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# Understanding Airpower

## Bonfire of the Fallacies

Colin S. Gray

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## *Bonfire of the Fallacies*

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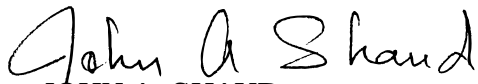
# Foreword

Dr. Colin Gray recognizes that there will always be defense debates. He also believes that some of the "frequently contested debating terrain" can and need to be clarified and settled. In this study, this noted strategic scholar addresses assumptions and conventionally held ideas about airpower that are wrong.

Professor Gray identifies and discusses nine fallacies that: (1) the USAF should abandon large-scale regular warfare; (2) airpower is inherently a strategic weapon; (3) airpower is driven by technology rather than ideas; (4) airpower is about targeting; (5) airpower must be subordinate to land power; (6) the theory of strategic airpower is flawed; (7) an independent USAF interferes with an effective joint force structure; (8) airpower is a minor player in counterinsurgency (COIN); and finally, a long-standing issue, (9) the twenty-first century is about missiles, space, and cyber power and airpower is yesterday's revolution.

The discussion of these "fallacies" should stimulate the appetite of most thoughtful Airmen, but also serious advocates of all services and everyone interested in national defense.



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## About the Author

Dr. Colin S. Gray is Professor of International Politics and Strategic Studies at the University of Reading in England. He is a dual US-UK citizen and has served as an adviser in Washington, DC, and London. He was educated in England at the Universities of Manchester and Oxford. Dr. Gray has taught at universities in Britain, Canada, and the United States, has been assistant director of the International Institute for Strategic Studies (London), and worked with Herman Kahn at the Hudson Institute before founding the National Institute for Public Policy. From 1982 until 1987, he held a presidential appointment on the President's Advisory Committee on Arms Control and Disarmament.

Dr. Gray's work has addressed a wide range of subjects on national security. For example, he has written extensively on nuclear strategy, maritime strategy, space strategy, special operations, geopolitics, airpower, arms control, and strategic theory. He is the author of 23 books, including *Another Bloody Century: Future Warfare* (Phoenix, 2006); *Strategy and History: Essays on Theory and Practice* (Routledge, 2006); *War, Peace and International Relations: An Introduction to Strategic History* (Routledge, 2007); and *Fighting Talk: Forty Maxims on War, Peace, and Strategy* (Praeger Security International, 2007). In 2009 he will publish *National Security Dilemmas: Challenges and Opportunities* (Potomac Books). Most recently he has completed *The Strategy Bridge: Theory for Practice*.

# Introduction

The general purpose of this monograph is to help prevent or reduce error in debates over all aspects of airpower. Since we humans, our institutions and procedures, and our behavior are friction prone and apt to err, it is sensible to try to diminish the pile of assumptions, beliefs, attitudes, and opinions that are plainly wrong. Much of the eternal debate on defense issues cannot usefully be approached with a view to locating error. But, large swathes of frequently contested debating terrain can be cleared definitively. As a scholar it is my duty to "recognize and eliminate the weeds" of falsehood to which Clausewitz referred in one of the epigraphs to this text.

This study examines and exposes nine fallacies. The fallacies and conclusions about them are as follows:

*Fallacy One: The era of conventional warfare between great states and coalitions has passed. The USAF needs to abandon the paradigm of large-scale regular warfare.*

**Judgment**: Future strategic history will be marred by the occurrence of regular-style conventional warfare between states, sometimes conducted on a very large scale. Obviously, the danger of escalation to nuclear use by the losing belligerent will be acute.

*Fallacy Two: Airpower is an inherently strategic instrument.*

**Judgment**: All of our geographically specialized military instruments, including airpower, are inherently strategic in the effect that they have upon the course of history. It makes no more sense to talk about strategic airpower, than it does to discuss strategic land power, sea power, space power, or cyber power. It is the consequences of military behavior that are strategic, not the forces themselves.

*Fallacy Three: The development of airpower is driven by technology not ideas.*

**Judgment**: Airpower has never been driven forward by a strategic and militarily mindless technological

momentum. Ideas, theory, and doctrine have always been in the cockpit (whether or not the aerial vehicle was ready to fly).

*Fallacy Four: Airpower is about targeting.*

**Judgment**: The very nature of airpower ensures that targeting for kinetic effect has to be of prime importance among the instrument's ways to contribute strategically to a conflict. But airpower is not only about targeting, as anyone who recognizes the variety of essential roles performed by aircraft in warfare should hardly be able to fail to appreciate.

*Fallacy Five: Airpower must always be subordinate to land power.*

**Judgment**: Whether airpower is subordinate to land power, or vice versa, must depend upon the war's overall military-strategic context. If the character of that context is largely regular, then today and tomorrow airpower should be the supported force. The reverse has to be true in war with a largely irregular military character. These key points granted, it is really more sensible not to contrast land power and airpower, but rather to consider them as inherently complementary dimensions of variable relative significance within a single military, strategic, and political effort.

*Fallacy Six: The theory of strategic airpower is fundamentally flawed.*

**Judgment**: The theory of strategic airpower is only flawed if one elects to identify it strictly with the overstated claims of some classical writers on airpower. Sensibly crafted instead, the theory of strategic airpower is entirely sound. It should state that airpower, employed either as a weapon independent of land- or sea-focused forces, or as an enabling agent for, perhaps, even component of, land power and sea power, generates strategic effect on a conflict. By and large,

airpower used independently is not able to deliver decisive military and strategic victories. However, it has demonstrated the ability to decide which combatant will win. It should be noted that there is no reason in principle why airpower can never aspire to secure a decisive victory by its own unaided effort.

*Fallacy Seven: The institutional independence of the USAF is a major hindrance to the development of a truly joint, coherently integrated, American theory of, and doctrine for, warfare.*

**Judgment**: The institutional independence of the USAF, in the context of a legally and politically superior Department of Defense, is best described as a regrettable necessity. It is regrettable that the essential unity of war cannot be matched with a similar unity of military power. The fact is that the skills necessary for warfare vary with geography. It is true that air-minded people are inclined to register military and strategic claims for airpower's potency that may seem to exceed the bounds of plausibility to those of a nonair persuasion. However, the undoubted costs of service partiality fade from sight when they are compared with the price likely to be paid for the misuse of airpower by nonair-minded military cultures. Given the primacy of America's aerial tools among its military instruments, there is no prudent alternative to ensuring retention of the US airpower advantage through sustainment of a dedicated air force.

*Fallacy Eight: Airpower can never be other than a minor player in the conduct of counterinsurgency warfare (COIN).*

**Judgment**: COIN is inherently land-, indeed, ground-centric in nature. But this geostrategic and tactical fact does not mean that the varieties of airpower that support the ground effort can accurately or helpfully be described as being only of minor importance. In COIN today, airpower cannot be the leading edge to the military dimension, but it will always be quite literally essential.

*Fallacy Nine: The twenty-first century is the missile, space, and cyberspace age(s); airpower is one of yesterday's revolutions.*

**Judgment**: The twenty-first century continues the air age that began in December 1903. The serial appearance of ballistic missiles, spacecraft, and computer-driven cyber power has not and does not threaten to oblige us to retire the airplane. The new century plainly will be one friendly to unmanned aerial vehicles (UAV), but this condition does not mean that manned aircraft are facing, or will face, bloc obsolescence as yesterday's technology. The manned aircraft simply is too useful, too adaptable and flexible, to be abandoned. The future of manned aircraft is completely secure, even though some of its roles in some political and military contexts increasingly will be assumed by UAVs.

# Understanding Airpower

## Bonfire of the Fallacies

*Air power may be defined as the ability to do something in the air. It consists of transporting all sorts of things by aircraft from one place to another, and as air covers the whole world there is no place that is immune from influence by aircraft.*

William Mitchell, 1925

*Faith matters so much to a soldier, in the stress of war, that military training inculcates a habit of unquestioning obedience which in turn fosters an unquestioning acceptance of the prevailing doctrine. While fighting is a most practical test of theory, it is a small part of soldiering; and there is far more in soldiering that tends to make men the slaves of theory.*

B. H. Liddell Hart, 1972

*Theory should cast a steady light on all phenomena so that we can more easily recognize and eliminate the weeds that always spring from ignorance; it should show how one thing is related to another, and keep the important and the unimportant separate.*

Carl von Clausewitz, 1832

*Yet the only empirical data we have about how people conduct war and behave under its stresses is our experience with it in the past, however much we have to make adjustments for subsequent changes in conditions.*

Bernard Brodie, 1976

This study rests upon two vital assumptions, both of them anathema to postmodern minds. First, it believes that historical truth can be found, or at least approached. Second, it believes in the utility of ambitious theory. The discussion here

flatly rejects the proposition that "history" simply comprises competing "fables" told by historians with interests and attitudes.[1] Similarly, it dismisses almost out of hand the belief that one theory is worth about as much as any other, which is not very much. This analysis seeks to find plausibly verifiable truth and, as a consequence, to identify error, the "fallacies" in the secondary title. To understand airpower, most especially American airpower, is a task imbued with high significance for national and international security. But, this task is harassed and frequently frustrated by both unsound history and incompetent theorizing. The problem is that those who debate airpower typically seek the history that they can use to advantage, not the history that strives honestly to be true. As for the theory of airpower, it never did take off safely; it continues to fly in contested skies or to taxi indecisively on the runway. No single short study can aspire to correct for 90 years of poor history and shoddy theory, but it can at least make a start.

The hunter who seeks to find and slay fallacies about airpower finds himself in a target rich environment. Paradoxically and ironically, airpower's most forceful advocates, from the time of "Billy" Mitchell (1920s) to the present, also have served as its worst enemies. The prime loser has been US national security. A good story overstated rapidly becomes unpersuasive to those yet uncommitted. Moreover, generic critics of airpower have been delighted to hold the aerial arm to unrealistic standards for successful performance as specified or certainly implied by its own spokespeople. This is frustrating because theory useful for education and ultimately for guidance in action falls victim to unsafe historical judgments and insecure concepts. Alas, this is just the way things are. Parochial analysis and counteranalysis is a fact of life in the extended defense community. Exhortations for greater objectivity are entirely futile, no matter how sincerely they are meant. Like Caesar's Gaul, the military instrument is divided by geographical focus into three main parts, land, sea, and air with space and cyberspace in addition pressing ever more insistently for status, attention, understanding, and funding. We may deter and, if need be, fight one war, but we must fight it in its separate albeit fairly interdependent military geographies. Every community on earth develops a protective ethos, invents a self-defining

doctrine, and struggles to assert its material and spiritual interests.[2] Obviously, military communities can be no different from the norm. In other words, interservice rivalry is just an eternal fact of life. History and theory are prime weapons in this ongoing contest. Mythology matters. Legends have a lasting currency. Fallacies need to be exposed insofar as this is possible, if only in order to provide some policing discipline in a defense debate that can stray into the dysfunctional zone. An open market for ideas and evidence based historical judgment is essential. Key to the quality of the historical and theoretical/doctrinal production offered in this market is a fearless commitment to burn such important fallacies as can be located and targeted. The hunt is on.

## The Approach

The general purpose of this monograph is to help reduce the reducible error in debates over all aspects of airpower. Since we humans, our institutions and procedures, and our behavior are friction prone and apt to err, it is sensible to try to diminish the pile of assumptions, beliefs, attitudes, and opinions that are plainly wrong. Much of the eternal debate on defense issues cannot usefully be approached with a view to locating error. But large swathes of frequently contested debating terrain can be cleared definitively. As a scholar it is my duty to recognize and eliminate the weeds of falsehood to which Clausewitz referred in one of the epigraphs to this text.[3]

This is a two-step inquiry. First, the varied character of the challenge posed by major fallacies is identified and outlined. Not all fallacies are stamped from the same mold. Some are sincerely held, others are merely expedient beliefs, but most either are, or become, both. The human ability to adhere to that which serves what we believe to be our interests is all but infinite.

The second step is to find and expose major fallacies about airpower. Nine were selected for trial by critical analysis and empirical verification. Phillip S. Meilinger has already made a most useful contribution to the necessary mission, and this study is in his debt. His *Airpower: Myths and Facts* provides exemplary proof of what can be achieved by precision bombardment with a host of checkable facts.[4] My work here can be

viewed as an attempt, at least, to continue on from Meilinger's excellent history albeit from a higher altitude. Deliberately this study strives to find and destroy beliefs that have extensive leverage over practical matters of doctrine, posture, and operational behavior. My nine broad fallacies are not as obviously empirically refutable as were Meilinger's massacred fourteen, but appearances to the contrary possibly notwithstanding, they are no less vulnerable to evisceration.

## Fallacies to Left of Them, Fallacies to Right of Them, Volleyed and Thundered

I must apologize to the memory of Alfred, Lord Tennyson, whose immortal poem, *The Charge of the Light Brigade* (at Balaclava in 1854 in the Crimean War), is the inspiration behind the title to this section. Following Sun-tzu, we must begin by knowing the enemy.[5] Also in the Chinese tradition, we need to bear in mind the heavy salience of deception. Arguments apparently about airpower often conceal other agendas. Readers may choose to compose their own list, but this study is content to get a grip upon its subject by means of recognizing, being alert to, no fewer than seven types of error or fallacy: (1) sincere error or (2) insincere error; (3) factual error; (4) logical error or (5) error of conception (wrong question, wrong answer); (6) refutable error or (7) irrefutable error.

Purposely, these seven nonexclusive analytical scalpels do not comprise a uniform tool set, but they do tend to cluster. Each of the fallacies exposed in the main section of this study can be categorized by (a) motive, (b) character, (c) logic, and (d) evidence. Specifically, the fallacies come with the following qualities: sincerity or insincerity; fact, logic, or conception; and refutability. It may be needless to add that a fallacy may comprise a compound product made of factual, logical, and fundamental conceptual error—a triple whammy!—as well as being either sincerely held or not, and more or less refutable. For example the long revered dictum that "airpower is an inherently strategic instrument" has been held with near religious conviction by many airminded persons, but is so flawed in conception that it promotes acceptance of massive errors of fact and logic.

In practice, many advocates of airpower have done their cause few favors by so misunderstanding the nature of war and of strategy that inadvertently they have presented easy targets to airpower's generic critics. The law of unintended consequences ensures that when airpower theorists, for the case in point, commit gross errors of fact, logic, and conception, they arm their enemies in debate.

This text generally chooses to dignify the historical reality of argument about roles, missions, policies, strategies, weapons, and budgets with the word "debate." But it has to be understood, should there be doubt in anyone's mind, that ideas, claims, and counterclaims may be employed simply as the currency of contention, not always as true substance. It can help to own a sound argument expressing plausible ideas, but this is only an advantage, not a guarantee of victory in the political realm. The policies, strategies, postures, and budgets that enable them are always, repeat always, negotiated outcomes.[6] Strategic intellectual debate is important, but it is only one strand to what we know, without overmuch affection, as "the policy process." This process is political by any definition which means it is about relative power. US national security policy and strategy emerge typically with characteristically bland and even banal content from a protracted, indeed endless, political struggle among a small set of stakeholders. Because policy and strategy are of necessity intensely political in nature, they are all about "who gets what, when, how,"[7] and what is done with what is won. There is no "Great Objective Strategic Person" as a stakeholder. Although ever higher levels of political authority should equate to ever more objectivity vis-á-vis the contending parochialisms at lower levels—among the services or among military functions—one soon realizes that every player in the grandly complex policy- and strategy-making process has their own interests. And those distinctive interests paint strategically unique pictures of reality for their players.

Because operational strategy has to be a "come as you are" project with the military establishment extant, it can be understood in good part with reference to the capabilities upon which it can call. But those capabilities and that strategy are so much the product of the workings of a domestic political context, that a defense professional such as this author can be driven to de-

spair by the lack of strategic reason and rationality in public policy. This discussion may appear somewhat tangential to the inquiry, but alas it is not. Defense professionals, military and civilian, must ply their trade as best they are able within parameters that usually could not withstand a strategic audit. Congress, the arbiter of defense's fiscal fate, does not really debate strategy, or even strategically. Its honorable members understand money, not strategy, so that is how they exercise their measure of control over the national security. Since national security debate is about politics, is conducted politically, and has a course trackable by money, it is not unreasonable to question the importance of ideas, of theory, or of history. Overall, even if it is conceded to be discoverable, how can strategic truth possibly matter in the context of a policy- and a strategy-making process that apparently is so indifferent to it?

The basic answer to the skeptical, cynical question posed immediately above, is that the United States can be well or ill prepared along a spectrum of the strategic challenges it will face. The content of the choices made on military posture and strategy matter deeply, whether or not it is the product of careful strategic analysis. Moreover, practicably viewed the US government is no more, nor less, peopled by "Rational Strategic Persons" than is the world at large. Every polity, no matter what its culture, makes strategic decisions through a political process. Furthermore, even though important tracts of national security country can be cleared of some, at least, major fallacies, much that is key to our future safety is inherently unknowable and therefore must be contestable.

Those defense professionals whose main area of concern encompasses the whole of the national security are obliged to try to seek strategic truth and fight for its recognition as such. This is a political duty, a moral imperative, and a matter of professional pride. We know that both good history and competent theory are achievable, yet frequently do not prevail in debate. So be it. At the very least, we are obligated to harass the purveyors of fallacy, embarrass them, and limit their ability to cause harm. Although it is all too easy to be pessimistic over the prospects for strategic understanding, it is a fact that better ideas succeed against worse ideas more often than might be expected. While there is much to criticise about US defense policy, strategy, pos-

ture, and behavior, there also is much to praise. One important reason why there is so much to praise is because a small body of defense professionals is committed to the pursuit and dissemination of reliable history and effective theory and doctrine. In addition, the US armed forces demonstrate an unrivalled willingness and ability to learn from their mistakes. In 1968 and in 2007–2008, America's military made huge course corrections in the context of ongoing warfare. Many countries' militaries could not have effected such radical changes.

In the fine arts, as in love, beauty may reside in the eye of the beholder though there are some standards for objective judgment. But in strategic matters there is always the possibility, sometimes the certainty, of a truly objective test of relative merit. The test, of course, is experience. We can have no evidence from the future, which is especially unfortunate since the future must be the focus of our security concern, but we do have 2,500 years of history from which to try to discover what tends to work, when, why, and how and what does not. Recall the epigraph to this study provided by Bernard Brodie.[8] It asserts, unarguably, that history provides the only evidence available to us as the basis upon which we can found strategic comprehension. Whatever the character or characters of error in the fallacies discussed below, they are all demonstrably challengeable empirically. Material reality has the final say, even when an error is conceptual.

Those readers with continental, maritime, space, or cyberspace mindsets and worldviews, may believe that their most-favored military-strategic instrument is unfairly treated in this analysis. Two claims must be recorded promptly. First, the purpose of this study is to tell the truth about contemporary airpower, not to promote the aerial instrument as an end in itself. I believe strongly that this "bonfire of the fallacies" will serve to advantage both the airpower stakeholder in US national security, *and the rest of us*. After all, it is *our* airpower that is the focus of this assessment. Second, airpower is not the only military instrument whose true value is menaced by the popularity of significant fallacies. One could, and probably should, serve the national security by exposing fallacies about the other American military instruments. In a previous publication for the Airpower Research Institute, I argued that al-

though airpower theory is weak and contested, so also are the general theories with which we seek to explain land power, sea power, space power, and cyber power.[9]

Airpersons may be unhappy with an item or two among these fallacies. The analysis takes serious issue with some service beliefs of such longstanding and historical authority that they are akin to being sacred. Doctrine, after all, is not only about what is believed to be the best military practice, sometimes preeminently it amounts to a credo. To overreach in what is believed to be a good cause is all too human. What can be termed the "friendly fallacies," those prompted by airpower's advocates, are apt to be more damaging than the "unfriendly fallacies" disseminated by airpower's foes.

## The Fallacies

This analysis of major fallacies needs to be prefaced by five aids to proper understanding. If readers judge these points to be reasonable, they should be able to approach the candidate great fallacies much as does this author.

First, the fallacies are not presented as quotations. One can locate quotations to support just about any belief about defense matters. Sometimes it is useful to illustrate a claim with a single verifiable quotation, but as often it is not. I contend that each of the fallacies discussed below is both widely believed and carries implications important for national security. The precise wording of each fallacy is driven by a determination to present the erroneous statement as clearly as possible, always consistent with truth in reporting, of course. The fallacies are not straw targets; they are all too real as persisting beliefs and attitudes. Some of the fallacies are fundamentally so hostile to airpower that they are rarely stated as unambiguously as they are recorded here.

Second, we have to be careful to guard the integrity of distinctive, albeit linked, levels of analysis. With thanks to the useful concept of "mission creep," we should be alert to the danger of "analysis creep." Tactical, operational, strategic, and political verities must not be permitted to slide promiscuously from level to level of analysis. For example, John Boyd's famed OODA (observation, orientation, decision, action), loop may

have tactical and even possibly operational merit, but it is far less plausible when it is presented as the strategist's "theory of everything," including, of course, the strategic and the political. One has to be alert to the temptation to apply a good looking conceptual key to every intellectual lock in sight.[10]

Third, reluctant though many debaters are to admit it, frequently within a fallacy there is a truth struggling for recognition. Hardly ever, indeed probably never, is a significant belief about a strategic issue utterly bereft of all merit. In the heat of defense debate, it is not difficult to persuade oneself that one's debating rivals are not only somewhat ignorant and misguided, but they are knaves and fools as well. They may well be such people, but it is never safe to assume that this is so. If we neglect to seek honestly to understand an unfavored argument, and probe it for merit, we both invite intellectual ambush in debate and ensure that our position is not as robust as it should be.

Fourth, fallacies can be situational. However, defense debate is not entirely innocent of "flat earthers" who insist upon ideas that seem to have zero value. Actually, such ideas can have negative value because they may be sufficiently popular that a great deal of scarce time and energy has to be expended countering them. Antisatellite (ASAT) arms control is an example of an idea, really a set of ideas, that has absolutely no merit.[11] That which cannot be reliably defined cannot be controlled. To be blunt, were the United States so ill advised as to sign up to a regime of ASAT constraint, it would not, indeed could not, know what it would be controlling. The number and variety of effects and their agents that can damage space systems in one or more of their three "segments" (ground, up/down links, orbiting vehicles), is so great that no effort at control could be monitored and verified. This is a matter of fact, not opinion. At least the ASAT control question is easily answerable firmly in the negative. It cannot be done and therefore we should not try to do it, let alone pretend to do it. But, many strategic beliefs are neither valid nor invalid in general terms. For example, unremarkably, airpower has always been highly effective tactically and operationally over desert terrain. Provided one enjoys air superiority, an enemy's army in the desert has no place to hide, so it must rely upon the contributions of camouflage, sheer space, and air defense weaponry. Beliefs about the qual-

ity of threat to land power posed by a superior enemy air force are shaped by experience in particular geographical and military contexts. In the spring and early summer of 1944, highly competent German generals disagreed about the practical implications of the Western Allies' aerial dominance. Field Marshal Erwin Rommel, trained by experience in adversity in North Africa, was far more respectful of his enemies' air menace than were the field marshals and generals who had practiced their trade in Russia. Both were correct—in specific contexts.

Fifth and finally, in the absence of thoroughly incorruptible and totally competent professional analytical policemen, any well trained defense theorist and analyst is able to produce the answer that he wants, and with which he began, by means of the simple method of selecting the question, or at least the wording of the question, friendly to his purpose. This seemingly banal point alas is all too relevant to the history of airpower up to and including the present day. For example, it is not especially difficult to demonstrate with overwhelming empirical plausibility that "airpower has failed"—provided one is allowed to construct the test that sets the "pass" mark.[12] More often than not, airpower's more vociferous generic advocates have cooperated in their own intellectual destruction by themselves setting out airpower's stall with improbably heroic claims. To risk stating what should be hugely obvious, if one wants to be sure that the answers will be "right," one has to be careful in drafting the correct questions. Since even honest and competent analysts can err greatly in defense analysis, it is scarcely surprising that the less honest and the not fully competent are able to thrive in an extended defense community as large as ours. And this is why we need to attend most assiduously to the necessary task of exposing fallacies. Antulio J. Echevarria makes this same point when, in his skewering of "transformation's clichés," he argues persuasively that "[t]he only truly essential key to transforming successfully is the capacity for critical analysis."[13]

The fallacies deployed and exposed here are none of them the inventions of this author. However, they are crafted in the form selected not for the purpose of impaling particular people and institutions—though that might be considered "bonus dam-

age"—or even directly to win debates, but rather to serve as keys to unlock rooms currently cluttered with misunderstandings.

### Fallacy One

*The era of conventional warfare between great states and coalitions has passed. The US Air Force needs to abandon the paradigm of large-scale regular warfare.*

Large-scale regular-conventional warfare between states is obsolete, at least obsolescent, so the story goes. Along with the autonomy of the sovereign states that have waged it over the past 400–500 years, such warfare does not lie in our future. As with every other fallacy in this collection of errors, this claim registers along a spectrum of strength of assertion. The belief that major interstate warfare is now "history" has been heralded for nearly 20 years. Gen Sir Rupert Smith of the British Army has offered a particularly forthright statement of this view. He argues that over the past several decades "a paradigm shift in war has undoubtedly occurred: from armies with comparable forces doing battle on a field to strategic confrontation between a range of combatants, not all of which are armies, and using different types of weapons, often improvised. The old paradigm was that of interstate industrial war. The new one is the paradigm of war amongst the people."[14] The general writes with exemplary clarity. He explains that

> War no longer exists. Confrontation, conflict and combat undoubtedly exist all round the world—most noticeably, but not only, in Iraq, Afghanistan, the Democratic Republic of the Congo and the Palestinian Territories—and states still have armed forces which they use as a symbol of power. None the less, war as cognitively known to most non-combatants, war as battle in a field between men and machinery, war as a massive deciding event in a dispute in international affairs: such war no longer exists.[15]

Nearly 20 years ago, Israeli historian and strategic theorist, Martin van Creveld, wrote brilliantly, if contestably, about an alleged *Transformation of War*,[16] while a band of scholars came to popularize the notion that the 1990s were witnessing "new wars" of ethnicity and identity in contrast to "old wars" about state power, wealth, and honor.[17] With the still-to-be concluded Wars of Yugoslavian Succession dominating the challenges to

international security in the 1990s, and the "long war" against terror with its Afghan and Iraqi consequences driving US policy and strategy after 11 September 2001 (9/11),[18] it is scarcely surprising that large-scale regular warfare today is regarded widely, and deeply, as yesterday's paradigm. The trouble is that the case for consigning regular-interstate warfare to the scrap-heap of history falls far short of compelling.

Not for the last time in this study, we must record the belief that the primary source of a significant error is undue "presentism." Irregular warfare of many kinds, complex insurgencies, failed states and local warlords, interethnic hostility, inherently transnational violent Islamist extremism, and so forth, has indeed dominated the post-Cold War global landscape up to and including the present. The claim of this first fallacy is that history is substantially linear which means that it has moved, at least is moving, on from the era of interstate industrial-age conflict to a new period defined strategically by "war amongst the people" as its most notable characteristic. This view is not merely the opinion of a handful of armchair experts and other pundits. Rather it is close to being the dominant mainstream opinion among security and defense professionals, civilian and military, on both sides of the Atlantic.

What does this view mean and what are its practical implications? If one were to sign on for a strict, perhaps we should say extreme, variant of this fallacy, one would be agreeing to the proposition that never again will the United States wage interstate warfare against a regional-, great-, or superpower enemy. Such interstate combat as might need to be conducted would only be in order to enforce access for an intervention or to punish for some grave affront to US interests. Given the high popularity of this opinion today, it is interesting to note how few followers of strategic fashion have the postural courage of their convictions. Since military capability should express national military strategy, strategy should be crafted to support policy, and policy should be designed to cope with the ever-dynamic realities of local, regional, and global insecurity. US defense preparation ought, on the logic of this fallacy, to be showing signs of a seismic shift. If we are convinced, truly convinced, that our future enemies will be nonstate political entities obliged to fight irregularly, and occasionally a local failing polity or a regional rogue, it must make little sense for

us to invest in the ability to wage heavy conventional combat on the greatest of scales.

As "revolution in military affairs" and "transformation," yesterday's buzzwords, are succeeded by the eminently more tangible and expensive realm of "recapitalization," it becomes obvious why guesswork about the political and strategic contexts of tomorrow is a matter of the highest importance. Not to mince words, we could be in peril of preparing for the wrong wars. What we decide to buy today assuredly will not determine what wars we fight nor even, just possibly, how we will attempt to fight them. But the broad and detailed choices we make on doctrine, organization, training, and equipment certainly will determine, at least influence heavily, how well we fight. As General Smith observes: "Indeed, armies do not prepare for the last war, they frequently prepare for the wrong one—if for no other reason than that governments will usually fund only against the anticipated primary threat as opposed to risk, and the adversary will usually play to his opponents' weakness rather than strength."[19]

We do not need to reach for help from Clausewitz in order to understand that the US airpower most "fit for purpose" against enemies in Taliban and other militia forms, would not be most suitable were it to be charged with the task of establishing and maintaining air superiority against a state or coalition foe of the first or even second international rank.

So, what is wrong with the view that America's future should be assumed to contain only conflict against irregular or distinctly minor state enemies?

Because by definition the future has yet to happen and no one can prove anything about it. However, we do have two and a half millennia of strategic history upon which to draw for our education. It is true to claim that tomorrow must come from today, but also it is true that tomorrow need not follow today in a linear fashion. The ingredients, the trends, that eventually must make our ever-changing future security contexts are, of course, evident today, but, these trends will interact and could produce "tomorrows" radically different from the current global security environment. Sometimes the course of history serves up "tipping points," brief episodes or even single events that effect and signal a drastic change in context and the current of happenings.

The Wall Street Crash of 1929 and the subsequent Great Depression comprised such a break point between relatively benign 1920s and a 1930s that was near certain to conclude with a more or less mighty war. The much under-expected fall of the USSR was another such radical break in history, an event with consequences that have yet to be fully worked through. More recent still, it can be argued with fair plausibility, that 9/11 was, and flagged, a tipping point with momentous implications.

Change, even very radical and abrupt change, happens. History is not linear. But to see, even to see clearly—as if one could be sure—the ingredients from which tomorrow's contexts for US security will be made, is not to know what outcome will be produced. History is too complex to allow for detailed prediction. However, we observe that the past and present exhibit many great continuities and that although the details of human behavior constantly change, broad motives do not. This is the reason why one can draft *general* theories of war and of strategy that should be valid for all periods, all belligerents, and all technologies.[20] In parallel, one can draft secondary, dependent theories explaining particular wars and how to conduct them that account fully for the uniqueness of each historical case.

Warfare is both cyclically and linearly arrow like. It is cyclical in that tactical advantage swings between offense and defense, while it is linear in that military science does advance towards ever-greater unilateral lethality. One cannot quite say effectiveness because always there is need to consider the blunting of potential military effectiveness by the intelligent measures taken by active enemies. War, as Clausewitz reminds us, is "nothing but a duel on a larger scale."[21] The claim that large-scale regular-conventional warfare between states does not lie in our future rests upon three principal assumptions, each of which is unsound.

First, a skilled strategic theorist can argue that military science finally has all but abolished large-scale regular-conventional warfare. The more powerful states of the twenty-first century, it is claimed correctly, will all either be nuclear armed or easily could become so. One can argue that contemporary, let alone future, information-led conventional forces would rapidly secure a decision in regular combat. The loss rates would be entirely unsustainable. Equipment of most kinds,

certainly the principal platforms in all geographical environments, could not be replaced rapidly if at all. Since *conventional* battlefield decision should be secured rapidly, the losing belligerent would have no option other than to accept defeat or escalate to nuclear use. It is improbable that a super or great power or even a regionally dominant power would tolerate defeat without bidding to recoup its losses with a nuclear initiative. The logic of this strategic context is that large-scale future conventional war means nuclear war, and that ought to be a conclusively deterring prospect for states of any character. Readers will note the qualifying "shoulds" and "ought to be's" in this argument.

There is nothing much wrong with the strategic logic just recounted. But moving from abstract theory to potential practice, this argument is fraught with error. It is true that nuclear weapons discourage, even deter, the employment of conventional force. However, they cannot prohibit it. America's nuclear-armed foes in the future—say, China, Iran, and possibly Russia—may be discouraged from escalation by the US nuclear posture by way of extended deterrence, or they may need to be defeated in their escalation. By means of offensive and defensive counterforce, the United States should be capable of defeating nearly all scales of military menace, as well as the nuclear. The proposition that nuclear armament has to be a conclusive show preventer or stopper for large-scale conventional warfare is true neither in theory nor plausibly in practice. It could be true were the political stakes at issue to be grossly unequal and weighted heavily in favor of America's enemy, but it is not a general verity.

Second, it is fashionable to believe that interstate warfare is in rapid decline because its authors, states, are in rapid decline as variably sovereign political entities.[22] As the inexorable forces of globalization proceed to bind societies ever more intimately, so the relevance of state-centric structures to security in its several dimensions must diminish. In short, states, as the building blocks around which the architecture of global politics and nearly all else beside is organized, are coming to matter less and less. The problem with this belief or assumption is that it is not true. Perhaps it would be more accurate to claim simply that it is nowhere near true enough to serve as a

principal guiding light for our general approach to security and to military defense specifically. Again, let me be very direct. As greater states, China, Russia, Japan, India, and—yes—the United States, are in no significant way becoming more conflict- and even war-proof in their mutual relations than they have been of recent decades. There is no "grand narrative," no "meta discourse" of global politics that is sidelining the great states, let alone the relevance of that shifty relative quantity and quality, power. Such indications of a shift towards coherent global attitudes and behaviors, as contrasted with national behaviors, say Chinese or American, are too faint and ambiguous to be of much interest to this analysis. States, especially very great states, are here to stay. Moreover, these mighty political entities, actually and prospectively, behave as Thucydides' Athenians in 432 BCE. They adopt, advance, and defend policies motivated by "fear, honor, and interest."[23]

Third and finally, the demise of large-scale regular-conventional warfare, and hence the alleged need for the demise of a US airpower geared to wage it, is predicated upon the sincere belief that the security challenges of the twenty-first century will be largely nonmilitary/strategic in kind. Listings of future security challenges typically include religiously motivated terrorism, but the threats in the new century are identified as climate change; resource shortages (food, water, energy); demographic catastrophe and mass migration; pandemics; identity, ethnicity, and cultural insecurities; and the erosion of respect for political authority (i.e., states that "fail"). To this short list, one could add the asteroid menace. It so happens both that the asteroid threat is indeed a real one, and that we could do a great deal to protect against it—at least with respect to objects of modest size. As a plausible "extinction" threat, it is high time that the spacefaring states of the world took their responsibility for global defense far more seriously.

The nonmilitary threats to future security cited above are only nonmilitary when one refuses or fails to recognize them for what they truly could be—triggers for traditional looking conflict. We do need to worry about adverse, and especially abrupt climate change, overpopulation, and resource shortages, but these are all plausible sources of conflict which would be certain to have a major strategic dimension. Again, to be blunt, a

deteriorating global climate, unsustainable population growth, and shortages of food, water, and energy, are all, especially in malign combination—perils tend to come in "bunches"—potential causes or triggers for war.[24]

It has to follow from this admittedly rather grim analysis that the twenty-first century will lack neither greater powers behaving as such powers always have behaved—for the same mix of Thucydidean reasons—nor a military/strategic context that could be exploited in pursuit of meaningful victory, nuclear danger notwithstanding. For a "Parthian shot," even if the argument provided here as a critique of this alleged fallacy is judged only inconclusively damning, dare any of the greater powers, most especially the United States, take the risk that this proposition is true?

### Fallacy Two

*Airpower is an inherently strategic instrument.*

It has long been doctrine, formal and informal, even canon law equivalent among airpersons, to claim that airpower (written as a single word, not as "air power," the standard pre-1940 usage),[25] is uniquely "strategic." As best one can tell from history and logic, this assertion rested upon the belief that airpower alone among the geographically distinctive military instruments could be independently decisive in war or as a deterrent in peace and crisis. This is a relatively sophisticated version of the strategic rationale. Less functional reasoning simply insisted that airpower is, or can be, strategic because it is long range or somehow very important. The somehow was rendered helpfully specific, indeed to the point of transcending grounds for contention, with the advent of the nuclear age. In the late 1940s and early in the 1950s, it was commonplace for speakers and authors to associate "atomic" and airpower so closely that adjective and noun all but fused in a single grand conception.

Although rarely stated explicitly, the claim that airpower is inherently strategic implies strongly that land power and sea power (and now space power and cyber power) are not. Plainly, if every kind of military power is strategic, this doctrinal assertion must lose any meaning. The claim matters enormously because it carries the message that airpower, being uniquely

strategic, matters most. The implications of what we shall demonstrate to be a fallacy could hardly be more serious for, dare one say, strategic understanding and, of course, for budgetary shares and their postural, career, and industrial consequences. It is well worth noting that despite its traditional adherence to belief in airpower's uniquely strategic quality, adaptive practice by the Air Force persistently has belied the tenet. Nonetheless it is clear from the historical record why airpersons registered the claim for a uniquely strategic status.

Two reasons were dominant. The first was no deeper than a genuine lack of conceptual grasp of the proper meaning of strategy, and hence of "strategic." The second reason, much aided by the conceptual disorder of the first, was perceived necessary as a firm basis for institutional autonomy—even independent service coequality or better. If airpower could deliver victory in war essentially unaided by the older services, its claim for independence should be undeniable. The arrival and then proliferation of atomic, succeeded by hydrogen, weapons seemed to close off any merit in further debate. After all, what could be more strategic than the capability to obliterate the USSR and China in a matter of hours? The tenet that nuclear-armed airpower is uniquely strategic appeared to be self-evidently true. It was both *the* deterrent and, if necessary, the instrument of Armageddon for the Evil Empire. Alas, such a commonsense view was seriously in error. Moreover, it was seriously erroneous in ways that have effected lasting damage to sound appreciation of airpower's potency. In other words, the claim for inherently strategic status is both fallacious and gratuitously self-harmful. What do we mean by this?

To explain this fallacy and correct for it, one must begin by clarifying the meaning of strategy and strategic, and by explaining why it is vital to take care to adhere strictly to this meaning. Stated at the most basic of levels: *policy* provides political goals to be secured, *military strategy* provides ways to secure them, and *tactics* do the actual securing. If one confuses these three fundamental distinctions, one enters a world of theoretical, doctrinal, and, especially of note, practical grief. The critical difference between the strategic and the tactical is the quality of instrumentality. Strategic effect is distinctive in kind or quality from tactical effect, not in quantity. For example, a bigger bang

is not strategic because it is bigger than a much lesser bang, which instinctively we choose to term tactical. A vehicle does not become strategic because it is intercontinental in range rather than merely intraregional or even intracontinental. A weapon, a capability, or a project is strategic only in its consequences.[26] Yes, US airpower inherently has strategic meaning, as does US land power, sea power, space power, and cyber power. The most crucial relevant concept is *strategic effect*. By this we mean the consequences of (tactical) actual military behavior for the course and outcome of a conflict. It is conceptual and practical nonsense to assert that some weapons and behaviors are strategic while others are merely tactical, perhaps operational.

Let us consider the hardest of hard cases for my argument, the erstwhile Strategic Air Command (SAC). How could long-range nuclear-armed air-and-missile power conceivably be anything other than quintessentially strategic? The answer, contrasuggestive to some among us though it may be, is that even SAC in its heyday should not have been regarded as a hermetically closed system, embracing both instrument and achievement. If SAC truly was strategic, then how could one distinguish between the doing of nuclear damage and the consequences of that action? To pull back our argument a little, assignment of the strategic title to SAC, the legatee of the mighty armadas of B-17s, B-24s, and B-29s, of World War II, all but definitively discouraged rigorous investigation into the possible/probable effects of US nuclear targeting plans in action. A military instrument deemed inherently strategic is difficult to question strategically. What one has done is to fuse the tactical and the strategic categories of thought and behavior, with the inevitable result that the intangible utility of strategic values and their political effects all too readily evade attention. Not to dodge the bullet, one is likely to produce a context wherein military action, in this case nuclear destruction on the largest scale, is divorced from intelligent political direction—via strategy—and political assessment—again via strategic review. The strategist must always pose the question, "so what?" Belief that there is inherently strategic military behavior is apt terminally to foreclose upon the insistent levelling of this challenge. However, as claimed here, there can be no inherently strategic forces, whether or not one is strategically educated. At issue here is not an arcane academic point of theory,

possible appearances to the contrary admitted. It is a fact that there is, and has always been, a fundamental distinction between behavior and its consequences.

With exemplary flexibility, the historical exercise of airpower by the US Air Force time and again has demonstrated the nonsense of the traditional tactical/strategic distinction. From Arc Light missions over Vietnam, through close air support (!) for the Northern Alliance in Afghanistan in 2001, the venerable B-52, the material icon of a strategic weapon, has performed splendid "tactical service."[27] "Strategic" is not a function of choice of target or character of weapon—it is all, repeat all, about the consequences of military behavior.

The damage to American airpower wrought by this fallacious seizure of the strategic ascription takes several forms. First, it all but obliged US air planners, strategists to seek independent decision through airpower because of their assertion of the uniquely strategic quality of their instrument. Since such independent decision is only very rarely achievable and because of the complexity and variety of wars and warfare, airpersons are setting themselves up for demonstrable failure. Increasingly in regular-conventional warfare, superior airpower decides which belligerent will win, though it will be unable to deliver conclusive victory unaided.[28] This was the case in both Gulf Wars. The quest for independently decisive airpower is pursuit of a chimera. The United States would like to have such a capability, reliably, but that is not possible. So, it should be more than content to settle for an airpower that will "decide" who wins its regular-conventional conflicts, and that delivers literally critical support when land power or sea power truly must be the leading executive agent of military decision.

The second damaging impact of the misuse and genuine misunderstanding of "strategic" is that it encourages underappreciation of airpower's nonkinetic impact upon the course of strategic history. Most people recognize that airpower is a concept and material descriptor that embraces everything that flies, rotary and fixed (and adjustable "swing") wings, but the abuse of "strategic" leads to undervaluation of airpower's many nonkinetic roles. In counterinsurgency warfare (COIN), for a very current example, while airpower provides essential firepower support, it also enables high tactical mobility to friendly forces—

insertion and timely extraction, reconnaissance, search and rescue, medivac, resupply, and humanitarian relief—to cite but some among airpower's roles and missions.[29] The point is that every one of the duties just cited, kinetic and definitely nonkinetic, will have more, or less, strategic effect upon the course of a COIN campaign. The proper appreciation of airpower's strategic value requires final abandonment of the old dogma that it is inherently a strategic instrument. Soundly viewed, all of America's armed forces are strategic agents.

Inadvertently, of course, many writers of military doctrine have fallen unknowingly into a deadly conceptual trap that can have dire real-world consequences. They have favored the idea that military theory divides war into strategic, operational, and tactical levels. This expedient and plausible three-way split has much to recommend it, save only, alas, for one deadly error. The three "levels" are appropriately associated primarily with battles (tactical), campaigns (operational), war as a whole (strategic) and sensible things are said about the connections among them. Unfortunately, even generally sophisticated US doctrinal writing has been prone to commit the error of failing to distinguish clearly between the application of force and the political consequences of that application. This lethal conceptual error is easily obscured by the drafting of doctrine which both talks sensibly about the ascending significance of the three levels from tactical, through operational, to strategic and speaks wisely about the contributions of each level to the others. But, what is absent is the all-important distinction, so clear in Clausewitz's theory, between the use of force and its meaning in the currency of politics. As recently as 1992, for a historical example, Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force* volume 2, makes it quite plain that the strategic level of war is about the direct and indirect *applications* of military and other resources.[30] For the strategist, any and all applications of airpower can have meaning only in their results. If this fundamental (Clausewitzian) distinction is neglected or not understood, airpower is unlikely to be employed as effectively as it should be.

**Fallacy Three**

*The development of airpower is driven by technology not ideas.*

It is commonplace to believe that airpower not only *is* technology, but also, pathologically, is *about* technology. This belief, which we shall demonstrate to be fallacious, holds that airpower is an ever-dynamic product of "the ripening plum" syndrome. The fable insists that technologies engineered into aerial vehicles mature more or less for reason of sheer technical momentum and cumulative, and sometimes radical, innovation. The roles of political context for policy, of strategic demand, and of operational and tactical requirements are judged historically to have been distinctly secondary. Technology, duly reified in this view, moved on for not much better reason than that it could do so. It is probably true to claim that a majority of commentators upon airpower history have subscribed to this erroneous opinion. In a previous publication, I deployed contrasting statements on the relationship between ideas and technology for airpower.[31] In effect, the fallacy claims that airpower can be likened to Goethe's *Sorcerer's Apprentice*, continuing mindlessly to go on doing what is being done currently, regardless of consequences. Technological advance is its own rationale. At ever-greater expense, so the argument proceeds, technology as airpower advances to nowhere in particular for no good political or strategic reasons. Technology is the pilot—served by policy, strategy, operations, tactics, and logistics.

This assertion can appear to fit historical facts. Airpower flies ever upwards in its technical specifications and performances, whether or not the performances enable net military, strategic, and political achievement that is useful. Why is this argument important? It taints the necessarily technological product that is airpower with the strong suspicion, or worse, of costly stupidity. Air forces generally purchase ever more sophisticated, which is to say ever more expensive, aerial vehicles even though strategic, operational, and tactical ideas for their employment persistently have lagged behind. Restated, the claim is to the effect that the history of airpower has been the story of a supply-led, not demand-led, instrument.

To endorse this belief, in a major or minor key, is to risk seduction by the attractions of technophobia. Because people

matter most and it is characteristically American to place faith in technology, it is tempting to cite the technologist, even a reified technology, as villain. Somehow, the material servant has replaced the political and strategic master. The principal reason why this fallacy is so significant is that technology continues to be the source of marked competitive benefit to the United States and its foreign security dependents. The country can ill afford a generic, frequently uninformed, suspicion of technology, when technical achievement is America's leading asymmetrical advantage over foes of all kinds. If Americans are apt to employ technology, especially as firepower, that can prove counterproductive, the problem lies with culture, theory, and doctrine, not with the machines themselves. Theory and doctrine for airpower has left much to be desired, but it makes no sense to seek improvement by demeaning technology.[32] Airpower is as airpower does, and what airpower is allowed to do is a matter of human discretion, guided by ideas. This third major fallacy implies that a mighty abstraction, airpower, somehow has developed while, and perhaps by, evading political, strategic, and military control. The confusion of technological instrument with human agency promotes the conviction that airpower typically has failed in war after war. Time after time, so the tale is told, it did not deliver upon its promise, explicit and implicit.[33]

The view just expressed is a fallacy, not so much because it depends upon an unsafe conceptual architecture, though that is the case, but rather because it is historically inaccurate. From the nineteenth century until today, ideas, strategic, and other theory, generally have led technical achievements. The whole historical saga of airpower has been peopled by scientists and engineers who have striven to solve technical problems so that flying machines could perform as political, military, and commercial clients required or desired.

Airminded people like aircraft and industry needs to develop, build, and sell aircraft. Here we find a robust marriage between demand and supply, or is it often the promise of supply and a consequential demand? In truth, the history of airpower is not a simple narrative of technical attainment for the love of discovery, commercial incentive, or perceived military needs to solve tactical crises or for high strategic purposes. Rather it is

the complex story of all of the above. Just because an air force did not ask for a particular aerial capability, does not mean that it would have no use for it. The challenge throughout history, from earliest times to the present, was partially explained by Winston Churchill in a memorandum, "Mechanical Power ibn the Offense," 9 November 1916. "A hiatus exists between inventors who know what they could invent, if they only knew what was wanted, and the soldiers who know, or ought to know, what they want, and would ask for it if they only knew how much science could do for them. You have never really bridged that gap yet."[34]

Airpower in all its shapes and forms has always been the product of a specific vision, or visions, of utility. One quality in particular, never in short supply among the airminded, is a notion, clear or fuzzy, of the value of aircraft that currently are over the technical horizon. In historical practice there has been an air community comprising inventors, manufacturers, and prospective commercial and military people who have conducted a constant dialog. Sometimes the aircraft and ancillary industry(ies) have invested speculatively in technical innovation in the hope that military or commercial customers will be unable to resist the new performance plausibly on offer. However, even when industry and its engineers move ahead of explicit military demand, it is nearly always the case that a need to achieve a definite capability guides the enterprise. Technology does not advance as it were mindlessly bereft of purpose beyond curiosity and profit. Rather it must be driven and shaped by goals that make sense to, and can be defended by, the intended customers.[35]

Of course there is a momentum to the advance in aircraft technologies. Since the onset of the Industrial Revolution, technical innovation has been routinized as historians insist convincingly. But, has there been a "mad momentum" to technological history? What is the evidence? Long-range airpower, for example, was not first developed in the 1930s and 1940s by an aircraft industry that was out of strategically motivated control. The quest for transcontinental and eventually transoceanic reach stemmed from pressing commercial and military demand. Ideas about global geostrategy explain the appearance of the B-17, B-24, B-29, B-36, B-47, and B-52. Mountaineers

try to explain their strange obsession with the existential quip, "because they (mountains) are there." But, societies as security communities do not develop and procure long-range bomber, transport, and reconnaissance aircraft just because these highly sophisticated machines can be built. There is method and purpose in the madness, if madness it be.

The relationship between military demand and industrial supply is not unidirectional. Manufacturers do conceive of vehicles, qualities in performance, and even of missions that potential clients did not know they needed before they were educated, which is to say "sold," by intending suppliers. In practice to date, armed forces have wanted more performance than aerial technology could provide. In large part, though, this situation now has been so altered that the "transformation of American airpower" described and assessed so convincingly by air analyst and pilot, Benjamin S. Lambeth, nearly ten years ago now, is approaching perfection.[36] The problems are no longer with a technically flawed military instrument, but rather with the nature of warfare as a duel. Uncooperative enemies have been sufficiently disobliging as to devise tactics intended to deny US airpower the targets it could certainly destroy were it able to locate them reliably. The potential perfection of American airpower, certainly as a kinetic tool for dealing out firepower, must remain only potential, albeit excellent, because its enemies will be motivated and to some degree able to find ways to offset the prospectively conclusive US military advantage in the air.

The airpower that we buy is the result of ongoing negotiation among many stakeholders, civilian and military. It expresses the balance of political power within the policy-budgetary process, the public political mood vis-á-vis security, the state of the art in weapons and other technologies relevant to airpower, and, last but not always least, systems of belief about air tactics, operations, and strategy. Would-be innovators, individuals and teams, will offer the Air Force dazzling prospects of military performance and value for what currently may only be glints in the eye. But, officials and politicians are not in the habit of buying into visions they do not share. Ideas as theory are not all that matters in the grand historical narrative of airpower, but they do matter most and they always have. Even available technology will not be acquired and applied if it does not

fit settled military doctrine. For example, fuel drop tanks to extend the range of escort fighters, most specifically the P-51 (the P-47 was too short legged, even with extra fuel tanks), were a vital enabler for the United States Army Air Forces' daylight blitz deep into Germany. But, even though the technology for the mission had been available in 1942, then current air doctrine insisted that B-17s and B-24s, in correct formation, were sufficiently self-protecting and fighter escorts were expensively superfluous. This was not correct. Eventually, belatedly, bloody education at the hands of the Luftwaffe home-defense fighter force produced a radical change in doctrine for strategic bombing. In 1944–1945 in Europe and the Pacific, contrary to standard practice in 1942–1943, US long-range bombers all but invariably were accompanied by a fighter escort.[37]

Throughout its history, US military airpower has expressed strategic, operational, and tactical beliefs. These are reflected in the evolving state of the technical art at the time of procurement and subsequently when inservice midlife upgrades would be effected. The latter point is simply a necessary truth; it does not mean that as a rule technology has led ideas on military utility. Not infrequently, though certainly not invariably, a country is obliged to fight with a basket of air and air-related technologies that are either more or less technically inadequate for their tasks or that express what prove by events to be the expression of faulty technical choices. This last point does not always refer to technologies that did not perform as expected, but rather to those that provided a military-air posture ill suited to the war it had to wage. A classic historical example of this mismatch includes the Third Reich's Luftwaffe which was a very powerful short-range force compelled by unanticipated circumstances to conduct warfare over great distances. Also, we can cite the case of US airpower in Southeast Asia in the 1960s. Following its doctrine, and obedient to the strategic logic of national policy, the US Air Force in the 1960s was equipped and trained near exclusively for the waging of a short nuclear war with the USSR. Instead, it had to adapt its prowess as best it could to the tasks of coercing North Vietnam and supporting the effort to defeat a countrywide insurgency in South Vietnam. US airpower had to learn in real time how to perform to survive in dogfights, then a

near-lost art, and how to use aircraft designed for nuclear delivery in quite different roles.

Finally, the "transformation of American airpower" achieved since the first Gulf War (1991) has been a cumulative achievement—visible over Bosnia in 1995, Iraq in 1998, Kosovo in 1999, and then over Afghanistan and Iraq in the 2000s—expressing strategic, at least military, theory as well as what technology can do. The latter has not in some deterministic fashion produced the former. US airpower today is very much the airpower desired by American ideas. There is always room for technical and doctrinal improvement, but that is a different story.

**Fallacy Four**

*Airpower is about targeting.*

No, it is not. What airpower is about includes the military, strategic, and political consequences of its targeting. The greatest of all air theorists, Italian general Giulio Douhet, claimed that "as a matter of fact the selection of objectives, the grouping of zones, and determining the order in which they are to be destroyed is the most difficult and delicate task in aerial warfare, constituting what may be defined as aerial strategy."[38]

A little later, Douhet reemphasizes the point that "[t]he choice of enemy targets. . . . is the most delicate operation of aerial warfare."[39] This fallacy holds that aerial strategy is the selection of targets. Airpower properly employed, which is to say true to its offensive nature, influences and even controls the course of events on the ground and at sea primarily by its kinetic effect. For airpower, the world is akin to a dartboard. Air theorist John Warden's "Five Rings" of target categories highlight the salience of this comparison.[40] Airpower delivers on its potential when it is unleashed to damage and destroy the vital centers of enemy power.

For example, in 1964 the US Air Force came up with a 94-item target list for US airpower to destroy in a 16-day blitz on North Vietnam. These targets, which did not include civilians as an enemy asset, comprised the lion's share of Hanoi's industry and modern infrastructure, such as it was. The "94 targets," subsequently iconic in the debate about the US conduct and misconduct of the war, were all attacked in the Rolling Thunder

aerial coercion campaign waged against North Vietnam from March 1965 until October 1968. US airpower was to perform well, at least as well as it was technically able, in those years.[41] Whether or not a compression of the assault into a time span of days or a few weeks would have made any significant difference to its political or military impact is arguable. In the opinion of this author, the "94" option could not succeed strategically, no matter how high the tempo with which damage was inflicted. Airpower was always going to "fail" in a mission that was fundamentally misconceived. It is true to claim that the US government displayed an almost incredible incompetence in its strategic and political mismanagement of Rolling Thunder, with its serial bombing halts (seven major bombing pauses, thirty-six all told) and targeting constraints. But, even had Gen Curtis LeMay's original, pure vision of an aerial blitz been unleashed in say 1965, it could not possibly have succeeded. North Vietnam ultimately was not vulnerable to aerial coercion. This judgment holds notwithstanding the apparently contrary evidence from Linebacker II (18–29 December 1972).[42]

This fourth fallacy is especially deadly because it invites misunderstanding in two vital respects. All the while it presents what can appear to be no more, nor less, than elementary common sense. The fallacy points to a partial truth that fits prior public and even much supposedly expert understanding. Every geographically specific kind of military capability has characteristic features that necessarily are obedient to physical realities.[43] Land power is terrain bound in a world that can be regarded as comprising a body of islands, distributed in a highly irregular manner. It follows that land power must have some difficulty moving, both within complex terrain, and between islands.[44] Similarly, sea power is gloriously global because, in geographical truth, "all the seas of the world are one."[45] But, alas for sea power, human beings live only upon the land. Conflicts always are between specific continentally defined, or at the least associated, security communities. Somehow, sea power has to make a strategic difference transenvironmentally, upon the land. This is not always easy or even possible. Airpower, in its turn in this litany of limitation, although unquestionably global in its potential mobility, is heavily constrained by the laws of physics. Aircraft can do many things, but as

combatant vehicles themselves they are limited to the delivery of firepower in several lethal forms. They can provide a fairly local presence at low altitude over the land and the sea, but it is not possible to occupy and continuously control terrestrial battlespace from the air, though UAVs can "persist" in action.[46] This is no more a criticism of airpower than were the previous comments criticisms of land power and sea power. Each of the five geographical environments of and for warfare—land, sea, air, space, and cyberspace—has partially defining physical limitations that technological advance cannot wholly abolish. The solution, of course, is to go "joint" and not to try to squeeze an achievement from say, airpower that it is physically incapable of delivering. Combined and joint arms and the enlistment of complementary foreign allies are the ways in which sensible countries and their militaries address the challenges posed by the constraints upon their geostrategically strongest suits.

To claim that airpower is about targeting is not entirely wrong. It is only an error if one insists that targeting for kinetic effect is all that really is important about the roles of airpower in war. The roots of this fallacy are not exactly hard to trace, any more than are the reasons for its continuing popularity among some misguided airpersons. While targeting for bombardment from the air can be regarded as a duty that enables more effective land power and sea power, also of critical moment to airpower as a cause or quasi-religion is the behavior that allows airpower to win wars independent of significant war-fighting assistance from the other military instruments and their agencies. Unfortunately, although firepower from altitude, whatever the character of the vehicle, is nearly always useful, and sometimes is far more than just useful, it cannot be synonymous either with war as a whole or even with warfare. It should be clear enough from this analysis that the fallacy does not lie in claiming importance for the targeting function or for kinetic impact from the sky. Rather are the fallacious elements: (1) the belief that bombardment equates to warfare, let alone to war; (2) the belief that bombardment itself somehow, mysteriously must translate into a strategic effect that will prove politically conclusive; and (3) the belief that airpower's distinctive strategic contribution is focused in its ability to damage things and kill people. Paradoxically strong adherence to this fallacy, a theory designed to promote airpower,

must have strongly negative consequences for its much preferred subject. By inadvertently harming its own institutional and other cause(s), the airpower-is-targeting camp of doctrine/opinion also harms its country's interests. Our essential airpower needs to be developed and, when necessary, applied in ways that yield maximum return for its costs. Fallacious beliefs can prove costly, not excluding the price paid by our military establishment in a joint prowess that falls short of what could be achieved were airpower and its potential better understood.

Lest my argument has been at all obscure, let me restate it in the most direct possible terms. Airpower writ large generally must express careful thought on targeting. But airpower is not, and cannot be, *about* targeting. What matters is not targeting per se or even the damage that well-directed aerial bombardment can inflict. Instead, what are of importance are the effects of that damage upon the course and outcome of a conflict. This is why a previous discussion in this study zeroed in on the fallacy that airpower is, or can be, inherently strategic. What airpower does cannot be strategic, regardless of what one calls a particular military organization (e.g., SAC or Strategic Command). What is strategic about airpower and its behavior—and land power, sea power, space power, and cyber power—is its instrumental value.

The targeting and symbiotically-associated kinetic themes in airpower theory have an unfortunate tendency to crowd out appreciation of the less dramatic, but frequently no less important, activities of air organizations. In truth airpower is all about mobility and power projection. It is about bringing fire to bear on the enemy, whether near or far; about inserting and extracting friendly ground troops;[47] about surveillance, reconnaissance, and other forms of intelligence gathering; about supply and its movement; about medical evacuation; and about search and rescue. Also, our airpower is about the business of helping train the airpower of friends and allies.[48]

This fallacy hurts at two levels. It risks encouraging the false belief that warfare is really all about killing people and damaging material, in this case from weapons in vehicles in the sky. Such violence is necessary and indeed is the most defining characteristic of war.[49] However, wars are not won by violence alone, and the violence exercised can be more, or less, effec-

tively chosen. The fallacy, by its implicit exclusions, also demotes the importance of airpower capabilities and behaviors other than the kinetic. To continue with the Vietnam theme in this part of the text, how important was airpower in Vietnam as manifested in the 428 helicopters of the 1st Air Cavalry Division? US airpower performed magnificently over Southeast Asia from 1964 to 1973. It "failed" only in the sense that neither when employed independently to coerce, nor when used to support the warfare in the South (and, to a lesser extent over Laos and Cambodia), could it deliver or help deliver a fair facsimile of victory. There are wars wherein an appallingly flawed strategy, and sometimes even a thoroughly ill-advised political purpose can be offset by the strategic effect of the military power applied. Vietnam, unfortunately, was not such a case.[50]

**Fallacy Five**

*Airpower must always be subordinate to land power.*

Because we humans can live only upon the land, and because all of our inter- and intracommunal quarrels must have terrestrial reference, it has to follow that land power, power on the land, is the senior military instrument. No matter how influential the joint contribution from the sea, air, space, and cyberspace, conclusive effects and their consequences have to be terrestrial. Militarily speaking, it follows of necessity that land power must always be the supported instrument.

This fallacy is important because, as so often with plausible conceptual errors, it contains sufficient truth to be highly credible. Little imagination is required in order to grasp why this erroneous belief is dangerous to strategic effectiveness. A blanket conviction that land power must always be the dominant military instrument all but ensures some misuse of airpower. This fallacy presents a minor, even banal, truth as justification for a massive mistake. Let us concede the truism that every conflict has terrestrial reference. We humans do not live in, or fight for, the air. When we fight in the air, or for dominating some segment of the air, it can only be in pursuit of advantage in a terrestrially defined contest. These elementary facts should be as uncontentious as they seem often to be unknown to rival theorists and practitioners.

The land power versus airpower controversy, which has flickered and flared from the early 1920s until the present day, reflects a pervasive Western intellectual weakness—a liking for binary distinctions. Warfare allegedly is regular or irregular, conventional or nuclear, symmetrical or asymmetrical, and is led by land power or airpower. Western strategic debate has great difficulty accommodating the holistic subtlety of both/and, *ch'i* and *cheng* (unorthodox and orthodox, energetic and passive). This systemic conceptual limitation is especially unfortunate given the increasing, though limited, number of important tasks that are not necessarily owned exclusively by any one of the five geographical environments. Rephrased, today far more than ever in the past, some military tasks can be performed on land, from the sea, and from the air. For the most obvious example, firepower with comparable accuracies can be delivered by artillery, land-based short- and medium-range missiles (ballistic and cruise), from ships, and in principle from orbiting satellites. Notwithstanding our joint organization for war fighting, the distinctive physical geographies continue to hold a telling grip on minds and, of course, on bodies. The geographies are real and to operate in one rather than in or on another requires unique equipment, doctrine, training, tactics, strategic reasoning, and mindset. For reasons of inherent physical limitations as well as state of technology, the inter-geographical military and strategic debate largely is focused upon the relationship between land power and airpower. Other debating pairs are possible, indeed are extant, but none (say airpower versus space power or land power versus sea power) has the fuel currently available to soldiers and airpersons.[51]

It may occur to some readers that debate between spokespersons for land power and airpower is ever liable to be impoverished by the troublesome swamp of spongy definitions. What is land power? What is airpower? These apparently conceptual, even philosophical, concerns have major implications for the power and influence of military institutions and for the manner in which we fight. This is not simply a matter of idle intellectual curiosity, rather is it a subject area deeply infused with practical significance.

Common sense is not always victorious in military debate, but let us at least try. All military power is land power. Our military

strength derives from the land, whereon we have to live, and must be sustained by our assets on land. This is true for armies, navies, air forces, space forces, and cyber forces. Although it is perhaps a trivial, but necessary truth, more explicit recognition of its merit might help defuse some needlessly angry contention.

What is military land power? If it is anything that can fight, or contribute quite directly to our ability to fight, on land, why should understanding of its domain be limited to the ground? Since the US Army owns more aircraft, helicopters in particular, than does the US Air Force, does it make sense to conceive of land power distinct from airpower? Given that the United States will never, repeat never, wage ground (or sea) warfare without a more or less integral air dimension as an enabler, a complement, or more, is it useful or accurate to talk about American land power, sea power, or airpower? I challenge any American defense professional, regardless of service orientation, to claim that he or she can conceive of the country waging war of any character on land or at sea in a manner utterly indifferent to the state of play in the air environment. The very idea is absurd in the 2000s, and indeed has been since at least the 1940s.

If we put aside for the moment the argument just presented, which suggests that today the concepts of land power, airpower, and sea power do not reflect military reality very usefully, is it possible to discern any general strategic truth about the relationship between land power and airpower? The answer, for once helpfully, is both "yes" and "no." Yes, in that the strategic history of the past 20 years demonstrates beyond a reasonable doubt that, *ceteris paribus*, the balance of relative influence between land power and airpower has been shifting in favor of the latter. [52] US airpower is vastly more capable than it was in Vietnam as we noted above. Despite a substantially inappropriate air posture, doctrine, and training, it still performed far above and beyond the strict call of duty. From the 1960s to the present, in conflict after conflict, US airpower cumulatively has been transformed into a truly lethal instrument, regarded either as an agent of kinetic effect or as a multicompetent enabler of ground power. But, and this has to be treated as a noteworthy caveat, the relative importance of airpower, especially airpower of the fixed-wing, longer-ranged kind, must be situational. Airpower is militarily relevant to every conflict, be

it largely irregular in character or be it conventional—in which case it will be the dominant military force—be it largely rural in battlespace or be it predominantly urban. However, its strengths are flattered in some contexts rather than others.

To combat a highly irregular and in the main only part-time enemy who hides amongst quite densely packed civilians, airpower cannot be the leading edge of military effectiveness. In the form of helicopters for tactical troop mobility and resupply, for the infliction of occasional very precise destruction, and for useful reconnaissance and intelligence gathering generally, airpower will be important, even vital. Nonetheless, in an urban context for insurgency, airpower's contribution to the COIN effort typically will be as necessary as it will be limited. The need for sustained presence by friendly "boots on the ground" may be a cliché, but it happens to be a strategic truth neglected at one's peril. Extreme tactical mobility by rotary-wing aircraft has the ability to place small numbers of very lightly armed soldiers in the greatest of danger. And the ability to insert does not always mean the ability to extract at will.[53]

By way of contrast, if an enemy chooses or has no practical alternative other than to wage warfare in a regular-conventional way, US airpower will defeat him long before US ground power comes into contact. This was clearly true in 1991, it was even more clearly true in 2003, and it should not require any very detailed defense as a thesis for the future.[54] US airpower will kill or disable any enemy forces it can locate on land, at sea, or in the air. I would like to add "or in orbit" but that would not be true. US defense policy and the national military strategy endorse the concept of "space control" unambiguously. Unfortunately, for reasons that need not be identified or explained here, the US armed forces currently do not have the means, let alone the official license, contingently to enforce this policy and strategy.[55]

Although land power, in the form mainly of unmistakeable *ground* power, continues to be literally essential for the conduct and conclusion of America's wars. It does not follow that this power must be the primary instrument of military, for strategic with political, decision. For example, the general and genuinely dazzling prowess demonstrated by the US Army and Marine Corps on the ground in Iraq in April 2003 was enabled by an air campaign that guaranteed them swift success.[56] This is not

to claim that the Army and Marine Corps could not have won without the air campaign, and neither is it to suggest, absurdly, that they did not face some determined, largely irregular foes who could not be lightly brushed aside. It is to claim, though, that as a matter of researchable record, US airpower played the dominant role in the brief regular war of spring 2003. Some among America's future enemies may prove far more effective in resisting US conventional military prowess than were the Iraqis in Gulf War II. But, this probability does not plausibly reduce the strength of the proposition that American airpower will decide the course and outcome of its regular warfare.

The thesis that airpower must always be subordinate to land power is fallacious because it rests upon a basic misunderstanding of airpower and its capabilities. Conceptually enabled by the great theoretical and practical oversimplification of a generic "airpower," it is a relatively easy matter to twist the debate into an argument about the efficacy of so-called "strategic airpower" (see the discussion below) committing the "binary error." Use of air-striking power independent of operations on land and at sea is condemned as a secondary, or an even net futile effort being somewhat complementary at best, to the decision that is being achieved by friendly "boots on the ground." As we show in our analysis of the next fallacy, this error, apart from being motivated in large part by parochial institutional interests, is much facilitated by the poverty of historical and current debate about the promise and performance of "strategic bombing."[57] In a recent publication for the Air Force Research Institute, I sought to argue that in a vital sense "one cannot get there from here." If we are to grasp how airpower and land power relate militarily and strategically, first we need to identify the contemporary measure of their essential unity. In particular, if land power must include a highly significant air dimension, which is the case today, it is not obviously sensible for us to try to argue about their relative military and strategic importance.

### Fallacy Six

*The theory of strategic airpower is fundamentally flawed.*

The classical and neoclassical theories of strategic airpower come in several variants, but the central tenet is to the effect

that airpower, properly exercised, is able to be an instrument of independent decision in war. There is, or should be, a rather more intelligent, less demanding, theory of strategic airpower which is eminently defensible historically. Unfortunately, the dominant ancient and modern theory took such firm hold within the air community and has been seized upon for so long by its critics that it is extraordinarily difficult to consign it to the museum of attractive ideas where it belongs. Because of what has been believed to be its life and death implications for the institutional independence of air forces and because technology has seemed to provide ever-greater support for the key concept, the extreme version of strategic-airpower theory continues to live.

Among the classical and neoclassical authors of strategic-airpower theory, I will single out just four: Italian general Giulio Douhet (1869–1930), Marshal of the Royal Air Force (RAF) Sir Hugh Trenchard (1873–1956), Brig Gen William Mitchell of the US Army Air Service (1879–1936), and far more recently Col John A. Warden III, US Air Force (1943–).[58] The differences in their theorizing arguably are important, significant, and interesting but they pale into near insignificance in comparison with the breadth and depth of their agreement. Each of these "classical" and "neoclassical" (Warden) theorist practitioners preached vehemently the gospel that it is possible to secure "a victory for air power and airpower alone," to quote British historian Sir John Keegan on the subject of NATO's ultimately successful 78-day air campaign against Serbia over Kosovo in 1999.[59]

Douhet claimed that airpower should be employed initially in order to disable and destroy the enemy's airpower on the ground. Next, having thus secured "command of the air," airpower would so terrify a civilian population by direct assault with high explosives, incendiaries, and gas that its government would be obliged to sue for peace. For his part, Trenchard came to believe that bombing must destroy the morale of an enem y's civilian population, the same thesis as Douhet's. But, whereas Douhet was willing to advocate assault explicitly upon civilians, Trenchard always insisted that civilian morale should be attacked through the infliction of damage and destruction upon vital industry. American "Billy" Mitchell was far less focused upon the mysterious quality, "morale," and far more upon the damage that precise long-range bombing could do to an ene-

my's "vital centers." He cofounded the American school of airpower doctrine which prescribed defeat of the enemy through the destruction of the most vital "nodes" in his "industrial web." If we fast-forward to the late 1980s, US Air Force colonel John Warden all but individually revived the classical theory of strategic airpower though his preferred route to victory by airpower was through the imposition of command paralysis. Warden reinvented the "air campaign" for the contemporary context albeit with much assistance from the intellectual heritage of Mitchell and the US Air Corps Tactical School of the 1930s. Warden specified a bombers' dartboard comprising five concentric circles. "The most important element—the enemy command—is in the center circle; essential production is second; the transportation network is third; the population is fourth; and the fielded military forces—the shield and spear—are fifth. The most critical ring is the enemy command structure because it is the only element of the enemy—whether a civilian at the seat of government or a general directing a fleet [sic.!]—that can make concessions."[60]

Figuratively or literally, Warden's vision of a well run strategic air campaign is one which seeks to decapitate and hence paralyze the enemy. Even if this ambitious goal is unachievable, the five-ring thesis provides a general theory of how an air campaign should be conducted. It explains targeting priorities. In short, it is an air strategy. Of course, the problem is that Warden's theory, in common with those crafted between the two world wars, is not just an air strategy. The theory is presented as an air theory of war. The theory claims to encompass all that needs to be done, as well as explaining how it should be done, in order to secure victory in war as a whole.

With the arguable exception of NATO's air war about Kosovo in 1999, "strategic airpower," which is to say airpower intended by its employers to achieve decisive strategic effect for political success, seems to have failed in war after war after war.[61] The air community has defended the integrity of its quasi-sacred doctrine by arguing repeatedly that the available airpower was misused, some wrong choices were made as to quantity and quality, and its technology has not been quite adequate for the mission. The first argument has been politically safer than the latter two. It so happens that the airperson's defense of air-

power has had a solid foundation in fact. Airpower has been misused. Not infrequently, highly challengeable technical decisions have been made. While it cannot be doubted that prior to the late 1990s and the 2000s airpower was hindered significantly by some strictly technical limitations. However, this is not to deny that from the 1940s to the present, the military and hence strategic deficiencies of available airpower, more often than not, have been the product of a mismatch between the war fighting anticipated and that which actually happened. One can always do better with more effective technologies, but it helps if there is some natural fit between the competencies of a particular air posture and the military tasks that are faced in conflicts.

It is unusual for a single scholar to dominate a strategic debate, but this is what has happened with respect to the argument over strategic airpower since the mid 1990s. The scholar in question is Robert A. Pape whose tour de force, *Bombing to Win: Air Power and Coercion in War*, appeared in 1996.[62] Contemporary debate about coercion from the air has been all but paralyzed by Pape's analysis. Although there is much of value in Pape's book and his other writings on the subject of strategic bombing, his central thesis is plainly and demonstrably wrong. Lest I be accused of misrepresenting Pape, I must hasten to permit the scholar in question to hang himself with his own words.

> Thus, from Iraq to Bosnia to North Korea, increasingly the first question in debates over American intervention is becoming, "Can air power alone do the job?"
>
> The answer is no. First, coercion is very hard. It hardly ever succeeds by raising costs and risks to civilians. When coercion does work, it is by denying the opponent the ability to achieve its goals on the battlefield. However, even denial does not always work. Sometimes states can succeed only by decisively defeating their opponents. *Second, strategic bombing does not work. Strategic bombing for punishment and decapitation do not coerce, and strategic bombing is rarely the best way to achieve denial. The "precision-guided missile revolution" is not likely to enhance the coercive effects of strategic bombing.*[63] (emphasis added)

The final sentence just quoted would be a revelation indeed to the regular Iraqi army of spring 2003. For all the good sense in Pape's analysis, he is guilty of committing cardinal errors against

both the gods of strategic theory and the often-unanticipated hand of history. Specifically, Pape and those he has misled have made four significant errors, a quartet that combines to destroy the value of his theory that is crafted to condemn coercion by strategic bombing.

First, Professor Pape is by no means the first, and he certainly will not be the last, theorist to be discredited by events. Despite his evasions in the immediate aftermath of regular Gulf War II, presented in a *Foreign Affairs* article in 2004,[64] the course of the invasion of Iraq in 2003 showed unmistakeably that Pape was wrong. By precision bombardment, assisted by an electronic political-warfare campaign, US airpower prevented the Iraqi Army from mounting a coherent defense of the country.[65] Baghdad's defeat in regular warfare in 2003 was the result of more than one or two factors, but it is difficult to argue seriously that US airpower was not in pole position among them. Pape has suffered from the familiar malady of "theory lock." Scholars are reluctant to admit that the theory upon which their career and reputation rests is wrong. In 2003, US airpower did to Saddam Hussein's regime what Robert A. Pape claimed it could not do—period. Was this an exception that proves the rule? Probably not. Pape's fundamental problem is that he plunged into the highly context-dependent realm of strategy within actual historical cases and mistakenly elevated what he believed his case studies revealed to the level of a general theory.[66] In other words, his (anti)theory about strategic bombing, even if historically well evidenced, can only be as reliable as his historical cases allow. His reasoning may have been good enough for the mid 1990s, but assuredly it is not for today, as he all but admits in the 2004 article cited above. Lest I be misunderstood, I must explain there is no disgrace in being wrong in prediction.

Second, although classical and neoclassical strategic airpower theory specifies the ability to win wars by aerial action alone, we are not obliged to endorse such an impractical goal. In principle, there is no reason why aerial coercion should not suffice to produce a "win." Neither Professor Pape nor anyone else can explain why airpower is incapable of independent decision. But, if we relax, as we should, what we are prepared to accept as success for strategic airpower; the nonsense in Pape's

theory is immediately revealed. Just because the classical airpower theorists grossly overstated their case, there is no good reason why we also should sin. It is unhelpful in the extreme to demand, or expect, of airpower that it should be able to win wars unaided by its supposedly "joint" partners. Rarely, airpower will deliver such a success. But, as a general rule it will succeed either by deciding which belligerent wins—which is to say, "us"—or by greatly assisting our other armed forces so that they can succeed in their warfare-leading roles. It must all depend upon the specific historical context. As theorist after theorist, and historian after historian, insists correctly, the utility of airpower is highly situational.[67] We need hardly add that this claim does not apply to airpower alone among the military instruments.

Third, Professor Pape neglected to notice that not all wars are to the death for the most vital of interests. Yes, an enemy engaged in a war literally for physical and political survival may be beyond coercion from the air or from anywhere else, but most wars do not have that character. Carl von Clausewitz was capable of effecting an intellectually dramatic "hand-brake turn" in 1827 when he realized that warfare typically lacked an absolute or total quality.[68] Hence his revised manuscript of *On War* shifted most significantly in recognition of the salience of the political factors critical to limited warfare. Coercive bombing cannot be sensibly analyzed only with reference to entirely desperate belligerents.[69]

Fourth and finally, the content of the classic theory tends to emphasize strongly the bombing of nonmilitary targets, albeit generally not civilians per se, *only their morale*! A more useful theory of strategic airpower would not be wedded to a rigid template, a doctrinal credo of bombing priorities. Properly stated, a proper theory of airpower must *inform strategies* anticipated to achieve maximum strategic effect upon the course and outcome of distinctive, indeed unique wars. This effect may be secured in political or military command decapitation or just paralysis, by the physical destruction and enfeeblement of fielded forces, or in a combination of these. The historical context must guide the application of airpower. To claim as a grand generalization "strategic bombing does not work" is plainly

wrong, theoretically and empirically. Faulty theory has a way of producing flawed answers.

### Fallacy Seven

*The institutional independence of the US Air Force is a major hindrance to the development of a truly joint, coherently integrated American theory of, and doctrine for, warfare.*

This is a plausible fallacy to most nonairpersons. Even to those with no organizational stake in the abolition or radical demotion of the US Air Force from its status as a distinct, bureaucratically coequal armed service—this claim appeals to both strategic logic and common sense. This being so, it is perhaps surprising to appreciate just how erroneous the argument proves to be when subjected to close examination.

The fallacy holds that the United States does not require an institutionally, and hence politically, independent air force. The claim has several interlocking pieces. Although there remains a long-range-(presumably very largely nuclear-) strike mission, there is no strict necessity for this even to imply the need for a American air force. Seaborne forces increasingly can fulfill the mission, while the comparatively recent creation of US Strike Command expresses the conviction that strategic-offense, defense, space, and cyberspace forces, should be organized and commanded as a single bundle of assets. Nuclear deterrence, for example, is a national-strategic task, not an air force one, and this has been a reality since the 1950s, when the US Navy first acquired the ability to strike at Soviet targets with nuclear weapons. In addition to there being no strategic nuclear (or other) mission that might lend persuasiveness to the case for independent airpower, the entire historical record of airpower in warfare demonstrates the complementary character of airpower, land power, and sea power (and now space power and cyber power). Institutionally and politically independent airpower cannot be trusted to perform as a reliably joint team player. The deepest belief of airpersons is that theirs is an instrument uniquely capable of securing independent military and strategic decision. While they can be bludgeoned into air-land and air-sea cooperation, usually they will perform reluctantly in those roles. They will not be uncooperative just for the

sake of being uncooperative. Rather will they be strongly motivated to resist what their quasi-religion of (strategic) airpower tells them is the proper employment of their specialty.

The core problem, this fallacy insists, is that an independent air force creates and sustains an air ethos that history shows to be counterproductive for the most effective prosecution of warfare in all its complexity. All major institutions, especially military ones, are obliged to invent, foster, and officially adopt distinctive cultures.[70] I should rush to explain that there is no necessary implication of a malign parochial, if Machiavellian, cunning in this argument. Generic opponents of institutionally independent airpower usually can be brought to recognize that airpersons are quite sincere in their credo, albeit mistakenly. I could proceed further to present the arguments against a separate US Air Force—past, present, and prospectively future. But I believe that the points exposed already will suffice. The indictment, for this is what it amounts to, is truly serious.

There are, and have always been, some unworthy reasons fuelling this fallacious belief but also one must admit that there is some good sense. Stated at its broadest, the purveyors of this fallacy, that is, the sincere ones, fail to grasp that separate armed services are a regrettable necessity. One could even go so far as to claim that an independent US Air Force, Navy, Army, (sort of) separate Marine Corps, and Coast Guard are necessary evils. Over the past decade, leaders of the US Navy and Coast Guard have advanced the concept, and some limited reality, of a "National Fleet."[71] In truth the United States does not and will not wage war by service, or by discreet geography, but rather by inherently joint combatant commands. The country wages warfare holistically with its *armed forces*, not with its Navy, Army, Air Force, and Marine Corps. However, although modern warfare for the United States necessarily is a joint project, it does have to be prosecuted in distinctive geographies and the distinctions matter greatly. Neither Americans nor other people realistically can aspire to recruit, equip, train, and employ generic soldiers, warriors, or combat persons—pick your preference! Although warriors and other military personnel share features in common among the geographical environments, it remains a fact that military behavior differs radically from geography to geography. In other words, while the separate armed services consti-

tute some organizational affront to the essential unity of warfare and war, more importantly they express inescapable material and consequential psychological truths.

Some air theorists have advanced the proposition that there is an "airmindedness" that needs to be treated as a vital input to defense planning, military strategy, and operational designs.[72] This obviously self-serving belief happens to be true as well as every bit as significant as air theorists insist. Indeed, the most persuasive and unbiased explanation of the worldviews of airpersons, soldiers, and sailors is to be found in an outstanding short book written forty years ago by an American rear admiral, J. C. Wylie.[73] He exposed the enduring reasons why the world as potential battlespace, its difficulties and its opportunities, looks very different to those who must function on land, at sea, in the air, or—today—in control of space power and cyber power. The United States is obliged to approach warfare holistically but also it has no option but to rely upon the expertise of military professionals who have no choice other than to be expert operators in one geography rather than others, let alone all five of them. And, as Wylie insisted, the world looks very different to those who must function in the mud of terrestrial terrain, on or under the uniformity of the sea, or over the heads of both.

It follows, as history and—for once—common sense suggest, that although airpersons will not as a consequence of their airmindedness necessarily have a grasp of the "grammar" of warfare as a whole,[74] they are certain to enjoy a superior understanding of what their particular military instrument can, cannot, and therefore should not be expected to deliver. At higher levels of command and staff work, of course, the airperson is required to empathize with those of other geographical persuasions (land, sea, space, and cyberspace) and perform jointly to a degree ever greater with career altitude.

The point that some critics of the US Air Force have failed to grasp is that the airmindedness that the airperson lives, breathes, and fosters is not only a reflection of the semirecreational joy of flying—though this should not be denied—or of loyalty to an institutional culture. In addition, and far more important, there should be no dispute over the fact that the US Air Force ought to be trusted to comprehend aerial battlespace,

if not always its terrestrial implications, better than do the Army and the Navy. Of course, faulty service doctrine can impede, and has impeded, such comprehension. This is why the promotion of unsound doctrine is so damaging to the service in particular, as well as to the country's strategic potency overall. The Air Force should learn from its history that when current doctrine hinders nationally required performance, eventually it is compelled to fall into line, regardless of its current credo. The US Army Air Forces shifted doctrine in the winter of 1943–1944 in order to sanction long-range fighter escort for the daylight bomber offensive against Germany (and later Japan). In 1965 the US Air Force, under great pressure from Gen William Westmoreland, US Commander Military Assistance Command Vietnam, via the White House, assigned a modest fraction of its quintessentially strategic B-52 force to a tactical mission over (largely South) Vietnam, the Arc Light strikes.

Airpersons need to appreciate the challenge in a vital paradox. On the one hand, only they can be trusted fully to understand airpower's strengths and limitations in detail. On the other, soldiers and sailors frequently mistrust them because of their actual, perceived, or anticipated military and strategic parochialism. All one can say about this, really, is that each service, reflecting its particular duties and contexts, cannot help but filter data through its own geographical lens. This is just a fact of strategic life and indeed of institutional loyalty and occupational culture. To have an independent air force is an expression both of geostrategic reality and is the best way by far to ensure that the ever more critically significant aerial dimension to conflict is appreciated in a professionally expert way. One need hardly add that service independence does come at some occasional cost in the quality of jointness foregone. However, the potential cost of a shotgun multiple marriage of the still fairly separate services would be truly enormous. If one wishes to advance the misuse of airpower, one could hardly do better, or worse, than recommend the institutional demise of the US Air Force.

Last, but not necessarily least, among the reasons why it is a fallacy to believe that the United States should not maintain a separate air force is the factor of morale, the human dimension. We humans, military folk probably more than most because of the unique demands of the profession, demand, even crave, clear

identity. It is a source of particular pride to join, be initiated into, encultured, and looked after by an armed service. The key values are tradition, pride, and their product, morale. Given the potential material perils of the warrior's life, his psychology has always been critically important. Moreover, given that warfare, in nearly all its aspects, essentially is a team effort, the strength of an individual's identification with his "team" is of fundamental moment. Today, all US service personnel are exactly that, players in a great joint enterprise. But the physical and hence key psychological reality is that they have a particular military geographical orientation and hence unique military institutional affiliation: they have a military family, actually a cluster of family groups, greater and smaller. This matters for military performance—it is an eternal truth about "soldiering." The ancient Greeks knew it, as did the Romans, and so should we.

**Fallacy Eight**

*Airpower can never be other than a minor player in the conduct of COIN.*

This is yet another fallacy apt to persuade because it contains some truth. Also, it sounds plausible with the image conveyed of firepower from the sky being applied without due care and discrimination, against insurgents who often are indistinguishable from largely innocent or even friendly civilians. The claim is to the effect that whereas airpower today should be a force for military decision in regular-conventional warfare, in COIN much, even most of its potential benefits cannot be delivered. The very nature of COIN warfare, so the argument proceeds, denies airpower the kind of targets against which it can be lethal. At a more fundamental level, whereas regular-conventional warfare is won by defeating the reasonably symmetrical forces of the regular-style enemy, in COIN victory is won only by securing the support of a large majority among the general public. The military road to success in regular warfare is by a flexible mix of firepower, shock, and maneuver. COIN warfare, in the main, is radically different. We must add the qualifier "in the main," because it is easy to forget that insurgency is not synonymous with guerrilla warfare or terrorism. Both are only tactics or styles of combat. By definition, indeed insurgencies aspire to expand

their scale of military behavior and "go regular" in order to achieve a decisive strategic and then political victory. This means that although insurgencies start small and highly irregular in style, if successful they will grow large and increasingly regular. It follows that COIN is not by definition a conflict only with an enemy committed narrowly to irregular forms of action.

Despite the important qualification in the paragraph immediately above concerning the "mixed" character of many insurgencies—with regular and irregular styles of fighting—it is generally true to claim that COIN requires the defeat of a guerrilla/terrorist foe. Two facts provide the highly plausible basis for the fallacious belief that airpower can only be a minor player in COIN. First, it is the case that COIN must principally be a political venture—so airpower is at a discount simply because it is a military tool. Everyone agrees that good governance is the key to counterinsurgency success. But what many scholars and officials neglect to mention is that generally a COIN campaign is required precisely because good governance has been lacking. In addition, not all textbooks on COIN explain as clearly as they should that such governance, though typically essential, cannot deliver political success in the absence of physical security for the bulk of the population. Neither can succeed without the other. COIN does not work as a wholly military enterprise but neither can it be treated as an exclusively political mission. Second, airpower is a military tool inherently incapable of engaging "up close and personal" with enemies or actual and potential allies amongst the people on the ground.[75] In combination, these twin blows suffice to make a potent generic claim for airpower's minor status in COIN.

Although this analysis explains and exposes this fallacy for the error that it is, the reality is, COIN must privilege land power, really ground power, over airpower. Given the necessity for a joint, even integrated, ground-air approach to COIN's military dimension, one needs to be careful lest the notion is conveyed that ground and air are competitors rather than mutually dependent partners. Content to follow "Billy" Mitchell's lead, this study takes a broad view of the nature of airpower.[76] For our purposes here, airpower is understood to mean the potential military and strategic effects of anything useful that can fly. So airpower can refer to the inherent capabilities of the diverse air instrument as

well as to its consequences in application. The gloriously mobile strength of airpower "works" kinetically as well as logistically. It gathers intelligence, evacuates the wounded, shifts troops and removes them, performs direct support to friendly assets in half a dozen ways, and indirect support in a dozen or more. With very rare exceptions, airpower will be the supporting force rather than the supported force in COIN.[77] However, to use that familiar formula is to risk misleading the reader. The supporting airpower is, by definition, the junior partner in COIN.[78] But that subordinate role, with its basketful of tasks, has become literally essential. To refine the point, while many states in the past have conducted COIN with zero or very poor aerial assets, the United States today and tomorrow could not even conceive, pragmatically, how to do so. America is uniquely air dependent in its way of COIN but it is far from lonely. Every country in the world that has a COIN problem and owns some airpower finds ways to employ its asymmetric (over insurgents) capability more or less usefully.

It may or may not be convenient to make a sharp conceptual and operational distinction between supported and supporting forces, but this idea is unhelpful in its ability to conceal the necessity for the contribution of the junior element. Airpower for COIN in the 2000s is not just "nice to have," it is absolutely essential. To register this empirically based claim is only to recognize operational realities; it is not to argue with the proposition that COIN inherently is ground- and people-centric.

Air strategy is a necessary component of the overall military strategy which in its turn is a necessary component of the grand strategy for a particular COIN campaign.[79] In the vital years from 1965 to 1968, US airpower did not fail in Southeast Asia. What failed was US grand strategy and military strategy, airpower contributed intensively but alas haphazardly.[80] It is commonplace to observe that America's airpower for that conflict inherently was so potent that it should have been able to have far more of a strategic impact on the course of events than was the case. This is apt to neglect the fact that US airpower and what passed for air strategy could only be as effective as the US grand strategy allowed. It is unlikely that any use of airpower could have saved South Vietnam given the fundamentally unsound premises upon which overall US strategy rested. The strategy

changed radically in 1968 but by that time, America's domestic political clock had struck twelve.

There is a danger that in analyzing airpower somewhat abstractly, as here, postural detail that really matters may be lost from sight. Airpower is not a uniform capability. A country may enjoy a sound understanding of what airpower should be able to accomplish, either as a primarily supporting or supported force, but countries do not fight with concepts, sound or otherwise. They fight with actual people, aircraft, and the infrastructure to keep those people and aircraft flying. An inadequate air posture will always be able to frustrate what otherwise appeared to be a good idea. The French in Indochina ultimately were defeated militarily in notable part because their airpower was required to generate more strategic effect in different ways than it was able. US airpower in Southeast Asia in the 1960s was awesomely powerful in an absolute sense, but in its fixed-wing components it was an instrument designed and trained to wage a short war of the highest intensity in Europe. For COIN support, an air force judged good enough to fight "the big one" is not necessarily good enough to cope with the different challenges posed by a complex irregular and regular style in warfare. In some significant ways, the proper diverse employment of airpower for COIN is every bit as challenging as is the task of preparing for a great-power conflict. Suboptimal equipment for airpower in COIN must lead to a suboptimal contribution to the ground-air team effort, notwithstanding the professional skills and courage of airpersons. Nonetheless, even the ill consequences that flow from the self-inflicted wound of poor, or just unlucky, choices in aerial force structure fade into relative insignificance when they are compared with the harm inflicted by incorrect strategy, military and grand.

Airpower is a vital component in the total civilian-military effort necessary for success in COIN. But land power, really meaning ground power, has to be the lead, the supported, military force. Efforts to reverse the supported-supporting force relationship in favor of airpower have yet to be validated as sound. Indeed, quite the reverse has been the case. Over Lebanon in July–August 2006, the Israeli Air Force (IAF) provided an all but definitive demonstration of the error in air-led COIN doctrine.[81] The IAF seemed to fail. However, what really failed

in Lebanon in 2006 was not the IAF,[82] let alone airpower generically, but rather a foolish grand strategy and a military doctrine that over promised. Israel required its air force to achieve results beyond its means. If any institution failed, it was the Israeli Army. In a role subordinate to airpower, whose campaign it was supporting, the Army performed poorly. One should hasten to add that an important reason why the Israeli Defense Forces (IDF) did not perform well was that the enemy, Hezbollah, performed well at all levels of conflict (tactical, operational, strategic, and—above all—political).

There is an obvious military and strategic lesson to be drawn from Hezbollah's humbling of Israel in 2006. Victory is improbable if one asks airpower to perform tasks for which it is not well suited against an intelligent and competent enemy. Strategic history favors irony and paradox. The undoubted major tactical virtues of the IAF encouraged strategic vice. Airpower is the sharpest tactical tool in the Israeli military toolkit, but that does not mean that it can substitute for political sense, grand strategic competence, or for joint integrity in military strategy. In August 2006, the IAF unsurprisingly failed to deliver a quality of decisive effect that was beyond it.[83]

Airpower has qualities that politicians tend to find uniquely appealing. The more extreme advocates of strategic airpower, seeing their favoured force as the dominant military source of strategic effect, find themselves in a dangerous alliance with policymakers in the search for swift and economical solutions to messy and complex problems. Even when properly conducted, COIN is always untidy and requires protracted military campaigning in the context of what the British government today likes to call a "comprehensive approach," one that combines political, military, and economic efforts. It is tempting to believe that an air-led COIN effort, relying primarily upon kinetic effect, will be able to defeat insurgents. Known or suspected deficiencies in one's ground power could be sidelined and casualties on both or all sides should be modest. Lebanon 2006 can be viewed as a candidate-classic example of the misuse of airpower because of erroneous doctrine and strategy. The grand political, strategic, and military narrative of the Israeli adventure in Lebanon in that year illustrates near perfectly why it is essential for US security that fallacies about

airpower in general, and US airpower in particular, should be recognized, exposed, understood, and avoided.

It may be important to mention a pathology, not of airpower itself, but of its misuse. Because the air instrument is swift in execution, lends itself to overoptimistic expectation, risks few American lives, and—in the US case—these days, at least, almost invariably is available, it is a constant temptation. When politicians want to do "something," most especially when they need to be perceived as doing something, and when other nonmilitary and military options either are not available or could only work slowly and uncertainly, it is a great temptation to reach for one's airpower "gun." Airpower usually will be the first preference for US policymakers who feel the need to make a bold, hopefully decisive statement through action. Too often, alas, it is highly expedient to resort to kinetic airpower as the default option; it is the available tool for those who are impatient or desperate. Of course, there are occasions when kinetic airpower should be used. This discussion is not in any sense intended to offer blanket condemnation. For a decidedly imperfect analogy, high-proof alcohol can have valuable medicinal effect, but it is a constant temptation to abusive behavior by those who are weak and become addicted. Because American airpower, necessarily and advantageously, is all but ubiquitously available to lead or support military action, it cannot help but invite and produce addiction. None of these comments contradict this author's belief that the merits of a "gently, gently" approach to "war amongst the people," particularly to COIN, can be overstated. As always, actual behavior, in contrast to theory, principle, and some myths, needs to be appropriate to the real-time situation.

It is easy to forget, for example, that the dominant British imperial approach to COIN was known, for excellent reasons, as "burn and scuttle." A punitive expedition, small or large, would teach the locals the errors of antisocial insurgent behavior. It is not politically correct to admit this in polite Western circles, but from the bad old days of colonial "policing" until today in Afghanistan and Iraq, there are times when it is highly desirable, strategically, to damage property and kill people. Regrettably we are talking about warfare and violence resides at the core of warfare's nature.[84] I should not need to add that the violence

should never be other than strictly an instrument. It ought not to become merely expressive, let alone recreational for those executing it—do some among our aircrews enjoy killing and damaging? But once the key is turned for its employment, we humans inalienably are in perilous terrain. Potential pathologies lurk to ambush what began as sound strategic behavior.

Because COIN can be exceedingly frustrating and demanding of high, even some rare, skills tactically on the ground, it is only sensible to reach for airpower to find compensation for otherwise missing effectiveness. In common with special operations forces, airpower is always liable to be charged with tasks that either it cannot perform well or that it ought not to be required to attempt at all.[85] What are those tasks? The answers derive both from airpower's inherent strengths and limitations, but most significantly of course, from the actual condition of friendly airpower in specific historical contexts. General theory has its place but it must always be expressed in terms suitable to distinctive historical circumstances. For example, although there are enduring truths about airpower that stem from the very nature of the instrument, those "truths" allow for a wide range of air competency along the spectrum of challenge. No matter how mature and elegant one's general theory of airpower, that theory will not answer such questions as, can—respectively German, French, and American—airpower:

1. sustain the Sixth Army in Stalingrad now in November 1942?
2. sustain the 15-thousand-man garrison at Dien Bien Phu now in March 1954?
3. sustain our stronghold at Khe Sanh so close to the DMZ now in January of 1968?

Examples are richly strewn throughout modern, even contemporary history. Strategy, including strategies for airpower, is always particular in detail, in its application at specific times, in distinct places, and by unique militaries. Airpower is a wonderfully generic concept, meaning anything useful that flies, it is anything but generic in its material reality from state owner to state owner in particular locales and at particular times.

**Fallacy Nine**

*The twenty-first century is the missile, space, and cyberspace age(s); airpower is one of yesterday's revolutions.*

This claim points to the still under-acknowledged fact that the emergence, maturing, and near perfection of airpower in the twentieth century was itself, and required, the most radical change in warfare in the period. The twentieth was the air century notwithstanding the abrupt atomic then nuclear facts of the 1940s and beyond. The airpower revolution in warfare, though nearly a hundred years in process, is still in some senses incomplete. If this were not so, how could this author have written this study? In the later part of the first decade of the third millennium CE, controversy continues to attach to issues such as the relative utility of airpower vis-á-vis every other kind of military power and those other kinds have expanded of recent decades to include space and cyber instruments. This fallacy points with unerring accuracy to the readily demonstrable facts that ours is not only the "air age" and the "nuclear age," but also the "missile, space, and information ages." As one should expect, the more recent technological arrivals seem more exciting, being new, more challenging to understand, and possibly more deadly in use than are "yesterday's" military tools.

The fallacy in question here pertains to the claim that airpower is becoming obsolescent to obsolete for a growing number of mission types. What is wrong with this assertion is the prediction that, in effect, airpower is being squeezed out of playing valuable military roles. Unmanned aerial vehicles (UAV), missiles of all kinds, space systems, and computers are reducing the significance of manned aircraft in its several manifestations. The error that fuels this fallacy is the mistaken conviction that the military relevance of manned airpower is being overtaken by technology. It is not. While it is true that some missions can and should be performed by UAVs, ballistic missiles, and orbiting spacecraft, there is no persuasive case for a need to anticipate the demise or even the substantial retirement of manned military aircraft. Ironically perhaps, the same technologies that appear to undermine the need for manned flying vehicles render manned aircraft much more effective. Yet

again in this discourse, in this case regarding *manned* airpower, controversy is foolishly framed in terms of either/or, when it ought to approach the matter as both/and. Yes, there are legitimate issues to analyze and debate over the future of airpower, especially manned airpower, in particular roles. But that analysis and debate should be conducted in full awareness of the complementarities of the technologies and vehicle types under discussion.

To repeat what by now must read as a familiar refrain, the importance of the subject addressed in this concluding fallacy could hardly be higher. At issue here is nothing less than the future air posture, space posture, and cyber posture of the world's only true airpower, the United States. Should the F-22 and the F-35 be regarded as the last generation of manned fighter aircraft? Does the United States require a follow-on long-range bomber to succeed the venerable B-52, the middle-aged-plus B-1, and the B-2? Should we be thinking of some approximation to a flying "missile truck," generically akin to the naval concept of an "arsenal ship?" Are we entering or have we entered already the final phase of the era of military manned aircraft in some key roles? These are large questions of great importance that this study cannot answer with absolute confidence. Nonetheless, this author is optimistic about the future of manned military aircraft for a number of strong reasons. Although these reasons are not advanced as would-be eternal truths, I do believe them to be more than marginally persuasive.

First, menacing air defense contexts in the future can be transformed by defense suppressive measures. Warfare is always a duel. It is necessary and useful not to forget the growing problems posed by state-of-the-art air defenses. But it is scarcely less necessary and useful to remember that not all air defenses will be state-of-the-art, and even those that are may be taken down or at least tamed by smart tactics and technologies. Just because the global military environment contains weapon systems lethal to particular elements in our arsenal, it need not follow that our nominally threatened forces are in any sense thereby rendered obsolete. For example, antiaircraft artillery appeared very early in the history of airpower, but scarcely ever has it achieved a tactical or technical dominance. Dedicated antitank weapons, similarly, followed closely on the

tracks of the first tanks, but tanks remain with us. The same reality has applied at sea. Submarines, for example, have yet to negate the value of a surface fleet, they can just make its operations more hazardous.

Second, while it is true in fact and potentially even more so that space and cyberspace could perform some missions currently assigned to airpower, it is essential to recognize the eternal truth that no geographical environment can be a sanctuary if it is exploited for strategic advantage. Cyberwarfare already is a reality. It figured significantly in Operation Iraqi Freedom in 2003;[86] it is a minor but continuous dimension to great power rivalry today; and we can be absolutely certain that it will figure in a major way in future conflicts, be they largely regular or irregular in character. It is plain to see that cyberspace is not a sanctuary today for any belligerent. Furthermore, orbital space, certainly space systems considered in all three of their segments (satellites in orbit, communications among them and with ground facilities, and ground facilities themselves), inevitably is going to join the other four geographies in the great column of "battlespace." To summarize, although it is sensible to anticipate growth in the lethality of late-model air defenses, there are not good grounds for pessimism over the prospects for US airpower to achieve tolerable survivability by tactical skill and technical excellence. Also, control of the space and cyberspace environments similarly will have to be defended. This is integral to the logic, even the lore, of warfare as a duel—past, present, and future.

Third, missiles tend to be relatively cheap when compared with manned aircraft. But this general truth easily can mislead. Missiles, certainly ballistic missiles, self-destruct in their suicidal missions, aircraft do not. How do we conduct an intelligent cost-benefit analysis comparing reusable with one-shot weapons? Also, while missiles have some obvious advantages—no loss of morale for example—and while generally, they are immune to the constraints of weather, they are far from invulnerable. This is indeed the missile age but increasingly it will be the missile-defense age also. Ballistic missiles, in common with orbiting spacecraft, are obliged to travel as the laws of physics command. Since those laws are common knowledge, the trajectories of ballistic missiles are predictable. At least they are pre-

dictable if the adversary has the technical means to observe the facts of their launch and early progress. In principle, missiles, ballistic and cruise, as well as satellites can be programmed or commanded to maneuver but this capability is technically demanding and operationally costly in loss of payload.

For logistic functions, manned aircraft face zero competition from missiles and spacecraft. This situation is likely to continue indefinitely. Given that it costs $10,000–$20,000 to hoist a pound of weight into orbit, space power has a way to go before it can even begin to emerge as a long-haul carrier of heavy or bulky items.[87] Missiles, transorbital and suborbital, are simply not in the technical-tactical frame to compete with airlift. Missiles can travel more rapidly, even as accurately as can aircraft but generically there are huge pragmatic constraints on the spectrum of their utility. For an overall judgment, missiles lack the flexibility of manned aerial vehicles. One day, UAVs may be genuine rivals to manned aircraft for nearly all intelligence gathering and strike roles, but I suspect strongly that major air powers will continue to favor retention of the flexibility and adjustability to unexpected circumstance inherent in the human presence in the cockpit.

Fourth, even in this age of fairly mature long-range missile technologies, if the intercontinental-manned bomber did not exist the United States would need to invent it. The ability to reach out and touch foes literally anywhere on Earth—with aerial refueling and some support from forward basing—with the flexibility provided by manned aircraft is valuable beyond strategic price. In all except for an extreme nuclear scenario, bombardment from altitude constitutes nowhere near the whole of warfare, let alone the whole of war. But such bombardment is a vital arrow in America's grand-strategic and military-strategic quivers. For reasons of survivability, prelaunch and en route, the United States should continue to find strategic value in an ICBM force. However, that force will not often compete plausibly with manned aircraft to be the chosen instrument for very long-range bombardment. Aircraft are not associated as closely as are ICBMs with nuclear missions, they are reusable assets, and they can execute tasks subject to real-time guidance for flexibility.

Fifth, airpower and space power are in modest measure rivals, but to a far greater degree are complementary. What they are not

are two geographically adjacent instruments that are in the lengthy process of effecting a fusion that offends against the laws of physics. In other words, airpower plus, or multiplied by, space power does not equal aerospace power. Aircraft inherently enjoy complete freedom of maneuver, subject only to the constraints of fuel weight, volume, gravity, and human operator tolerance. Spacecraft, by contrast, enjoy no freedom of maneuver in orbit, save at a high cost in payload for fuel and (admittedly small) engines. The relative military and strategic value of aircraft, manned or UAVs, and spacecraft does not admit of a general analysis and answer. This vital subject is thoroughly mission and military context specific. For high-resolution imagery needed on short notice, for example, reconnaissance satellites in low-earth orbit may not be well positioned to respond. With reference to the possible military value of spacecraft as providers of kinetic support for terrestrial combat, gravity would be our friend. To date, though, even if the political arguments against "weaponizing" space could be overcome, there is no compelling reason to do from orbit what we can do far more cheaply and flexibly from Earth. By way of a closing thought, US preparation for space warfare in all its aspects—to, in, and from orbit—currently is so immature, in good part because our theory and doctrine for space power still leaves so much to be understood and agreed, that it is premature to advance far into the zone of considering air/space competition. Overall, it seems all but self-evident to this author that for the US armed forces, airpower, space power, and cyber power must be approached as true partners, not as rivals.

## America, the Air Power

Airpower is America's sharpest sword in regular-conventional, though probably somewhat asymmetrical, warfare. When the country chooses to wage warfare against enemies who fight irregularly, it is choosing a military context wherein its most deadly weapon will have only some discounted value. If warfare against irregulars is judged necessary by US policymakers, then so be it. But, those politicians need to understand that in wars where airpower cannot be the dominant tool in the military tool bag, the United States may well prove to be fatally short of the

means and methods essential for sufficient strategic advantage. When airpower leads, which is to say in regular warfare, the battlespace is healthily tilted, probably precipitously, in America's favor.

In this study, we deployed nine fallacies about airpower for the overarching purpose of improving understanding of what US airpower generally can do well and what it is likely to do poorly. Above all else, the story here has emphasized the necessity for a truly joint, even integrated, approach to warfare. This is not, at least should not, reduce to the banality that each military instrument in its way is strategically essential, true though such a platitude happens to be. Rather should the claims be registered that airpower:

1. is America's prime military advantage, a benign condition that has endured since 1943–1944; and
2. that the more relevant, militarily, airpower is in the unique context of a particular conflict, the more probable it is that American arms will win.

These claims should not be read as demeaning to the US Army and Navy. The former noble institutions today and in the future, more and more, must be the supporting rather than the supported forces *in regular-conventional warfare*. In warfare against insurgents, the reverse is true. As for the US Navy, its vital contribution to maritime strategy and even its residual interest in naval strategy narrowly, is all but wholly tightly meshed with a pervasive aerial dimension. For the United States, at least, to try to distinguish between sea power and airpower in the twenty-first century would be an exercise in futility. The details have changed radically, but the claim just made applied no less to the realities of US military power in the 1940s than it does today. The US Navy and Marine Corps "do" airpower of characters and in quantities that the navies of other states cannot even begin to emulate. If other states need to compete with, perhaps even fight the United States at sea, they must seek means and methods highly asymmetrical to those favored by America's sailors and sailor-airpersons.

It may be useful to contextualize my arguments in this study by offering the reminder that it has been unknown since the Ro-

man era for a state to be militarily dominant in all geographies. The United States cannot always translate this dominance into decisively favorable strategic effect for true political victory, but the facts of the current US superiority are both readily grasped and politically appalling, and unacceptable, to the country's major state rivals (which is to say China and Russia). Hopes to the contrary are almost certain to be revealed by future events to be just that, only hopes. The point of note is that the United States today is not only the world's first airpower, also it is the world's dominant military sea power and it fields the world's finest army. The US lead in space power is perhaps of 10 to 20 years duration, though its neglect of dedicated active means to achieve and sustain space control should be cause for anxiety. As for cyber power and its belligerent exercise in offense and defense, no one really knows how the United States would fare against a skilled opponent. The unarguable success of US cyberwarfare against Iraq in 2003 should not be permitted to fuel complacency. In military conditions characterized overwhelmingly by regular-conventional combat, it is much easier and cheaper for America's enemies to wage effective cyberwarfare than for them to pose credible threats in the air, at sea, on land, or in orbit. Quite, what an enemy, in state or nonstate form, would do strategically with technical success in cyber disruption is somewhat opaque at present.

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To reveal and demolish some fallacies about airpower is not much more challenging than shooting fish in the proverbial barrel. However, because the fallacies examined here generally have contained a germ or two of merit, apparent and otherwise, they warrant description as plausible fallacies. In order to conclude this analysis on a positive and constructive note, corrected statements of the fallacies follow.

1. Future strategic history will be marred by the occurrence of regular-style conventional warfare between states, sometimes conducted on a very large scale. Obviously, the danger of escalation to nuclear use by the losing belligerent will be acute.

2. All of our geographically specialized military instruments, including airpower, are inherently strategic in the effect that they have upon the course of history. It makes no more sense to talk about strategic airpower than it does to discuss strategic land power, sea power, space power, or cyber power. It is the consequences of military behavior that are strategic, not the forces themselves.

3. Airpower has never been driven forward by a strategically and militarily mindless technological momentum. Ideas, theory, and doctrine have always been in the cockpit (whether or not the aerial vehicle was ready to fly).

4. The very nature of airpower ensures that targeting for kinetic effect has to be of prime importance among the instrument's ways to contribute strategically to a conflict. But airpower is not only about targeting, as anyone who recognizes the variety of essential roles performed by aircraft in warfare should hardly be able to fail to appreciate.

5. Whether airpower is subordinate to land power, or vice versa, must depend upon the war's overall military-strategic context. If its character is largely regular, then today and tomorrow it must be airpower that should be the supported force. The reverse has to be true in war with a largely irregular military character. These key points granted, it is really more sensible not to contrast land power and airpower, but rather to consider them inherently complementary dimensions of variable relative significance within a single military, strategic, and political effort.

6. The theory of strategic airpower is only flawed if one elects to identify it strictly with the overstated claims of some classical writers on airpower. Sensibly crafted instead, the theory of strategic airpower is entirely sound. It should state that employed either as a weapon independent of land- or sea-focused forces, or as an enabling agent for, perhaps even components of, land power and sea power, airpower generates strategic effect on a conflict. By and large, airpower used independently is not able to deliver decisive military and strategic victories. However, it has demonstrated the ability to decide which combatant will

win. It should be noted that there is no reason in principle why airpower can never aspire to secure a decisive victory by its own unaided effort.

7. The institutional independence of the US Air Force, in the context of a legally and politically superior Department of Defense, is best described as a regrettable necessity. It is regrettable that the essential unity of war cannot be matched with a similar unity of military power. The fact is that the skills necessary for warfare vary with geography. It is true that airminded people are inclined to register military and strategic claims for airpower's potency that may seem to exceed the bounds of plausibility to those of a nonair persuasion. However, the undoubted costs of service partiality fade from sight when they are compared with the price likely to be paid for the misuse of airpower by nonairminded military cultures. Given the situational specific potency of America's aerial tools among its military instruments, there is no prudent alternative to ensuring retention of the US airpower advantage through sustainment of a dedicated air force.

8. COIN is inherently land-, indeed ground-centric in nature. But this geostrategic and tactical fact does not mean that the varieties of airpower that support the ground effort can accurately or helpfully be described as being only of minor importance. In COIN, airpower is not the leading edge to the military dimension, but it will always be quite literally essential.

9. The twenty-first century continues the air age that began in December 1903. The appearance of ballistic missiles, spacecraft, and computer-driven cyber power have not and do not threaten to oblige us to retire the manned airplane. This new century plainly will be one friendly to UAVs, but this condition does not mean that manned aircraft are facing or will face bloc obsolescence as "yesterday's technology." The manned aircraft simply is too useful, is too adaptable and flexible, to be abandoned. The future of manned aircraft is completely secure even though some of its roles in some political and military contexts

increasingly will be assumed by UAVs. For the most obvious example, persisting surveillance can be provided far more effectively by UAVs and, of some kinds, by satellites than it can by manned aircraft. This undeniable reality does not ring the death knell for manned aircraft, though, even in surveillance, reconnaissance, and strike-reconnaissance roles. Stated in the most basic terms, the manned aircraft is just too flexible and therefore useful to be phased out of the defense posture.

**Notes**

1. In 1852 Leo Tolstoy wrote: "History is nothing but a collection of fables and useless trifles, cluttered up with a mass of unnecessary figures and proper names." Quoted in Isaiah Berlin, *The Hedgehog and the Fox: An Essay on Tolstoy's View of History* (New York: Mentor Books, 1957), 24–25.

2. Carl H. Builder, *The Masks of War: Military Styles in Strategy and Analysis* (Baltimore: Johns Hopkins University Press, 1989), is classic. His later foray into the perilous realm of military culture and ideas is helpfully targeted explicitly on airpower and the value of theory. Idem, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the US Air Force* (New Brunswick, NJ: Transaction Publishers, 1994). These are both excellent studies with enduring merit.

3. Carl von Clausewitz, *On War* [1832–1834], edited and translated by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 578.

4. Phillip S. Meilinger, *Airpower: Myths and Facts* (Maxwell AFB, AL: Air University Press, December 2003).

5. Sun-tzu, *The Art of War* [ca. 490 BCE], translated by Ralph D. Sawyer (Boulder, CO: Westview Press, 1994), 179.

6. I grant that in times of total war the budgetary lid generally is lifted. But even in those mercifully rare years (only in 1861–1865, 1917–1918, and 1941–1945, for the United States), there are practical limits to the military effort. Since even the United States did not have infinite resources, hard choices had to be made. Of course, the era of industrial mobilization for effectively open-ended production runs of major military platforms is now long past.

7. Harold Lasswell, *Politics, Who Gets What, When, How* (New York: Peter Smith, 1950).

8. Bernard Brodie, "The Continuing Relevance of *On War*," in Clausewitz, *On War*, 54.

9. Colin S. Gray, *The Airpower Advantage in Future Warfare: The Need for Strategy*, Research Paper 2007-2 (Maxwell AFB, AL: Airpower Research Institute, Air University, December 2007), 11–13, http://www.aupress.au.af.mil/ARI_Papers/GrayARI2.pdf.

10. Isaiah Berlin, *The Hedgehog and the Fox*, presents an unrivalled brief discussion of comprehensive theory versus many theories, or no theories. He quotes the words of Greek poet Archilochus: "The fox knows many things, but the hedgehog knows one big thing," 7. Berlin writes: "If we may recall once again our division of artists into foxes and hedgehogs: Tolstoy perceived reality in its multiplicity, as a collection of separate entities round and into which he saw with a clarity and penetration scarcely ever equalled, *but he believed only in one vast, united whole"* (emphasis added), 62. The author must confess to being a strategic hedgehog. See my forthcoming book-length effort to present a comprehensive theory of strategy, *The Strategy Bridge.*

11. For the demonstration of error, albeit error professed in a moderate tone, see Michael O'Hanlon, *Neither Star Wars nor Sanctuary: Constraining the Military Uses of Space* (Washington, DC: Brookings Institution Press, 2004). One might as well bid the waves retreat, as if our willpower could command geophysics.

12. See the fine studies in Robin Higham and Stephen J. Harris, eds., *Why Air Forces Fail: The Anatomy of Defeat* (Lexington, KY: The University Press of Kentucky, 2006). For a little useful context, it is well to recognize that books can be written with such titles as "Why Armies Fail" and "Why Navies Fail." It is easy for the unwary to believe that failure is somehow more of an airpower than a land power or sea power issue. Such a belief is, of course, ridiculous. Failure happens, period. There needs to be a book with the title "Why Air Forces Succeed."

13. Antulio J. Echevarria II, *Challenging Transformation's Clichés* (Carlisle, PA: Strategic Studies Institute, US Army War College, December 2006), 2.

14. Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (London: Allen Lane, 2005), 3.

15. Ibid., 1.

16. Martin van Creveld, *The Transformation of War* (New York: The Free Press, 1991). Also idem, *The Changing Face of War: Lessons of Combat from the Marne to Iraq* (New York: Ballantine Books, 2006).

17. See Mary Kaldor, *New and Old Wars: Organized Violence in a Global Era* (Cambridge, UK: Polity Press, 2005); and Isabelle Duyvesteyn and Jan Angstrom, eds., *Rethinking the Nature of War* (Abingdon, UK: Frank Cass, 2005).

18. Donald H. Rumsfeld, *Quadrennial Defense Review Report* (Washington, DC: US Department of Defense, 6 February 2006), 9–18.

19. Smith, *Utility of Force*, x.

20. As with Sun-tzu, *Art of War*; Clausewitz, *On War*; and, to risk undue immodesty, Gray, *Strategy Bridge*.

21. Clausewitz, *On War*, 75.

22. From a huge and diverse literature, see van Creveld, *The Rise and Decline of the State* (Cambridge, UK: Cambridge University Press, 1999).

23. Robert B. Strassler, ed., *The Landmark Thucydides: A Comprehensive Guide to "The Peloponnesian War* [ca. 400 BCE]*,"* (New York: Free Press, 1996), 43.

24. For a well focused set of short essays on the question of the possible and probable connections between resource shortages and war, see "Symposium: The World Is Not Enough," *The National Interest*, No. 93 (January/February 2008), 25–36.

25. David MacIsaac claims plausibly that the authorial parent of "airpower" as a single word, a form that seems to connote an incantation, may have been invented by Major Alford Joseph Williams in his *Airpower* (New York, 1940). "Voices from the Central Blue: The Air Power Theorists," in Peter Paret, ed., *Makers of Modern Strategy: from Machiavelli to the Nuclear Age* (Princeton, NJ: Princeton University Press, 1986), 627, n. 7.

26. See Clausewitz, *On War*, 128, 177; Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), 17–23.

27. William P. Head, *War from above the Clouds: B-52 Operations during the Second Indochina War and the Effects of the Air War on Theory and Doctrine*, Fairchild Paper (Maxwell AFB, AL: Air University Press, July 2002); Benjamin S. Lambeth, *Air Power Against Terror: America's Conduct of Operation Enduring Freedom* (Santa Monica, CA: RAND, 2005).

28. See David E. Johnson, *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post-Cold War Era*, MG-405-AF (Santa Monica, CA: RAND, 2006).

29. See Philip Anthony Towle, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare, 1918–1988* (London: Brassey's, UK, 1989); and James S. Corum and Wray R. Johnson, *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Lawrence, KS: University Press of Kansas, 2003); and Alan J. Vick, Adam Grissom, William Rosenau, Beth Grill, and Karl P. Mueller, *Air Power in the New Counterinsurgency Era: The Strategic Importance of USAF Advisory and Assistance Missions* (Santa Monica, CA: RAND, 2006).

30. US Air Force, "Essay F: Three Levels of War," Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force,* volume 2, March 1992, 43–49. I have selected a recent, but "historical" document in the hope that my argument will not trigger so irritated a reaction as to obscure the merits of the case advanced here.

31. Gray, *Airpower Advantage*, 8–10.

32. Especially useful overviews of the history of airpower theory include MacIsaac, "Voices from the Central Blue"; and the first-rate studies in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, AL: Air University Press, 1997). The latter is essential reading.

33. See Higham and Harris, eds., *Why Air Forces Fail*; James Clay Thompson, *Rolling Thunder: Understanding Policy and Program Failure* (Chapel Hill, NC: The University of North Carolina Press, 1980); Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (New York: The Free Press, 1989); and Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY: Cornell University Press, 1996).

34. Winston S. Churchill, *The World Crisis, 1911–1918*, volume 2 (London: Odhams Press, 1938), 1442.

35. Stephen Budiansky, *Air Power: From Kitty Hawk to Gulf War II: A History of the People, Ideas and Machines that Transformed War in the Century of*

*Flight* (London: Penguin Books, 2003), is an exemplary popular history that weighs in heavily on airpower's necessarily essential and enabling technological dimension. Budiansky can be complemented by the outstanding scholarly yet practical-minded study by pilot/historian/analyst Benjamin S. Lambeth, *The Transformation of American Air Power* (Ithaca, NY: Cornell University Press, 2000).

36. Lambeth, *Transformation.*

37. See Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942–1944* (Washington, DC: Smithsonian Institution Press, 1991).

38. Giulio Douhet, *The Command of the Air* [1927] (New York: Arno Press, 1972), 50.

39. Ibid., 59.

40. John A. Warden III, "Employing Air Power in the Twenty-first Century," in Richard H. Shultz, Jr., and Robert L. Pfaltzgraff, Jr., eds., *The Future of Air Power in the Aftermath of the Gulf War* (Maxwell AFB, AL: Air University Press, July 1992), especially 64–69.

41. Ronald B. Frankum, Jr., "Swatting Flies with a Sledgehammer: The Air War," in Andrew Wiest, ed., *Rolling Thunder in a Gentle Land: The Vietnam War Revisited* (New York: Osprey Publishing, 2006), 212–33, is exceptionally balanced and fair in its judgments. Rather more problematic is Earl H. Tilford, Jr., *Crosswinds: The Air Force's Setup in Vietnam* (College Station, TX: Texas A and M University Press, 1993).

42. See John T. Smith, *The Linebacker Raids: The Bombing of North Vietnam, 1972* (London: Arms and Armour Press, 1998), chapters 10–11; and Head, *War from above the Clouds*, 72–87.

43. J. C. Wylie, *Military Strategy: A General Theory of Power Control* (Annapolis, MD: Naval Institute Press, 1989). Chapter 5 offers brilliantly perceptive insight into the influence of physical geography upon the different strategic worldviews of soldiers, sailors, and airmen.

44. See Sun-tzu, *Art of War*, chapter 10.

45. J. H. Parry, *The Discovery of the Sea* (Berkeley, CA: University of California Press, 1981), xi.

46. Persistent presence at altitude requires unmanned aerial vehicles (UAV), or spacecraft in geostationary orbit 22,300 miles high.

47. For the most classic of examples, one illustrating the positive and negative aspects of air mobility, consider the French experience under siege at Dien Bien Phu in March–May 1954. The French deployed by air two parachute brigades (seven battalions) and eleven infantry battalions to this *base aero-terrestre* (air-ground base), but to their surprise, they lacked the ability to support the besieged garrison or to extract the survivors as the battle went against them. Martin Windrow, *The Last Valley: Dien Bien Phu and the French Defeat in Vietnam* (London: Weidenfeld and Nicolson, 2004), is the most recent and best account. Air mobility enables tactical, operational, and strategic boldness that can, with hindsight, prove reckless. As all prudent air theorists and strategists insist, the exact utility of airpower is always highly situational. General truths are subject to contextual exceptions. A well exe-

cuted period piece, written by an officer who served in Vietnam with the 1st Cavalry Division, is John R. Galvin, *Air Assault: The Development of Airmobile Warfare* (New York: Hawthorn Books, 1969). Appropriately enough, the book's foreword was written by Gen James "Jumping Jim" Gavin.

48. Vick et al., eds., *Airpower in the New Counterinsurgency Era*.

49. To marry two vital points made by Clausewitz: "War, therefore, is an act of policy," but also it is "*an act to compel our enemy to do our will*" (emphasis in the original) Clausewitz, *On War*, 87, 75. Not all violence is warfare, but all warfare entails violence.

50. See Weist, ed., *Rolling Thunder*. Powerful revisionist arguments are presented in Mark W. Woodruff, *Unheralded Victory: Who Won the Vietnam War?* (London: HarperCollins Publishers, 1999); C. Dale Walton, *The Myth of Inevitable US Defeat in Vietnam* (London: Frank Cass, 2002); and Mark Moyar, *Triumph Forsaken: The Vietnam War, 1954–1965* (Cambridge, UK: Cambridge University Press, 2006).

51. See Johnson, *Learning Large Lessons*.

52. See Lambeth, *Transformation*; and idem, *Airpower Against Terror*.

53. This sadly classic lesson in military prudence was demonstrated for all time in Mogadishu, Somalia, on 3 October 1993. See Mark Bowden, *Black Hawk Down* (London: Bantam Press, 1999). From the minor to the major in scale, the worst historical case of the misuse of air mobility was the dropping of the British 1st Airborne Division near the city of Arnhem in Holland in September 1944, for the purpose of seizing and holding the Rhine bridge (Operation Market Garden). It is one thing to insert an airborne force, it can be quite another to relieve or rescue them. Paratroops were popular, even fashionable, in the 1940s and 1950s. The potential for disaster has always been severe for these elite troops.

54. See Richard B. Andres, "Deep Attack against Iraq," in Thomas G. Mahnken and Thomas A. Keaney, eds., *War in Iraq: Planning and Execution* (Abingdon, UK: Routledge, 2007), 69–96, presents an impressive case for airpower's enablement of the rapid victory on the ground.

55. It is no direct part of the mandate for this study to discuss the future of US space power. Suffice it to say that I am greatly troubled by the vulnerabilities of our essential space systems. This persisting condition is a gigantic irresistible temptation to any competent state opponent of the United States. Prudent preparation for space warfare in all its dimensions is a vital necessity for US and more general international security in the twenty-first century. See Colin S. Gray and John B. Sheldon, "Space power and the Revolution in Military Affairs: A Glass Half-Full," in Peter L. Hays, James M. Smith, Alan R. Van Tassel, and Guy M. Walsh, eds., *Spacepower for a New Millenium: Space and US National Security* (New York: McGraw-Hill, 2000), 239–57. Also see Steven Lambakis, *On the Edge of Earth: The Future of American Spacepower* (Lexington, KY: The University Press of Kentucky, 2001); and John J. Klein, *Space Warfare: Strategy, Principles and Policy* (Abingdon, UK: Routledge, 2006).

56. See Andres, "Deep Attack."

57. Gian P. Gentile, *How Effective is Strategic Bombing? Lessons Learned from World War II to Kosovo* (New York: New York University Press, 2001), is exceptionally well researched.

58. Douhet, *Command of the Air*; Hugh Trenchard, "The War Object of an Air Force [2 May 1928]," in Gerard Chaliand, ed., *The Art of War in World History: From Antiquity to the Nuclear Age* (Berkeley, CA: University of California Press, 1994), 905–10; Trenchard, "Air Power and National Security [August 1946]," in Eugene M. Emme, ed., *The Impact of Air Power: National Security and World Politics* (Princeton, NJ: D. Van Nostrand, 1959), 192–200; William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power—Economic and Military* [1925] (New York: Dover Publications, 19); John A. Warden III, *The Air Campaign: Planning for Combat* (Washington, DC: Pergamon-Brassey's, 1989); Warden, "Employing Air Power." Useful secondary sources include MacIsaac, "Voices from the Central Blue"; Meilinger, ed., *Paths of Heaven*; Meilinger, *Airmen and Air Theory: A Review of the Sources* (Maxwell AFB, AL: Air University Press, 2001); Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914–1945* (Princeton, NJ: Princeton University Press, 2002).

59. John Keegan quoted in Benjamin S. Lambeth, *NATO's Air War for Kosovo: A Strategic and Operational Assessment* (Santa Monica, CA: RAND, 2001), 220 n. 4.

60. Warden, "Employing Air Power," 65.

61. See Lambeth, *NATO's Air War for Kosovo*; and Ivo H. Daalder and Michael O. Hanlon, *Winning Ugly: NATO's War to Save Kosovo* (Washington, DC: Brookings Institution Press, 2000).

62. Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY; Cornell University Press, 1996).

63. Ibid., 314.

64. Robert A. Pape, "The True Worth of Air Power," *Foreign Affairs* 83, no. 2 (March/April 2004), 116–30.

65. See Andres, "Deep Attack."

66. Gray, *Strategy Bridge*.

67. See Lambeth, *Transformation*, 308; and Edward N. Luttwak, *Strategy: The Logic of War and Peace*, revised ed. (Cambridge, MA: The Belknap Press of Harvard University Press, 2001), 1.

68. This thesis is advanced in Azar Gat, *The Origins of Military Thought: from the Enlightenment to Clausewitz* (Oxford, UK: Clarendon Press, 1989), 199–200. Gat's discovery and judgment has not been seriously challenged by scholars.

69. An excellent critique of Pape, of which I stand in no small debt, is Patrick C. Bratton, "A Coherent Theory of Coercion? The Writings of Robert Pape," *Comparative Strategy* 22, no. 4 (October–November 2003), 355–72. Also recommended are: "Theory and Evidence in Security Studies: Debating Robert A. Pape's *Bombing to Win*," *Security Studies* 7, no. 2 (Winter 1997/1998), 91–214, articles by Robert A. Pape, Barry D. Watts, John A. Warden III, and a reply by Pape; and Karl Mueller, "Denial, Punishment, and the Future of Air Power," *Security Studies* 7, no. 3 (Spring 1998), 182–228.

70. See Builder: *Icarus Syndrome*; and idem, *Masks of War*.

71. The US Navy's capstone strategy document refers to the *National Fleet Policy* as well as to the "Sea Services" as a unitary maritime conception. The Navy, Marine Corps, and Coast Guard are all the authors of *A Cooperative Strategy for 21st Century Seapower*, US Navy, October 2007, http://www.navy.mil/maritime/MaritimeStrategy.pdf.

72. No less an Airman than Gen Henry H. "Hap" Arnold himself blessed the concept of "airmindedness," Charles J. Dunlap, Jr., "Developing Joint Counterinsurgency Doctrine: An Airman's Perspective," *Joint Force Quarterly*, no. 49, (2nd quarter, 2008), 86–92.

73. Wylie, *Military Strategy*, chapter 5.

74. Clausewitz, *On War*, 65.

75. This claim may seem to be refuted by the capabilities of rotary-wing aircraft. However, even these flexible machines, albeit often locally welcome, have a separating effect in the relationship between civilians and the COIN effort.

76. Mitchell, *Winged Defense*, xii, 3–4.

77. See Corum and Johnson, *Airpower in Small Wars*.

78. It is the opinion of this author that, notwithstanding its many virtues, the new COIN manual of the US Army and Marine Corps is notably thin in its accommodation of the air dimension. Airpower in COIN is relegated to appendix E. This is unfortunate both for the gratuitous limitation it imposes on presentation of an inherently joint subject, and probably even more for the message that it appears to send. A joint, even integrated, COIN capability should not be relegated to an appendix. Perception matters. See Field Manual 3-24, Warfighting Publication number 3-33.5, *The US Army and Marine Corps Counterinsurgency Field Manual*. Dunlap, "Developing Joint Counterinsurgency Doctrine," does not pull many punches in its Airman's critique of FM 3-24.

79. Wisely, it has been said that "COIN is grand strategy in miniature."

80. See Frankum, "Swatting Flies with a Sledgehammer."

81. N. Parton, "Air Power's Illusion? Israel's 2006 Campaign in the Lebanon," *British Army Review* No. 143 (Autumn 2007), 41–47, is a deadly assessment. The author happens to be a group captain in the RAF, a fact which lends weight to his critique.

82. An important source for the IAF's faulty air-led COIN doctrine was the study by Shmuel L. Gordon, *The Vulture and the Snake, Counter-Guerrilla Air Warfare: The War in Southern Lebanon*, Mideast Security and Policy Studies No. 39, Begin-Sadat Center for Strategic Studies, Bar-Ilan University, July 1998, http://www.biu.ac.il/Besa/books/39pub.html (accessed on 23 May 2008).

83. Airpower is a vital team player against somewhat irregular enemies; rarely can it comprise the whole of the team, with ground power assigned unchallenging mop-up duties. In addition to the scorching analysis by Group Captain Parton (see note 81), the careful balanced judgments by William M. Arkin merit respect. See the latter's important study, *Divining Victory: Airpower in the 2006 Israel-Hezbollah War* (Maxwell AFB, AL: Air University Press, August 2007).

84. Ralph Peters, "In Praise of Attrition," *Parameters* 34, no. 2 (Summer 2004), 24–32, says what needs to be said, no matter the offense it must cause to decent liberal opinion. War is violence, and COIN, at least in part, is warfare.

85. I pursued the subject of airpower's inherent strengths and limitations in my *Explorations in Strategy* (Westport, CT: Praeger Publishers, 1998), chapter 4.

86. See Andres, "Deep Attack." The cyber dimension to Operation Iraqi Freedom is nowhere near as well known as it deserves to be.

87. "Launch costs are $10,000-$15,000 per pound to inject into low earth orbit. To attain a geostationary "parking slot" costs between $15,000 and $20,000 per pound." The space shuttle was intended to serve as a relatively inexpensive "bus service" into orbit, hence its aspirational name. Alas, it has been a disappointment, at least it has disappointed as the needed provider of basic transportation. I am grateful to Col M. V. Smith, USAF, for his advice on current launch costs.

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