of one century is the conservative of the next. The radical invents the views. When he has worn them out, the conservative adopts them.

—Mark Twain (Samuel Clemens)