



Thunder and Lightning

Desert Storm and the Airpower Debates

Edward C. Mann III, Colonel, USAF

Volume two of a two-volume series

Air University Press
Maxwell Air Force Base, Alabama

April 1995

Library of Congress Cataloging-in-Publication Data

Mann, Edward C., 1947–

Thunder and lightning: Desert Storm and the airpower debates / Edward C. Mann III.

p. cm.

Includes index.

1. Persian Gulf War, 1991—Aerial operations, American. 2. Airpower—United States.

DS79.724.U6M36

1995

95-3971

956.7044'248—dc20

CIP

First Printing January 1995

Second Printing May 1995

Third Printing August 1996

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This publication has been reviewed by security and policy review authorities and is cleared for public release.

For the Troops

**Those who have, those who would, and, especially,
those who may yet have to.**

**My confidence in you is total. Our cause is just!
Now you must be the thunder and lightning of
Desert Storm. May God be with you, your loved ones
at home, and our country.**

**Gen H. Norman Schwarzkopf
January 1991**

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To preach the message, to insist upon proclaiming it (whether the time is right or not, to convince, reproach, and encourage, as you teach with all patience. The time will come when people will not listen to sound doctrine, but will follow their own desires and will collect for themselves more and more teachers who will tell them what they are itching to hear. They will turn away from listening to the truth and give their attention to legends.

2 Tlm. 4:2-4

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Foreword

At 0200 local time on the morning of 17 January 1991, airmen from all military services and 10 nations became the “thunder and lightning” of Operation Desert Storm, the multinational military offensive sanctioned by the United Nations to liberate Kuwait from the domination of Iraqi dictator Saddam Hussein. What occurred over the next several hours, days, and weeks is a classic in the decisive application of aerospace power. Literally in minutes, the coalition delivered a knockout blow to Iraqi air defenses and paved the way for thousands of air sorties to pummel Iraqi leadership, their command and control capabilities, essential services, infrastructure, and military forces. After only 28 days, the Iraqi army in Kuwait and eastern Iraq was so demoralized, disorganized, and degraded that coalition surface operations envisioned to require weeks took only days. Yet, while the people of Iraq suffered seriously from degraded services and infrastructure, they remained nearly exempt from direct physical attack. Precise applications of force almost eliminated collateral damage.

Such dramatic performance demands much attention. Desert Storm has spawned and will continue to spawn numerous histories, anthologies, and analyses. Few, however, will be as focused and useful to airmen as *Thunder and Lightning: Desert Storm and the Airpower Debates*. A small team of military analysts, working at Air University’s College of Aerospace Doctrine, Research, and Education (CADRE), under the initial oversight of Lt Gen Chuck Boyd and—later—Lt Gen Jay Kelley, spent over three years piecing together the conceptual development of the Desert Storm air campaign. Their interest was not specifically historical; rather, their motivation stemmed from the inherent curiosity of airmen who aspire to understand their profession.

This book is the second of two works produced by the CADRE team—the first being Col Rich Reynolds’s *Heart of the Storm. The Genesis of the Air Campaign against Iraq* (Air University Press, 1995). In *Heart of the Storm*, Colonel Reynolds explores “a hot and often bitter debate” that developed in the early days of August 1990 between “tactical” and “strategic” schools of

thought. In *Thunder and Lightning*, however, Colonel Mann explains that debate in terms of an almost “theological” division within the Air Force over the proper uses of airpower. Judiciously incorporating a historical perspective, he asserts that this debate is not new but is rooted in the earliest conceptualizations of airpower's utility. We are still engaged, he argues, in a 75-year-old debate (beginning in World War I) over issues that our doctrine answered 50 years ago (during World War II). The debate itself often hinders us from moving on to more current—and, possibly, more important—issues. Colonel Mann believes that the brilliant performance of aerospace power in Desert Shield/Storm resulted from an internal compromise which reflected, to a remarkable degree, airpower doctrine of 1943 (specifically, FM 100-20, *Command and Employment of Air Power*, July 1943). While much has changed, especially in our technical ability to execute this doctrine, the internal divisions and resultant debate proved inefficient as we strove to apply some of the most basic tenets of aerospace doctrine. In *Thunder and Lightning*, Colonel Mann challenges airmen as well as other strategic thinkers to consider how aerospace power works best so as to preclude, or at least minimize, these 75-year-old debates when we face the next challenge.

Because we must prepare for the next war—not the last one—we should push concepts and ideas well out in front of technologies and capabilities. That responsibility lies primarily within our institution—specifically, with those of us who are airmen. What Mitchell, Arnold, and other airpower heroes have been to us, we must be to a new generation of airmen who face dramatic changes in technology and in the sociopolitical environment.

Not only must we know how to do aerospace power, we also must know how to think it.

RONALD R. FOGLEMAN
General, USAF
Chief of Staff

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About the Author



Col Edward C. Mann III

Col Edward C. Mann III was born in the same year as the United States Air Force—1947. Most of his life has been interviewed in one way or another with the service, first as the son of a 30-year civilian employee of the Department of the Air Force and for the last 25 years as a commissioned officer. Colonel Mann has served as a pilot, instructor pilot, staff officer, and researcher/educator. He has flown over 5,200 hours in T-37, -38, -41; C-130; and KC/EC-135 aircraft, including over 1,000 combat hours in Southeast Asia. He served as an operations officer on a wing staff and as the deputy chief of the airborne division at Headquarters Strategic Air Command (SAC). Since leaving SAC, Colonel Mann has been the Research Associate (now National Security Fellow) to the Fletcher School of Law and Diplomacy at Tufts University; chief of the Doctrine Research Division, Airpower Research Institute, College of Aerospace Doctrine, Research, and Education (CADRE) at Air University; and is currently deputy director for Information Warfare Education at CADRE. Colonel Mann has published in *Air Force Times*, *Army Times*, *Navy Times*, *Airpower Journal* and *Military Review*.

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Preface

I firmly believe that the future is not a product of determinism. Certainly, controlling forces exist that we all must recognize, whether we call them fate or God. But to a great extent, we create the future—in which we and our descendants will live through a series of actions both large and small, informed and uninformed. We live in the present, but we set our course to the future either by way of navigation aids from the past or by sheer chance. For those of us who are committed to the profession of arms, the price of steering by chance is too high. In our future, people we love—or would love if we came to know them—will live or die, based on the understanding of warfare that we protect into the future. In order to plan what we will be, we must understand—as clearly as possible—what we have been and how that experience has affected what we are.

Acquiring such understanding inevitably entails a degree of pain, since we are human beings and therefore make mistakes. The case at hand—the participation of the US Air Force in Operations Desert Shield and Desert Storm—is no exception. The accomplishments of airpower from August 1990 through February 1991 (and well beyond) were incredible, exceeding any previous demonstration of airpower. Yet, some aspects of these operations were not pretty—some were so ugly, in fact, that we probably would rather not face them. But the measure of a person—as well as an institution—is the ability to study failure with the same alacrity as success. Desert Shield/Storm offers valuable insights into our institution and its doctrinal underpinnings—insights that can help us form a future to be proud of.

Statements of what things are not are sometimes as useful as statements of what they are. It is important to say that this volume is not a work of history—though it necessarily contains much of historical significance. Qualified historians are at work producing some very good histories of Desert Shield/Storm. *Thunder and Lightning*, however, is a doctrinal analysis set in historical context. Although individual data points usually have some utility, they are almost invariably most useful when we place them in the context of related data points. For example, the

trend line that connects data points on a graph offers more useful information than the individual points themselves. Whereas data points only rarely are successfully projected into the future, trend lines quite often are so projected. That is the overarching purpose of this volume: to protect the trend line of airpower theory into the future.

Developing the trend line of our institution's theoretical underpinnings requires that we reveal and analyze events which are likely to prove painfully controversial and embarrassing to both individuals and institution. But I reveal and analyze only what I feel is necessary to get at the truth—my ultimate objective. Ernest Hemingway provided the benchmark in 1942:

A writer's job is to tell the truth. His standard of fidelity to the truth should be so high that his invention, out of his experience, should produce a truer account than anything factual can be. For facts can be observed badly; but when a good writer is creating something, he has time and scope to make it of an absolute truth.*

Though it seems necessary that truth be supported by facts, it is nonetheless true that facts (at least as we know them) do not always lead to truth. Sometimes the writer's job, then, is to find the truth in spite of the facts. I am quite certain that I have some of the facts wrong and the reader will likely notice these errors. In every case, however, I have tried to reach the truth in light of—or in spite of—the facts. The reader must decide what is right and what is wrong. I have told what I believe to be the truth.

EDWARD C. MANN III,
Colonel, USAF
Maxwell Air Force Base, Alabama
15 October 1994

*Men at War: 7he Best War Stories of All Time, ed. Ernest Hemingway (1942; reprint, New York: Wing Books, 1991), xiv.

Acknowledgments

Although it is common for one person to receive credit for a great success, it is a rare occasion when only one person is responsible for that success. Instead, significant accomplishments are nearly always team efforts. Without the Grand Armée for example, Napoléon was just a petty bureaucrat. The same principle applies to this book. If *Thunder and Lightning* is successful, the credit belongs to a large number of people who loyally supported the research and writing that produced it; any shortcomings, of course, belong only to the author. Certainly, if the quality of the team is the determining factor, then the success of this book is assured. All the members of my team deserve thanks, so bear with me.

First and foremost is the United States Air Force, one of the greatest institutions on the face of the earth. It has sustained, nurtured, developed, educated, trained, and supported me and my family for 25 years. Among the many opportunities it has given me, perhaps the most rewarding has been the time to study, research, and think about airpower. If I occasionally seem hard on the Air Force in this book, it is only because I love it and care about its future. It has always been good to me, and I hope to return the favor.

Although many people contributed to this work, only a select few actually “made it happen.” One is Gen Charles G. Boyd, former commander of Air University (AU) and the man who “commissioned” our study. General Boyd well understands the need to study the past with an open mind in order to attain a vision of the future that is grounded firmly in experience. He chartered me and my research partners to “tell the truth, however painful it may be.” We worked hard to execute that charter, and I hope we have succeeded.

I also owe a debt of gratitude to General Boyd's successor at AU, Lt Gen Jay W. Kelley, who supported our efforts, even to the extent of reading and commenting upon my early manuscript. A number of his good ideas have been incorporated in the volume.

A string of commanders of the College of Aerospace Doctrine, Research, and Education (CADRE) “flew top cover,” beginning with Col John B. Sams—now a major general—who first

recognized the potential of our research and brought it to the attention of senior Air Force leadership. Col (now Brig Gen) Ervin C. (“Sandy”) Sharpe was next, prodding us intellectually to refine our research and analysis. He was also most responsible for providing us with the necessary resources (including the ever-present “evil” [i.e., money]) to complete our efforts. Col (now Brlg Gen) Gary Voellger, Col Paul Dordal, and—most recently—Col Leroy Barnidge all provided support in the Sams/Sharpe style.

When I tell my grandchildren about the good old days, I will certainly mention the team that started this whole effort: Dr David Albright, Col Richard T. Reynolds (author of *Thunder and Lightning’s* companion volume, *Heart of the Storm: The Genesis of the Air Campaign against Iraq*), and Col Suzanne B. Gehri—faithful friends all! Dr Albright and Colonel Gehri left the team to go on to bigger and better things before we could finish our work, but they were both instrumental in the establishment and early progress of our research. Colonel Reynolds is . . . well . . . Richard Reynolds (those who know him will require no further explanation). There is no finer wingman.

Col Dennis M. Drew, USAF, Retired, former director of the Airpower Research Institute (ARI), deserves a special vote of thanks for his philosophical approach to the workplace: “Hire good people, tell them what you want them to do, and get out of their way.” This project would not have been possible without his fatherly support. The same may be said of his two successors—Col Bryant Shaw and Col Robert M. Johnston. Colonel Johnston also offered useful steerage in his role of “gray-haired” (his term, not mine) senior editor.

I also thank all the “pushers” around AU’s academic circle for continually prodding us to make something useful out of all the data and information we had collected. I especially thank ARI’s “backyard philosophers,” past and present, for their constant “encouragement.”

Refinements offered by people who agreed to read the manuscript at various stages vastly improved the final product. Particularly useful inputs came from three esteemed academics: Maj Gen I. B. Holley, Jr., USAFR, Retired, Duke University (who really saved my bacon—I will never reveal how, but thank you, Dr Holley), Dr Grant Hammond of Air War

College, and ARI's own Dr Jim Titus. I hope they are as proud of Thunder and Lightning as I am to call them colleagues and friends.

A number of historians and archivists from the Air Force history program made essential contributions to our research, beginning with Dr Richard P. Hallion, Air Force Historian. Very early in our research, Dr Hallion generously put all the resources of his office at our disposal. We accepted that offer unashamedly. Two of Dr Hallion's finest historians Dr Richard Davis and especially Dr Diane Putney, whose research on the Gulf War parallels our own—were extremely helpful in providing factual support and refining our analysis of events.

Here at Maxwell Air Force Base, the history program's Historical Research Agency (HRA) provided us both home and sustenance from the beginning. The former director, Col Elliott V. Converse, made office space available, allowing us to collect and store classified materials. This area also proved to be a quiet place to work—away from the routine demands of ARI. His replacement, Col Richard S. Rauschkolb, continued Colonel Converse's kind indulgences including essentially unlimited access to HRA's personnel and archival resources.

Counted among the people who were not only helpful but absolutely essential to our effort are Mrs Juanita Faye Davis and Maj E. Anne Sumpter. Without Faye, our 4,000-plus pages of transcribed interviews would still be mostly audio tapes and virtually useless to researchers. Similarly, Major Sumpter transformed our chaotic mass of documents into an indexed, researchable collection. Faye and Anne also provided immeasurable moral support along the way and have become good friends. A multitude of other people at HRA provided all kinds of assistance many thanks to all of you.

No work such as this could be accomplished in one lifetime without the active support of a good research librarian. I could always count on Ms Sue Goodman, AU Library bibliographer for Desert Shield/Storm, to drop whatever she was doing and help me find anything I needed. Thorough professional that she is, she never failed me.

Participants in Desert Shield/Storm were universally helpful in providing necessary information. I am indebted to all the people who agreed to be interviewed (over 40 altogether)

especially Col Bernard E. Harvey, a trained historian whose notes gave us wonderfully detailed, eyewitness accounts of many key events, and Col David A. Deptula, who provided interviews, personal notes, and tireless coaching on events and their meaning. Both men are true “warrior-aviators” who have much to contribute to the Air Force.

I must not forget my trusty lieutenant, Kurt Konopatzke. I counted on Kurt, whose flying career is on temporary hold (waiting for an airplane to come available somewhere), to take care of all kinds of tasks, big and small, so I could get on with the business of writing. Kurt never complains he must execute his assigned mission and comes back for more. Without him, I would be in an insane asylum somewhere believing I was a famous author. Mark my words he will be a general one day.

Now for the guy who really wrote all the words in this volume—Dr Marvin Bassett of AU Press. Marvin is undoubtedly the world's greatest editor. (Sorry, but all the rest of you merely deal with manuscripts and ordinary people; Marvin, however, has “handled” Richard Reynolds and Edward Mann—a truly daunting task!) I would love to complain bitterly about his “meddling” with my work, but truthfully, it's always better when he's done. Happily, he was able to retain my thoughts and analyses while transforming the prose into something readable. For that accomplishment, readers owe him at least as great a vote of thanks as I do.

Finally, I thank my wife Sharon. She has (mostly willingly) shared me for 25 years with a very demanding mistress the United States Air Force. Without her support and personal sacrifice, I would not be here, and this book never would have happened.

Introduction

The Airpower Debates

Fields are won by those who believe in winning.

—Thomas Higginson

The group of planners* who met in the basement of the Pentagon under the direction of Col John Warden, Air Staff director of war-fighting concepts, during early August 1990¹ had one clear purpose in mind: to force Iraq's army out of Kuwait by applying airpower** in a strategic offensive directed at the sources of Iraqi national power. Their plan would employ “new” concepts—inside-out warfare, simultaneity, and parallel warfare—to apply cataclysmic and unrelenting pressure on the Iraqi nation and Saddam Hussein's regime until the latter acquiesced to United Nations (UN) and coalition demands. Warden and his planners hoped to correct what they felt were America's previous “mistakes” of applying airpower in a gradualistic, supporting role (especially in Vietnam). Airpower would be the “main show” (in some minds, the only show), and the Air Force would demonstrate—once and for all—the dominant role that the “military-technical

*Often referred to as Checkmate planners but mistakenly so because—even at this early stage—the Checkmate directorate's original cadre of planners had been augmented by other people from throughout the Air Force for the express purpose of working on the plan they called Instant Thunder. Further, shortly after Gen H. Norman Schwarzkopf, commander in chief (CINC) of US Central Command (CENTCOM), received the first Instant Thunder briefing, representatives of all the other military services joined the planning effort (see note 1). As a matter of convenience, Checkmate continued to be used in reference to the Instant Thunder planners.

**The author frequently uses airpower interchangeably with air and space power and aerospace power. Such a practice is necessary because the book covers a period of time during which the mission of air forces evolved from one dealing strictly with air-breathing flying machines to one including missiles (which transit both air and space) and space vehicles. The author has tried to differentiate among these terms (i.e., using airpower to refer to times and events before the advent of space usage and using aerospace or air and space for later times and events). However, using airpower to refer to all things done by air forces is commonplace in the US Air Force and almost certainly has crept into this work in at least a few places.

revolution" (MTR)* had made possible for airpower. Indeed, some of the planners hoped to prove that airpower could in fact win a war "all alone." At the very least, the US would avoid the horrible mistakes of Vietnam (i.e., bomb a little here, a little there, and see if the enemy is ready to be more accommodating). They called their plan Instant Thunder in direct opposition to the Vietnam era's Rolling Thunder campaign. There would be no gradualism or escalation—no pauses in the bombing until Hussein gave up or the Iraqi conscript army removed him.

The Instant Thunder plan, though supported by the Air Force chief of staff (Gen Michael J. Dugan), the vice-chief (Gen John M. Loh), and even the CINCCENT himself (General Schwarzkopf), ran head-on into heavy opposition from a group of Air Force general officers with deep roots in the Air Force's Tactical Air Command (TAC).² For example, Gen Robert D. Russ, then the commander of TAC, thought that the plan's all-out approach was too violent to be acceptable politically. According to Col Richard Bristow,** a planner at Headquarters TAC, General Russ "felt like the American public would not support an all-out war. In other words, we couldn't just go in there and start a massive attack to win."³

Russ's idea was to destroy a single, heavily defended target "to demonstrate to not only Saddam Hussein but to the world what we can do [and] let the State Department work from then on, or . . . do all kinds of different things."⁴ Eventually, a

*The theory of the military-technical revolution, first articulated by Soviet Marshal N. V. Ogarkov in the early 1980s, asserts that we are currently experiencing a scientific revolution that is at least the magnitude of the nineteenth-century industrial revolution. The speed with which new nonnuclear weapon systems and supporting systems, such as intelligence and command and control (C²) systems, are fielded is rapidly accelerating (technologies, not necessarily platforms), and militaries that do not keep pace will be overwhelmed in future wars. Some of these technological advances, such as stealth and precision guided munitions (PGM), played a major role in Operation Desert Storm. See Mary C. Fitzgerald, "The Soviet Military and the New 'Technological Operation' in the Gulf," *Naval War College Review*, Autumn 1991, 16-43. This phenomenon is also referred to as a revolution in military affairs (RMA).

**Colonel Bristow was part of a group of four TAC colonels, recent graduates of Air War College, who had been selected to assist in the planning effort after General Loh relayed General Schwarzkopf's request of 8 August for Air Staff planning assistance (see chap. 2). The other three colonels involved in the TAC effort were Alex Bettinger,

compromise plan emerged from TAC that included gradualistic “demonstrative attacks” and “escalating offensive operations.”⁵ Even some of the TAC planners thought it looked like “a throwback to the Vietnam era”⁶—an interesting observation because one of the key reasons General Russ inserted himself into the planning process was “to make sure that we didn't have someone picking targets in Washington [sic] like they did in Vietnam.”⁷

Actually, the issue of competing plans was already resolved by the time the TAC plan reached Washington on 11 August. General Schwarzkopf had wholeheartedly embraced the concept of Instant Thunder the day before.⁸ Consequently, TAC's plan went into a safe in that command's Plans and Programs Directorate for the duration of the war. But the controversy over Instant Thunder didn't end there. People within and without the Air Force continued to challenge the plan (both during and after the war) for a variety of reasons.

Some, including General Russ, maintained that the plan originated in the wrong place (Washington), while others said it was no plan at all—only a briefing that was discarded after being presented on 20 August to Lt Gen Charles A. Horner,* commander of US Air Forces, Central Command (CENTAF [i.e., Ninth Air Force]).⁹ Still others thought Instant Thunder was sound—as far as it went—but lacked “tactical sense”¹⁰ insofar as it omitted such details as planned radio frequencies¹¹ and ignored such tactical realities as the presence of the Iraqi army in Kuwait.¹² Interestingly enough, nearly all of the early opposition to the plan came from airmen.** Considerable evidence indicates that this controversy emanated at least partially from a long-standing debate within the Air Force over the most efficient applications of airpower (see chaps. 2 and 10)—specifically, whether airpower should be used to carry out strategic attack or to

*Throughout this book, military rank is that attained by the individual at the particular time under discussion.

**Initially, both Headquarters TAC at Langley AFB, Va., and Headquarters CENTAF at Riyadh, Saudi Arabia, opposed Instant Thunder. *Heart of the Storm*, chaps. 2–4 (see note 1).

support surface forces (primarily close air support [CAS] and interdiction).

This same sort of dialectic had produced debates on airpower dating back to World War I. At that time, airpower advocates such as Col William (“Billy”) Mitchell, Brig Gen Mason M. Patrick, Maj Gen Hugh Trenchard, Col Henry H. (“Hap”) Arnold, Capt Carl A. (“Tooeey”) Spaatz, and a host of others (even the oft-maligned Giulio Douhet) addressed tough questions that carried over into the 1920s:

1. What is airpower capable of accomplishing, either alone or in conjunction with other military forces?
2. Can airpower alone be decisive in warfare?*
3. Does airpower have an independent role in warfare?
4. How is airpower best employed?
5. Do we need an independent Air Force?

Arnold, Spaatz, and others were still struggling with these questions as the storm clouds of World War II rolled in. By then, they had been joined by another generation who, lacking material resources during the austere days of the 1930s, had honed their minds on the raging debates at the Air Corps Tactical School (ACTS) at Maxwell Field, Alabama: What kind of airpower? How much? How should it be organized? Who should control it?¹³ When Lt Col Harold L. (“Hal”) George, Lt Col Kenneth N. (“Ken”) Walker, Maj Haywood S. Hansell, and Maj Laurence S. Kuter (all former ACTS instructors) were tasked in August 1941 to build a war plan for Europe, they faced an agonizing dilemma—one eerily similar to that faced 49 years later, almost to the day, by the planners of Instant Thunder:

[George's] heart—like the hearts of Walker, Kuter, and Hansell—was strongly in favor of winning the war with airpower. Yet he knew the Army war planners would demand heavy emphasis on close air support. Which way should he go? How might he balance those

*The answer to this question turns on the definition of two key words: decisive and alone. Is airpower decisive only if it achieves the desired outcome all by itself? Advocates of ground power readily accept the “decisiveness” of their arm in Desert Storm even though it was preceded, accompanied, and succeeded by air operations. Yet, they argue that airpower was not decisive because airpower alone did not drive the Iraqis out of Kuwait.

concepts when Generals [George C.] Marshall and Arnold were out of town, and he had only seven more days to finish the plan? He wasn't about to sell airpower short, but there was little sense in rushing to prepare an all-airpower plan only to have it disapproved. What balance would work best? Which could win the Army's approval of an airpower plan for winning the war? It was an almost impossible question, and one that took longer than any other to resolve.¹⁴

What they produced in only nine days was Air War Plans Division—Plan 1 (AWPD-1),* referred to in the title of a book written later by Hansell as *The Air Plan That Defeated Hitler*.¹⁵ Yet, the questions they struggled with remain unresolved over 50 years later. Despite airpower's contribution in Operation Desert Storm, airmen find themselves embroiled in the same debates. Clearly, the answers to the persistent questions about airpower are not as self-evident as the Gulf War initially made them appear to be. Although the consequences of our failure to resolve these debates proved minor during Desert Storm, they might have been much more severe had we had less time to prepare the attack.**

Such failure might prove even more serious in the future, due to the rapidly changing nature of international conflict and warfare. Some people say that these changes are so dynamic as to constitute a revolution (MTR or RMA), while

*Several very interesting parallels exist between AWPD-1 and Instant Thunder. Both were mainly conceptual in nature, although both necessarily delved into significant detail to prove their practicality—AWPD-1 detailing aircraft production requirements (because this factor represented the major potential “showstopper” in August 1941) and Instant Thunder providing a two-day, realistic—though still notional—master attack plan (because sortie generation and deconfliction represented the major potential showstoppers in August 1990). Both plans were developed on very short suspenses in Washington, D.C., by Air Staff planners, and both faced opposition from people who did not believe in the ability of strategic bombardment to achieve significant national objectives without a tactical-level assault on the adversary's field army.

**Prewar estimates of casualties for US and coalition forces ranged as high as 45,000, 10,000 of which would be fatalities. Most estimates ranged from 9,000 to 30,000 coalition casualties for the entire operation. See, for instance, Federal Information Systems Corporation, Federal News Service, 14 January 1991; Michael K. Frisby, “US Isn't Set for Casualties, Doctors Say,” *The Boston Globe*, 15 January 1991, 4; and Reuters North American Wire, 9 January 1991. These figures were likely predicated on the wrong kind of war. If the assault had kicked off with five or six days of “battlefield preparation,” followed by a surface attack—as posited by the Army's doctrine of AirLand Battle—casualty counts probably would have approached at least the lower end of these estimates.

others argue that we are experiencing only a rapid evolution in war-fighting concepts.* This point of debate, however, lies well beyond the scope of this book. Whether revolutionary or evolutionary, airpower theory must keep pace. The people responsible for organizing, training, equipping, and employing airpower resources in the interests of the United States must not continue to be embroiled in 75-year-old debates.

Although no analysis of Desert Shield/Storm will definitively answer all of these critical questions, the Gulf War represents a valuable data point that, when viewed in the context of history, offers significant insights. Adopting a historical perspective allows one to search for long-term continuities and discontinuities in the conceptual development of airpower (and military) theory—potentially a more useful exercise than the mere exploitation of specific “lessons learned.”** This book, then, examines the promises and accomplishments of airpower in Desert Shield/Storm in the context of the rich history of airpower theory and doctrine development with the hope of contributing to a resolution of the long-standing airpower debates and an advancement of airpower theory.

This exercise would prove useless if ideas, philosophies, theories, and doctrines have no impact on the outcome of military operations—if, as some people suggest, we should

*Serious debate is raging over the nature of MTR/RMA (e.g., the identity of its constituent parts and their interaction) and its critical implications for national and international security (if such terms still have meaning in a world where national boundaries are ever-more permeable to proliferating information-transmittal and information-management systems). Also uncertain are the questions of when (or if) this revolution/evolution began and when (or if) it will end. The latter is of great consequence to people who must attempt to map the course of nations (or corporations, cartels, tribes, etc.) and their instruments of power.

**This is not to imply that the lessons-learned approach has no utility—only that it tends toward answers that are much narrower and dependent upon current technology. For example, it is useful to know that the failure of an AIM-7 missile to fire after release is related to an improper maintenance procedure, but more useful to know that this procedure is common at several bases and has resulted in multiple failures (since one can take steps to solve that problem). To know that AIM-7 missiles are particularly susceptible to this kind of failure is even more useful since this knowledge affects initial and continuation training of maintenance crews and quality control measures at all levels. To know that air-to-air missiles have always been prone to such a problem would be most useful of all, since this knowledge would affect procurement, operational testing, and other life-cycle issues. Thus, placing a single data point in historical context leads to a higher order of learning.

simply throw them away when the war begins and start from scratch. Therefore, chapter 1 begins the analysis by addressing the relationship between people, technology, and ideas in an attempt to answer the question “Do Concepts Matter?” Chapters 2 through 4 lay out the development of the Desert Storm air campaign from its beginnings to execution and probe the airpower debates that this planning reenergized. Chapters 5 through 8 examine how airmen planned and executed the air campaign in terms of time-honored military principles and how successfully they employed those principles. The emerging debate over “information warfare” and the question of whether or not it was part of the Desert Storm air campaign are covered in chapter 9, while chapter 10 draws conclusions about airpower, the debates over airpower, and Air Force institutional doctrine. Finally, the epilogue speculates about the future of the Air Force in the evolving security environment.

The future appears as darkness to the ignorant, but history provides a torch that can pierce that darkness, however imperfectly. But that torch must be lit with ideas of what might be. The Mitchells, Arnolds, and Georges kept the torch burning for over 75 years. It is time for our generation of airpower theorists to light the path of the future.

Notes

1. For a full description of the planning cell and its early activities, see chapter 2 of *Heart of the Storm: The Genesis of the Air Campaign against Iraq* by Col Richard T. Reynolds (Maxwell AFB, Ala.: Air University Press, 1995).

2. See Lt Gen Robert M. Alexander, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 10–11, 23, 66–68, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Col Steve Wilson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 15–17, 20, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

3. Col Richard Bristow, Langley AFB, Va., transcript of interview with Lt Col Richard T. Reynolds and author, 9 November 1992, 10, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

4. Gen Robert D. Russ, Alexandria, Va., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 9 December

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1991, 14, 11, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

5. See CENTCOM air campaign plan briefing material, 11 August 1990, 9-12, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

6. Bristow, 9 November 1992, 6.

7. Russ, 9 December 1991, 20.

8. See *Heart of the Storm*, chap. 4.

9. "You talk about Instant Thunder as a plan. Not in my mind. It was a conceptual briefing." Maj Gen Larry Henry, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 2 June 1992, 31-32, 50, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

10. Bristow, 9 November 1992, 20, 26.

11. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 111, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Lt Gen Robert M. Alexander, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 3 June 1992, 1-2, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

12. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2 December 1991, 34-35, 38-40, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

13. See Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917-1941* (Washington, D.C.: Office of Air Force History, 1955), 47-67 (especially 56, 59, 61, and 64).

14. James C. Gaston, *Planning the American Air War: Four Men and Nine Days in 1941* (Washington, D.C.: National Defense University Press, 1982), 17.

15. Maj Gen Haywood S. Hansell, Jr., *The Air Plan That Defeated Hitler* (Atlanta, Ga.: Higgins--McArthur/Longino & Porter, Inc., 1972).

Chapter 1

Do Concepts Matter?

So the people shouted when the priests blew with the trumpets: and it came to pass, when the people heard the sound of the trumpet, and the people shouted with a great shout, that the wall fell down flat, so that the people went up into the city, every man straight before him, and they took the city.

—Josh. 6:20

On the Normandy coast, just a stone's throw behind the beach, lies the small village of Colleville-sur-Mer. Most Americans probably know little, if anything, of Colleville. It is as unremarkable as any number of similar villages in Normandy: La Madeleine, les Moulins, Vierville-sur-Mer, Saint Mère Église, Ouistreham, Arromanches, and so forth. These villages and others like them share much—style, culture, history, and . . . 6 June 1944, which Field Marshal Erwin Rommell called “the longest day.”* On that day, thousands of young Americans came to two beaches—around which most of these villages are clustered—to break through Adolph Hitler's vaunted Atlantic Wall and destroy his Festung Europa. For the invasion, these two beaches were code-named Omaha and Utah. The Americans came here in deadly earnest—many of them to stay forever.

Today, what sets Colleville apart from the others is the nearby American military cemetery. There, in neat rows stretching hundreds of yards in all directions, stand over 9,000 small, white-marble crosses, intermixed with an occasional Star of David. Each marks the supreme sacrifice of one American for a cause he or she held great. Behind the rows of markers stands a massive, semicircular colonnade—perhaps 30 feet tall—which houses the “Wall of Missing.” In 1961 the wall bore the inscribed names of over 1,500

*Cornelius Ryan immortalized this phrase in the title of his book *The Longest Day: June 6, 1944* (New York: Simon and Schuster, 1959), which recounts the day's events.

additional sacrifices—warriors missing in action, presumed captured or killed, but never found. To a 13-year-old boy, the sight was awe-inspiring, creating a memory that emerged occasionally—revived by a newspaper or magazine article or an old war movie—but that dimmed over time, losing sharpness and detail and eventually fuzzing out to a vague, general recollection. “The cemetery in Normandy? Why yes, I’ve been there.”

In 1993 the boy, now grown to manhood, suddenly and startlingly recalls the scene in vivid detail. The sun shines brightly, and the cool sea breeze blows across the beach, climbing the cliffs to gently ripple the huge American and French flags that stand near a bronze statue of a young man rising from the water, strong and virile, straining with every carefully sculpted muscle toward his goal. A lock of hair curls upward in the breeze, like the waves that, years ago, propelled him toward the beach and immortality. More than likely, his name appears on one of the crosses or stars that gleam in the bright sunlight or perhaps on the marble wall nearby. The waves crashing on the rock- and litter-strewn beach below the cliffs maintain a steady, distant murmur.

The suddenness and vividness of the memory cause the hair on my neck to rise as I comb the pages of a report on the Gulf War of 1991. I suddenly confront pages full of names—a list of fatalities—that serve the necessary but nonetheless macabre requirement of identifying those people who have most recently sacrificed themselves in defense of the Constitution of the United States.* I run my finger down the list, looking for names that might be familiar. Suddenly, in my mind’s eye, I am once again standing on a sunny plateau—above the beach, beyond the cliffs—staring at a much larger list of names etched in white marble.

Although this list is at least four times as large as the one in the report, it represents only the soldiers whose remains were never found—their fate known but to God.

*Unlike any other military in the world, the armed forces of the US are sworn to defend not a person or a government or even a nation of people, but a piece of paper—the Constitution. Everything worthy of defending is subsumed within the words on that document. In effect, service members thus pledge their lives to defending a concept.

Beyond the marble wall lie the remains of six times as many who were found and left interred in Normandy. Others were shipped to final resting places chosen by their next of kin. Just one World War II campaign produced all these deaths. On the first day alone, American casualties numbered over 2,000; indeed, the number of men in the 82d and 101st Airborne Divisions who lost their lives on 6 June 1944 nearly equalled the entire number of American deaths in all of Operation Desert Shield/Storm. None of these people died in vain, but the price paid in Normandy was clearly greater than the one paid in Southwest Asia.

The sunlight fades, the breeze drops, and the carefully manicured graveyard fades from view. Just as suddenly as he appeared, the boy of 13 is gone, and I—a middle-aged military analyst ensconced in a cool, tiny, dimly lit office and surrounded by lifeless archives—am left alone with my thoughts. What made the difference? Even discounting the relative size of contending forces and the duration of the conflicts, the disparity in the number of casualties is enormous. Can we attribute the difference to improved tactics and technologies? Partially, perhaps. But then, what would explain that long black gash in the Washington Mall, just north of the Lincoln Memorial—and the painful legacy it represents?

With the exception of the clashes between the British and Africans in the nineteenth century, it is hard to imagine a conflict involving a greater disparity in tactics and technologies than that between the American forces in Vietnam and their Vietcong and North Vietnamese opponents. Although our adversaries had a few sophisticated weapons, most of the time American gunships, artillery, century-series fighters, and B--52 bombers went up against pajama-suited men wielding AK-47 rifles, crude rockets, and homemade explosives. In the 1991 Gulf War, we finished off a well-equipped, tactically proficient field army in four days of surface combat yet sustained fewer than 500 combat casualties coalition-wide.* In Vietnam, although we always

*Of 44 Iraqi army divisions engaged in the Kuwaiti theater of operations (KTO), 42 were considered combat ineffective before the cease-fire. Col Arthur H. Blair, *At War in the Gulf: A Chronology* (College Station, Tex.: Texas A&M University Press, 1992), 120.

prevailed on the battlefield,* the war dragged on for more than eight years—and we lost. The price was high: a divided and disillusioned nation coping with a nightmare that etched over 58,000 names on the Vietnam Veterans Memorial in Washington, D.C.

Surely, more is involved than better tactics and technologies. What about personalities and individual genius? Perhaps. History reveals again and again, however, that despite the fact that personalities and genius are important and play a role in success and failure, truly great achievements require personalities of vision and intellect who exploit sound tactics and technologies to execute great concepts and theories. All three elements—good people, technology, and concepts—are necessary.

As we have seen, in 1941 Hal George and company drafted a plan for “winning the war with airpower.” AWPD-1 relied primarily on strategic bombardment to bring about the collapse of one adversary after another.¹ These same men also authored the more extreme AWPD-4, which clearly reflected their belief that strategic daylight precision bombardment could win the war and save the bloody expense of a grinding surface campaign.²

Although George, Walker, Hansell, and Kuter were bright, articulate, and clever men, they did not produce either of these war plans in some instantaneous flash of brilliance. They all had been to the Air Corps Tactical School, both as students and faculty members,³ and were aware of (or had participated in) the debates between advocates of strategic bombardment and pursuit aviation.⁴ They had read Douhet (or at least extracts of his writings) and had taken part in arguments about Billy Mitchell's views on airpower.⁵ Some had even testified before Congress in favor of an independent Air Force.⁶ These men could claim personal responsibility for the particulars of AWPD-1 but not for the concepts and theories of warfare that underpinned those particulars and that still survive in air force doctrines.

*“You know you never defeated us on the battlefield,” said the American colonel.

The North Vietnamese colonel pondered this remark a moment. “That may be so,” he replied, “but it is also irrelevant.” Harry Summers, Jr., *On Strategy: A Critical Analysis of the Vietnam War* (Novato, Calif.: Presidio Press, 1982), 21.

For instance, Ken Walker had argued (as had many others, beginning with Douhet) that the bombers would always get through.⁷ On 5 January 1943, Walker—now a brigadier general—rode the wreckage of his B-17 to the bottom of Rabaul Harbor, winning a Medal of Honor in the process. But the theory was not discredited; the other bombers had gotten through to



Escort Fighters. During World War II, determined bomber crews were able to penetrate air defenses and reach their targets, but loss rates proved too high. Deep raids had to wait until escort fighters such as these P-51s (below) became available in sufficient numbers.



destroy seven enemy ships and three fighters. Even on the famous Schweinfurt-Regensburg raids later in that same year, the main bomber force reached its targets. On 17 August 1943, for example, US Army Air Forces (USAAF) bombers unloaded 724 tons of bombs on their targets, despite horrendous losses—60 bombers and over 600 crewmen.⁸ Because USAAF leaders and planners learned valuable lessons from every setback, the bombers ultimately made a “decisive” contribution to the outcome of the war.* But the bombers had to share the limelight with their “little buddies,” the long-range fighters whose protection proved necessary if the larger aircraft were to survive repeated missions deep into enemy territory.

The larger aircraft also shared the glory with attack fighters and light bombers that supported surface maneuvers, with transports that delivered supplies and dropped paratroops, with surveillance and bombardment aircraft that escorted ship convoys, with fleet carrier forces that attacked enemy shipping and battle fleets, with escort carrier forces that supported amphibious invasions, and so forth. The academic debates over strategic bombardment versus pursuit aviation had given way to the pragmatic melding of strategic bombardment and pursuit—and close air support and interdiction and surveillance and antishipping and resupply—plus a whole lot more. In other words, the debates yielded to the concept of integrated airpower that would finally be articulated in Army Field Manual (FM) 100-20 in July 1943 (see chap. 3).

In the meantime, George and the others—like Walker—had moved on to other important tasks. After completing work on plans for the famous Combined Bomber Offensive and being promoted to brigadier general, Haywood Hansell assumed command of the First Bombardment Division in England.

*Many commentators cite the US Strategic Bombing Survey as evidence that strategic bombing was not decisive. However, the survey’s summary report for the European war says that “Allied air power was decisive in the war in Western Europe,” and the summary report for the Pacific war notes that “the experience of the Pacific war supports the findings of the Survey in Europe . . . that no nation can long survive the free exploitation of air weapons over its homeland.” The United States Strategic Bombing Surveys, 37, 110 (see note 10).

Larry Kuter, now a major general, had commanded units in England and Northwest Africa and was back at the Air Staff working for General Arnold. And Hal George himself, recently promoted to lieutenant general, was commander of the Air Transport Command. All of these men continued to make significant contributions to the war effort, although none were so all-encompassing as AWPD-1.

Despite the importance of AWPD-1, that plan alone did not win the war. Other people (many of whom had been to ACTS9) contributed ideas and concepts: George Kenney, Ira Eaker, Tooey Spaatz, Curtis LeMay, Hap Arnold, Jimmy Doolittle, Claire Chennault, and so forth. Furthermore, Allied aircraft—bombers, fighters, transports, and specialty planes—all contributed to the victory at the tactical, operational, and strategic levels.* There were no “silver bullets.”

*The terms tactical, operational, and strategic can be confusing. For years before Desert Storm, strategic and tactical were used in reference to particular systems (e.g., strategic bombers), weapons (e.g., tactical nuclear weapons such as the Pershing missile), and organizations (e.g., Tactical Air Command)—sometimes even people (e.g., tactical fighter pilots). Out of historical necessity, this study perpetuates such usage to some extent, but for the most part it uses these terms to refer to the effect of particular actions or operations. That is, tactical-level events affect immediate operations such as the battle (e.g., shooting down an enemy fighter in an air-to-air engagement). Likewise, strategic-level events affect the entire war (e.g., destroying homeland fighter aircraft production facilities in order to decrease the availability of those aircraft for the duration of the war). In either case, only the intended or actual effect determines whether the event is strategic or tactical.

The operational level has caused the greatest confusion because the US military (especially the Air Force) has only recently begun to rediscover it. For our purposes, operational-level events affect an entire theater or area of operations (e.g., fighter sweeps designed to engage and destroy enemy air forces in a particular area of operations).

Adding to the confusion is the fact that when combat occurs in a single area of operations—as was the case in Desert Storm—the operational and strategic levels tend to merge. To some observers, fighter sweeps in Kuwait served essentially the same purpose as bombing various kinds of production facilities in Iraq insofar as they affected operations in the KTO. Had there been another area of operations, the bombing in Iraq would have affected both theaters equally, while fighter sweeps in the KTO would have had a near-term impact only in the KTO. Even in Desert Storm, the differentiation between the operational level and the strategic level was much more distinct than it may seem. Specifically, the bombing of production facilities in Iraq was directly related to the strategic-level objective of reducing Iraq's overall offensive capability for the near-to-intermediate future. Any near-term effect on the KTO was coincidental.

Instead, the Allies won the war through slogging, treacherous, hard work.

Good men—some of them brilliant—rose to the occasion, employing concepts and theories they had developed during the interwar years, as well as some they devised quickly in the heat of battle or even on the brink of defeat. These concepts and theories, together with their antitheses, included high-altitude daylight precision bombardment/low-level nighttime saturation bombardment; decentralized control and execution/centralized control and decentralized execution; close escort of bomber formations/fighter sweeps in front of bomber formations; offensive counterair/defensive counterair; and strategic bombardment/interdiction and/or close air support.

Sometimes planners abandoned one concept in favor of another. For instance, FM 100-20's vision of centralized control and decentralized execution replaced decentralized control and the division of airpower into penny packets, a practice that had proved disastrous in Northwest Africa, particularly at Kasserine Pass.* Allied air forces then began to gain ascendancy over Axis air forces—a process that was nearly complete by 6 June 1944.

At other times, seemingly opposing concepts proved synergistic. For example, although counterair operations may compete for resources with other air missions, all operations are enhanced by counterair's efforts to control the air. According to the Strategic Bombing Survey, “control of the air permitted close air support to ground forces . . . effective interdiction . . . [and] destruction by long--range bombing of such of [Japan's] industries and cities as we chose to

*Allied (mostly American) ground forces suffered heavy casualties and equipment losses during the Axis attack at Kasserine Pass in mid-February 1942, partially due to ineffective air/ground coordination and the penny packeting of airpower under the initial organizational scheme for Northwest African Air Forces. The reorganization to place air under a single air commander—coequal with the ground commander—was already under way but had not yet taken full effect. Allied air forces were still engaged in flying “defensive umbrellas” over friendly ground troops at this point, thus dissipating their strength in unsuccessful defensive operations. Shortly after the battle at Kasserine ended, this wasteful practice was halted, and the Allies were ascendant in the air from that point forward. Richard G. Davis, Carl A. Spaatz and the Air War in Europe (Washington, D.C.: Center for Air Force History, 1993), 178–84.

attack."¹⁰ The effects of dominance in the air were similarly pervasive in all theaters.*

Occasionally, one concept worked well under one set of circumstances, while another worked better under other circumstances. For example, although high-altitude daylight precision bombardment proved effective in Europe, Gen Curtis LeMay found it too costly and ineffective in attacking Japanese industry, which was much more dispersed and “softer” than German industry. Instead, he used low-level nighttime attacks to negate Japan's air defense systems, as well as saturation firebombing of Japan's major population centers to disrupt industrial output.¹¹

The duration and casualties of World War II could have been reduced if concepts and technologies had been better matched and/or the concepts themselves more fully developed and accepted when the war began. But, as is usually the case, concepts and theories—not technologies and tactics (normally the products of concepts and theories) or brilliant individuals (normally the products and/or progenitors and/or catalysts of good concepts and theories)—were principally responsible for the Allied victory in World War II.

Likewise, the lack of good concepts and theories helps explain the black gash in the Washington Mall. We had plenty of good equipment, tactics, men, and women during the Vietnam War. However, we did not have sound concepts to answer some of the basic questions: Why are we here? Where are we going? What do we hope to achieve? What should it look like when we're finished? If we win an engagement, how will that victory contribute to our objectives? For that matter, what are our objectives?

Undoubtedly, one of the key problems in Vietnam was our failure to articulate clear national objectives or achievable military objectives. Body counts were a poor substitute for

*In 1946 General Spaatz summed up the situation with some prescient observations: “The first and absolute requirement of strategic air power in the war was control of the air in order to carry out sustained operations without prohibitive losses. . . . Strategic air power could not have won this war alone, without surface forces. . . . Air power, however, was the spark to success. Another war, however distant in the future, would probably be decided by some form of air power before the major surface forces were able to make contact with the enemy in major battles. That is the supreme military lesson of our period in history.” Gen Carl (“Tooy”) Spaatz, “Strategic Air Power; Fulfillment of a Concept,” *Foreign Affairs*, April 1946, 394–96.

sound measures of battlefield success. Though we carefully measured levels of destruction and duration of effects, we could not prevail over pajama-clad men and women who held tenaciously to a single political objective—national self-determination.

Twenty years later, good men and women came to Desert Shield/Storm with the most impressive collection of sound tactics and advanced technologies ever seen on any battlefield.* But tactics and technologies do not guarantee success. Although Hussein had little chance of prevailing tactically against us, his own collection of military capabilities was impressive, including much modern equipment from the former Soviet Union, France, and Germany.¹² His troops employed battle-tested tactics which, though not up to American standards, had proven grindingly effective against Iran's massive military.¹³ Indeed, in August 1990 the Iraqis executed beautifully against Kuwait's tiny force, rolling south in a multipronged, corps-level attack that effectively decided the issue in hours.¹⁴ Further, the Iraqi combat engineers, considered among the best in the world, had had five and one-half months to prepare defensive positions to counter any coalition assault.¹⁵ Finally, their leader clearly had the will—a bully's will—to have his way.

Hussein's modern military, tactically proficient in World War I-style operations, faced a mostly ultramodern force that was trained for the latest in high-tempo offensive operations. Considering the array of forces on both sides, Iraq had little chance of winning any given battle. But Hussein's apparent strategy made winning tactical engagements unnecessary. If his forces could bleed the coalition while grudgingly giving way in the “Mother of All Battles,” he might still pull off a strategic victory.** As in Vietnam, tactical- and operational-level military defeats might prove irrelevant to the political

*Although some people doubted that our advanced technology would function as well as it did in a desert environment, no one questioned whether it was good enough to win at the tactical level.

**Many commentators argue that simply by facing the “great Satan” and accepting the inevitable tactical- and operational-level defeats, Hussein scored a strategic victory. See, for instance, Edward N. Luttwak, “Ground Nuts: The Army's Fatal War Strategy,” *New Republic*, 25 February 1991, 20–21.

outcome.* Hussein was counting on the possibility (perhaps even probability) that the coalition, especially the United States, would not have the stomach to finish the job.

Thus, the most disturbing variable for the US and its military forces was the cost of victory. According to the best statistical simulation models, slugging it out with Hussein's army would produce 17,000 to 30,000 US casualties.¹⁶ No one wanted that; in fact, the American public probably wouldn't have tolerated it. There had to be a better way. To achieve coalition objectives, we had to defeat Hussein conceptually as well as tactically by finding ways to pit our strengths against his weaknesses. Many observers, including Hussein himself (see chap. 3), thought the coalition's advantage lay in airpower. But what was the most effective way to use it? Opinions varied on that issue.

Despite the fact that the Desert Storm air campaign plan, as finally developed, struck some airmen as appropriate to the task (Gen Merrill A. McPeak, the Air Force chief of staff, called it "a no-brainer, straightforward"¹⁷), it generated extensive controversy, even among airmen. For example, they questioned the role of the Air Staff in developing the plan, the appropriateness of the strategic attack phase, and the balance between deep attack and surface support (see chaps. 2 and 3).

Outside the community of airmen, the controversy intensified, raising questions about the command (control/coordination) of resources and the rightful commander of the air campaign. Certainly, the air plan would have been significantly different if Warden had not acted as he did, if Schwarzkopf had not asked for Air Staff assistance, and if Schwarzkopf had not so adamantly (and correctly) designated Horner his single commander for air.¹⁸ Building the air campaign around the surface scheme of maneuver, as suggested by FM 100-5,¹⁹ or placing Maj Gen Royal Moore, the Marine Corps air wing commander during Desert Shield/Storm (who wanted the "first bomb [to] drop after the

*This thinking is closely related to the Clausewitzian concept of political primacy, cited by the early advocates of Instant Thunder. As pointed out previously, they reasoned that direct pressure would cause leadership to acquiesce and thus negate the impact of the disposition of forces on the battlefield.

first marine crosses the line”²⁰), in charge of CENTCOM air operations, might have fulfilled those predictions of thousands of coalition casualties. Instead, the 38 days of air operations that preceded the surface assault denied Saddam Hussein the opportunity to inflict such damage.

Hussein's concepts, doctrines, and philosophies proved no match for ours. After his tactical victory in Kuwait in August 1990, he elected to dig in and wait for the world either to accept his gains or launch the inevitable counteroffensive. His military doctrine (whether articulated as such or not) called for securing small advances and then regrouping. In eight years of warfare with the Iranians, he had learned to bleed an attacker on cleverly designed defensive positions, to seize small parcels of territory with brigade-sized (or multiple-brigade-sized) attacks, and to dig in again.²¹

Hussein's doctrine called for saving his air force for long-range strikes against high-value targets and for direct support of the surface battle. This policy had served him well against an adversary who embraced a similar doctrine and who engaged with him in World War I-style trench warfare. Accordingly, Hussein used airpower for strategic strikes (against oil platforms, cities, etc.), strategic air defense (against the enemy's strategic strikes), and tactical support (CAS and interdiction)²²—but always incrementally.²³ When not in use, his strategic reserve air forces were housed in “nuclear-hardened” shelters.²⁴ In conjunction with his high-technology integrated air defense system (IADS), these shelters protected his vital resources admirably from an enemy whose air strategy resembled his own. But they proved useless against an adversary who followed an aggressively offensive doctrine and who possessed resources to execute a massive, precision air assault supported from space.

Hussein's predictions about the outcome of the war varied in their accuracy. For example, he was right in saying that America relies heavily on airpower to achieve many political and military objectives. But his argument that airpower has never been the decisive factor in warfare was only partially correct insofar as it has rarely been as decisive as it was against him.* Finally, his assumption that America's reliance

on airpower would lead to military and political defeat in Southwest Asia was dead wrong. As General Russ had concluded, Hussein's misunderstanding of the capabilities of our air forces was a critical mistake.**

After the first night of the air campaign against Iraq, Hussein had lost his chance to bleed American and coalition forces. His IADS was defeated and cowed, and his air force was virtually grounded. Unbeknownst to him, the crushing left pincer of our ground assault (if it were needed!) had already begun rolling west. Even if he had known about this maneuver, he had no way of countering it without succumbing to more highways of death. Both his personal power and his country's power were under serious assault, yet the only defense was to hunker down and hope. Indeed, Hussein's only remaining hope was that the coalition still might choose to mount an early ground assault on his prepared defenses while his forces remained relatively fresh and well supplied.

Such might have been the case if airmen had not resisted AirLand Battle's subordination of airpower as part of a system of tightly synchronized supporting fires.²⁵ Instead, most air operations were governed by the broader vision of aerospace doctrine, which allowed not only for independent air operations when they were appropriate, but also for CAS and other closely synchronized operations when they were called for.²⁶ Although the compromise that allowed these broader applications was tenuously formed (see chap. 3), it clearly reflected tenets of air doctrine that have survived since the days of FM 100-20 (see chaps. 3 and 10). Conceptually, the initial air assault was designed to leave Saddam Hussein, the

*On 30 August 1991, Saddam Hussein said, "The United States relies on the Air Force and the Air Force has never been the decisive factor in the history of wars." Dan Rather, "Excerpts from Interview with Hussein on Crisis in Gulf," *New York Times*, 31 August 1990, A-10. As already pointed out, the US Strategic Bombing Survey concluded that air forces can be decisive (indeed, had been decisive in World War II).

**"We have a tremendous capability in airpower, and Saddam Hussein [needed] to really pay attention to us. I didn't think he really knew how good we really were." Gen Robert D. Russ, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 9 December 1991, 14, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

nation of Iraq, and the Iraqi fielded forces blind, deaf, and mute, thus allowing all other coalition operations to proceed with minimal interference. It seems to have worked.

The entire ground campaign depended upon VII and XVIII Corps' execution of Schwarzkopf's left-hook maneuver, which in turn depended upon the complete air superiority provided by 38 days of intense aerial attack.²⁷ The westward redeployment of coalition surface forces began on the same day as the air campaign and was still in progress as the ground campaign kicked off. Had the air campaign coincided with the beginning of the ground campaign (as Marine Corps general Moore insisted), the left-hook maneuver would have been forced to start 30 days or more before the air campaign, obviously without the benefit of air cover. In that time, Iraq might have succeeded in discovering and countering the move.

The alternative would have been to execute an entirely different ground campaign beginning from the two corps' original positions far to the east. In either case, the Iraqis could have drastically improved their awareness of the situation by easily updating their information on the coalition order of battle. Consequently, any engagement with such a carefully prepared enemy probably would have been costly. Instead, coalition airpower denied such information to the Iraqis, making it possible to convince them to defend against a bogus deployment of coalition forces while the actual deployment proceeded to flank, envelop, and engage them before they knew what was happening.²⁸

Additionally, the 38 days of strategic air warfare adversely affected the Iraqi home front by seriously depleting supplies of petroleum products, virtually shutting down the generation of electricity, and giving Hussein himself—who was hiding in different bunkers throughout the country—reason to believe that he was only one bomb away from oblivion. Battlefield preparation by coalition aircraft exacted a similar toll at the front by seriously degrading Baghdad's ability to communicate with field commanders, disrupting supply lines, and cutting off information about the order of battle. Unsurprisingly, when the battle began, many Iraqi troops appeared eager to surrender. Obviously, the concepts,

doctrines, and philosophies that underlay the air campaign plan bore substantial fruit.

We have much to learn from Operations Desert Shield/Storm. For example, we now know that—under the right circumstances—we can penetrate and destroy nuclear-hardened shelters with conventional weapons. Hopefully, people in our defense laboratories, maintenance depots, and operational squadrons are learning and exploiting thousands of such lessons from the war. We can also be sure that the brilliance, decisiveness, and dedication of the people who planned and executed the Shield and Storm will serve to motivate generations of American military leaders.

Perhaps most importantly, an examination of the concepts, doctrines, and philosophies employed in the Gulf War in conjunction with the lessons of the past and the tactics and technologies of the future could shape the face of warfare for the next 100 years or more. The resolve that we bring to that task might very well determine how many names, how many gleaming crosses, how many marble walls, and how many bronze statues will cover the landscapes on these and distant shores.

Certainly, concepts do matter.

Notes

1. Air War Plans Division—Plan 1, Munitions Requirements of the Army Air Forces, 12 August 1941, 1, US Air Force Historical Research Agency, Maxwell AFB, Ala.

2. Air War Plans Division—Plan 4, Air Estimate of the Situation and Recommendations for the Conduct of the War, 15 December 1941, 4, 6–7, 9–10, US Air Force Historical Research Agency, Maxwell AFB, Ala.

3. Robert T. Finney, *History of the Air Corps Tactical School, 1920–1940* (Washington, D.C.: Center for Air Force History, 1992), 103–4, 106, 119, 121, 124.

4. *Ibid.*, 62–68; and James C. Gaston, *Planning the American Air War: Four Men and Nine Days in 1941* (Washington, D.C.: National Defense University Press, 1982), 72–74.

5. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 1, 1907–1960 (Maxwell AFB, Ala.: Air University Press, December 1989), 38–39, 51, 62–65.

6. Gaston, 74–75.

7. Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917–1941* (Washington, D.C.: Office of Air Force History, 1955), 55–56, 58–59.

8. Kit C. Carter and Robert Mueller, *The Army Air Forces in World War II: Combat Chronology, 1941–1945* (Washington, D.C.: Office of Air Force History, 1973), 176.

9. Finney, 101, 103, 117, 125, 133.

10. *The United States Strategic Bombing Surveys (European War) (Pacific War)* (30 September 1945, 1 July 1946; reprint, Maxwell AFB, Ala.: Air University Press, October 1987), 109.

11. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 5, *The Pacific: Matterhorn to Nagasaki, June 1944 to August 1945* (1953; new imprint, Washington, D.C.: Office of Air Force History, 1983), 609–27.

12. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 9.

13. *Ibid.*, 10–11.

14. *Ibid.*, 1–3.

15. Stephen C. Pelletiere and Douglas V. Johnson II, *Lessons Learned: The Iran–Iraq War* (Carlisle Barracks, Pa.: Strategic Studies Institute, 1991), 55–56; and *Conduct of the Persian Gulf War*, vol. 1, 93.

16. Diane T. Putney, “From Instant Thunder to Desert Storm: Developing the Gulf War Air Campaign’s Phases,” *Air Power History*, Fall 1994, 45.

17. Gen Merrill A. McPeak, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 5 November 1992, 2, *Desert Story Collection*, US Air Force Historical Research Agency, Maxwell AFB, Ala.

18. See chaps. 2–4 of this volume; Col Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign against Iraq* (Maxwell AFB, Ala.: Air University Press, 1995); and Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War* (New York: Houghton Mifflin, 1993), 216–28. With significant justification, Atkinson identifies the American military services’ most implacable foes as “each other.”

19. FM 100-5, *Operations*, May 1986, 30.

20. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Richard T. Reynolds and author, 10 December 1991, 31, *Desert Story Collection*, US Air Force Historical Research Agency, Maxwell AFB, Ala.

21. *Conduct of the Persian Gulf War*, vol. 1, 10–11; and Pelletiere and Johnson, x.

22. Maj Ronald E. Bergquist, *The Role of Airpower in the Iran–Iraq War* (Maxwell AFB, Ala.: Air University Press, December 1988), 46–47, 51–53, 59–62, 74–75.

23. “Observers never saw more than six aircraft in a single attack.” *Ibid.*, 47.

24. *Conduct of the Persian Gulf War*, vol. 1, 168–69.

25. FM 100--5, 28–32.

26. *Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force*, 5 January 1984, 2-11 through 2-15, 3-2 through 3-8.

27. In the words of retired Army colonel and military analyst James F. Dunnigan, “This solution would not have been possible if the Allies had not had complete control of the air.” James F. Dunnigan and Austin Bay, *From*

Shield to Storm: High-Tech Weapons, Military Strategy, and Coalition Warfare in the Persian Gulf (New York: William Morrow and Co., 1992), 290.

28. “[The Iraqis] never anticipated an attack from the south. . . . [They] never knew what hit them,” according to retired Army major James Blackwell, who worked as a military affairs analyst for Cable News Network during the Gulf War. This statement was probably true of the vast majority of Iraqi units. James Blackwell, **Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War** (New York: Bantam Books, 1991), 195.

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Chapter 2

Instant Thunder: Why an Air Staff Plan?

“[I told my planners,] ‘This is what we are going to call the plan: it's going to be Instant Thunder’.”

“In your mind, what did that mean?”

“That meant it was not Vietnam. That meant we were going to do it right this time.”

“It was not Rolling Thunder?”

“It was not Rolling Thunder. . . . [I said,] ‘This is not your Rolling Thunder. This is real war, and one of the things we want to emphasize right from the beginning is that this is not Vietnam. This is doing it right. This is using airpower’.”

—Interview with Col John A. Warden III, USAF

On 6 August 1990 when Colonel Warden returned to the Pentagon from his vacation, he instructed his staff to begin planning an offensive strategic air campaign¹ (the early version was titled simply “Iraqi Air Campaign”) because he believed that no such thing existed in the collection of operations plans (OPLAN) and concept plans (CONPLAN) at CENTCOM, and that neither the deliberate planning process nor the crisis-action planning process was likely to produce one.² A hard look at those CENTCOM plans tends to support his view.

Over a period of more than 40 years, the United States had settled into a defensive mind-set, the result of being a “peace-loving, democratic nation.” Virtually no one in the Air Force (or the US military, for that matter) was writing theater conventional war plans to take the offensive and carry the fight to the enemy's homeland. On the contrary, most plans assumed a “worst-case” scenario in which the US would deploy forces into full-blown regional conflicts. Initially, those forces would always be outnumbered and falling back.

The notable exception was, of course, the single integrated operational plan (SIOP) for strategic nuclear options, a plan designed and maintained by staffs such as the Joint Strategic

Target Planning Staff. Although the SIOP was certainly offensive and directed at the enemy's homeland, it was strictly nuclear and intended for use only in a global war. In exercises, its execution sometimes followed upon the failure of theater OPLANs to stop an enemy's conventional assault (escalation) or the overly successful prosecution of a theater contingency response (counterescalation). But the SIOP never truly integrated with theater conventional warfare. Rather, it followed sequentially—and it was always strictly nuclear. For theater contingencies—in which US forces expected to be outnumbered and falling back—the best our troops would be able to do at the outset was “defend, delay, and attrit.”

The briefing that General Horner gave in April 1990 to General Schwarzkopf on OPLAN 1002* air operations during CENTCOM's Internal Look exercise was just such a defensive, worst-case scenario.³ It laid out the campaign strategy in three phases: (1) deter; (2) defend, delay, and attrit; and (3) begin counteroffensive. Even in phase 3, the emphasis was on defeating the ground forces of Country Red (a thinly veiled code for Iraq, considered at the time a potential ally—or at least a useful counterbalancing power—in the Middle East). For instance, General Horner's handwritten comment at the bottom of the briefing slide titled “Mission Flow” is telling: “Build a hose and point it where the ground commander sees that it's needed” (emphasis added). The briefing makes no mention of strategic attack** or targeting of leadership, industrial infrastructure, or centralized C² functions. Instead, every reference is to CAS or interdiction targeting.⁴

Warden and others in the Pentagon felt that this psychology of worst-case tactical planning was further exacerbated by internal fragmentation of the US Air Force according to job specialty. That is, the loyalty of many airmen to their particular specialty precluded them from taking a broad view of airpower.* In the case of the “tactical” specialists, many

*OPLAN 1002 was the major regional contingency plan for the defense of the Arabian Peninsula.

**Considering this fact and the tremendous pressure on CENTCOM and CENTAF commanders and planners during early August 1990, it is highly unlikely that an offensive strategic air campaign would have suddenly materialized at either of these headquarters.

(perhaps most) had been “captured” by the Army's AirLand Battle doctrine, as is evident in General Horner's remark about “build[ing] a hose.” Not only is the main air effort directed at interdiction and CAS, but it is also directed where “the ground commander sees that it's needed.”⁵

According to the then-current version of FM 100-5, Operations, airpower is an integrated but subordinate element of the AirLand team. Throughout the document, air operations are depicted as fire support for ground maneuver. Although planners must coordinate “air and naval support of ground maneuver” (emphasis added),⁶ ground maneuver never supports air operations. “In a large-scale nuclear conflict, fire support could become the principal means of destroying enemy forces. The scheme of maneuver (ground) would then be designed specifically to exploit the effects of the fire support” (emphasis added).⁷ Even though airpower is the principal means of destruction in this scenario, it is still characterized as “fire support,”⁸ a view that does not exactly preclude the use of airpower in independent, decisive ways (strategic attack, for instance) but certainly does not encourage it.

A debate has raged for many years over the degree to which the Air Force has committed itself to AirLand Battle and over that doctrine's depiction of the supporting role of airpower. If indeed the TAC community largely agreed with the Army view, then in the minds of Warden's group and his senior supporters, TAC and TAC-trained people would fight any effort to inject an offensive strategic air campaign plan into the system. They would prefer to wait to see the Army scheme of maneuver and then plan to support it. A considerable body of evidence indicates that such was the case.* In any event, if theater planners understood tactical employment of airpower

*Much evidence supports this view of specialization, including the rationale for the reorganization of Strategic Air Command (SAC) and TAC into Air Combat Command (ACC). See, for instance, James W. Canan, “The End of the Stovepipe,” *Air Force Magazine*, June 1992, 32; Carl Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution of the U.S. Air Force* (New Brunswick, N.J.: Transaction Publishers, 1994), xvi-xviii; and Dr Donald B. Rice, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 32, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

only in terms of AirLand Battle doctrine, they would not likely develop a strategic air campaign without outside impetus.

As for Air Force strategic planners (who, at the time, belonged to SAC), they dealt only with the nuclear SIOP. Although they could have put together a strategic air campaign against Iraq (in fact, they provided considerable assistance in the early days⁹), they did not have the expertise in “tactical” systems or conventional munitions delivery and effectiveness to plan the campaign for execution with conventional systems.¹⁰

All of these factors convinced Warden that if his little group didn't build a conventional strategic air campaign plan against Iraq, no one would. He had no idea how he would insert such a plan into the system, but he felt he had to try.¹¹ Further, the problem of getting the Air Staff plan recognized and accepted was exacerbated by the Goldwater-Nichols Department of Defense Reorganization Act of 1986.

With regard to war fighting, Goldwater-Nichols sought to “seal off” the theater of operations, thereby giving the theater CINC total authority. The services and commands are supposed to provide assistance on request, but they have no authority to “meddle” in the CINC's affairs. In anticipation of combat—according to Goldwater-Nichols—the CINC would become a self-sufficient “warlord.” In reality, this situation is quite impossible because the CINC has no means of generating intertheater lift, logistics, space systems utilization, communications, and so forth. Therefore, under very strict rules, this kind of “meddling” is allowed, as “requested” by the CINC.

Campaign planning probably also falls into the category of things one can't do in isolation—theater commanders will always require some outside help. The generic CONPLANS or

*Evidently, General Horner initially planned to support an Army scheme of maneuver. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2 December 1991, 13, US Air Force Historical Research Agency, Maxwell AFB, Ala. General Russ, commander of TAC at the time of Desert Shield/Storm, has long believed that the Air Force's sole job is to support the Army: “The fact that you don't ever have to use [ground forces] doesn't make any difference. It is support.” Gen Robert D. Russ, Alexandria, Va., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 9 December 1991, 80, US Air Force Historical Research Agency, Maxwell AFB, Ala.



Powell, Cheney, and Schwarzkopf. The Goldwater-Nichols Act of 1986 strengthened the roles of the chairman of the Joint Chiefs of Staff (CJCS) and theater commanders in chief (CINC). Seated with Secretary of Defense Dick Cheney are Gen Colin Powell, CJCS (left), and Gen H. Norman Schwarzkopf, CINC of US Central Command (right), during Desert Shield/Storm.

OPLANs built by theater planning staffs often take months or years to develop fully. Materials are collected through various sources, supporting plans are built by the supporting commands, and annexes are let out for development by supporting staffs.

At the time Hussein invaded, the basic version of OPLAN 1002-90 had been constructed but was still generic. The supporting annexes and the all-important time-phased force and deployment data (TPFDD) were being developed in the field. Moreover, a generic force structure had been built for the 1002 contingency but had not been “sourced” (the process of identifying specific units and equipment to fill the force structure requirements).¹² As long as a contingency is notional and remains in the (perhaps) distant future, the fact that the plan is in such a nebulous state is no problem. When

Hussein invaded, however, all the what-ifs suddenly became very immediate realities, and the campaign plan had to take shape quickly.

Under such circumstances, it is helpful to know that Washington has exclusive, direct, “eyeball-to-eyeball” access to people and organizations possessing precisely the kind of information that planners need to quickly build a specific campaign plan. Sources include myriad national and supporting intelligence agencies, as well as other important sources of information about foreign nations. The fact that Warden's group contacted and developed working relationships with many of these sources (e.g., Defense Intelligence Agency [DIA], Central Intelligence Agency [CIA], National Intelligence Council [NIC], etc.)¹³ helped make vital information available to the theater (through the Air Staff) literally days before it arrived through normal channels.¹⁴ Without this kind of access, the process likely would have taken months to years, as is the case with OPLAN building. Despite the obvious utility of the Air Staff (or at least someone in the Pentagon) in this process,* Goldwater-Nichols nonetheless discourages such involvement.

Like so many other things that happen in war, however, Instant Thunder benefited from a seemingly incredible stroke of luck. General Schwarzkopf's phone call to Gen John M. (“Mike”) Loh on 8 August 1990 to request a strategic bombing campaign¹⁵ and his effusive acceptance of the plan at the briefings on 10 and 17 August gave the plan a glow of jointness (one of the key intended outcomes of Goldwater-Nichols), as well as the imprimatur of the CENTCOM warlord. Without General Schwarzkopf's phone call, the plan probably never would have left the Pentagon. Even with the CINC's seemingly bulletproof seal of approval, the battle to gain acceptance of Instant Thunder was long and arduous.¹⁶

Setting aside personality conflicts (which certainly played a part), the controversy surrounding Instant Thunder seems to

*For example, Maj Gen Michael E. Ryan, TAC's director of operations, was initially distressed by the “intervention” of the Air Staff but has since changed his mind for the reasons cited. Maj Gen Michael E. Ryan, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 4 September 1992, 17-18, US Air Force Historical Research Agency, Maxwell AFB, Ala.



Gen H. Norman Schwarzkopf. Even with General Schwarzkopf's effusive approval, the Instant Thunder strategic air campaign plan seemed to hang by a thread during mid- and late August 1990.

stem from disagreements over the extent to which destruction of the opposing army is central to victory.

Nearly all students of warfare agree that war is waged for political reasons: one nation (or segment thereof) wants something from another.¹⁷ Warfare may be used as a first, last, or intermediate resort to achieve the desired end, depending upon several factors (not the least of which is the general bellicosity of the nation in question). But once war is decided upon, the practitioners of war generally turn to one of two schools of thought on the primary objective.

One school maintains that the objective of warfare is defeat of the opposing army and that all the resources of war must

be directed toward that end.* Understandably, Army people tend to think and write this way. For example, according to FM 100-5,** “all ground actions above the level of the smallest engagements will be strongly affected by the supporting air operations of one or both combatants”¹⁸ (emphasis added). Proponents of this viewpoint frequently cite the Prussian military theorist Carl von Clausewitz: “To sum up: of all the possible aims in war, the destruction of the enemy's armed forces always appears as the highest.”¹⁹ If this line of reasoning prevails, then it makes sense that all airpower applications should be measured against their contribution to destruction of the enemy army (and, in turn, support of the friendly army). Thus, “a main effort is always clearly designated and ground plans are thoroughly coordinated with plans for air support”²⁰ (emphasis added). In other words, air campaign plans should be built around ground schemes of maneuver.

The other school takes its cue from Clausewitz's principle of political primacy in war: nations do things because national leaders (or their constituents) decide to do them.²¹ Although one may use sheer force to compel the enemy to comply (e.g., the complete destruction of Germany's resistance at the end of World War II), more often than not, a political decision produces the result (e.g., the Japanese surrender in 1945).

In this scheme of things, the best means of achieving the desired end is to apply calculated pressure at key points (i.e., centers of gravity²²—another Clausewitzian term). This stratagem will convince the enemy leadership that resisting is futile or that the cost of resisting is higher than that of acquiescing. Clear examples of the latter are difficult to produce, but Muammar Qadhafi's response to the limited

*To a small extent, this view also applies to destruction of the other elements of military power (i.e., navy, air force, etc.) but only insofar as their efforts affect the army (specifically, ground forces). This view is essentially the one that Gen Douglas MacArthur was championing when he said, “There can be no substitute for victory.” Gen of the Army Douglas MacArthur, *Reminiscences* (New York: McGraw-Hill Book Co., 1964), 404.

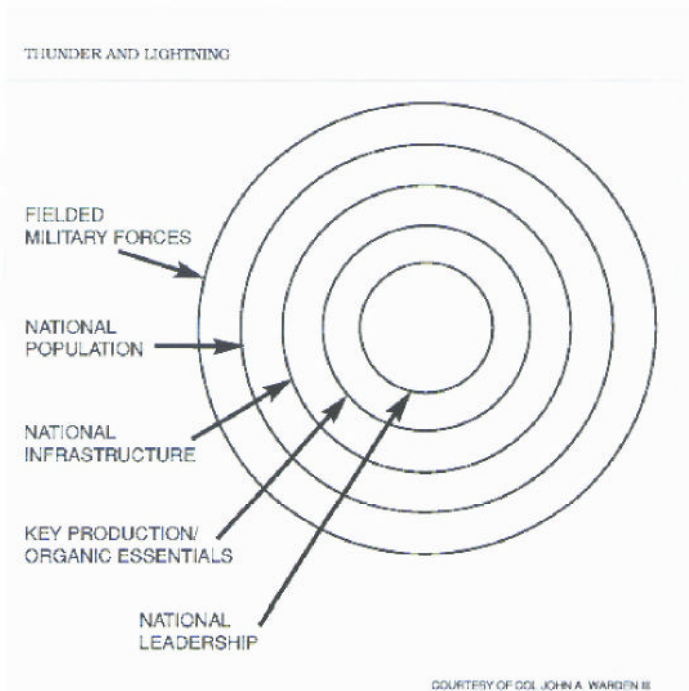
**Throughout FM 100-5, airpower is important to AirLand Battle but always in a supporting role. The single exception is thermonuclear war, in which airpower is the primary means of destruction. Nonetheless—as pointed out earlier—the manual still refers to it as fire support.

strikes against Libya in 1986 provides one case in point. Thus, national leadership becomes the principal target in war, while military forces merely protect the true centers of gravity within. If this line of reasoning prevails, then one may be able to design an air campaign that will be completely independent of all ground operations and that, by itself, will convince the enemy leadership to acquiesce. In part, Instant Thunder was designed to accomplish this goal—if indeed it were possible.

Using new military technologies that promised to make the predictions of Douhet, Mitchell, and the AWPD-1 war planners come true, Warden's staff expected to demonstrate the decisiveness of modern airpower and fulfill America's political objectives, while essentially ignoring the Iraqi army in Kuwait. The combination of technology, doctrine, and strategy proposed in Instant Thunder would impose “strategic paralysis”* on Iraq and either convince Saddam Hussein to capitulate or bring about his removal by the people of Iraq (perhaps even by his undamaged conscript army after it withdrew from Kuwait).²³

Warden's planners based their concept of operations on a unique five-ring model of the modern nation-state, a model which they had developed over time. It consisted of five concentric circles, each circle representing a critical element of the nation-state (see fig. 1). The center circle or ring—surrounded, supported, and protected by the others—represented the national leadership, the most critical element in terms of the political outcome of warfare. The second ring was key production (since the war, this ring has been redesignated organic essentials), including factories and plants that produce the electricity, petroleum products, and war materials essential to national power. The national infrastructure—the roads, railroads, and power grids—made up the third ring, while the fourth ring was the national population. The last and outermost of the five rings was the

*Warden and his group did not use strategic paralysis at the time they were building Instant Thunder, but the term has since been applied to denote the effect they were hoping to achieve. They intended to disconnect the Iraqi leadership (Hussein and the Baath party) from the Iraqi people, as well as from the fielded military forces, and cause a systemic breakdown of strategically critical functions (e.g., communications, electricity, petroleum distribution, etc.).



COURTESY OF COL JOHN A. WARDEN III

Figure 1. Five-ring Model of the Modern Nation-State

nation's fieldied military forces, an element the Instant Thunder planners thought they could largely bypass. Instead of attacking these forces, they would use new technologies (stealth, PGMs, precision navigation, night vision devices, etc.) to directly attack the national leadership in the first ring.²⁴ They referred to this scheme as "inside-out warfare."²⁵

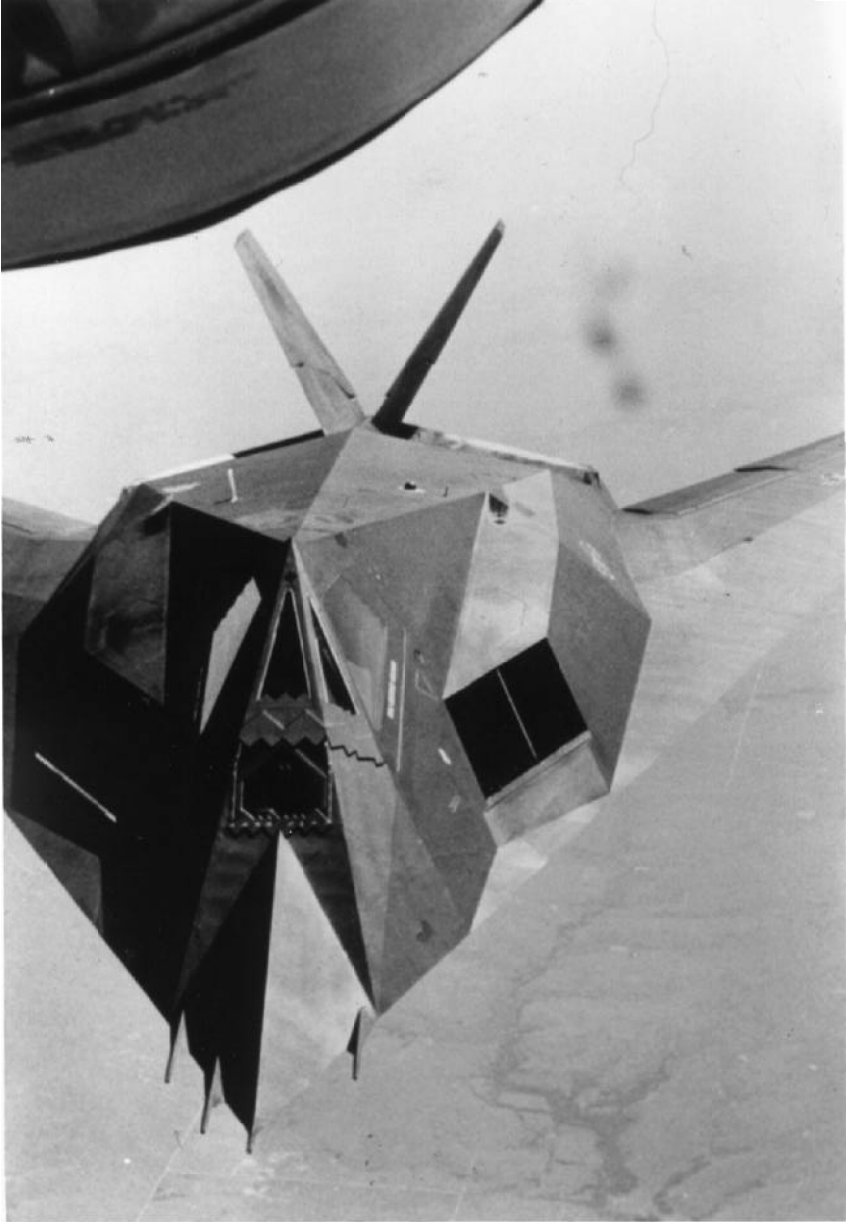
The planners hoped that use of this five-ring model would help the US military to fulfill certain national political

objectives which the planners themselves derived from some recent speeches of President Bush:

1. Immediate, unconditional and complete withdrawal of all Iraqi forces from Kuwait.
2. Kuwait's legitimate government must be restored to replace the puppet regime.
3. Committed to the security and stability of the Persian Gulf.
4. Protect the lives of American citizens abroad.²⁶

Specifically, Instant Thunder would realize these objectives through a violent but controlled strategic air campaign directed at the nerve centers of Iraqi national power. Coalition forces would attack critical elements (e.g., communications, electricity, distribution of petroleum products, etc.) to convince the Iraqi leadership and/or citizenry that holding Kuwait was more expensive than releasing it. At the same time, they would destroy the elements of key production and national infrastructure (e.g., facilities for nuclear, biological, and chemical [NBC] weapons research and production) that supported Iraq's attempt to produce weapons of mass destruction. The coalition would thereby reduce Iraq's offensive capability without seriously impeding its ability to defend against other regional powers after the war. Further, coalition forces would mount psychological operations (PSYOPS—e.g., leaflet drops, attacks against monuments that were part of Hussein's “personality cult,” etc.) to convince the Iraqi people to remove Saddam Hussein. Perhaps most importantly, casualties on both sides (especially among Iraqi civilians) would be kept to a minimum because the plan called for extensive use of the remarkable precision of modern airpower.²⁷

After clarifying the presidential objectives mentioned above, Warden's planners began to identify categories of targets critical to Iraq's centers of gravity.²⁸ Over the next few days, they identified eight categories of systems whose destruction they thought would strategically paralyze Iraq: (1) strategic air defenses, (2) strategic offensive capability, (3) leadership (the Hussein regime), (4) civil and military telecommunications, (5) electricity, (6) internal consumption of oil, (7) railroads, and



F-117. Instant Thunder relied heavily upon modern precision weapon systems—such as this F-117, which is undergoing aerial refueling—to reduce casualties on both sides.

(8) NBC research.²⁹ They had added two more sets (ports and military support) by the time Instant Thunder became phase 1 of CENTAF's offensive campaign.³⁰ Further additions and recombinations would ultimately produce 12 target sets in the Desert Storm air campaign plan.* Eventually, Warden's staff would select specific targets for each of these systems—or target sets—but for the time being, these generic categories would suffice.

Perhaps the most critical of these target sets was the Iraqi strategic air defense system, whose neutralization would render Iraq defenseless against air attack (and to a certain extent, surface attack as well) and would facilitate all other coalition operations. Specific targets in this set included early warning and ground-controlled intercept radar sites; air defense C³ facilities; surface-to-air missiles (SAM) and their launchers; and air defense interceptors and their operating airfields.³¹ The planners expected to use F-117, F-111, F-15E, F-4G, F-16, and Tornado aircraft against this target set.**

Attacks on two key target sets were designed to reduce Iraq's short- and long-term offensive capability within the region. The former included fielded chemical weapons and the aircraft and surface-to-surface missiles that delivered them, while the latter included Iraq's NBC research and production facilities. To avoid the inadvertent spreading of NBC agents, F-117s and F-15Es would attack the targets with PGMs.³²

*The final 12 sets included (1) leadership command facilities; (2) electricity production facilities; (3) telecommunications and command, control, and communications (C³) nodes; (4) strategic IADS; (5) air forces and airfields; (6) NBC research, production, and storage facilities; (7) Scud missiles, launchers, and production and storage facilities; (8) naval and port facilities; (9) oil refining and distribution; (10) railroads and bridges; (11) army units, including Republican Guards; and (12) military storage and production sites. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 126–30.

**Initially, Warden's group planned only for Air Force assets, not knowing what else would be available: "We were told to build an air option, and we did it from an Air Force perspective because of the expertise that we had and what our tasking was." At the briefing of 10 August, Schwarzkopf directed them to "ensure that we planned for Army special forces, Army helicopter, naval planning forces, Marine planning forces, etc." Stanfill, 3 June 1991, 45–46 (see note 28). The term planning forces refers to forces made available to CENTCOM for a contingency response under the joint strategic capabilities plan (JSCP).



COURTESY OF COL DAVE DEPTULA

Target Sets. For ease of handling, planners categorized targets in sets that corresponded to military objectives.

Strikes against three of the target sets—telecommunications, oil, and railroads—were intended to disconnect the national leadership from both the people of Iraq and the Iraqi army in Kuwait. Attacks on telecommunications facilities (both civil and military) and military C³ systems were expected to “freeze Iraqi ability to act” and to cause the “population to question Hussein's actions.” Specifically, F-16s, F-117s, and various airborne electronic warfare (EW) systems of the USAF would go against television and radio stations, satellite ground stations, telephone systems, and military C³ sites.³³

Because of a US commitment “to the security and stability of the Persian Gulf,” the Instant Thunder planners did not wish to cripple Iraq's ability to maintain a balance of power in the region after the war. Thus, instead of destroying the country's means of producing and exporting crude oil,

coalition airpower would target only internal pumping and storage facilities. This action would affect domestic distribution and usage but would allow a rehabilitated Iraq to reestablish exports after it complied with coalition (i.e., UN) demands.³⁴ The planners hoped that attacks by B-52s, F-16s, and Tornados on petroleum, oil, and lubricants (POL) targets would both demoralize the Iraqi population by incapacitating commerce and cut off POL to the Iraqi forces in Kuwait.³⁵

Planners targeted railroads in order to interdict the flow of forces and materiel to the Iraqi army in Kuwait. Toward that end, B-52s, F-16s, and F-15Es would hit key railroad bridges, marshaling yards, and junctions.³⁶

They also quickly designated electricity as a “highly leveraged target set” because damage to it would likely affect other target sets. Warden's group believed that attacks on five key power transfer stations would disrupt electrical service to almost all of Baghdad and much of the rest of the country. Furthermore, applying the same rationale as they did with the oil target set, the planners reasoned that attacking the transfer stations (transformer yards) would have the same effect as striking the generator halls (i.e., disruption of the electrical power grid) but would be much easier to repair after Iraq complied with UN demands. This approach, combined with a strategic PSYOPS campaign, would signal the Iraqi people, “Hey, we're ready to help as soon as you help us.”³⁷ Because of its importance, electricity became an early target set for the superprecise and stealthy F-117s.³⁸

Planners considered the eighth target set—the Hussein regime itself—the “pivotal center of gravity.” Attacks against the palace and other locations where Hussein might be found were intended to help make the regime's position untenable and reinforce other messages to the Iraqis that our dispute was with Saddam Hussein and the Baath party, not the Iraqi people. If Hussein died in one of these attacks, so much the better—but for political reasons, he was not an official target.³⁹ Because of the sensitive nature of this target set, Instant Thunder planners recommended attacking it only with F-117s or special operations forces.⁴⁰

Of course, driving a wedge between Hussein and his people, as well as his military forces, was the coalition's ultimate objective. Indeed, Colonel Warden and many of the people working with him thought that once they achieved their military objectives (i.e., incapacitation of the key strategic target sets), the Iraqi forces in Kuwait would realize the futility of their situation and return home. Surely, either Iraqi civilians or, more likely, the conscript forces—stranded in Kuwait by the now thoroughly discredited regime—would overthrow Hussein.⁴¹ Although many people—even some of the planners—found this expectation a bit extreme,⁴² work continued, and by 10 August the concept was ready* for General Schwarzkopf.

Although Schwarzkopf received the Instant Thunder concept briefing** with enthusiasm⁴³ and approved it for further development,⁴⁴ he was not sure that it alone would achieve the president's objectives. Rather, he saw the plan either as a possible retaliatory measure in the event Hussein did something heinous or as phase 1 of a much larger offensive campaign designed to throw the Iraqis out of Kuwait.⁴⁵ The Air Staff planners did not really care why he liked Instant Thunder; for them, it was enough that he did.

The next step in fleshing out the plan was selecting specific targets within each target set and determining bomber run-in headings, aiming points, types of ordnance, and so forth. However, because Warden's people were primarily operations/staff officers, they did not have access to the type of intelligence they needed to select, study, and plan discrete targets.

*General Schwarzkopf's autobiography confuses the dates of the briefings. He mentions a single briefing on 16 August, but testimony of several Air Staff and CENT - COM participants shows that he received the Instant Thunder briefing twice. On 10 August an Air Staff team headed by Warden's boss, Maj Gen Robert M. ("Minter") Alexander, briefed him on the basic concept, and on 17 August a "joint staff" team headed by Maj Gen James W. Meier presented a more complete briefing, including a list of some 84 planned targets. In both cases, Colonel Warden was the briefing officer. Schwarzkopf with Petre, 319-20 (see note 15).

**Some of the specifics of the plan had changed by the time of the 10 August briefing—for instance, special operations forces were no longer targeted against leadership—but the basic concepts were still the same. Instant Thunder briefing (see note 26).

Consequently, they requested help from Maj Gen James Clapper, Air Force chief of intelligence, who reportedly told them that CENTCOM already had a “strategic plan” and that they were “interfering and trying to tell CENTAF how to prosecute this war.”⁴⁶ However, General Loh quickly intervened, and Col James Blackburn, Air Force chief of targeting, and 13 of his targeteers were soon working side by side with the other planners in the Checkmate office area.⁴⁷

Although the operators often disagreed with the intel people over what they were doing and why they were doing it, both parties were able to work together fairly smoothly over the next few days, preparing for the second meeting with Schwarzkopf.⁴⁸ Later, however, major problems would arise between intelligence and operations planners, both in the Pentagon and in Riyadh. For example, throughout the planning and execution of the Desert Storm air campaign, many operations planners felt that the intel people were obstructionist and that their “system” was too cumbersome.⁴⁹ The intel people, on the other hand, felt that the operations planners would not give the intelligence system a fair chance to work and therefore created many of their own problems.⁵⁰ This division between the two communities appears to have been extensive and also appears to remain unresolved.

The operations planners were especially concerned about whether their counterparts in intelligence understood the concept of strategic paralysis.⁵¹ After all, an understanding of how strategic paralysis might be imposed and how that action might lead to the achievement of national objectives is critical to grasping how Instant Thunder and its successor—phase 1 of Desert Storm—differed from all other air operations plans of the time.

As mentioned earlier, theater conventional war plans were based almost entirely upon the Army's AirLand Battle doctrine and were designed to defeat the enemy army. US forces would defend, delay, and attrit and then launch a counteroffensive, during which air support would conduct interdiction and CAS operations. This scheme was so deeply ingrained at CENTAF that the computer-assisted force management system (CAFMS), with which the air tasking order (ATO)* was constructed and then transmitted to units, had no category for strategic targets—the

only force-application targeting categories were interdiction and CAS. This omission, in and of itself, was not an impediment to strategic planning because one could input strategic targets to the system as interdiction targets. In fact, some people argue that the former are really “deep interdiction” targets anyway.** However, this conceptualization tended to seriously confuse the intent of the Instant Thunder planners because interdiction is designed to “divert, disrupt, delay or destroy the enemy's surface military potential before it can be used effectively against friendly forces.”⁵² Instant Thunder, however, was designed to destroy temporarily the cohesion of an entire nation, including its fielded forces (but without necessarily attacking the bulk of those forces directly).⁵³

Instant Thunder also differed significantly from the SIOP, even though the latter was a strategic air campaign.*** Specifically, the SIOP called for the destruction of adversary nations, while Instant Thunder only aimed to create national strategic paralysis, which would allow the quick rehabilitation of

*The ATO was the final document produced by CENTAF planners to task units with specific missions. When transmitted with additional special instructions (SPINS) attached, it provided flying units with the information necessary to plan for packages of strike and supporting aircraft (sometimes as large as 50-60 sorties), as well as the individual strike missions themselves. During Desert Shield/Storm, every fixed-wing aircraft that flew over land in the CENTCOM area of responsibility (AOR) was tasked on the ATO, which often ran over 300 pages in length. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1, 139 (see note 34).

**This argument demonstrates the extent to which many Air Force people had been captured by Army doctrinal thinking, which stresses the battle and the flow of soldiers and materiel to the battlefield. If air forces' sole responsibility is to provide fire support for Army maneuver elements, then the purpose of strategic attack does not differ from that of interdiction—it stops or delays the flow of soldiers and materiel to the battlefield. Such a conceptualization further fuels the idea that strategic differs from tactical in the use of nuclear and thermonuclear weapons.

***However, one can argue that the original Instant Thunder plan represented a sort of “thinking man's conventional SIOP.” Modern penetrating munitions, such as the I-2000 and GBU-27 2,000-pound laser guided bombs (LGB), make it possible to achieve probabilities of kill (PK) on many “hardened” targets approaching PKs for the thermonuclear weapons planned in the SIOP (witness the attacks on Iraqi nuclear-hardened aircraft shelters, for instance). It is possible, then, to plan a “weapons lay-down” that closely resembles that planned for the SIOP. On many levels—target selection, for instance—the planning processes would be quite similar. For a discussion of this point with a key Desert Storm planner, see Lt Col Dave Deptula, Washington, D.C., transcript of interview

Iraq after the coalition achieved its objectives. Thus, Instant Thunder entailed targeting and weaponeering procedures that differed significantly from the ones that had developed during the cold war. For example, targeteers and weaponeers had learned to project levels of damage that were characterized by a measure of physical destruction of a target and by the duration of the effect produced by that destruction. “Severely damaged” might mean that three-quarters of a target structure was destroyed and that any operations it housed would be disrupted for six months. Lesser levels would receive a rating of “moderately” or “slightly” damaged. Intelligence planners used complex formulas to determine the type and number of weapons that would produce the desired level of damage.⁵⁴ But such factors were irrelevant to the people who planned Instant Thunder/Desert Storm. They wished only to disrupt the function of a large number of critical facilities and operations in a short period of time and planned to keep them dysfunctional by reattacking them until the coalition achieved its objectives. The idea of temporarily suppressing targets was not new. Both SIOP and conventional targeteers had experience in planning to do this rather than destroy the targets outright. But the operations planners' idea of using temporary suppression across a large target set to cause systemic collapse, rather than picking the set apart target by target, ran contrary to the targeteers' training and experience. Clearly, Instant Thunder represented a vast departure from conventional air operations planning, which hoped to induce tactical paralysis by using follow-on forces attack (FOFA) and the so-called deep battle to disrupt enemy reinforcements while attriting and stopping the enemy's initial

with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 19–23, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

But planners designed the SIOP during the cold war for the purpose of deterring thermonuclear war. The USAAF/USAF had exited World War II with a compelling, conventional airpower doctrine (FM 100-20) but had been sidetracked over time. That is, the strategic arm was carried into the netherworld of nuclear deterrence, while the tactical arm—struggling for its very survival—was seduced into close alliance with the US Army and captured, to a great extent, by the Army's doctrine. Thus, a thinking man's conventional SIOP had no natural home in the USAF in 1990. See Carl Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (New Brunswick, N.J.: Transaction Publishers, 1994), 145–49, 165–89.

assault forces. This approach pretty much left strategic attack to nuclear planners. The Instant Thunder and Black Hole* planners, however, sought to induce national paralysis by launching a massive, unrelenting strategic attack with conventional systems and weapons and thereby cause either the surrender or overthrow of the Hussein regime. Like all things elegant, Instant Thunder—in retrospect—appears simple and straightforward, and people who read it are inclined to say, “Of course.”

Of course, any reasonable offensive air campaign plan would target strategic air defenses, industrial infrastructure, leadership, and strategic C³. Yet, the Internal Look “air operations” briefing set makes no mention of such target sets, focusing instead upon the battlefield and airpower's support of the Army.

Of course, any reasonable air campaign would avoid the mistakes of Vietnam and exert massive, unrelenting pressure on the adversary. Yet, the plan developed at TAC in early August 1990 proposed “demonstrative attacks” and “escalating offensive operations.”⁵⁵

Of course, any plan designed by Air Force people would have contained many of the Instant Thunder targets because we all hold certain truths to be self-evident (e.g., control of the air enables all other operations).

But attempting to impose strategic paralysis on Iraq through intense, massive, and unrelenting attacks on selective target sets while ignoring enemy forces in Kuwait and Iraq was an unlikely (even unacceptable) proposition to many Air Force leaders. Nonetheless, over the next several months, a heavily augmented CENTAF staff would refine Instant Thunder and make it phase 1 of General Schwarzkopf's four-phase offensive, which would commence on 17 January 1991. Meanwhile, the debates raged on, questioning the existence of con-

*Black Hole was the name of the special planning cell established in late August 1990 at Headquarters CENTAF in Riyadh. Under the direction of Brig Gen Buster Glosson, the cell developed Instant Thunder into the strategic portion of the Desert Storm air campaign. According to a CENTAF planner, the cell was dubbed the Black Hole “because we would send people in, and they would never come out. We would never see them again because they would just stay there.” Lt Col Sam Baptiste, Maxwell AFB, Ala., transcript of interview with Lt Col Richard T. Reynolds and Dr Diane Putney, 24 September 1992, 25, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

ventional strategic attack and the way it affects the necessity for and effectiveness of tactical actions against surface forces (if it does so at all).

Notes

1. See Col Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign against Iraq* (Maxwell AFB, Ala.: Air University Press, 1995), for a detailed description of the work done by Warden's planners and its effect on CENTCOM's offensive air campaign that began on 17 January 1991.

2. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 117, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

3. Briefing, subject: OPLAN 1002 Air Operations, April 1990, file 19, Gulf War Air Power Survey Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.

4. *Ibid.*

5. *Ibid.*

6. FM 100-5, Operations, May 1986, 30.

7. *Ibid.*, 43.

8. *Ibid.*, 22-32.

9. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 78, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Maj Jim Brogan, Offutt AFB, Nebr., interview with author, 23 August 1991.

10. Lt Gen Robert M. Alexander, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 3 June 1992, 22-25, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

11. Warden, 30 May 1991, 118-19.

12. Maj Gen Walter Kross, US Transportation Command director of operations and director of strategic plans and policy, interview with Lt Col Suzanne B. Gehri and author, 30 April 1991.

13. Warden, 30 May 1991, 104-7; and Warden, 22 October 1991, 81.

14. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 12 December 1991, 101-4, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

15. There is some question about exactly what General Schwarzkopf asked for. General Loh, who was the Air Force vice-chief of staff and acting chief of staff in the absence of Gen Mike Dugan, received a call from General Schwarzkopf on 8 August 1990. Loh was pretty sure Schwarzkopf asked for a strategic air campaign: "I think he did use the term strategic air campaign, but whatever he said, my reaction was, 'I know exactly what he is talking about. He is talking about a broader campaign, the same thing Maj Gen Minter Alexander had talked about the day or two days before.'" Gen John M. Loh, Langley AFB, Va., transcript of interview with Lt Col Suzanne B.

Gehri and Lt Col Richard T. Reynolds, 26 September 1991, 3, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

On 5 May 1992 General Schwarzkopf told Dr Diane Putney of the Air Force Office of History that he had asked for “a retaliation capability” in case of something “heinous being done.” In response to the direct question, “Did you ask the Air Staff for a strategic air campaign?” he responded, “No. I asked for a plan to meet the need I just talked to you about [i.e., retaliation capability].” Gen H. Norman Schwarzkopf, telephone interview with Dr Diane T. Putney, 5 May 1992, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

In his autobiography, however, General Schwarzkopf says, “The following morning I called Colin Powell and asked that the Air Force put planners to work on a strategic bombing campaign aimed at Iraq’s military” (emphasis added). Gen H. Norman Schwarzkopf with Peter Petre, General H. Norman Schwarzkopf, the *Autobiography: It Doesn’t Take a Hero* (New York: Bantam Books, 1992), 313. Whatever he asked for, he was delighted with Instant Thunder. See Reynolds, *Heart of the Storm*, chapters 4 and 6, for a complete recounting of the briefings on 10 and 17 August 1990.

16. The reception of the plan (and the planners) is described in Reynolds, *Heart of the Storm*, chapters 4 to 7.

17. “We maintain . . . that war is simply a continuation of political intercourse, with the addition of other means.” Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 605.

18. FM 100-5, 9.

19. Clausewitz, 99.

20. FM 100-5, 23.

21. Clausewitz, 605.

22. *Ibid.*, 595–96.

23. Warden, 22 October 1991, 57, 71.

24. Col John A. Warden III, Washington, D.C., interview with Lt Col Richard T. Reynolds and author, 19 March 1991 (author’s personal notes).

25. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 10 December 1991, 38, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

26. Briefing, subject: Instant Thunder: A Strategic Air Campaign Proposal for CINCCENT, 10 August 1990, file 1, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified. These objectives differed slightly over time, but after 10 August, they did not change.

27. See Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 10 December 1991, 93, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 5, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

28. Warden, 22 October 1991, 40-41; and Lt Col Ronnie Stanfill, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri and author, 3 June 1991, 20, 22-23, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
29. "General Target List," 9 August 1990, Deptula file 5, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
30. Briefing set, "Offensive Campaign, Phase 1," 3 September 1990, Deptula file 4, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
31. "General Target List"; and Deptula, 12 December 1991, 8.
32. "General Target List."
33. Ibid.
34. Deptula, 11 December 1991, 5; and Conduct of the Persian Gulf War: Final Report to Congress, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 129.
35. "General Target List."
36. Ibid.
37. Deptula, 11 December 1991, 5.
38. "General Target List."
39. Schwarzkopf with Petre, 318-19.
40. "General Target List."
41. Warden, 22 October 1991, 57-58, 71.
42. See, for instance, Lt Gen Robert M. Alexander, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 34-36, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
43. See Reynolds, *Heart of the Storm*, chapter 4, for a full account of the presentation and Schwarzkopf's reaction.
44. Stanfill, 3 June 1991, 40.
45. Schwarzkopf with Petre, 319-20.
46. Alexander, 3 June 1992, 5, 7-8.
47. Col James Blackburn, Bolling AFB, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 21 April 1993, 2, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
48. Ibid., 10-12, 15-17, 29-39.
49. See Deptula, 12 December 1991, 26-32, 64-70; and Stanfill, 3 June 1991, 71-72.
50. See Blackburn, 21 April 1993, 8-9, 27, 31-34, 47-49, 137-43.
51. Deptula, 11 December 1991, 20-27.
52. Joint Publication (Pub) 1-02, Department of Defense Dictionary of Military and Associated Terms, 1 December 1989, 187; and Joint Pub 1-02, 23 March 1994, 193.
53. Warden, 22 October 1991, 58.
54. Blackburn, 21 April 1993, 9-13; and Deptula, 12 December 1991, 20-22. For a taste of the complexity involved in this process, see *Joint Munitions Effectiveness Manual: Methodology Report*, TH 61A1-3-6 (USAF), 5 November 1974, 2-1 through 3-9.

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55. CENTCOM air campaign plan briefing material, 11 August 1990, 9-12, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

Chapter 3

How Does Airpower Work?

The inherent flexibility of air power, [sic] is its greatest asset. This flexibility makes it possible to employ the whole weight of the available air power against selected areas in turn; such concentrated use of the air striking force is a battle winning factor of the first importance.

—FM 100-20, Command and Employment of Air Power, 21 July 1943

In 1941 Lt Col Hal George and his handful of subordinates in the Air War Plans Division struggled with the question of which approach “could win the Army's approval of an airpower plan for winning the war.” Their solution was to draft a series of options, the most extreme of which—AWPD-4 (written after the attack on Pearl Harbor and four months after AWPD-1)—assumed an “overriding priority” for producing aircraft, as opposed to other types of armaments. Given this level of resource allocation, Allied forces were “to wage a decisive air offensive against the Axis powers in Europe, to engage in a defensive effort in the Far East, and to conduct a land invasion of Europe when and if it becomes necessary” (emphasis added).¹ In other words, if all went well, a land invasion might not be necessary at all. This notion of winning a war with airpower alone ran head-on into the Joint Army-Navy Board opinion that “it should be recognized as an almost invariable rule that only land armies can finally win wars.”² The Anglo-American Combined Chiefs of Staff rejected AWPD-4's recommendation on aircraft production and accepted a modified version of AWPD-1 instead. This debate over the role of airpower in warfare was not new in 1941 and continues even today.

Can airpower alone be decisive in warfare? If so, how? What kinds of airpower applications are likely to be decisive and under what circumstances? Does airpower have an independent role in warfare, or is it properly applied as a dependent function of surface power (i.e., as fire support)? Such questions have troubled the US military since at least the closing days of World

War I, when “the employment of aviation continued to be planned in terms of the ground mission.” Yet, certain avant-garde advocates of airpower were already declaring that “mass attacks made at night by long-range Allied bombers against industrial targets deep within Germany and Austria definitely could overwhelm the enemy” (emphasis added).³

Specific approaches changed over time; for instance, “mass attacks made at night” were replaced by “daylight precision bombardment.” But the debate over the proper role of airpower continued through the 1920s and 1930s, as more theorists became convinced that strategic bombardment could be decisive. This stance was ultimately adopted in the US by the Air Service Tactical School—later the Air Corps Tactical School—as well as certain leaders of the Army Air Corps.⁴ Because most of the people who worked on AWPD-1 were former instructors at ACTS,⁵ they knew what they wanted to achieve with the air plan and also how difficult it would be to sell to the Army.

The acceptance of AWPD-1 and the completion of an organizational plan for an independent Eighth Air Force (with emphasis on the strategic role) in Britain under Lt Gen Carl



Lt Gen Carl Spaatz, first commander of Eighth Air Force during World War II.

Spaatz suggested that advocates for independent airpower had carried the day.⁶ Yet, while Eighth Air Force continued as a consolidated, independent command, air forces allotted to the invasion of North Africa in November 1942 were divided into two separate elements that operated under separate command structures until the disaster at Kasserine Pass in February 1943. Worse yet, in compliance with FM 31-35, *Aviation in Support of Ground Forces*, air forces were “specifically allocated to the support of subordinate ground units.”⁷ This “penny packeting” of air forces resulted in inefficiency and the inability to apply airpower cohesively. The failure of this approach led to a complete reorganization of command structure that placed all theater air forces under a single air commander.⁸ Although this reorganization was something of a victory for proponents of centralized control of air forces, it did not signal defeat for advocates of “tactical-support” operations.

The final decision on the use of airpower in Northwest Africa was codified in FM 100-20, which was released on 21 July 1943 in response to problems encountered prior to and including the unfortunate debacle at Kasserine. According to the manual, “control of available airpower must be exercised through the Air Force commander if [its] inherent flexibility and ability to deliver a decisive blow are to be fully exploited.”⁹ Instead of giving strategic operations preeminence over tactical operations (which would have constituted a complete victory for the strategic airpower zealots), FM 100-20 lists six “basic tasks,” the fourth of which (not necessarily in order of precedence) is “offensive air warfare against the sources of [enemy] strength, military and economic.” The other basic tasks are as follows: “destroy hostile air forces; deny establishment [of] and destroy existing, hostile bases; operate against hostile land or sea forces . . . operate as a part of the task forces in the conduct of military operations; and operate in conjunction with . . . naval forces.”¹⁰

This compromise embraced a much more comprehensive view of airpower than that demanded by either of the extreme positions. According to FM 100-20, airpower had a broad-based mission that included both independent operations against sources of military and economic power and direct

support of engaged forces—but transcended both of these functions. Further, the manual prescribed an independent yet powerfully synergistic role for airpower in a joint task force: “air operations almost invariably precede the contact of surface forces [and] are undertaken in furtherance of the strategical and tactical plan. . . . Control of available air power in the theater must be centralized and command must be exercised through the air force commander” (emphasis added).¹¹ These principles flowed naturally from FM 100-20’s doctrinal premise that “land power and air power are co-equal and interdependent forces; neither is an auxiliary of the other.”¹² Although some parties continued to grouse over the “diversion” of airpower from one mission to another (presumably less important), this compact (14-page) manifesto of airpower employment basically settled prevailing arguments and laid the groundwork for the successes of Allied airpower in World War II.

In principle, the US Air Force never forgot these lessons; indeed, the tenets of FM 100-20 were still apparent—though less explicit—in the 1984 version of Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force (the version current during Desert Shield/Storm).^{*} Even so, as Desert Shield began, serious debates raged over the same old issues: What can airpower do? Can it alone be decisive? What is the best way to use it? In 1990-91 these debates produced a compromise between the two “airpower schools” (Army support and strategic attack) remarkably similar to the one established by FM 100-20 in 1943. Although it didn’t take a battlefield disaster to bring about, one would be incorrect to assume that this compromise was inevitable—or easily won—just because its

^{*}For instance, “Unity of command is imperative to employing all aerospace forces effectively. . . . To take full advantage of these qualities, aerospace forces are employed as an entity through the leadership of an air commander. . . . The capacity to maneuver freely in three dimensions allows our forces to exploit the characteristics of speed, range, and flexibility. These characteristics enable forces to apply combat power against all elements of an enemy’s structure [and] to move quickly from one course of action to another” (emphasis added). The manual’s list of Air Force missions reflects the comprehensiveness of air missions: strategic aerospace offense, strategic aerospace defense, counterair, air interdiction, close air support, special operations, airlift, aerospace surveillance and reconnaissance, and aerospace maritime operations. AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, 5 January 1984, 2-8, 2-2, 3-2.

essential elements had been published nearly 50 years earlier in FM 100-20.

As was the case in 1942-43, airpower had to clear two major hurdles before assuming its proper role in Desert Shield/Storm. Probably the more critical question addressed whether airpower would be used for strategic operations or for CAS and interdiction. Before tackling that problem, however, one had to decide whether to use a single air commander, coequal with the surface commanders, or to divide and subordinate airpower to surface commanders. In contrast to the explicit guidance of FM 100-20, the joint doctrine of 1991, while specifically allowing for such arrangements, was deliberately unclear on their implementation (nor is it much clearer today). The vagueness on this subject resulted from the intent of the Goldwater-Nichols Act of 1986 to shift war-fighting responsibilities to the theater CINCs.

Goldwater-Nichols considerably (and deliberately) redistributed power in the joint arena, greatly strengthening the hand of the chairman of the Joint Chiefs of Staff (CJCS—the sole advisor to the president) and the CINCs (who became virtual theater warlords).^{*} Joint, service, and component staffs can do little but suggest to theater CINCs how to organize to fight wars. Relevant joint publications recommended designation of a joint force air component commander (JFACC) to control all air resources, as well as an area air defense commander (AADC) to control the air defense battle and an airspace control authority (ACA) to control and deconflict all flight operations in the joint force commander's (JFC—in this case, CINCCENT) area of

^{*}The CJCS is the “principal military advisor to the President, the National Security Council, and the Secretary of Defense.” He seeks advice from the other joint chiefs and the CINCs “as he considers appropriate.” If another member of the joint chiefs disagrees strongly enough with the chairman, he has the right to have his position presented along with the chairman's, but the chairman makes the presentation unless the president directs otherwise. CINCs have authority to direct subordinate commands, “including authoritative direction over all aspects of military operations, joint training, and logistics”; prescribe the chain of command; organize subordinate commands and forces; employ forces as they feel necessary; and assign “command functions to subordinate commanders.” US Code, Congressional and Administrative News, 99th Cong., 2d sess., 1986, 100 STAT-1005, 1014.

responsibility. The JFC not only has the choice of designating any of these positions but also may specify their responsibilities and authorities.* Thus, in contrast with the doctrine of FM 100-20—Army doctrine of 1943—which specified an organization wherein air and ground force commanders were coequal, joint doctrine of 1990 left General Schwarzkopf free to organize any way he saw fit. Whatever his reasoning may have been, the organization he decided upon deviated only slightly from that recommended by FM 100-20.

Schwarzkopf designated the commander of CENTAF (COMCENTAF), General Horner, to be his JFACC (as well as ACA and AADC), and the commander of US Naval Forces Central Command (COMNAVCENT), Vice Adm Henry Mauz, Jr., to be his sea component commander. But in deference to “the Marines’ sensibilities, he was unwilling to designate a land component commander.” Instead, he elected to assume this title himself.¹³

This decision would ultimately cause considerable acrimony between the air and land components because as CINC, Schwarzkopf would make targeting decisions and relay them to his air component (through Horner) for execution but not to the land component because as land component commander, Schwarzkopf obviously knew his own reasoning.¹⁴ Further, subordinates were probably confused about whether they were talking to the land component commander or the CINC. General Horner had anticipated this problem, explaining that he might become “gnarly” with Schwarzkopf at times because as the air component commander, he would sometimes “have legitimate disagreements with what the land component commander wants to do.”¹⁵ Although Schwarzkopf’s organizational scheme was a less-than-perfect compromise, it allowed for a single air

*For instance, joint doctrine for counterair operations states that “the joint force commander will normally designate a joint force air component commander. The joint force air component commander’s responsibilities will be assigned by the joint force commander (normally these will include, but not be limited to, planning, coordination, allocation and tasking based on the joint force commander’s apportionment decision). Normally the joint force air component commander will be the Service component commander who has the preponderance of air assets to be used and the ability to assume that responsibility.” Joint Publication (Pub) 3-01.2, Joint Doctrine for Theater Counterair Operations (from Overseas Land Areas), 1 April 1986, III-4.



Schwarzkopf and Horner. General Schwarzkopf (above) designated General Horner (below) the JFACC for Desert Shield/Storm. This decision, combined with Horner's judicious use of the ATO as the central flight coordination tool for fixed-wing flights over Saudi Arabia, Kuwait, and Iraq, guaranteed centralized control of the main air striking force—a central tenet of airpower doctrine for at least the last 50 years.



commander with overall responsibility for all (fixed-wing) air operations.¹⁶

General Schwarzkopf's designation of Horner as JFACC, ACA, and AADC¹⁷ resolved the overall responsibility for the planning and conduct of the air war. However, it did not begin to address the question of what authority and control the JFACC would have over the resources necessary to execute the air campaign—a delicate issue because both the Navy and Marine Corps objected strenuously to the entire JFACC concept and questioned the role of the JFACC as a commander.

Both during and after the war, the Marines insisted that the JFACC was strictly a coordinator. In fact, Lt Gen Royal N. Moore, Jr., commander of the Marine Expeditionary Force's aviation unit during Desert Shield/Storm, seemed to take great delight in circumventing JFACC control of Marine air operations.¹⁸ Reportedly, the Marines were so adamant about this matter that they addressed messages for COMCENTAF to the "joint force air coordinator" just to drive home their point.¹⁹

Many Navy people felt that the JFACC staff was not joint at all (as they argued it should have been) but composed entirely of Air Force people. In their view, Air Force procedures had therefore dominated air campaign planning and execution to the detriment of the Navy.²⁰ According to Col Brian E. Wages, Air Force liaison officer to COMNAVCENT during Desert Shield/Storm, Navy and Marine staffers at NAVCENT felt that

the role of a JFACC was not . . . solidly grounded in joint doctrine, nor his authority and responsibility clearly delineated. . . . Establishment of a JFACC was perceived as an attempt to rewrite joint doctrine on the

*Of course, as we have seen, the position of JFACC is quite clearly grounded in joint doctrine, though it is fair to critique it for a lack of clearly delineated authority and responsibility. But the Air Force perspective on the advantages of a single air component commander, coequal with the ground commander, goes back at least as far as World War I, when Billy Mitchell amassed over 1,400 planes of all types for a decisive air effort that helped surface forces reduce the Saint Mihiel salient in September 1918. Futrell, 23–24 (see note 1).

One of the all-time best examples of how centralized control of air forces under a single air commander can enhance operations is the case of Gen George C. Kenney in the Southwest Pacific during World War II. Authorized by the JFC, Gen Douglas MacArthur, to concentrate his forces initially upon a single air objective (i.e., control of the air), Kenney was able to overcome deficiencies in aircraft, crews (quantity and quality), and tactics to stem the advance of Japan and help turn the tide in the Pacific. He accomplished this feat by massing his relatively meager forces and taking them on the offensive. See Maj Charles M. Westenhoff, "Aggressive Vision," *Airpower Journal* 3, no. 3 (Fall 1989): 34–49.

battlefield, subordinate one component commander to another, and enhance Air Force prestige . . . at [the] Navy's expense.*

In fact, Wages stated that as late as November 1990 “NAVCENT was still looking for ways to disestablish the JFACC.”²¹ After the war, the Navy came solidly on board in favor of the JFACC concept. The deputy chief of naval operations (CNO) for plans, policy, and operations (OP-06 at the time, now N3/N5) even contracted a study by the Center for Naval Analyses to “develop an in-depth understanding of the Navy's experience with the Desert Storm JFACC and to examine potential Navy participation” with or as a JFACC.²² Even so, the Navy continued to complain that the Desert Storm JFACC was not joint.

Although the Army would later join in the Navy's complaint that CENTAF's tilt toward USAF doctrine and procedures adversely affected Army and Navy inputs to targeting,²³ there appears to have been little, if any, opposition by US Army Forces Central Command (ARCENT) to the designation of Horner as JFACC. ARCENT probably did not object because helicopters, which comprise most of the Army's air assets, were almost entirely exempt from the ATO—the primary air tasking tool for Desert Shield/Storm.

The ATO became a lightning rod for interservice controversy early in Desert Shield because General Horner used it to gain the resource control he needed as JFACC. Initially, the ATO was used as a matter of course to task and control air defense and surveillance sorties (by F-15s, airborne warning and control system [AWACS] aircraft, RC-135s, etc.). As more forces arrived, the necessary training sorties were simply added to the ATO. According to Horner, “the Saudis loved that [because] they were terrified that the [US aircrews] would start buzzing the villages and scattering goat herds. They wanted some control . . . and the training ATO gave them a way [to get it].” The ATO was also “the key [to] legitimizing the JFACC [by] making the Navy . . . and the Marine Corps come on board.” In Horner's words, “Without the ATO, you don't have the JFACC. With the ATO, you don't have anything but a JFACC.”²⁴ Simply stated, if you want to fly, you fly in the ATO; if you fly in the ATO, you fly under JFACC control. Although this arrangement amounted to something less than the centralized control called for in FM 100-20, it gave Horner all the control he needed, especially since in his role as Ninth Air Force

commander, he possessed operational control of the huge pool of USAF aircraft that eventually wound up in-theater.²⁵ Inter-service squabbles would continue, but Horner now had sufficient control of assets and air operations to do whatever had to be done. The next question was how best to employ airpower. Would it support surface maneuver elements or win the war by itself?

Before Colonel Warden and his small briefing staff arrived in Saudi Arabia on 19 August 1990, CENTAF was thinking in terms of the so-called D day defensive plan, which changed daily to incorporate arrivals of aircraft in-theater during the buildup of coalition forces. Time and manning constraints precluded planning for anything other than (1) strictly defensive operations to slow the progress of an Iraqi invasion of Saudi Arabia²⁶ and (2) beddown of forces.²⁷ Even if time and resources had been available, any offensive plan CENTCOM might have built would probably have looked more like the tactical counteroffensive planned for the July 1990 Internal Look exercise of CENTCOM forces than the strategic offensive attacks planned for in Instant Thunder.

In General Horner's mind, "the best thing to do was to fight a ground war of maneuver and use airpower to cut the sustainment since [the Iraqis] were vulnerable there."²⁸ This comment is consistent with the emphasis on CAS and interdiction (to the exclusion of strategic attack) in Horner's Internal Look briefing to General Schwarzkopf in April 1990 ("build a hose and point it where the ground commander sees that it's needed").²⁹ Lacking any evidence to the contrary, one may conclude that CENTAF would have written a campaign plan that concentrated almost entirely upon the Iraqi army and allied maneuver plans, a logical deduction since CENTAF planners felt they were preparing for an Iraqi invasion of Saudi Arabia—the premise of Internal Look.³⁰

In contrast, the Instant Thunder planners—especially Warden—were inclined to ignore the Iraqi army in Kuwait. Although some of Iraq's fielded forces would be targeted—particularly the strategic air defense system and the strategic offense system (primarily chemical weapons)—none of the occupying forces in Kuwait would be attacked because they just didn't seem to be "a practical target." Warden and some of his planners assumed that six to nine days of relentless strategic

attack would likely produce either a coup d'état or surrender. In any event, the Iraqis would be unable to mount any offensive operation because by then they would be suffering strategic paralysis.³¹ Further, as mentioned in chapter 1, the conscript army in Kuwait might even overthrow Hussein.³²

Before long, the CENTAF approach and the Instant Thunder approach began to merge into a single, expanded, and extremely powerful vision that strongly resembled FM 100-20's six basic tasks, mentioned earlier in this chapter. Indeed, the Desert Storm air campaign would ultimately attack every facet of Iraqi war-making capability—including war-production and force-deployment capabilities—as well as Iraqi military forces in Kuwait (and some in Iraq) and the will of the Iraqi people to support the war and the oppressive regime of Saddam Hussein.

In accordance with FM 100-20, the campaign would “employ the whole weight of the available air power against selected areas in turn.”³³ Airpower would be the principal weapon in “a coordinated multi-axis air, naval and ground

*Since the end of the war, a considerable debate has occurred concerning use of the term campaign. In general, Air Force people maintain that it is proper to refer to the air, land, and sea components of a theater campaign as individual subcampaigns (e.g., “the air campaign” or “the ground campaign”). But people from other services maintain that there is only one campaign—the theater campaign—with air, land, and sea elements. The debate became so acrimonious after the war that the Department of Defense's (DOD) final report to Congress included a special sidebar that explained the controversy.

**In his autobiography, Schwarzkopf simply refers to phase 1 as Instant Thunder, as does this study (Schwarzkopf with Petre, 320—see note 43). The extent to which phase 1 constituted an expanded version of Instant Thunder has been the subject of considerable debate since the war. Maj Gen Larry Henry, the expert on suppression of enemy air defenses (SEAD) whom General Russ dispatched from Headquarters TAC to assist General Horner's staff with the SEAD campaign (a component of the theater campaign?), thinks the final CENTCOM plan contained very little of the Instant Thunder plan. Maj Gen Larry Henry, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 2 June 1992, 120, US Air Force Historical Research Agency, Maxwell AFB, Ala.

An alternative view is provided by Lt Col Dave Deptula, a key planner who helped develop (in Checkmate) the Instant Thunder concept that General Schwarzkopf approved on 17 August and who wrote (in Riyadh) the overall attack portion of the CENTCOM offensive air campaign plan that was finally executed. According to him, Instant Thunder provided the philosophical and conceptual basis for—and much of the content of—the final plan. He says the major difference between the two was size (the developed target base grew larger over time). Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 22 May 1991, 36-37, US Air Force Historical Research Agency, Maxwell AFB, Ala.

attack beginning with Phase I, 'Strategic Air Campaign'* against Iraq [Instant Thunder];** Phase II, 'Kuwait Air Campaign' against Iraqi air forces in Kuwait; Phase III, 'Ground Attack Combat Power Attrition' to neutralize the Republican Guard and isolate the Kuwait battlefield; and Phase IV, 'Ground Attack' to eject Iraqi forces from Kuwait."³⁴

It is difficult, if not impossible, to determine who had the idea of conducting Operation Desert Storm in phases. General Schwarzkopf claims to have thought of it himself immediately after he was briefed on Instant Thunder; General Horner believes that the idea emerged from his discussions with Schwarzkopf* in April 1990;³⁵ and Colonel Warden thinks it originated with his Checkmate planning cell** sometime between 10 and 17 August.³⁶ Regardless of who thought of phasing the plan, the important point is that sometime between 10 and 25 August, Schwarzkopf directed the CENTCOM strategic plans and policy staff to build a plan that would "concentrate [first] on destroying Iraq's war-making capability . . . [attain] air superiority in Kuwait . . . focus on the battlefield prep, [and finally move to the] ground offensive campaign."³⁷

Dividing an operation into phases is neither new nor revolutionary. Army operational doctrine, for instance, prescribes generic phases for all offensive operations.³⁸ Thus, it is conceivable that the CENTCOM planning staff—very early in the process—could have laid out a conceptual plan in

*The OPLAN 1002 briefing on air operations that Horner presented to Schwarzkopf in April does indeed contain phased operations, as previously mentioned: phase 1, de - ter; phase 2, defend, delay, and attrit; and phase 3, begin counteroffensive. This fact might account for Horner's recollection of phasing operations, but the three phases just mentioned are not at all similar to the four phases that were finally selected.

**Warden recalls asking his deputy, Col Emery M. Kiraly, to take charge of the planning for phases 2 through 4, while he concentrated on phase 1. He believes that the phases were laid out in supporting documents to the briefing delivered to General Schwarzkopf on 17 August, but documentary evidence does not support Warden's memory. None of the documents prepared for the briefing of 17 August contain refer - ences to phasing or attack of Iraqi forces in Kuwait. There is a reference to "subelements" of the campaign, but the latter bear little, if any, resemblance to the fi - nal four phases. Briefing set, "Iraqi Air Campaign Instant Thunder," 16 August 1990/2100, Desert Story Collection, US Air Force Historical Research Agency, Max - well AFB, Ala. (Secret) Information extracted is unclassified.

phases. It is less likely, however, that they envisioned a first phase consisting primarily of strategic air strikes into Iraq.

In all probability, Gen Colin Powell, CJCS, suggested the specifics of phases 1 and 3 during the Instant Thunder briefing on 11 August.³⁹ When told that the strategic campaign alone might convince Hussein to withdraw his forces from Kuwait (the first presidential objective—see chap. 1), Powell responded, “Okay, that may be so, but I don't want those guys to go home. I want to destroy those tanks. I want to blow them all up.”⁴⁰ At the time, no one noted that this statement had the effect of changing the first objective from forcing the withdrawal of the Iraqi army in Kuwait to destroying it, and the objective was never formally changed (although it did later become a specific theater objective⁴¹). However, Powell's desire to destroy the Iraqi army and the fact that he agreed to give strategic attack first priority⁴² assured that the campaign would have at least two specific phases: a strategic air campaign and a direct attack on Iraqi forces in Kuwait (phases 1 and 3, respectively). Almost everyone agrees that Schwarzkopf himself decreed that phase 2 would be an effort to gain air superiority over Kuwait,⁴³ and no one argued against making the final phase a ground assault into Kuwait (if needed). Thus, the four phases worked themselves out over time.

Regardless of how it came about, CENTCOM's four-phase offensive plan attacked the Iraqi war-making potential in depth, from Saddam Hussein in Baghdad to the frontline infantryman on the Saudi-Kuwaiti border—and anything that might link them together. The plan utilized virtually every aspect of US military and coalition power, highlighting “our strength” (air forces) against “his weaknesses” (air defenses)⁴⁴ and bringing ever-increasing pressure on Hussein to withdraw and comply with all UN resolutions. Further, it offered a seamless progression to the use of brute force to attain US and UN objectives if Hussein did not make the “right” decision. There were no pauses and no decision points. If Hussein did not remove his forces, we would eject them bodily. If he didn't comply willingly, we would take away everything he had: defenses, command and control, generation of industrial power, communications, weapons of

mass destruction and associated research and production facilities, and internal security organizations and military forces—especially the vaunted Republican Guard. Eventually, by systematically attacking his C² headquarters, we might even have gotten Hussein himself.*

Although the four phases eventually merged, their articulation and development helped maintain focus on achieving military objectives in support of national objectives. FM 100-20's observation that the flexibility of airpower “makes it possible to employ the whole weight of the available air power against selected areas in turn” (mentioned earlier) is actually a restatement of the ancient principle of mass: “concentrate the effects of combat power at the place and time to achieve decisive results.”⁴⁵ In theory as well as practice, one must also apply the corresponding principle of economy of force: “allocate minimum essential combat power to secondary efforts.”⁴⁶ Perhaps FM 100-20 would have been more accurate had it substituted “the necessary preponderance of weight” for “the whole weight” because application of both principles—mass and economy of force—creates something of a conundrum. One cannot completely remove military effort from all areas save one, because doing so would create unacceptable vulnerabilities in the vacated areas. Rather, one must strike a balance between applying mass at the critical place and time and applying minimum essential combat power at all other places and times.

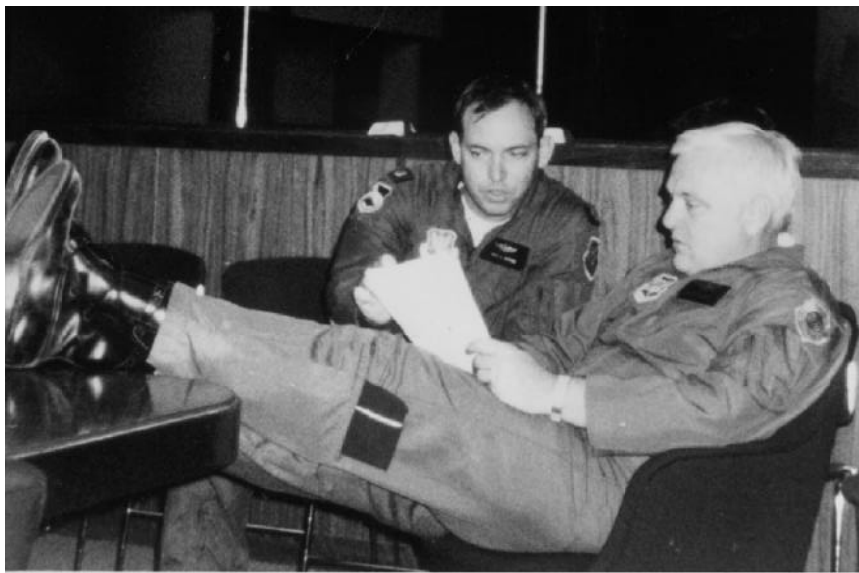
For example, General Schwarzkopf requested another US Army corps (VII Corps from Europe) for his famous “Hail Mary” left hook to achieve such a balance. He and his staff convinced the national command authorities (NCA) that, without a second US Army corps, the coalition would not be able to achieve the necessary mass for the left hook without

*The idea of targeting the Iraqi dictator needn't have been so controversial. After all, Hussein is quite fond of wearing his general's uniform and flaunting his personal control of military operations. He is the ultimate authority in Iraq and, by his own declaration, makes all operational decisions. In sum, he is the single most lucrative target of military significance in all of Iraq and, therefore, a perfectly legal one. To successfully target the commanding general of theater forces during critical military operations that require his personal attention is a master stroke—not a criminal act. During the war, Hussein was as legitimate a target as any battalion commander or frontline infantryman.

creating exploitable vulnerabilities elsewhere along the front.⁴⁷ In other words, allied forces could not create sufficient mass and still maintain minimum essential combat power on secondary objectives. In either case, they could not use the “whole weight,” but with VII Corps, they could achieve a “necessary preponderance.”

Furthermore, by the time the huge coalition air armada had assembled in the Middle East, it was neither prudent nor necessary to apply the whole weight of airpower to strategic attack. Yet, maintaining sufficient weight to achieve air campaign objectives remained extremely important. In the end, the coalition's vast resources allowed the first three phases to begin nearly simultaneously on 17 January 1991. But the heavy emphasis was on the strategic attack against Iraqi leadership, C³, air defenses, and the means of industrial and military production and distribution.⁴⁸ Coalition F-117s, F-15Es, F-111s, Tomahawk land attack missiles (TLAM), and B-52 air launched cruise missiles (ALCM)—which were well suited to precision attack in the face of moderate to high air defense threats—would go against those targets. As the coalition achieved specific objectives, emphasis would shift toward attrition of the Iraqi military forces in Kuwait. General Schwarzkopf directed that the ground offensive (phase 4) would begin when air attacks had reduced Iraqi combat effectiveness in the KTO by 50 percent. Hopefully, this reduction would allow coalition forces to achieve phase 4's objectives (removal and destruction of the Iraqi forces in Kuwait) in a matter of days and thus keep combat casualties to a minimum.⁴⁹

When General Horner was first briefed on the Instant Thunder concept of operations on 20 August 1990, very little of the final plan was yet evident. A general idea of a phased operation that relied heavily on airpower to establish conditions for success on the ground was beginning to emerge, but it seems fair to say that no one knew where this would lead. Schwarzkopf thought he recognized Instant Thunder as phase 1 of his theater campaign, but it was General Horner who would have to execute it—so Schwarzkopf sent Warden to see Horner. Although the CENTAF commander was not pleased with the presentation of Instant Thunder, he



COURTESY OF COL DAVE DEPTULA

Glosson and Deptula. Brig Gen Buster Glosson (front), after his recall from the USS *La Salle*. He is conferring with Lt Col Dave Deptula, chief planner for the Black Hole.

kept the three Air Staff planners who had accompanied Warden to Riyadh and assigned Brig Gen Buster C. Glosson to direct their activities in a special planning group, which would become known as the Black Hole. Exactly what they were to do in this group was not at all clear, but Glosson didn't mind because his new assignment got him off the ship he was otherwise consigned to* and out of “the penalty box,” according to General Horner.⁵⁰ Glosson, his Black Hole staffers, and the Instant Thunder plan would eventually prove instrumental in the development of all aspects of the Desert Storm air campaign and the “airpower compromise” it represented.

*General Glosson was assigned as the deputy commander of Joint Task Force (JTF) Middle East, which meant that he was quartered on the JTF flagship, the USS *La Salle*, not a particularly pleasant location for a USAF fighter pilot.

Notes

1. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 1, 1907–1960 (Maxwell AFB, Ala.: Air University Press, December 1989), 128.

2. *Ibid.*, 112.

3. *Ibid.*, 24.

4. See *ibid.*, 19–114, for a full discussion of these debates and their outcomes.

5. *Ibid.*, 109.

6. See Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 1, *Plans and Early Operations, January 1939 to August 1942* (1948; new imprint, Washington, D.C.: Office of Air Force History, 1983), 579–88, for a description of the battle fought by Maj Gen Hap Arnold to make Eighth Air Force a separate command coequal with the surface armies.

7. Cited in Futrell, 133.

8. See Craven and Cate, 136–65; and Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, D.C.: Office of Air Force History, 1993), 155–84, for more detailed discussions of the command arrangements, problems encountered, and corrective reorganization of Northwest African Air Forces.

9. FM 100--20, *Command and Employment of Air Power*, 21 July 1943, 2. Several statements, including the one cited, were considered so important that they were written in capital letters in the original manual.

10. *Ibid.*, 6.

11. *Ibid.*, 6–8.

12. *Ibid.*, 1.

13. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2 December 1991, 48, *Desert Story Collection*, US Air Force Historical Research Agency, Maxwell AFB, Ala.

14. “Tensions between the Air Force and American ground commanders persisted because the commanders did not understand that many decisions causing them problems were Schwarzkopf’s and not Horner’s.” Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, D.C.: Department of the Air Force, 1993), 155. *Gulf War Air Power Survey (GWAPS) Collection*, US Air Force Historical Research Agency, Maxwell AFB, Ala.

15. Horner, 2 December 1991, 48–49.

16. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 136.

17. *Ibid.*, 56.

18. “The JFACC process can’t do that [fight a fluid battle] if you’re talking about command. . . . If you’re talking about coordination . . . then that’s exactly what the process did out there.” Lt Gen Royal N. Moore, Jr., “Marine Air: There When Needed,” *US Naval Institute Proceedings*, November 1991, 63.

19. Col Brian E. Wages, USAF liaison officer to COMNAVCENT for Operations Desert Shield/Storm, *End of Tour Report*, 5 March 1991, 3, file

THUNDER AND LIGHTNING

4, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

20. "As the JFACC, CENTAF instituted the Ninth Air Force's procedures for air operations and, for the JFACC staff, used an Air Force staff supplemented by liaisons from the other services." Maureen A. Wigge, "The Joint Force Air Component Commander: Theory and Practice," CRM 92-195 (Alexandria, Va.: Center for Naval Analyses, March 1993), 17-18.

21. Wages, 2-3.

22. Wigge, 2; and Gregory M. Swider, "The Navy's Experience with Joint Air Operations: Lessons Learned from Operations Desert Shield and Desert Storm," CRM 92-166 (Alexandria, Va.: Center for Naval Analyses, July 1993), 3.

23. See, for instance, Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 206-9; and Swider, 19-20.

24. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Dr Perry Jamieson, Dr Rich Davis, and Dr Barry Barlow, 4 March 1992, 8, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

25. Horner, 2 December 1991, 28, 64-66.

26. Col James Crigger, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2-4 December 1991, 14-18, 23-25, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Lt Col Sam Baptiste, Maxwell AFB, Ala., transcript of interview with Lt Col Richard T. Reynolds and Dr Diane Putney, 24 September 1992, 21-22, 24-25, 31-33, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

27. Crigger, 2-4 December 1991, 24.

28. Horner, 2 December 1991, 12-14.

29. Briefing, subject: OPLAN 1002 Air Operations, April 1990, file 19, GWAPS Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.

30. Crigger, 2-4 December 1991, 16-17.

31. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 56-59, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

32. *Ibid.*, 71.

33. FM 100-20, 2.

34. *Conduct of the Persian Gulf War*, vol. 1, 88.

35. Horner, 2 December 1991, 41.

36. Discussion between Colonel Warden and Dr Diane Putney, Air Force Office of History, in the author's presence, 13 August 1991.

37. Col James Sutherland, MacDill AFB, Fla., transcript of interview with Lt Col Richard T. Reynolds, 22 October 1991, 112, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

38. Interestingly enough, such Army operations are divided into four phases: "preparation, attack, exploitation, pursuit." FM 100-5, *Operations*, May 1986, 98-100.

39. See Col Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign against Iraq* (Maxwell AFB, Ala.: Air University Press, 1995), chap. 5, for a full discussion of General Powell's reaction to this briefing.

40. Warden, 22 October 1991, 71.

41. "Destroy Republican Guard forces in the KTO." *Conduct of the Persian Gulf War*, vol. 1, 97.

42. Lt Gen Robert M. Alexander, transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 31, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

43. Sutherland, 22 October 1991, 112; and Horner, 2 December 1991, 41. In his autobiography, General Schwarzkopf gives credit to Warden for providing him the idea in response to Schwarzkopf's question, "What would you have to do if we wanted our airplanes to operate freely over the battlefield in Kuwait?" Gen H. Norman Schwarzkopf with Peter Petre, *General H. Norman Schwarzkopf, the Autobiography: It Doesn't Take a Hero* (New York: Bantam Books, 1992), 319-20.

44. Alexander, 30 May 1991, 31.

45. Joint Pub 3-0, *Doctrine for Joint Operations*, 9 September 1993, appendix A, A-1.

46. *Ibid.*, A-2.

47. Schwarzkopf with Petre, 356-60.

48. *Conduct of the Persian Gulf War*, vol. 1, 133-34, 151-59.

49. *Ibid.*, 135.

50. Horner, 4 March 1992, 15.

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Chapter 4

Knockout Blow? Or Decision on Points?

The United States relies on the Air Force, and the Air Force has never been the decisive factor in the history of warfare.

—Saddam Hussein, 30 August 1990

Since the advent of airplanes in the early twentieth century, one very powerful question has consistently bedeviled military thinkers: Can airpower achieve decisive, war-winning results, or is its primary merit in the tactical support it can lend armies and navies? The way in which proponents of “independent” airpower operations approach this question is captured in the following simple analogy.

Imagine two boxers circling warily—feeling each other out. They try small flurries, light taps—mostly off the gloves—and occasional body blows that are sharp and stinging but not dangerous. Just testing one another.

Suddenly, one of the boxers feints with his left and lands a crushing right to the side of his opponent's head, which snaps sideways, spraying sweat and blood. Before the crowd even hears the sound of the glove smashing into flesh and bone, the second boxer has changed dramatically. Less than a second ago, his eyes were bright and his movements crisp. He was precise and sure of himself—reading every move, deflecting every punch, mounting well-timed flurries of his own, and never dropping his guard. Now, his eyes are dull and his hands and arms heavy, as he stares vacantly at a swirling scene.

More heavy punches are on the way, but he is defenseless. The gloves flying toward his face are indistinguishable from the rest of the blur reeling before him. It doesn't matter much. Even if he could see the punches coming, he couldn't react in time. His feet, hands, and body respond too slowly to stop the pummeling he is about to receive. The fighter has lost control of his vision, brain, central nervous system, and body. He isn't down, and he isn't out—but if the bell doesn't ring soon, he's finished! For all practical purposes, he is paralyzed. Like the winning boxer, the planners of

Instant Thunder and its successor, the CENTCOM strategic air campaign (phase 1 of CENTCOM's offensive campaign), clearly hoped to inflict paralysis—at the strategic level—on their opponent. Toward this end, the attack on Iraq had to be intense, persistent, and coordinated (i.e., focused upon creating strategic paralysis).¹ In their minds, the level of destruction and the duration of its effect on individual targets had little importance compared to the impact of a particular attack sequence on the system and subsystems of the Iraqi nation-state.²

The planners hoped to feint with a right (i.e., convince Hussein we were building up for a combined amphibious and land assault on his forces in Kuwait)³ and then land a stunning blow to the head (i.e., Iraq, especially Baghdad) with a left (i.e., airpower, the very factor that Hussein himself would denigrate on 30 August 1990). Warden likened the scheme to the Germans' famous Schlieffen Plan of the late nineteenth and the early twentieth centuries,⁴ which accepted a deliberately weakened German left wing in order to concentrate all possible combat power on the right. (In Warden's conceptualization, the weak left wing was the coalition ground force, while airpower made up the strong right wing.) The German plan sought to deliver an overpowering blow on the right, which would stun the French and allow the Germans to envelop and quickly defeat them.*

Stunning an enemy this way requires a different approach to creating the target list. Admittedly, planners must still develop a list of the kinds of “things” that make for lucrative strategic targets (e.g., major military headquarters; command, control, communications, and intelligence [C³I] nodes; electrical

*The strategic position of Germany (Prussia) in Europe placed that country between powerful adversaries on two fronts: the Anglo-French in the west and the Russians in the east. Alfred von Schlieffen, chief of the German General Staff from 1891 to 1906, felt that Russian mobilization would be slow enough to allow his forces to concentrate initially on the western front, but only for a short period. If they could defeat the Anglo-French quickly, they would then be able to turn their full strength back to the east and defeat the Russians in turn. To accomplish this, Schlieffen planned for a weak left wing on the western front, which would first feign an attack and then slowly withdraw to prepared positions in the Alsace-Lorraine region. The concentrated German forces on the right (perhaps as much as 90 percent of the total force available) would then break out through Holland and Belgium, sweeping south and east to crush the French army against the fortified German positions in Alsace-Lorraine. If all went well, most of the western front forces could be dispatched to reinforce the eastern front before the Russians could mount a major offensive. See Capt B. H. Liddell Hart, *The Real War: 1914–1918* (Boston: Little, Brown and Co.,

generating and distribution facilities; POL production and distribution points; war materiel industries; and air defense systems [if they are likely to inhibit other operations]). But one can make plans for “servicing”^{*} these targets in at least three different ways.

The first option views strategic results as a sum of things attacked and destroyed. In this view a target is a target. Since all targets are equal, one should just attack the targets randomly until the list is exhausted and be done with it. Planners need only determine the level of destruction desired for a given target, select an acceptable probability for achieving such destruction, and combine these functions with measurements of weapon effectiveness. This process yields the number and types of weapons appropriate for each target. Thus, if planners have chosen the right targets, the war should be favorably decided by the time the last one is destroyed.

The second option is to view strategic results as a product of weighted values. Obviously, the ability to properly assess target values is essential to this approach. After assigning priorities to targets, the planners apply the targeting skills described for the first option to the targets in order, from highest priority to lowest. Attacking the most valuable targets early in the campaign will serve to multiply the overall effect of the attack plan, hastening victory at a relatively low cost. Although no one really subscribes to the first option, the Air Force probably favored the second one at the beginning of Desert Shield/Storm.⁵

The third option, espoused by the Checkmate and Black Hole planners, exploits the principle of exponential strategic impact. Specifically, one “multiplies” the effect of attacking specific targets by spreading attacks against numerous key nodes of a vital system (i.e., simultaneity) and then raises the effect “exponentially” by launching “parallel” attacks against multiple systems.^{**} Instead of causing progressive failure of the enemy

^{*}Air planners' jargon for planning, directing, and executing an attack on a target or target set.

^{**}Like strategic paralysis, simultaneity and parallel attack are terms developed after the fact to describe what planners had hoped to achieve. Simultaneity is essentially a new way of looking at the familiar military concept of tempo. Massive attacks against a system over a very short period of time are expected to have a much greater impact on

nation's cohesion and capability, this action induces catastrophic failure. Like the defeated boxer, the enemy's "eyes" become dull, his "central nervous system" slows down, and his "feet, hands, and body" react sluggishly. And he wouldn't be saved by the bell because additional stunning blows would follow—hour after hour, day after day—until even Hussein would see how hopeless his situation was. In only a few days (six to nine was the initial estimate), Iraq would first be stunned and then driven to the mat. The only smart thing to do would be to stay down for the count. Because of the hopelessness of their situation, the Iraqis would be well advised to accede to coalition demands and live to fight another day. Otherwise, they might be "killed." To achieve this effect, coalition forces would have to maintain the strategic focus, but—since this targeting option was not dominant at the time—the task would prove arduous.

Maintaining this focus in phase 1 of Desert Storm, while at the same time expanding the overall attack plan to incorporate phases 2 through 4 (air superiority in Kuwait, battlefield preparation, and support of the ground assault, respectively), was the mission of General Glosson and his special planning group (later known as the Black Hole and finally—after a massive reorganization in January 1991—known as the Iraq/strategic target planning cell of

the system than a drawn-out series of attacks that achieve the same physical results over a longer period of time. This takes on particular significance if Napoléon was correct when he declared that "in war the moral [psychological] is to the material [physical] as three is to one." Cited in Robert D. Heinl, Jr., *Dictionary of Military and Naval Quotations* (Annapolis, Md.: United States Naval Institute Press, 1966), 196.

Basically, parallel attack refers to the capability to attack multiple nodes of multiple systems simultaneously. This type of attack was not technically feasible during previous wars, in which dozens—even hundreds—of bombers were sent against individual targets to achieve desired damage levels. Advances in bombing platforms, navigation and guidance systems, and weapons made it possible to inflict the same damage with just a few platforms and weapons. See Lt Col Edward Mann, "One Target, One Bomb: Is the Principle of Mass Dead?" *Airpower Journal* 7, no. 1 (Spring 1993): 35–43.

Attacking multiple nodes in individual systems would freeze the entire system (systemic paralysis); attacking multiple systems simultaneously (parallel attack) would not only cause national strategic paralysis but also make repairs to those systems futile, since damage would increase exponentially compared to the repair efforts.



COURTESY OF COL DAVE DEPTULA

Glosson and Planners. General Glosson (center) and some of his Desert Storm planners watch General Schwarzkopf's televised daily update briefing near the end of the war.

the GAT [guidance, apportionment, and targeting]).* The Black Hole, which eventually gained an amazing level of control over the prosecution of the air war, began as an upstart, outcast organization with no official power.

Initially consisting almost exclusively of non-CENTAF personnel, the special planning group/Black Hole continued—throughout the planning phase and the war itself—to be

*In early January, a significant reorganization of most of CENTAF took place. First, all the field forces assigned to CENTAF were reorganized into four air divisions (AD): 14th AD (fighter aircraft), 15th AD (EW and C² aircraft), 1610th AD (Military Airlift Command [MAC] aircraft), and 17th AD (SAC aircraft). *Conduct of the Persian Gulf War*, vol. 2, K-12 (see note 13).

More pertinent to this discussion, CENTAF and augmentee planning staffs (chiefly Black Hole) were also merged into the Campaign Plans Division under the direction of General Glosson. It consisted of four branches: GAT (both Iraq/strategic cell and KTO/tactical cell); ATO; Airborne Command Element; and Service Liaison. Deptula, 10 December 1991, 26-27 (see note 11).

dominated by augmentees. General Glosson himself was an augmentee to CENTAF, formally assigned to CENTCOM as the deputy commander, JTF Middle East.⁶ To CENTAF regulars, members of the special planning group must have seemed like interlopers meddling in CENTAF's affairs. Over time, however, the informal, unofficial Black Hole assumed so much power in the planning process that CENTAF reorganized its plans function to formalize the role of the Black Hole/GAT in the Desert Storm air campaign.

Ultimately, the number of people directly involved in planning the Desert Storm air campaign (counting both Glosson's Campaign Plans Division and Checkmate) was probably larger than the number assigned to the entire CENTAF staff in peacetime.* Not only that, but some of the interlopers would have more say in the plan and its execution than would any of the CENTAF regulars.⁷ Although one expects and plans for wartime augmentation of theater staffs,⁸ the growth of CENTAF in preparation for Operation Desert Storm far exceeded anyone's expectation.⁹ How this dramatic increase came about is fairly clear. What remains unclear is why it happened the way it did and what that implies for the future. This uncertainty adds a number of important, specific questions to those raised in previous chapters.

For example, was all the reorganization and growth necessary? If not, was it detrimental to smooth operations? Should we try to implement procedures to stop it next time? If it were necessary and served to improve operations, should we assume that correctives will occur spontaneously in the future? Or should we try to implement procedures and correctives to ensure the right things will happen next time? Can we and should we try to formalize some or all of the unusual linkages that occurred? For instance, should we create (formalize) a central planning function in Washington (i.e., something similar to the Joint Strategic Target Planning Staff, developed at Offutt AFB, Nebraska, for planning the SIOP) to augment and support theater planning staffs? Because potential adversaries now know it isn't wise to

*The Black Hole strategic air campaign planners alone would eventually number at least 45, of whom, fewer than one-third were from Ninth Air Force. "'Black Hole' Strategic Air Campaign Planners," 1, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

allow the US six months to build up forces in-theater, our future operations will require off-the-shelf answers to these questions.

In light of the remarkable growth and reorganization that occurred during Desert Shield, General Horner, General Glosson, and everyone who worked for Glosson both inside and outside of Campaign Plans had to make an extraordinary effort to maintain the focus of the air campaign. After all, they were preparing to do something that had never been done before. To create strategic paralysis and simultaneously prepare the battlefield for a possible ground assault, they would need to coordinate and direct not just dozens—or even hundreds—but literally thousands of sorties per day, 24 hours per day, seven days per week, as long as necessary to achieve coalition objectives. Landing a blow that would dull Iraq's senses required early concentration on the phase 1 strategic attacks, yet in the interest of cutting off the hands as well,* priorities of the land and sea components also demanded attention. Once coalition aircraft induced strategic paralysis and achieved air superiority (or supremacy), our planners could shift their focus to the more methodical preparation of the battlefield. But as General Alexander had cautioned General Powell in August 1990, it was first necessary to “concentrate our forces on the strategic campaign.”¹⁰

General Glosson, working closely with his two chief deputies—Lt Col Dave Deptula for strategic operations and Lt Col Sam Baptiste for tactical operations—was able to balance these two approaches to warfare. But the fact that inputs arrived from all directions often made their task rather difficult. For example, they had to balance the need to defend Saudi Arabia (CENTAF's sole purpose in late August and early September) against the need to conduct offensive operations to achieve national and coalition goals. Further, Glosson and his staff not only were obliged to heed the CINC's guidance (relayed through Horner), which was sacrosanct but not always perfectly understood, but also were bound to consider and account for the sometimes-divergent interests of the various services. Finally, they had to weigh the vision of decisive, independent air operations against that of closely

*During discussion of the Instant Thunder concept on 11 August 1990, General Powell referred to the Iraqi forces in Kuwait (whose combat capability he wanted destroyed) as “the hands” when he said, “The strategic air campaign cuts out the guts and heart, but what about the hands?” Alexander, 30 May 1991, 36 (see note 10).

integrated fire support for attainment of surface maneuver objectives.

Many Instant Thunder/Black Hole planners felt that CENTAF's fixation on the D day plan (see chap. 2) to the exclusion of any sort of offensive thinking interfered with planning for the offensive air campaign for quite some time.¹¹ CENTAF's plan sought to attrit enemy fielded forces by attacking Iraq's forward support infrastructure, which was notoriously weak.¹² But this approach amounted to little more than counterpunching to score points for a decision instead of landing a stunning blow to set up a knockout. Although a serious lack of resources made the D day plan the only reasonable game in town for the first few days, the rapid flow of airpower into the theater made possible the contemplation of more ambitious goals.¹³

Furthermore, confusion over the CINC's intent sometimes exacerbated the schism between informal and formal planning staffs. In light of the Goldwater-Nichols Act, it should have been easy to follow CINC guidance: "just do it!" But communication problems are inevitable. Purple* as they may be, Army and Air Force officers do not speak quite the same dialect, just as Britons and Americans are said to be "two peoples divided by a common language." Although we usually understand one another, misinterpretations can sometimes be spectacular. (Imagine, for instance, the virile young American male's reaction to the [perfectly harmless] request of a nubile and charming young British lady to "knock me up in the morning."**)

The same kind of problem sometimes occurs between a CINC and his service commanders. For instance, during air campaign planning, Schwarzkopf asked Horner and his staff to "put more [effort] on the Republican Guards." Consequently, they "put some B-52s on the Republican Guards in the opening moments." Schwarzkopf apparently thought that Horner's staff understood they were to "annihilate the Republican Guards." Just before the air campaign commenced, Schwarzkopf "became incensed that [in fact they] weren't [planning on] annihilating the Republican Guards."¹⁴ The air planners, who understood that destroying the

*Purple is used throughout DOD to connote jointness (i.e., joint officers don't wear green, blue, or dark blue—they wear purple).

**Of course, she is simply requesting that he wake her up by knocking on her door.

Guard would take a huge effort (assuming it was at all possible), thought they had been executing Schwarzkopf's guidance religiously by planning to keep constant pressure on the Guard. But the CINC, who apparently never spoke explicitly of annihilation, felt he had been misled.

One may attribute such a misunderstanding—at least in part—to disparate viewpoints concerning the military objectives of warfare (see chap. 1). On the one hand, if the military objective is destruction of the opposing army and if the Republican Guard is the Iraqi army's center of gravity, then the coalition should have sent everything available against the Guard (within the constraints of the principle of economy of force). According to General Horner, as early as April 1990 Schwarzkopf had in fact identified the Republican Guard as “the center of . . . gravity [of the Iraqi army].”¹⁵ On the other hand, air campaign planners in the Black Hole concentrated on centers of gravity they felt were more directly linked to Iraqi political leadership and its control of the country and the military forces.¹⁶ In their estimation, there would be plenty of time to deal with the Republican Guard later—if it were necessary. If, as Schwarzkopf feared, the Guard attempted to withdraw after the air war began, so much the better—it would simply find itself on another “highway of death.”¹⁷ The planners managed to resolve this problem by increasing the level of effort against Republican Guard units while simultaneously maintaining their focus on the powerful “left cross” they had prepared for Baghdad.¹⁸

Other problems that detracted from the strategic air campaign took the form of varying perspectives among the services on warfare and the application of airpower. The Navy and Marine Corps, for instance, placed a high priority on servicing targets that would lend credence to the amphibious deception plan or that posed a potential threat to fleet operations,¹⁹ while Army corps commanders wanted allotments of aircraft to help them attain their objectives.²⁰ Moreover, the Marines would have preferred to operate autonomously within their own AOR (much like the “route pack” system implemented during the Vietnam War).²¹

Attempting to deal with all of these issues piecemeal would have made it impossible to focus on the principal objective of creating strategic paralysis across an entire nation. Indeed, the interservice problems described above might have been debilitating (or at least required a clearer resolution of authority) had it not been for the vast resources available to the coalition air forces. Horner accurately assessed these issues as irritants rather than real problems because of the airpower available to him.²²

Finally, with the approval of Horner and Schwarzkopf, General Glosson and his staff resolved the problem of using airpower independently or in support of ground operations. After reviewing all plans available at CENTAF headquarters in Riyadh, Glosson saw that CENTAF had prepared defensive plans for support of surface maneuver elements (AirLand Battle) but no offensive plans. He also saw that the Air Staff had prepared an offensive plan to create strategic paralysis but had not yet prepared anything to follow up with if the strategic strikes didn't force a surrender or coup d'état.²³ In Glosson's mind, Warden's plan was Douhetian in that it visualized driving an umbrella shaft through the enemy's heart. Glosson himself leaned more toward (his interpretation of) Billy Mitchell's technique of driving the shaft deep through the heart but spreading the umbrella as well, to smother the beast.²⁴ After all, even though a stunned fighter should logically throw in the towel, his condition might make him unpredictable. If he tried to get up, what would we do next? Glosson concluded that we should plan to create strategic paralysis but also be prepared to exploit the condition if it alone did not decide the issue.

Over the next five months, Glosson and his key subordinates worked to maintain this dual focus by planning first to deliver a stunning right cross and then apply a flurry of blows to finish the job.²⁵ When the air campaign opened on 17 January 1991 and for several days thereafter, strategic attacks made up the preponderance of the air effort. Later, emphasis would shift to preparation (some would even say destruction) of the battlefield. First, the sweat and blood would fly, the eyes would dim, and the muscles would go flaccid. Then coalition forces would pummel a defenseless, stunned Iraq from all directions. At the war's end, 42 days later, the Iraqi leadership was so disoriented it had to rely on

coalition reports for the status and location of its own forces.*



Iraqi Military Leaders. During the war-termination talks at Safwan, Iraq, Iraqi military leaders evidently had no clear understanding of the military disaster that had befallen them. Coalition forces had so totally dominated the struggle for information that the Iraqis didn't even know the disposition of their own troops three days after cessation of hostilities.

Notes

1. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 52, 56–58, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 12 December

*Although the talks between coalition and Iraqi military leaders at Safwan, Iraq, occurred three days after the cease-fire, the Iraqi leaders obviously still had no clear picture of the thrashing their forces had taken. The number of Iraqi prisoners in coalition hands (over 58,000 by count at the time of the talks—eventually 86,000 total) and the extent of the coalition advance on the ground stunned the Iraqi negotiators. The Iraqi vice-chief of staff turned to his III Corps commander as each of these facts was announced to ask if it were true. Each time the commander replied that he did not know, but it was possible. *Conduct of the Persian Gulf War: Interim Report to Congress* (Washington, D.C.: Department of Defense, July 1991), 4–10.

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1991, 20–25, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Lt Gen Buster C. Glosson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 4 June 1992, 14, 54–55, 110, 115–16, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

2. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 15–21, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

3. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 102.

4. Warden, 22 October 1991, 97.

5. Deptula, 11 December 1991, 20–25.

6. Maj Gen Buster C. Glosson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 29 May 1991, 22, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

7. See, for instance, Glosson, 4 June 1992, 92; and Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 22–23 May 1991, 65, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

8. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2 December 1991, 69–70, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

9. Brig Gen Patrick M. Caruana, Offutt AFB, Nebr., transcript of interview with author, 19 August 1991, 2–3, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

10. Lt Gen Robert M. Alexander, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 30, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

11. Col Steve Wilson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 20–22, 24–26, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 23 May 1991, 14–15, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Richard T. Reynolds and author, 10 December 1991, 129–30, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and notes, Lt Col Ben Harvey, 22 August 1990, 136, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.

12. “The best thing to do was to fight a ground war of maneuver and use air power to cut the sustainment since they were vulnerable there.” Horner, 2 December 1991, 12–14.

13. Warden and his planning group initially (by 12 August, when they briefed the CJCS) felt that Instant Thunder could be executed as early as the end of August, "if you change[d] your flow [of aircraft into the theater] around a little bit and really push[ed] things." With no changes to the flow, they thought it could be done around 7 or 8 September 1990. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 102, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

The fact that air combat power arrived rapidly seems to support their assumption. According to DOD's report to Congress, over 200 USAF combat aircraft were in-theater by 14 August, as well as two aircraft carrier groups on station (not counting the aircraft of our coalition partners). Conduct of the Persian Gulf War: Final Report to Congress, vol. 2 (Washington, D.C.: Department of Defense, April 1992), E-23 through E-24.

14. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Dr Perry Jamieson, Dr Rich Davis, and Dr Barry Barlow, 4 March 1992, 82-83, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. See also Warden, 30 May 1991, 75-76; and Horner, 2 December 1991, 32-33, for discussions of similar instances of miscommunication.

15. Horner, 4 March 1992, 82.

16. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 12 December 1991, 15-16, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

17. Alexander, 30 May 1991, 24.

18. Horner, 4 March 1992, 82-83.

19. See Glosson, 4 June 1992, 11; and Maj Gen Larry Henry, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 2 June 1992, 102-5, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

20. Horner, 4 March 1992, 11; Deptula, 10 December 1991, 36; and Deptula, 12 December 1991, 128-30.

21. "I knew the Marine Corps would come in and try and carve out their own AOR; and the Navy would want to resist being in the ATO; and the Army would want to divide air power up and assign it according to individual units." Horner, 4 March 1992, 10-11.

22. Ibid., 25.

23. Glosson, 4 June 1992, 5-6.

24. Ibid., 29 May 1991, 2-3.

25. Ibid., 4 June 1992, 14.

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Chapter 5

The Objective

“Would you tell me, please, which way I ought to walk from here?”

“That depends a good deal on where you want to get to,” said the Cat.

“I don't much care where,” said Alice.

“Then it doesn't matter which way you walk,” said the Cat.

—Lewis Carroll, *Alice in Wonderland*

Wherever a traveler goes, he or she usually has more than one way to get there, and some of these modes of transportation are costlier than others. Indeed, until the traveler has decided on a destination (objective), any consideration of alternative routes (ways and means) is nearly always wasteful. Although some people allow themselves to be as frivolous as Alice, most of us (as well as organizations and nations) cannot afford the high cost of wandering aimlessly. Not knowing our objectives in Vietnam, for instance, cost 58,000 lives without a reasonable return. The agony of that waste continues to plague US efforts in foreign policy to this day. Clearly defined objectives do not guarantee success, but they are absolutely crucial if one is to have any reasonable hope of achieving it.

According to Joint Pub 3-0, *Doctrine for Joint Operations*,* “the purpose of the objective is to direct every military operation toward a clearly defined, decisive, and attainable objective.”¹ Clearly, the bureaucrats who wrote this convoluted statement did not include simplicity as one of their objectives. Although the Joint Staff defines the principle satisfactorily, Sun Tzu's definition (written almost 2,500 years ago) is much simpler: “He whose ranks are united in purpose will be victorious.”² Sun Tzu understood that goal-directed

*Although Joint Pub 3-0 didn't appear until well after the Gulf War, the definition cited here is consistent with others included in doctrinal writings available at the time of the war. An authoritative source, Joint Pub 3-0 applies to all US military services.

activity is almost always more productive and, ultimately, more satisfying than random activity.

The bigger and more important the activity, the more clearly this principle applies. When the lifeblood and treasure of nations are involved, the level of importance rises to the nth degree, as do the need for and impact of clearly defined, decisive, and attainable objectives. One must clearly define national objectives before bringing to bear the right mix of instruments of national power: economic, diplomatic, and military (i.e., deciding how much of what goes where and does what). Further, the objectives must be capable of rendering a decision favorable to our interests, so that the selected economic, diplomatic, and military actions produce the desired result (often referred to as the desired “end state”^{*}). Finally, objectives must be attainable to avoid squandering blood and treasure while trying “to reach the unreachable star.” A nation should never contemplate using force without carefully and deliberately considering its political objectives as well as the subsidiary objectives that support them.

This principle suggests the need for a systematic approach to defining (1) the policy objective(s); (2) the supporting economic, diplomatic, and military objectives; (3) the plans, manpower, equipment, supplies, and sustainment capabilities required; and (4) the means of measuring success (i.e., a way of knowing when the policy [and underlying subordinate] objectives are met). (The fourth point highlights the need for a clear definition of the end state that the nation [or its policymakers] hopes will result from the achievement of policy objectives.) Without such an approach, objectives tend to create themselves and then wander over time, as circumstances change.

Planning military operations without a clearly defined objective is a very frustrating and horribly expensive business. What force mix should we deploy: heavy armor, light infantry,

^{*}The term is something of a misnomer, since political scientists (and most sensible human beings) realize that nothing is ever final in relations between states in the international system. Rather, the term suggests some change in or maintenance of the status quo with regard to the beliefs, actions, and/or resource organization (e.g., bellicose attitude, economic policy, territory, type of government, and so forth) of a second state.

or a mix of ground forces? (For that matter, what kind of mix?) How much artillery and Army aviation is necessary? Will we need carrier task forces? (If so, how many?) Does the operation require air defense fighters, surface-attack fighters, bombers, tankers, or airlifters? (Which ones and how many?) What weapons mix is most appropriate: dumb bombs, smart bombs, or standoff munitions? Do we use the Army, Navy, Air Force, Marine Corps, or some combination? In this day of artificial jointness, the answer seems to be, "Send some of each." But what goes first: heavy armor, light infantry, or a mix? No one can answer these questions without a systematic, clear definition of objectives.

The Desert Storm air campaigners did themselves a favor by carefully and systematically defining their objectives and scrupulously following them throughout planning and execution. The fact that their efforts were spectacularly successful suggests that we would do well to study their procedures closely. For instance, instead of waiting an indeterminate time for politicians or DOD officials to give them a formal list of political objectives, these planners developed their own list from public statements of the president,³ floated it up the chain of command through a series of briefings, and eventually submitted it to the secretary of defense and the president himself for revision and approval. Although the planners did not get the list completely right the first time, they needed only a couple of days to formulate four national objectives pertinent to the operations at hand.⁴ As things turned out, their approach proved functional and effective.

War planning without such specific political and military objectives tends to devolve to the creation of elaborate deployment* lists (e.g., the now somewhat infamous time-phased force and deployment list [TPFDL]). For instance, the military objectives that underlay OPLAN 1002-90 were not specific but quite broad and supported general US policy in the Middle East.⁵ This plan, designed to stop an armored invasion of Kuwait and Saudi Arabia, was clearly defensive in nature and focused on battlefield employment in Kuwait and

*Force deployment is—in and of itself—very important, but deploying the right kinds of forces is even more important.

northern Saudi Arabia.⁶ Although such generic planning is absolutely necessary and always forms the basis of our initial actions (if we are thinking correctly), it is subject to change once the real action begins.

After Iraq's lightning invasion of Kuwait, Hussein's decision to have his forces hunker down and await the world's next move⁷ meant that, although the deterrence phase of OPLAN 1002-90 might still prove appropriate, the portion dealing with the defense of Saudi Arabia and the counteroffensive into Kuwait no longer applied. If diplomatic efforts and economic pressure on Iraq did not work, then the coalition would have to initiate a military offensive for which it had no contingency plan. Now that the initiative lay with the coalition rather than Iraq, we had to choose the best response from a number of options that 1002-90 had not anticipated. This choice, however, depended upon a redefinition of objectives.

Prussian strategist Helmuth von Moltke (the elder) spoke to this kind of revision, wryly noting that “you will usually find the enemy has three courses open to him, and of these he will adopt the fourth.”⁸ Once the adversary has staked his course, the redefinition of objectives—from national to tactical—provides a point of departure for strategic-, operational-, and tactical-level planning and replanning (which, in turn, prompts a periodic reevaluation of objectives during extended operations to ensure that they remain appropriate).

Further, these objectives must be decisive in the sense that they should give us hope of deciding the issue on favorable terms, an outcome requiring the deliberate linkage of objectives from top to bottom, bottom to top. For example, tactical-level objectives that do not contribute to operational- and strategic-level objectives are inappropriate. Alice's travels seemed to take her into ever deeper trouble because she felt the need to walk but “[didn't] much care” where she went. The same is true of tactical events that are not linked to operational and strategic objectives: they waste time, divert attention, and squander resources. The resultant physical and psychological exhaustion and wastage lead to strategic defeat, as in Vietnam.

Before we can clearly define appropriately decisive subordinate objectives, we must first define our principal objec-

tive. For instance, President George Bush's bold statement that "this will not stand"⁹ made clear his intention to reverse Hussein's aggression but did not specify the means (political, economic, and/or military) for doing so. Actually, the statement was so general that it could have encompassed almost any action, including the destruction of Iraq. In other words, the desired political objective—not to mention a fully developed conceptualization of the desired end state—had not yet been completely defined.

The subsequent formulation of four national policy objectives—(1) removal of Iraqi forces from Kuwait, (2) restoration of Kuwait's sovereignty, (3) establishment of regional security and stability, and (4) protection of American lives—added specificity to the president's general statement. Even so, a number of economic, diplomatic, and military options still remained.

The US, as well as the rest of the world community, selected several of these options in an effort to fulfill the first of the four above-mentioned objectives, which called for the immediate, unconditional, and complete withdrawal of all Iraqi forces from Kuwait. For example, other nations joined the US in issuing diplomatic condemnations and calls for withdrawal.¹⁰ Arab nations made an unsuccessful attempt to settle the issue diplomatically in a meeting of Arab states in Cairo on 10 August 1990, after which they began to join the military coalition against Hussein.¹¹ The Soviets' efforts to negotiate a diplomatic solution extended well into the execution of the air campaign—just before the ground war began—but produced no results.¹² Further, the United Nations imposed "tough economic sanctions—mandatory for all U.N. members." Even the Arab League supported this action and endorsed Arab participation in the US-led coalition. Other options put into effect included freezing Kuwaiti assets to keep them out of Hussein's hands¹³ and imposing an embargo on Iraqi oil exports.¹⁴

A number of military options also lay at our disposal. The fact that the coalition had deployed a powerful military force sent the unmistakable signal that most of the world was serious about our policy objective that called for the ejection of Iraq from Kuwait. If this demonstration of forceful resolve,

combined with the political and economic efforts mentioned above, did not convince Hussein to withdraw, the military had other options to consider.

One of these was military enforcement of the oil embargo—an option that put few lives at risk but required an indeterminate length of time to be effective. Although we implemented this option, we chose not to wait it out. Another course of action was a strategic bombardment campaign, which—like the military embargo—proved controversial because of questions about the amount of time necessary to produce results. Indeed, some people argued that such a campaign would never convince Iraq to leave Kuwait. Specifically, Lt Gen Tom Kelly, Joint Staff director of operations (J-3), declared that “air power has never worked in the past by itself; never worked in the past by itself. . . . Air power can't be decisive.”¹⁵

Other military options included a direct attack, a demonstration strike, or an interdiction campaign. The appeal of a direct attack on Iraqi field positions, which would either push the Iraqis back to their border or destroy them in place, was that it would directly fulfill the objective (assuming a coalition victory). The major drawback, of course, was the risk to coalition lives. This liability would be lessened considerably (part of our policy objectives) in a successful strategic bombardment campaign. A demonstration strike, favored by General Russ, would show Hussein what we could do if he didn't acquiesce, while an interdiction campaign would possibly force out the Iraqis through isolation and starvation.

In the end, any or all of these options might fail. After all, embargoes rarely work, yet politicians continue to try them—probably because the cost is relatively low. Why should strategic attack as a potential policy tool be thought of any differently? Under the right circumstances, it promises a high political payoff at low cost—the main risk being pretty much the same as that for embargoes (i.e., failure to achieve objectives). Of course, strategic attack carries a higher risk of loss of lives and military equipment than do most embargoes (because of the need to penetrate the adversary's airspace), but the potential payoff is usually higher as well. Because no tool works every time, it is best to have as many tools as

possible. National objectives and the adversary's capabilities should determine which of these tools will be employed.

During Colonel Warden's briefing to General Powell on 11 August 1990, the CJCS further delimited the military options. At the time, Instant Thunder called for a strategic offensive that would force a political decision by Hussein to withdraw his forces (see chap. 2). But Powell's desire to destroy the Iraqi army in Kuwait (a sentiment presumably shared up and down the chain of command) changed all that and had a substantial effect on the CENTCOM mission statement and the list of theater (operational-level) military objectives. Two key phrases in the mission statement are directly relevant to the first national policy objective, mentioned earlier: (1) eject Iraqi armed forces from Kuwait and (2) destroy the Republican Guard. These statements, in turn, translate into three key military objectives: (1) sever Iraqi supply lines, (2) destroy Republican Guard forces in the KTO, and (3) liberate Kuwait City.¹⁶ Such objectives are much more direct and limiting, in terms of potential employment options, than the national policy objective's call for "unconditional withdrawal." The military objectives clearly require a direct attack on Iraqi forces in Kuwait and on the Republican Guard in Iraq. Simple withdrawal would no longer be an option.

The operational-level objectives (in addition to those mentioned above) included attacks on Iraqi political-military leadership and C²; attainment and maintenance of air superiority; and destruction of Iraqi nuclear, biological, and chemical capabilities.¹⁷ These objectives were both a logical outgrowth of the four national policy objectives and an effective means of attacking the CENTCOM-defined Iraqi centers of gravity: (1) command, control, and leadership of Saddam Hussein's regime, (2) Iraqi NBC capabilities, and (3) the Republican Guard. Disconnecting Hussein from his military forces and/or the people of Iraq might compel him, for pure survival reasons, to comply with coalition demands (policy objectives one and two). Destroying his NBC capability would reduce Iraq's threat to other states in the region (policy objective three). Eliminating the Republican Guard would reduce Iraq's capability to defend Kuwait and its ability to threaten other states (policy objectives three and four).¹⁸

Thus, the military objectives served the national policy objectives.

With strategic-level and operational-level objectives in synch, only the development of appropriate tactical-level objectives remained. The four-phase campaign plan and the 12 target sets (see chap. 2) provided the necessary framework for designing a systematic process that accomplished this task (see fig. 2). Whether or not this particular scheme represents the definitive process for translating national policy objectives into military force applications, planners should implement a systematic process of some description.

The system designed for Desert Storm used national objectives, military factors such as friendly and enemy centers of gravity, desired effects, and available resources to arrive at a concept of operations. In this case, the concept entailed utilizing our strength—airpower—in the opening round to inflict strategic paralysis through carefully orchestrated attacks against Iraqi vulnerabilities (i.e., the eight strategic target sets). It then called for exploiting that paralysis to throw Iraqi forces out of Kuwait while simultaneously reducing Iraq's offensive capability (essentially the four remaining target sets, although there is some overlap). Thus, the concept of operations is essentially an “artist's conception” that lays out the general idea for the campaign.

Prior to the construction of a building, an architect must convert the artist's conception into drawings that show the structure's main features (e.g., rooms, walls, doorways, windows, etc.) and finally into a blueprint that specifies the placement of individual structural and aesthetic components. In Desert Storm, the master attack plan depicted the “architectural drawings” by matching targets with attack systems and by sequencing sorties to produce the desired concentration, intensity, and tempo of the overall effort. The daily air tasking order, or “blueprint,” specified detailed instructions for every sortie (or at least every mission). In such a system, planners must recognize the necessity of each level of detail and must link each of these levels to the hierarchical array of objectives in order to fulfill the national political objectives.

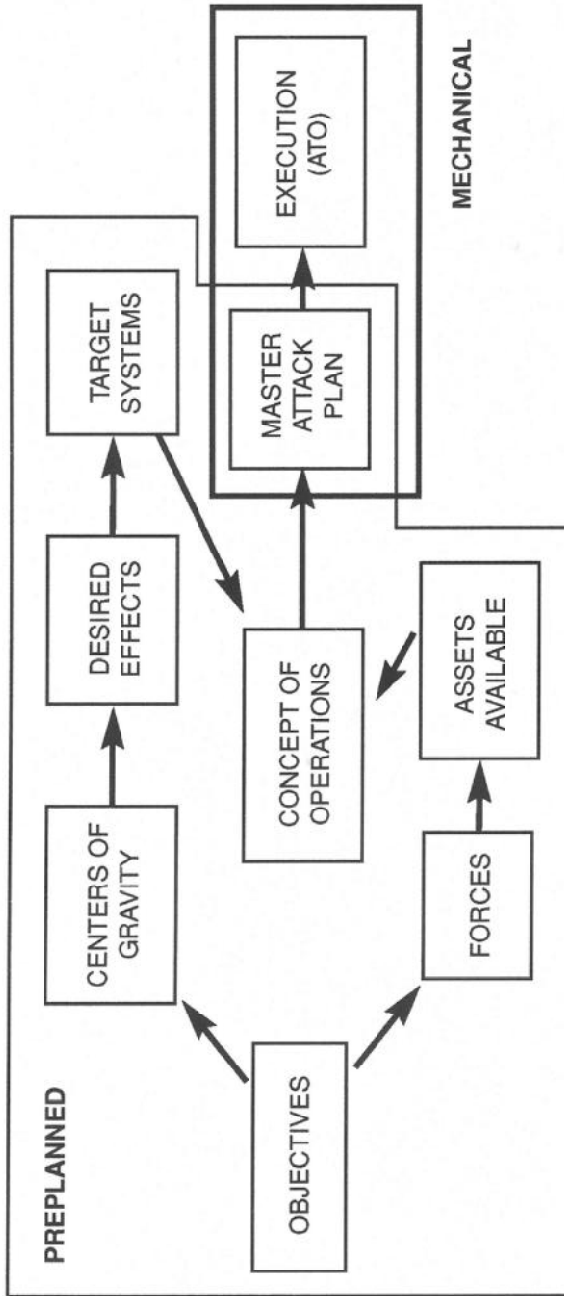


Figure 2. Planning Phases: Concept to Execution

Since “no plan survives contact with the enemy,”¹⁹ planners must also install feedback loops at each level. In other words, they must be prepared for changes. In Desert Storm, for example, the worst weather in 14 years interfered with operations, causing aircraft to seek out secondary targets or abort without releasing their weapons.²⁰ Even when aircraft hit their targets, inaccuracy, miscalculation, weapon or systems malfunctions, or other problems sometimes compromised the mission.²¹ Although the Desert Storm planners never had to contend with changes in objectives or the concept of operations—typically the result of political activities, changes in friendly and enemy capabilities, and so forth—their plan had to allow for such changes.* To do otherwise is to risk having the campaign wander around like Alice, lost and seeking the way without knowing the destination.

Feedback—including the possibility of having to change objectives—is vital. Unlike the operator, who cares only whether the bomb went where it was supposed to, the planner must know not only that fact, but also whether the bomb went off, whether it produced the desired damage, whether it—combined with effects of other weapons—had a systemic effect, and whether that effect contributed to fulfilling the objective. For the planner, each bomb, bullet, and missile must relate to clearly defined, decisive, and attainable objectives—or it is probably wasted.

This systematic approach to planning was as critically linked to the success of Operations Desert Shield/Storm as the lack of such an approach was to the failure of Operation Rolling Thunder, almost 30 years earlier in Vietnam. Some

*Desert Storm was quick and decisive, at least in terms of achieving declared objectives. Because little time existed for major changes in the political environment and the developing outcome seemed favorable to coalition demands, shifts in goals and objectives were unlikely. Shifts of this kind are more likely to occur during prolonged operations, such as the Vietnam-era Rolling Thunder campaign (or, for that matter, the “peacekeeping” operation in Somalia). Indeed, by taking a cataclysmic approach to the air campaign, the Instant Thunder planners hoped to leave little or no time for such changes. When such shifts do occur, however, military operations will not support the changing political objectives unless the shifts in these objectives are recognized and military operations are revised to support the new objectives. This process requires constant feedback and review.

people may feel that the coalition's failure to remove Saddam Hussein and his regime from power tainted the victory. If that is true, it represents a policy failure—not a military one—because Desert Storm arguably achieved every stated political objective, including the establishment of greater stability in the region. The coalition achieved President Bush's desired end state of removing Iraq's forces from Kuwait, restoring Kuwait's government, and enhancing regional stability, at the cost of as few American lives as possible. If that end state proves to be less than desirable, one cannot blame the military. In terms of fulfilling the stated political objectives, the Desert Storm planners produced the most successful air campaign in history.

Notes

1. Joint Pub 3-0, *Doctrine for Joint Operations*, 9 September 1993, A-1.
 2. Sun Tzu, *The Art of War*, ed. Samuel B. Griffith (London: Oxford University Press, 1963), 83.
 3. Lt Col Ronnie Stanfill, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri and author, 3 June 1991, 20, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
 4. The planners included four national objectives in a briefing to General Loh on 8 August 1990. What they presented that day differed somewhat from the final four objectives (see chap. 2), particularly in that the third objective was originally to “secure [the] free flow of oil.” This was quickly changed to “[ensure] security and stability of the Persian Gulf [region],” a change that appeared in the first briefing to General Schwarzkopf just two days later. Briefing, subject: Iraqi Air Campaign, 8 August 1990, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified; and briefing, subject: Instant Thunder: A Strategic Air Campaign Proposal for CINCCENT, 10 August 1990, file 1, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.
- Although the wording of the four objectives changed slightly in later versions, its intent remained constant for the duration of the war. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 38.
5. OPLAN 1002-90, *Defense of Saudi Arabia*, 18 July 1990, 5. (Secret) Information extracted is unclassified.
 6. Briefing, subject: OPLAN 1002 Air Operations, April 1990, file 19, Gulf War Air Power Survey Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.
 7. Some analysts speculated that the Iraqi forces had reached the end of their logistics tether at this point and were, at least temporarily, incapable of

coherent large-scale operations much beyond the Kuwaiti border. Other analysts expected the Iraqis to continue after a short pause.

8. Quoted in Lt Col Charles M. Westenhoff, *Military Air Power: The CADRE Digest of Air Power Opinions and Thoughts* (Maxwell AFB, Ala.: Air University Press, October 1990), 78.

9. Gerald F. Seib and John J. Fialka, "Americans Will Feel Pain of Boycott; Military Role Poses Even More Dangers," *Wall Street Journal*, 6 August 1990, 1.

10. Steven B. Michael, *The Persian Gulf War: An Air Staff Chronology of Desert Shield/Desert Storm* (Washington, D.C.: Center for Air Force History, 1992), 11. (Secret) Information extracted is unclassified.

11. John Kifner, "Boost for U.S. Stand—Iraq's Leader Issues Call for Holy War," *New York Times*, 11 August 1990, 1, 6.

12. Bill Gentile, "The Gulf War: The Gulf War's Final Curtain," *U.S. News & World Report*, 4 March 1991, 24–34.

13. Lisa Beyer, "The World Closes In," *Time Magazine*, 20 August 1990, 26–29.

14. Bruce W. Nelan, "Can the U.S. Turn Off Iraq's Oil?" *Time Magazine*, 13 August 1990, 21–22.

15. Gen John M. Loh, Langley AFB, Va., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 19 September 1991, 20, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

16. *Conduct of the Persian Gulf War*, vol. 1, 96–97.

17. *Ibid.*, 96.

18. *Ibid.*, 94.

19. This quote is commonly attributed to Helmuth von Moltke (the elder). See Robert D. Heinl, Jr., *Dictionary of Military and Naval Quotations* (Annapolis, Md.: United States Naval Institute Press, 1966), 239.

20. Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 176–77; and *Conduct of the Persian Gulf War*, vol. 1, 227–29.

21. See Barton Gellman, "Gulf Weapons' Accuracy Downgraded," *Washington Post*, 10 April 1992, 1.

Chapter 6

Taking It to the Enemy

Invincibility lies in the defence; the possibility of victory in the attack.

—Sun Tzu, *The Art of War*

According to an old adage, “the best defense is a good offense.” In the world of sports, this saying translates to “let'em score; we'll score more!” Of course, no matter how offensively oriented any team is, it never leaves the field when the opponent has the ball. The adage really means that (1) “if our offense is good enough, we will score so many points that our opponents will never score enough to match us,” (2) “if we hit them fast enough, hard enough, and early enough, they will be disoriented by the onslaught,” and (3) “if we keep the pressure on—they will never recover.”

On the other hand, anyone familiar with “classic matchups” of the great offense versus the great defense knows that the great offense is not always the victor. Sometimes the strong defensive team shuts down the strong offensive team and hangs on to win by a small margin, usually in a low-scoring game. Even great defensive teams, though, must be able to generate some offense in order to win. Such teams aren't all defense—it is simply their dominant characteristic.

This need for offense also applies to warfare, especially if one wants a “cheap” win (i.e., with low casualties)—as seems to be true of the American public. Wars dominated by defense are usually long, bloody affairs, like the American Civil War and World War I. The offensive phases of those wars were straightforward, blunt, and sequential, producing bloody stalemates and massive casualties on both sides. Unable to achieve their objectives expeditiously, the adversaries tried to wear each other down with continual pressure. In terms of our metaphor from the sports world, they tried to outscore each other but failed to induce shock by going on the offense fast, hard, and early, and by keeping the pressure on.

By contrast—from its earliest iteration as Instant Thunder to the waning hours of the ground campaign—Operation Desert

Storm used modern technology and unique American advantages in airpower and space power to apply intense and unremitting pressure on Iraq through a coordinated, comprehensive strategic air campaign. Executing this campaign according to the coalition's timetable—not Hussein's*—coalition forces took the offensive against the Iraqi dictator and his sources of power, as well as his army.¹ They employed inside-out warfare, simultaneity, and parallel attack (see chaps. 1, 3, and 3, respectively) to inflict national strategic paralysis and allowed no chance for recovery by pressing home the attack, seeking to diminish Hussein's power until he acquiesced or succumbed to a coup d'état or revolution.

As we have seen, Colonel Warden's concept of inside-out warfare called for early attacks on Iraqi leadership and key essential targets instead of the Iraqi army. Such a strategy was unimaginable to Clausewitz, who wrote that “the destruction of the enemy's armed forces always appears as the highest [of all the possible aims in war]” (emphasis added).² During Clausewitz's day, there was little chance of attacking a nation's leadership or capital without first encountering its army and/or navy. Defeating these forces laid the capital at the feet of the victor, an event that usually proved decisive because the monarch would sue for terms of peace.**

*The clearest indication of CENTAF's determination to execute on its own timetable came during discussions that followed the Iraqi test-firing of two Scud missiles on 29 November 1990. In a briefing to Lt Gen Cal Waller on the question of what to do if Hussein began lobbing Scuds at the coalition, General Horner stated that “any type of attack on any of our forces should be answered with phase 1 [i.e., strategic attack]. [Any other response would be] extremely inefficient use of air.” A formalization of this position was the Reflex Plan, which allowed smooth flow into phase 1 with as little as two hours' notice. Maj Mark B. Rogers, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 3–4 June 1991, 157–60, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

**Like most “rules” of warfare, this is a general one. Capturing the capital did not always achieve the political objective, even in Clausewitz's time—witness the occupation of Moscow by the French in 1812, following the indecisive Battle of Borodino. What probably made the difference in that case, however, was the fact that the Russian army was not decisively defeated before the occupation. Czar Alexander I and his army withdrew from the city, leaving it to the occupier. In time, under the threat of a largely intact Russian army and for unknown reasons (perhaps exhaustion), Napoléon abandoned Moscow and withdrew, losing most of his army to the Russian winter.

Clausewitz did recognize, however, that capitulation resulted not so much from the physical defeat of the army as from its perception of hopelessness: “One might say that the physical [factors] seem little more than the wooden hilt, while the moral [i.e., psychological] factors are the precious metal, the real weapon, the finely-honed blade.”³ In other words—cases of annihilation excluded—defeat normally occurs more in the mind than the body, a principle that inside-out warfare seeks to exploit.

Although General Schwarzkopf did not care for the analogy, Colonel Warden had a point when he likened Instant Thunder to the Schlieffen Plan (see chap. 3).⁴ Just as that plan refused engagement of most of the fielded French army, so did Instant Thunder—and, later, the strategic attack phase of Desert Storm—refuse engagement of Iraqi army divisions deployed in Kuwait and southeastern Iraq. Instead, von Schlieffen preferred to flank the French army by attacking through the Low Countries and then wheeling left to envelop it. Severely dislocated by this unexpected maneuver, the French would immediately collapse, allowing the Prussians to turn quickly to deal with the Russians. Similarly, Instant Thunder was designed to “flank” the Iraqi fielded forces (by flying over and around them) and then to “envelop” Iraq by attacking key strategic nodes.

Inflicting systemic paralysis on a nation-state is not a new concept (it was part of AWPD-1 in 1941, for example⁵), but using it efficiently is possible only through the skillful exploitation of the most modern technologies. A combination of precision navigation and weapons guidance, electronic warfare and counterwarfare capabilities, near-real-time C² capabilities, stealth, and other recent technological improvements is necessary to inflict rapid systemic collapse through aerial bombardment. But planners who adhere to old planning philosophies such as the sequential (or even simultaneous) engagement of enemy forces at and beyond the forward edge of the battle area (FEBA) could squander these capabilities. Instead, they should try to envision the potential of concepts such as inside-out warfare for fully exploiting such capabilities, especially when joined to other concepts such as simultaneity and parallel attack.

Now that it is possible to simultaneously attack many key nodes within a system, one can make total systemic stress greater than the sum of the stresses placed on individual nodes. For example, disrupting four key nodes at a critical juncture is likely to cause more than four times the systemic dislocation caused by completely destroying one of the four nodes at precisely the same moment. By multiplying this impact manifold (i.e., exponentially), as in Desert Storm, one can temporarily (sometimes permanently) paralyze the system.

This principle underlay the operations planners' decision to depart from common targeteering practice and use only two bombs against individual sector operations centers (SOC) instead of the eight recommended by targeteers.⁶ Although the use of fewer bombs would reduce the physical damage at each site, it promised to increase both the physical and psychological disruption of the entire system. More than half of the sites bombed were likely to go off the air, either for physical or psychological reasons (people tend to be distracted by 2,000-pound bombs exploding around them*). The sheer number of sites going off the air in just minutes would likely increase the already considerable apprehension of Iraqi air defense forces,⁷ further interfering with air defense operations.⁸ Some analysts have described this effect as “death by a thousand cuts.”

For both physical and psychological reasons, the thousand cuts should occur quickly—simultaneously if possible. Physically, it is important to overcome the system's capability to (1) withstand and compensate for losses (often described in military parlance as robustness) and (2) recover lost capabilities through repair. Military systems are designed to be as robust as possible, but all of them are susceptible to breakdown at some point. Because work-arounds require time to implement, disrupting a large number of nodes in a short amount of time increases the probability of exceeding the system's robustness. Likewise, damage to many sites will tax repair capabilities more severely than will damage to fewer

*Chief planner Lt Col Dave Deptula, originator of the concept during Desert Shield, phrased it this way: “You know a 2,000-pound bomb can go off down the hall. . . . It will make a heck of a lot of noise, and we won't be dead, but I can guarantee you we [won't] continue to sit here and drink coffee.” Deptula, 11 December 1991, 18 (see note 13).

sites (even though the cumulative amount of damage may be the same) because repair personnel, equipment, and supplies must be spread over a larger number of locations.

Studies of the psychological dimension of warfare have demonstrated a direct relationship between the intensity of operations and their psychological effect on troops. Although these studies apply specifically to battle fatigue in trained combat forces, their findings suggest that widespread damage in a short period of time is likely to be more dislocating than the same damage over a longer period of time.⁹ If this phenomenon is true of trained troops, it is likely to be true of civilian leaders as well.

When the simultaneous attack of multiple nodes is combined with the parallel attack of multiple systems, the effect on a modern nation-state may become exponential (see chap. 4) if the nation-state is a system of highly integrated subsystems. For example, air defense systems and their components require electrical power, usually supplied through integrated power grids. Since attacks on these grids would disrupt the air defense system, most such systems have disbursed, oil-fired, backup generators, usually located at the sites themselves. Long-term usage of these generators depletes on-site fuel stocks, which must be replenished from fuel-storage and refinement facilities. This requirement places increased demands upon transportation systems, which also require fuel from the same stocks. Conceptually, parallel attack calls for the individual and collective disruption of all of these systems and supporting subsystems by massive and continuous aerial attacks. The mutual reinforcement of all these disruptions, combined with those of other key subsystems such as C², is likely to bring the entire national infrastructure to a screeching halt—thus inducing strategic paralysis.

Reeling defenselessly, the nation-state under attack has only two options—stay on the mat or take a beating to end all beatings. It seems as though any rational leader would admit defeat and sue for peace. But Hussein and the Baath party—rational or not—did not appear to understand what was going to happen next and did not embrace the hopelessness that their situation warranted. Otherwise, they

could have saved many lives, a considerable amount of military equipment, and the national infrastructure simply by announcing (and executing) unconditional compliance with UN demands any time in late January or early February 1991.

There may be something of a “global” learning curve associated with the concept of strategic paralysis. Some things are learned only through experience, whether our own or others'. It may well be, for instance, that the first general who lost control of his line(s) of communications (LOC) and resupply did not understand the danger he was in. He may have pressed on, not comprehending that he could be strangled and then slaughtered since he could neither resupply himself nor retreat without facing the enemy on the enemy's terms. In fact, in the days before armies needed to replenish their shotshell, powder, guns, and—more recently—petroleum, oil, and lubricants (as well as other expendables of modern war), it made little difference when LOCs were cut. The armies could subsist off the land and resupply the necessities of war by plundering the adversary. It probably took some time for commanders to become as concerned as they are today about secure LOCs. But now it is understood that if communication cannot be maintained, all is probably lost. Commanders who cannot secure their LOCs begin to negotiate terms of surrender or prepare for a final stand. Perhaps, in the same way, nation--states will one day begin to understand the significance of a successful strategic air attack—at least better than Saddam Hussein did.

In Desert Storm, coalition air forces demonstrated how a properly sequenced and massed air attack can dismantle extensive air defenses in a stroke, leaving the nation-state and its fielded forces defenseless against aggressive exploitation. In the opening hour of the war, strikes by TLAMs and F-117s against air defense, C³, electrical, and leadership targets in Baghdad activated the Iraqi IADS, also known as Kari (Iraq spelled backwards in French*). The coalition then launched drones into the Baghdad area to simulate a second attack

*Composed of a mixture of former Soviet and Western equipment, Kari was linked and coordinated by a French-built, computerized C² system—hence the inverted French name.



Coalition Aircraft. A carefully coordinated and massed assault can very quickly dismantle ground-based air defenses. Shown here (top to bottom) are an E-3A AWACS aircraft, two EF-111 electronic monitoring and jamming aircraft, and a flight of F-4G Wild Weasels loaded with HARMs.

force in order to keep Kari active. At that point, a large force of coalition EW aircraft attacked Kari, jamming radar and communications emitters and shooting over 200 high-speed antiradiation missiles (HARM) at fire-control radar sites. Other coalition aircraft waged a similar effort against air defense ground control facilities and airborne Iraqi fighter aircraft. This massed offensive against Kari and other air defense resources allowed coalition air forces to exploit Iraqi airspace for the remainder of the war while sustaining negligible losses.¹⁰

Because all Iraqi leadership and C³ nodes were now vulnerable and virtually indefensible, coalition air attacks were sudden, unexpected, and deadly. Even hardened bunkers no longer could be counted on for protection. Actually, given the selectivity of coalition targeting, the safest place for leadership to hide was probably a home in a residential district. But any place that radiated the volume of communications necessary to run a nation and an army at war would be quickly detected by coalition electronic monitoring and targeted for attack. Certainly, there was no way to escape monitoring and detection because the coalition controlled the air. For the same reason, the Iraqis were unable to gather information on coalition activities.

The inability of the Iraqi leadership to understand that an aggressive adversary now held the initiative at all levels—tactical, operational, and strategic—proved disastrous. Having observed what happened to Iraq, perhaps future leaders in a similar situation will know when to sue for terms of peace. In any event, the fact that one leader's powers of perception were faulty does not prove that other leaders will be equally blind.

Proving the value of inside-out warfare in Desert Storm is impossible because analysts lack the tools to collect and analyze essential data. For that reason, some people will continue to argue that the only meaningful event in the operation was the defeat of the Iraqi army in Kuwait and that strategic attack on leadership and other key nodes had no effect on the outcome of the war. Somehow it seems implausible to argue, however, that a running, hiding leadership out of normal contact with its citizenry and army could effectively direct a nation-state for long. Hopefully, some

future despot whose air defenses and communications have been destroyed by strategic attack will remember the kind of devastation that can follow (as in Iraq and Kuwait) and choose a wiser course of action than did Hussein. Just as nations and alliances frequently turn to embargoes and quarantines—even though their efficacy cannot be proven—military theorists should continue to develop the concept of inside-out warfare as a useful military option in pursuit of national political objectives.

However effective the concept of death by a thousand cuts may eventually prove to be, it calls into question certain beliefs long held by students of war (especially airpower thinkers). Superficially at least, the concept seems to argue for dispersion of effort (spreading sorties and weapons over a large target base rather than concentrating on a few). This flies in the face of both the old military principle of mass—the concentration of combat power to achieve decisive results¹¹—and the airpower tenet of centralized control¹² articulated by FM 100-20 in July 1943* (see chap. 3). Indeed, since air forces can now accomplish so much more with small numbers of air assets, perhaps it is necessary to reconsider arguments in favor of penny packeting. Further, the new technologies may now allow control to be decentralized to field-command levels (e.g., corps and below). But the truth is that when the concept is viewed at the proper levels of abstraction, death by a thousand cuts demands even greater allegiance to the time-honored principle of mass and the tenet of centralized control. In this case, sights must be raised above the tactical level of warfare because the new technologies in conjunction with concepts both new and old (e.g., simultaneity, parallel attack, inside-out warfare, and strategic paralysis) permit the conduct of warfare more directly at the operational and strategic levels.

Massing of attack forces against single targets is no longer necessary—at least not in the traditional sense. In previous conflicts, destruction of “strategic” targets often required hundreds of attacks with thousands of bombs, and “servicing”

*“Control must be centralized and command must be exercised through the air force commander.” FM 100-20, *Command and Employment of Air Power*, 21 July 1943, 2.

just a handful of targets could take days—even though the enemy could begin repairs immediately. Now, however, the fact that a single bomb delivered by a single weapon system (see fig. 3) may be sufficient means hundreds of targets can be attacked in one day and reattacks can outpace repairs.

Again, the attack against Iraqi SOC^s provides a useful example. The decision by Desert Storm planners to neutralize Kari was logical and doctrinally correct because it would help enable all other air and surface operations.* The SOC^s, therefore, became high-priority targets on the master attack plan (i.e., if necessary, they would be serviced at the cost of delaying attack on other targets).

At the time, the standard targeteer's approach to planning target servicing relied heavily on "engineering solutions." Using probability-of-kill charts and duration-of-effect tables, targeteers calculated the number of weapons necessary to achieve the desired probability of destroying the target. The trouble with this approach is that it becomes simply a number-crunching exercise that completely ignores what Clausewitz and others posited about the dominance of the psychological over the physical dimension in war. As Desert Storm planners discovered, the approach also eats up enormous quantities of resources very quickly: "You can only hit a few targets. It limits your ability to hit a whole lot of targets."¹³

Instead, the operations planners proposed that success be measured not by the amount of damage inflicted but by the effect produced (e.g., is the SOC operating or not?). SOC^s still operating after the first attack or returning to operation later could be reattacked as necessary.¹⁴ This proposal entailed an important conceptual shift from "destruction-based" to "effects-based" planning. Furthermore, using two bombs instead of the eight recommended by targeteers (note that both numbers apply to precision weapons delivered by a

*"Air forces must be employed primarily against the enemy's air forces until air superiority is obtained. In this way only can . . . the inherent mobility of modern land and air forces be exploited to the fullest." FM 100-20, *Command and Employment of Air Power*, 21 July 1943, 1.

"Aerospace control permits aerospace and surface forces to operate more effectively and denies these advantages to the enemy." AFM 1-1, vol. 1, 10 (see note 12).

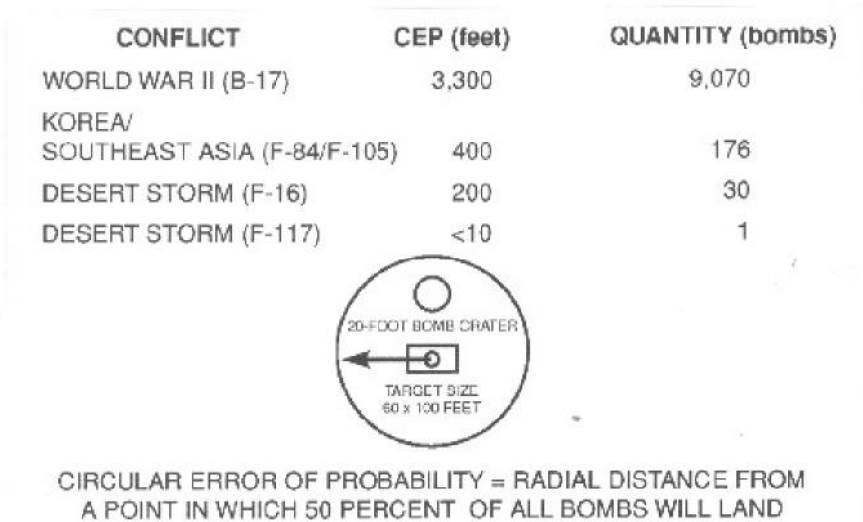


Figure 3. Effect of Circular Error of Probability (CEP) on Quantity (2,000-pound bomb, 90 percent probability of hit)

precise, stealthy platform) freed six bombs for other targets and reflected a second conceptual shift: one should apply economy of force and mass at the operational level as opposed to the tactical, because of the additional leverage gained through simultaneous, parallel attack (see chap. 3).

To comprehend this second conceptual breakthrough, one must understand that individual targets become less significant when the rapid infliction of strategic paralysis is intended. Taking down a specific SOC, for instance, might allow easier ingress to other targets and a reduction in attrition to friendly forces in proximity to that SOC. But if one is to effect rapid systemic collapse, it is more important that a large number of SOCs, spread widely across the entire system, be quickly disabled. Thus, individual targets become, in effect, “secondary efforts” (i.e., failure against one target does not negate the entire effort because the cumulative effect is more important).

As articulated in US joint doctrine, economy of force demands that “minimum essential combat power [be allocated] to secondary efforts.”¹⁵ In accordance with this

precept, two bombs constituted the minimum essential combat power to achieve the desired effect on individual SOCs (i.e., secondary efforts), since this number virtually guaranteed some damage to each one. Chief planner Deptula also expected (rightly or wrongly) the attendant psychological impact to halt operations at least temporarily, even if the physical damage did not.¹⁶ According to Deptula, coalition aircraft never used more than four bombs (including reattacks) against any SOC. The results of the air campaign (especially the exceptionally low loss rates for coalition forces) suggest that his calculations were correct.

Applying economy of force in this way to individual targets made possible a revised application of the principle of mass to the “main effort” (i.e., inducing rapid collapse of entire systems). Instead of massing at the tactical level (lots of bombs on one target), coalition aircraft applied mass at the operational level (lots of targets successfully attacked). This change does not mean that the principle of mass can be casually discarded at the tactical level. Rather, with modern technology, one or two weapons sometimes provide sufficient mass (surely an understatement had one bomb killed Saddam Hussein). The reconceptualization of this principle at the operational level, however, allows for a considerable increase in the leverage available through specific modern technologies.¹⁷

Of course, it is important to apply the principle of mass in such a way as “to achieve decisive results.”¹⁸ Therefore, cohesion, timing, and tempo of the entire campaign (i.e., which targets, when, and how?) became critical considerations. Even though planners had at their disposal literally thousands of sorties per day (a goodly number of which were dedicated to strategic targets), many targets remained unserved or required reattack at the end of 44 days of air campaigning. Because random attack of such a large target base is not likely to achieve desired results, one must impose order of some kind—certainly, order of a very high level if one intends to inflict strategic paralysis.

If, as we have posited, a modern nation-state is a system of highly integrated, robust, and repairable subsystems, then an attack designed to paralyze that nation-state and demoralize

its people must be integrated, pervasive, persistent, and properly sequenced, a task that demands highly centralized control at the operational level (see chap. 3). As Napoléon wrote concerning unity of command, “One bad general would be better than two good ones.”¹⁹

Now that individual and small groups of assets using modern technologies can accomplish even more than large groups using older technologies, it is more important than ever to centralize planning and control of these highly leveraged assets to achieve operational-level objectives quickly. We can achieve the leverage available through the application of modern technologies such as precision guided weapons and stealth only when we apply the “stick” of technology upon the “fulcrum” of concepts. The ancient principles of the offensive, mass, and economy of force are not outdated, but some of our thinking about them may be. If we cannot learn to think in new ways, the power of our awesome technologies will eventually be forfeited to more flexible adversaries.

Notes

1. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 72–73, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

2. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 99.

3. *Ibid.*, 185.

4. During the second briefing to Schwarzkopf on 17 August 1990, Warden said Instant Thunder was “like the Schlieffen Plan.” Schwarzkopf replied, “Don't call it the Schlieffen Plan.” “But it is the Schlieffen Plan, rotated into the third dimension,” Warden responded. Notes, Lt Col Ben Harvey, 17 August 1990, 92, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.

5. For instance, the following discussion of the inland waterway and rail transportation systems in AWPD-1 has an eerily familiar ring:

The transportation system of Germany is indispensable to the functioning of her military organization and national structure. The disintegration and failure of this system can be brought about by the neutralization of the inland waterway system and by simultaneous attack upon certain selected points in the railway system. . . . It is estimated that the existing inland waterway establishment can be paralyzed by the destruction of 9 locks, 3 ship elevators and inland harbor facilities at Mannheim and Dusseldorf. . . . It is estimated that

the destruction of about 15 marshalling yards and about 15 other sensitive points within the rail net, in conjunction with the attacks on the inland waterways, will cause the disintegration and failure of the transportation system of Germany. (Emphasis added)

Air War Plans Division—Plan 1, Munitions Requirements of the Army Air Forces, 12 August 1941, tab 2, 2-3, US Air Force Historical Research Agency, Maxwell AFB, Ala.

6. Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 153.

7. Col S. D. Ramsperger, cited in Alan D. Campen, "Iraqi Command and Control: The Information Differential," in Alan D. Campen, ed., *The First Information War: The Story of Communications, Computers and Intelligence Systems in the Persian Gulf War* (Fairfax, Va.: AFCEA International Press, 1992), 173.

8. Hallion, 173.

9. Anthony Kellet, "The Soldier in Battle: Motivational and Behavioral Aspects of Combat Experience," in Betty Glad, ed., *Psychological Dimensions of War* (London: Sage Publications, 1990), 209, 230-31; and Capt Robert W. VanGorder, *Qualitative Analysis of Combat Stress* (Wright-Patterson AFB, Ohio: Air Force Institute of Technology, 1980), 56-57.

10. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D. C.: Department of Defense, April 1992), 151-60.

11. See Joint Publication (Pub) 3-0, *Doctrine for Joint Operations*, 1993, A--1.

12. See AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 1, March 1992, 8.

13. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Richard T. Reynolds and author, 11 December 1991, 18-20, *Desert Story Collection*, US Air Force Historical Research Agency, Maxwell AFB, Ala.

14. *Ibid.*, 19.

15. Joint Pub 3-0, A-2.

16. Deptula, 11 December 1991, 18-20.

17. See Lt Col Edward Mann, "One Target, One Bomb: Is the Principle of Mass Dead?" *Airpower Journal* 7, no. 1 (Spring 1993): 35-43, for an expanded discussion of the impact of this conceptual shift.

18. Joint Pub 3-0, A-1.

19. Quoted in Peter Paret, ed., *Makers of Modern Strategy from Machiavelli to the Nuclear Age* (Princeton, N. J.: Princeton University Press, 1986), 130.

Chapter 7

Seizing the High Ground: Airpower as a Maneuver Element?

The end for which a soldier is recruited, clothed, armed, and trained, the whole object of his sleeping, eating, drinking, and marching **is simply that he should fight at the right place and the right time.** (Emphasis in original)

—Carl von Clausewitz, *On War*

As we have seen (chaps. 4 and 6), Alfred von Schlieffen's plan of 1905 relied on the principles of economy of force and mass to bring about the rapid defeat of France. The real subtlety of the plan, however, lay in its use of maneuver to gain positional advantage (i.e., drawing forward the French right wing [on the German left] while wheeling around as if in a “revolving door”¹ to crush it from behind). Reportedly, von Schlieffen's dying words were, “It must come to a fight. Only make the right wing strong.”² But von Schlieffen's successor, Helmuth von Moltke (the younger), failed to understand the use of maneuver “to place the enemy in a position of disadvantage through the flexible application of combat power,”³ and his modifications to the plan contributed to the stalemate that the Western Front settled into in 1914—a stalemate that would eventually consume millions of lives.⁴

According to Joint Pub 3-0, *Doctrine for Joint Operations* (1993), “effective maneuver keeps the enemy off balance and thus also protects the friendly force. It contributes materially in exploiting successes, preserving freedom of action, and reducing vulnerability by continually posing new problems for the enemy.” The focus of maneuver is “to render opponents incapable of resisting by shattering their morale and physical cohesion (their ability to fight as an effective coordinate whole) rather than to destroy them physically through attrition.” What von Moltke failed to grasp about von Schlieffen's plan was that the efficacy of the revolving door depended more

upon “movement . . . to secure . . . positional advantage” than upon physical destruction.⁵

The Instant Thunder plan, as explained by Colonel Warden to General Schwarzkopf in early August 1990 and to General Horner later in the month, relied upon maneuver in the air to “render [the Iraqis] incapable of resisting by shattering their morale and physical cohesion” and to “protect the friendly force” by “keep[ing] the enemy force off balance.” When someone raised the possibility of Iraqi ground operations in response to the proposed air campaign in the briefing to Schwarzkopf, Warden himself likened Instant Thunder to the Schlieffen Plan: “A useful way to think about this is as the Schlieffen Plan, but now think about your air arm as being a third-dimensional maneuver [element] which you will use to smash the Iraqis while you are refusing your left flank, which is the ground flank.”⁶ Warden was confident that Instant Thunder’s proposed strategic attack would so dislocate the Iraqi leadership and C³ that an offensive ground campaign launched out of Kuwait would be beyond the Iraqis’ capability.⁷ Thus, coalition forces could “refuse the left flank” (ground operations) while pressing home the attack on the “right flank” (rotated into the third dimension).

Although the concept of third-dimensional maneuver may seem new to some people, the basic idea actually extends at least as far back as 1921, when Italian airpower theorist Giulio Douhet wrote, “Now it is possible to go far behind the fortified lines of defense without first breaking through them. It is air power which makes this possible.”⁸ Other theorists, as well, hoped to use airpower to break the deadlock at the front (after the experience of World War I, most military analysts expected such a stalemate). In 1923 Brig Gen Billy Mitchell wrote, “Against an enemy not in possession of an adequate air force, offensive aviation, if employed effectively, can force a decision before the ground troops or sea force could [sic] join in battle.”⁹ In September 1928 Maj Gen James E. Fechet, then chief of the Army Air Corps, said,

If the true objective can be reached without the necessity of defeating or brushing aside the enemy force on the ground or water . . . the object of war can be obtained with less destruction and lasting after

effects than has heretofore been the case. At present the Air Force provides the only means for such an accomplishment. ¹⁰

On the eve of World War II, the Army Air Corps plans for war in Europe, articulated as AWPD-1, reflected the belief that one could use airpower to break a stalemate on the ground (see



Brig Gen Billy Mitchell believed that “offensive aviation” could force a military decision without a surface battle.

introduction and chap. 3).

Prior to the outbreak of World War II, many airpower theorists thought that armed bomber forces would prove invincible against defensive counterair operations (i.e., the use of antiaircraft artillery [AAA] and what was then called pursuit aviation). Due to the state of technological development in the

late 1930s, multiengined bombers were nearly as fast as pursuit aircraft and could carry heavier armament due to their larger size and carrying capacity. Since the bombers could also normally choose the place and time of engagement (i.e., by choosing ingress routes and attack timing) and since sophisticated detection and tracking technologies such as radar had yet to be developed, aviation experts assumed that bombers would be difficult both to find and to destroy.¹¹

In 1934, for instance, Col Hap Arnold (who would command the Army Air Forces in World War II) “concluded that the speeds of bombers and fighters were so evenly matched that `pursuit or fighter airplanes operating from front line airdromes will rarely intercept modern bombers except accidentally'.”¹² Douhet believed that, even if pursuit aircraft were able to engage them, exchange ratios would favor the more heavily armed bombers (or “battleplanes,” as he called them).¹³

Thus, the offensive force would strike when and where it wanted, “destroying the hostile air force in the air, on its airdromes, and in the enemy's depots and factories.”¹⁴ The bombers could then attack whatever target set was of most immediate interest. In other words, these aircraft would have gained positional advantage and would now be able to “deliver—or threaten delivery of—the direct and indirect fires of the maneuvering force.”¹⁵ Although the initial results of surface maneuver in World War II would be quite different from those in World War I, both sides would eventually attempt to apply this theory to break a stalemate of surface forces.

In marked contrast to the Germans' failure of 1914, a quick and powerful maneuver force of a mere 10 armored divisions, one parachute division, and one air-portable division¹⁶ achieved for Germany in 1940 what von Moltke's modified Schlieffen Plan and over 60 divisions had failed to acquire—positional advantage. The panzers penetrated the weak Allied defensive lines in the Ardennes Forest (thought by the Allies to be impassable for heavy armor), crossed the Meuse River and other water obstacles on bridges secured by air-delivered light-infantry detachments, outflanked the now infamous Maginot Line, and enveloped the British Expeditionary Force and Belgian army in northern France and the Low Countries. This time the door revolved so

easily that German leaders repeatedly checked the advance because they feared a trap.* The German success resulted in the heroic but ignominious evacuation of British forces (intermingled with some French and Belgian forces) from Dunkirk. France fell less than a month later, and for 12 tense but illustrious months, Britain stood alone.¹⁷ Germany's powerful airland force, though dominant on the Continent, was held at bay by British sea power operating under the protection of the Royal Air Force (RAF). To break the stalemate, the Luftwaffe would have to sweep the RAF from the skies. Thus, the stage was set for Britain's "finest hour."¹⁸ The outcome of the Battle of Britain would bring into question the prewar assumptions that offensive action would always be decisive in air warfare.

The Germans hoped to gain positional advantage once again—this time through the third dimension—by defeating the RAF "in the air, on its airdromes, and [in the British] depots and factories." They came excruciatingly close before their own loss of hope brought on a dispersion of effort that offered the rapidly dwindling RAF a modicum of relief.** Had

*The German High Command stopped the advance at least three times. First, immediately after the crossing of the Meuse, Panzer Group Headquarters ordered the advance halted and the bridgehead built up. Fearing that this halt would forfeit the element of surprise, Gen Heinz Guderian, panzer corps commander, asked that he be allowed to continue the advance and received permission to do so for 24 hours (during which time the halt order was rescinded). Second, the advance stopped three days later at the Oise River on orders from Hitler, who feared a French counterattack against the Germans' southern flank. Guderian again obtained permission to conduct "strong reconnaissance," which he interpreted as the continuance of offensive operations. Soon after, the German command allowed him to begin his race to the coast of the English Channel. After the panzers reached the coast, Hitler ordered another halt—this time for three days. This hiatus may have cost the Germans the war because during this time the British Expeditionary Force occupied Dunkirk and began its famous evacuation. Liddell Hart, *History of the Second World War*, 72, 74–75 (see note 16).

**During August 1941, the RAF lost 338 first-line fighter aircraft with an additional 104 badly damaged, while the Germans lost only 177 such aircraft with 24 badly damaged. Further, British industry produced fewer fighters than were lost from 24 August to 6 September (265 produced versus 295 lost and 171 badly damaged). Clearly, the Germans should have pressed home the advantage by continuing their attacks on British fighters, bases, and factories. Instead, they switched in early September to a daylight bombing offensive against London, a decision that probably saved the RAF Fighter Command from destruction. Liddell Hart, *History of the Second World War*, 103–4 (see note 16).

the Germans maintained their pressure on British fighter resources, they might have achieved their objective of “defeat[ing] the RAF and [then] . . . neutraliz[ing] the Royal Navy.”¹⁹ Indeed, the German invasion force for Operation Sea Lion was ready and waiting to exploit such an advantage.²⁰ Fortunately, although the British were repeatedly decimated, these beleaguered few to whom so much is owed* did not fold. Consequently, the stalemate of surface forces—prolonged by the inability of either side to cross the English Channel in the face of opposing airpower—remained unaltered.

Next, the Anglo-American Allies would have their turn at testing the still-evolving airpower theories. After much debate, the British and Americans agreed to conduct a Combined Bomber Offensive, sending American daylight precision bombers against German industry, while British nighttime carpet-bombing targeted the will of German workers. The intermediate goal of the Allies was command of the air (air supremacy), just as it was for the Germans during the Battle of Britain. According to Wesley Frank Craven and James Lea Cate, “it had been a postulate in all Allied planning—from AWPD-1 of September 1941 to the final draft of the NEPTUNE plan**—that the success of an invasion of the European continent would depend upon the establishment of supremacy in the air.”²¹

Although this effort took more than a year and although objectives changed over time—as occurred during the German effort in the Battle of Britain—the Allies ultimately experienced phenomenal success. On D day only 25 German aircraft attempted attacks on the invasion convoy, inflicting no significant damage. The Allies' heavy bombers alone flew a total of 1,083 successful sorties against the beachhead areas, dropping 2,994 tons of bombs, and Allied air forces flew a total of more than 8,000 sorties that day.²² The stalemate was over, and Hitler was doomed.

*Speaking of the RAF in the Battle of Britain, Winston Churchill declared, “Never in the field of human conflict was so much owed by so many to so few.” Quoted in Heinl, 6 (see note 28).

**Neptune was the code name for the Initial Joint Plan for the invasion of Europe. It included the first phases of the invasion and seizure of the Normandy beachhead. The plan for Operation Overlord, however, encompassed the entire invasion, including pre-invasion operations and the breakout from the beachhead (code-named Cobra).

If, as stated in Joint Pub 3-0, maneuver is indeed “the movement of forces in relation to the enemy to secure or retain positional advantage, usually in order to deliver—or threaten delivery of—the direct and indirect fires of the maneuvering force” (emphasis added),²³ then air forces possessing command of the air (i.e., air superiority or air supremacy) constitute a maneuver force par excellence. They not only have the advantage of approaching the enemy from any direction on the face of the earth, but they also possess the positional advantage of the third dimension—altitude. Used properly, sole possession of the third dimension allows air forces to disregard terrain and enemy opposition. It also allows the compression of events, due to the ability of modern jet aircraft and missiles to move very rapidly over the battle area. In addition, it offers a greater probability of achieving surprise, particularly at the operational and tactical levels, since (with current technology) aircraft operating at medium to high altitudes are rarely detected without special equipment such as radar (which can be negated by a properly equipped air force in command of the air).

When Task Force Normandy* fired the first shots of the coalition offensive at 0238 on 17 January 1991 (22 minutes prior to H hour), the lead elements of the Desert Storm phase 1 enveloping force were already around (i.e., over) the flank, rapidly approaching targets in downtown Baghdad. Ten F-117s, followed by TLAMs, opened the attack on Baghdad at 0300, and in their wake the planned ambush of Kari helped secure the way for less stealthy attacks throughout Iraq.²⁴ Iraqi fielded forces in Kuwait did not even know what was going on, let alone possess any power to intervene. They were dug in deeply—and utterly helpless.

In a matter of minutes and from many positions of advantage, coalition aircraft brought tremendous firepower to bear on Iraq and its war-making capabilities. B-52s released ALCMs from well beyond radar-detection, let alone visual, range. Secure fleets in the Persian Gulf and Red Sea launched volleys of TLAMs. F-117s made their presence known only by the thunder

*Code name for the Air Force/Army team of MH-53 Pave Low and AH-64 Apache helicopters that destroyed the two SOCs along the Iraqi border, opening the way for the less stealthy elements of the attacking force. See, for instance, Hallion, 166 (note 24).

and lightning of their 2,000-pound bombs. EF-111s, EA-6s, EC-135s, and other EW aircraft jammed enemy radar and communications from secure positions at standoff range. F-4G Wild Weasels, EA-6s, and F/A-18s fired Shrikes and HARMs at Iraqi radar sites that were tracking and shooting at unarmed remotely piloted vehicles. As Kari disintegrated, coalition aircraft attacked hundreds of targets in a matter of minutes. Their positional advantage was so complete that, with a single exception,* these thousands of aircraft and crews all came home. By dawn on 17 January 1991, Iraq had been crippled by a massive air assault from which it would not recover in time.²⁵ Ultimately, airpower ensured that the coalition would achieve all of its objectives and, because of the positional advantage secured by Desert Storm's "air-Schlieffen Plan," actually made the defeat of Iraq look easy at all levels.

During the war, complete positional advantage in the air made a lot of things look easy. Before Desert Storm, most of the coalition air forces followed the standard practice of planning attack operations at low level—usually 50 to 200 feet above the surface. This tactic made target acquisition more difficult for the attacking aircraft, due to the extremely short time a given point in the flight path would be in view (usually just a few seconds), but it increased their chances for survival. As an integrated air defense system, Kari depended upon an overlay of guidance and weapon systems to force these attackers into difficult choices—stay high and risk radar intercepts by air defense fighters and SAMs, or stay low to negate the radar-guided threats and risk flying into the "golden BB," an unguided shot by air defense artillery (or even a stray small-arms round).

*An F/A-18 from the USS *Saratoga* was shot down the first night by an Iraqi MiG-25, killing the pilot, Lt Comdr Scott Speicher. *Conduct of the Persian Gulf War*, vol. 1, 160 (see note 31); and Atkinson, 47 (see note 25).

**A site goes autonomous when it becomes disconnected from the integrated system of which it is a part. While the system is integrated, engagements are centrally controlled and coordinated to avoid multiple engagements and fratricide. One-on-one engagements of autonomous sites are much easier to deal with from the air than engagements with a site still operating in the integrated system. The strength of the integrated system is the presentation of multiple, coordinated threats, while the autonomous site represents only a single threat.

Once the system starts to break down, however, the attacker's problem is simplified. As radar sites and intercept control centers are destroyed or forced to autonomous mode,** much more attractive options become available to the attacker. During Desert Storm, coalition aircraft were able to move to the middle and high altitudes once the air-to-air and SAM threats were under control (from the second day forward). Bombing accuracy suffered to a greater or lesser extent, depending on the specific systems in question, but loss rates were extremely low, and an additional element of surprise was added to the attacks.

With nearly all the coalition aircraft operating at medium to high altitude, destruction often seemed to come from out of the blue. Tanks exploded in the middle of the night with no warning as F-111s and A-10s—working together and using imaging infrared (IIR) Maverick missiles and 500-pound LGBs—learned to target the infrared images of armored vehicles, which cooled more slowly than the surrounding sand. Apparently, this threat affected the sleep (and, consequently, the morale) of those Iraqi tankers who survived the attacks.*

Taking shelter in “hardened” C³ bunkers and SOCs could not have been much more comforting because these facilities also developed a nasty habit of suddenly disintegrating. The carnage inside the Al Firdos bunker, viewed internationally via satellite transmission, gave the world a small taste of the shock and devastation of these attacks. Rick Atkinson captures the scene vividly in his book *Crusade: The Untold Story of the Persian Gulf War*:

The lucky ones died instantly. Screams ripped through the darkness, muffled by tons of shattered concrete and the roaring inferno that enveloped the shelter's upper floor. Sheets of fire melted triple-decker bunk beds, light fixtures, eyeballs. One survivor, Omar Adnan . . . described the conflagration: “I was sleeping and suddenly I felt heat and the blanket was burning. Moments later, I felt I was suffocating. I turned to try and touch my mother who was next to me, but grabbed nothing but a piece of flesh.”²⁶

**During the Iran War, my tank was my friend. . . . I could sleep in it. . . . During this war my tank became my enemy. . . . None of my troops would get near a tank at night because they just kept blowing up.” Remarks made by a captured Iraqi officer during interrogation. Hallion, 202-3 (see note 24).



COURTESY OF COL DAVE DEPTULA

Iraqi Aircraft Shelter. Even “nuclear hardened” facilities such as this Iraqi aircraft shelter were not safe from the coalition's conventional, precision, penetrating weapons.

Two 2,000-pound bombs dropped by undetected F-117s killed 204 people in the bunker.²⁷ This incident was both unfortunate and unnecessary, for these civilians should not have been allowed in a C³ facility (a violation of Geneva Convention protocols). Even so, the incident is instructive because it gives us an idea of what Iraqi military personnel must have experienced in hundreds of other hardened sites across Iraq.

Regardless of personal or national sensitivities, the side that has attained positional advantage must either exploit or forfeit that advantage. All good military officers know the value of holding high ground in the enemy's flank and rear, a position that offers huge—usually insurmountable—advantages. The ultimate objective of maneuver is to achieve these advantages.

If a force holds such a position, is nearly invulnerable from attack, and can deliver heavy firepower on the enemy at will, the final outcome of the fight is assured. Such a force can pick the enemy apart, while conserving its own resources—especially precious human lives. If enemy leaders understand the position that a maneuver force has placed them in, they can save both sides a great deal of trauma. (As the Duke of Wellington said, “Next to a battle lost, the greatest misery is a battle gained.”²⁸) With a huge coalition air maneuver force operating nearly unopposed everywhere along the front and in his rear areas, “a humane leader would have sued for peace,” as Richard P. Hallion put it.²⁹ Unfortunately, as nearly everyone would agree, the Iraqi dictator is anything but humane.

Hussein's failure to see what would inevitably occur in the following days seems implausible. In one night and one day, airpower achieved and demonstrated complete maneuver dominance for the US-led coalition. From a position of virtual invulnerability (above 10,000 feet and almost always beyond useful detection), coalition airpower delivered ton after ton of firepower on tactical, operational, and strategic targets, day after day for over 40 days. Hundreds of targets caught thousands of bombs daily, communications and infrastructure remained under constant pressure, and fielded forces were pinned in place with little hope.

Even the occasional moment of laxness on the part of the coalition served only to further reinforce the message. Part of a three-brigade Iraqi force (i.e., division level—though the enemy offensive was not really properly coordinated as a division attack) managed to enter and temporarily occupy Al Khafji, a relatively unimportant village on the Saudi-Kuwaiti border. During the Iraqi buildup for the attack on Al Khafji, two American A-10s and a single AC-130 gunship, cued by an E-8A joint surveillance target attack radar system (JSTARS) aircraft, destroyed 58 of 71 vehicles in a support convoy. As the battle raged, at least 60 more vehicles were destroyed from the air,³⁰ and Iraqi armor columns attempting to reinforce the attack were crushed by airpower of every description.³¹ Although the Iraqis managed to down one AC-130 during the melee, they were generally unable to respond to the death raining down from on high.³² Even running proved

dangerous—witness the fate of the Iraqis who tried to scramble home from Kuwait City on the now-famous “highway of death.”³³ The ability to maneuver freely and unobserved over the battlefield and beyond is a powerful advantage. Even if airpower can't be everywhere all the time, the positional advantage pertains because the adversary cannot know when it is there—and it can be there whenever it needs to be.

When the coalition ground attack finally came, 38 days of carefully exploited positional advantage had a telling impact on the outcome. The ground operation, expected to last three weeks, actually took only four days and achieved all stated political objectives.* Perhaps more Iraqi heavy equipment escaped than we would have liked, but a very large amount was destroyed. The Iraqis offered no organized resistance above regimental level. Those who did resist were destroyed by firepower massed from the surface and above. In the main, coalition forces knew where the Iraqis were, but the Iraqis had little or no idea of the location or movement of coalition forces.** The westward movement of two powerful American

*Commentators have argued that the coalition's objectives were not met for various reasons (e.g., Hussein is still alive and in power; the Republican Guard was not completely destroyed; NBC facilities were not entirely destroyed; and so forth). Although it is true that some subsidiary objectives were not met, the four political objectives mentioned in chapter 2 were the measure of success for the people who wielded the instruments of national power. That is, fulfillment of the political objectives articulated by national leaders provides the measure of success of the military instrument—not the fulfillment of subsidiary military objectives. Military objectives are merely those that are expected to lead to attainment of the national political objectives. If one can fulfill the political objectives short of full realization of the military objectives, so much the better. In the case of Desert Storm, the coalition achieved all stated political objectives. Specifically,

1. there are no Iraqi forces remaining in Kuwait;
2. Kuwait's previous government is restored;
3. security and stability in the region are improved (improved—not perfect, if in fact perfect security and stability exist); and
4. American lives were protected beyond any previous measure in war.

Shortfalls, if any, were present only in the stated political objectives—not in their achievement. An analysis of this issue, however, is beyond the scope of this work.

**For example, one Iraqi brigade commander reported having “no idea we [coalition forces] were coming, even though the unit right adjacent to him had been attacked two hours before.” Col S. D. Ramsperger, cited in Alan D. Campen, “Iraqi Command and Control: The Information Differential,” in Alan D. Campen, ed., *The First Information War: The Story of Communications, Computers and Intelligence Systems in the Persian Gulf War* (Fairfax, Va.: AFCEA International Press, 1992), 174.

Army corps had gone undetected, allowing them to attack Iraqi forces that were often oriented in the wrong direction.³⁴

If Col John Boyd's OODA loop model is accurate (i.e., victory goes to the one who observes, orients, decides, and acts most rapidly), then coalition forces could hardly lose because they were usually deciding and acting while Iraqi forces were still straining to observe.³⁵ Satellites, JSTARS, advanced synthetic aperture radar systems (ASARS) mounted on TR-1 tactical reconnaissance aircraft, U-2 camera systems, RC-135s, and other reconnaissance systems maintained constant surveillance for coalition forces, while the Iraqis relied on binoculars. Thanks to night vision goggles, forward looking infrared (FLIR), low-altitude navigation and targeting infrared for night (LANTIRN), and other technomiracles (even the lowly Maverick missile, which A-10s were able to use as a poor man's FLIR), the coalition owned the night, operating nearly as efficiently in darkness as in daylight.*

With all these advantages, victory was relatively well assured. But the real value of positional advantage resides in the fact that it saved coalition lives. Tens of thousands of Iraqis were captured, wounded, or killed,** but total coalition casualties numbered only 1,358 (including 390 Americans killed).³⁶ Twenty-one Americans were captured by the Iraqis but were quickly released after the cease-fire.³⁷ Certainly, our

*In fact, one could argue that coalition air forces, led by the American F-117s, F-15Es, and F-111Fs (in particular), were more efficient at night than in daytime. For instance, the F-117 was probably the single most effective vehicle used for strategic attack (as well as the only manned system allowed to go into downtown Baghdad because of the heavy air defenses and the desire to reduce losses)—and it operated only at night. For various reasons, Iraqi air defenses everywhere (particularly manned interceptors) were less efficient at night. The coalition exploited this weakness by planning the most demanding sorties for nighttime and by using the various infrared (IR)-equipped systems available to their forces. The 117s in downtown Baghdad and the “shelter-busting” campaign are two examples. Some other attacks could be carried out only at night for technical reasons. For instance, F-111Fs, A-6Es, and F-15Es used their IR systems to find and target tanks, which cooled slowly after sunset and therefore were easily distinguished from the terrain, even though they were buried in sand. In the daytime, however, these targets were nearly invisible. See *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1, 155–56, 168–70, and 184–85 (see note 31).

**The question of exactly how many Iraqis were killed has been much debated, with estimates ranging from a few hundred to 100,000. The latest—and presumably most reliable—figures place an “absolute” upper limit of 8,000 on the number killed and 32,000 on total casualties. The report acknowledges that the total number killed may have been as low as 1,500. “Report Puts Iraqi Dead at 1500,” 5 (see note 38).



Iraqi POWs. Tens of thousands of Iraqi soldiers surrendered, many without a fight.

positional advantage met the president's objective of protecting the lives of American citizens abroad.

In view of the tens of thousands of casualties predicted in prewar estimates (see introduction), such a low figure is remarkable.³⁸ It seems more than fair to claim that a measure of credit for this phenomenal success belongs to coalition air forces operating in the Iraqi rear and striking from out of the blue. To reiterate the terminology of Joint Pub 3-0, these forces provided the coalition with “positional advantage” that they exploited

to deliver—or threaten delivery of—the direct and indirect fires of the maneuvering force . . . keep[ing] the enemy force off balance [to] protect the friendly force . . . [and] contribut[ing] materially in exploiting successes, preserving freedom of action, and reducing vulnerability by continually posing new problems for the enemy.³⁹

Operating as one of the most successful maneuver forces of all time (and fulfilling every aspect of the joint definition of maneuver), coalition air forces kept airpower's long-standing

promise to help avert a bloody, attritional slugfest on the ground.

Notes

1. Capt B. H. Liddell Hart, *The Real War: 1914–1918* (Boston: Little, Brown and Co., 1930), 47.
2. *Ibid.*
3. Joint Pub 3-0, *Doctrine for Joint Operations*, 9 September 1993, A-2.
4. Liddell Hart, 47–49; R. Ernest Dupuy and Trevor N. Dupuy, *The Encyclopedia of Military History from 3500 B.C. to the Present*, 2d rev. ed. (New York: Harper & Row, 1986), 939–40, 990; and B. H. Liddell Hart, *A History of the World War: 1914–1918* (London: Faber & Faber Ltd., 1934), 89.
5. Joint Pub 3-0, A-2.
6. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 57–58, 97, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
7. “If you succeed in taking away the enemy’s strategically important things, you can just plain prevent him from having the ability to do subsequent things, especially offensive things.” *Ibid.*, 57–58.
8. Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (1942; reprint, Washington, D.C.: Office of Air Force History, 1983), 9.
9. Quoted in Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 1, 1907–1960 (Maxwell AFB, Ala.: Air University Press, December 1989), 42.
10. *Ibid.*, 63.
11. *Ibid.*, 68–69.
12. *Ibid.*, 80.
13. Douhet, 381–89.
14. Futrell, 65.
15. Joint Pub 3-0, A-2.
16. B. H. Liddell Hart, *History of the Second World War* (New York: G. P. Putnam’s Sons, 1970), 66.
17. *Ibid.*, 66–75; Dupuy and Dupuy, 1060–77; and Edgar McInnis, *The War: First Year* (London: Oxford University Press, 1940), 186–97.
18. Dupuy and Dupuy, 1064–66.
19. *Ibid.*, 1065.
20. Liddell Hart, *History of the Second World War*, 87–108.
21. Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II*, vol. 3, *Europe: Argument to V-E Day, January 1944 to May 1945* (1951; reprint, Washington, D.C.: Office of Air Force History, 1983), 186.
22. *Ibid.*, 185, 190.
23. Joint Pub 3-0, A-2.
24. Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 165–69.
25. For a more detailed account, see *ibid.*, 166–76; Bruce Watson et al., *Military Lessons of the Gulf War* (London: Greenhill Books, 1991), 64–78;

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and Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War* (Boston: Houghton Mifflin Co., 1993), 13-49.

26. Atkinson, 285.

27. *Ibid.*, 285-86.

28. Quoted in Robert Debs Heinl, Jr., *Dictionary of Military and Naval Quotations* (Annapolis, Md.: United States Naval Institute Press, 1966), 26.

29. Hallion, 175.

30. *Ibid.*, 219-23.

31. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 120; and Hallion, 220-21.

32. Atkinson, 209-10.

33. Hallion, 234-35.

34. *Ibid.*, 231-40.

35. Col John R. Boyd, "A Discourse on Winning and Losing," 1987. Unpublished set of briefing slides available at Air University Library, Maxwell AFB, Ala.

36. Atkinson, 492.

37. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 2 (Washington, D.C.: Department of Defense, April 1992), A-13.

38. "Report Puts Iraqi Dead at 1500," *Jane's Defence Weekly* 19 (13 March 1993): 5.

39. Joint Pub 3-0, A-2.

Chapter 8

Setup for the Knockout Blow

We have inflicted a complete surprise on the enemy. All our columns are inserted in the enemy's guts.

—Maj Gen Charles Orde Wingate
11 March 1944

Cleverly employed airpower can be used to ensure the security of friendly forces and operations, while inducing shock and surprise among the adversaries' leadership, populace, and troops. At the same time, the speed, range, and flexibility of air forces allow relatively simple plans to serve complex operations. These attributes of airpower were deliberately exploited by the Desert Storm air campaign planners, as demonstrated in the following scene.

0200/16 January 1991/Somewhere over Northern Saudi Arabia

Nearly overcome by exhaustion, the pilot of the F-15C Eagle was relieved to drop away from the boom of the KC-135 Stratotanker and slip smoothly and safely into tactical formation with his wingman. Together they turned north, heading back toward the Saudi/Iraqi border and another hour or so of sheer boredom. He wished they would hurry and get this show on the road. Even if the way home were through Iraq, he was ready to go. The Eagle driver wasn't sure how much longer he and his buddies could maintain this routine, night after night, especially now that many of them had resorted to taking pills—both to stay awake and then to sleep. All of them were near the limits of their endurance.¹ In their current physical condition, boredom was dangerous. Falling asleep on patrol could mean death.

The constant vigil had become well-established routine: three E-3 AWACS aircraft—each guarded by a flight of

Eagles—flew along the northern Saudi border, monitoring Iraqi air activity.² The primary purpose of these aircraft was to provide security—a barrier against surprise attack by a formidable enemy air force. Their secondary purpose, one that they shared with other aircraft, was to lull the Iraqis into accepting a routine that would mask the coming onslaught until it was too late for a cohesive response. To that end, reconnaissance aircraft of various types occasionally made runs along the border to monitor Iraqi activity and get a clear picture of enemy field deployments. Periodically, a simulated attack package of coalition aircraft would feint at the border to elicit a reaction from the Iraqi air defense system. Accompanying EW aircraft would monitor the Iraqi reaction in an attempt to clarify the adversary's electronic order of battle. After a while, these feints became so commonplace that the Iraqis quit responding, apparently tiring of the game of cat and mouse.³ Of course, this response was exactly what the coalition had hoped for because it would set up the Iraqis for a surprise attack. With any luck, many of them would sleep right through their rapidly approaching apocalypse.

The ploy was elegant in its simplicity—painting and repainting the same benign scene over and over, until the enemy accepted it, and then altering it just in time to quickly thrust home the knife. Simple though it may seem, such a ruse can be immensely effective, especially when one includes the clandestine performance of key tasks prior to changing the deluding picture (or even during the change, while the enemy is still confused). In Operation Desert Storm, for example, stealth (both technological—as with F-117s and TLAMs attacking Baghdad at H hour—and operational—as with the Pave Low/Apache attacks on Iraqi SOCs at H minus 22 minutes) provided the capability to put the Iraqi leadership, C³I, and strategic air defenses under siege at the same time the scene viewed by the Iraqi defenders was rapidly changing. Although technological capabilities heightened the impact, the simplicity of the ruse assured its success.

Dismantling a nation's key centers of gravity from the air is a complex undertaking, but the plans for doing so need

not be equally complex. Indeed, the Desert Storm air campaign planners managed to keep their plan simple enough “to ensure thorough understanding”⁴ by the people who executed it.* Thus, the planners resolutely honored these three key principles—security, surprise, and simplicity—throughout the war.

According to Joint Pub 3-0, *Doctrine for Joint Operations*, “the purpose of security is to never permit the enemy to acquire unexpected advantage.” Recognizing that “risk is inherent in military operations,” this publication defines security in terms of “prudent risk management, not undue caution.” It further states that “security enhances freedom of action by reducing friendly vulnerability to hostile acts, influence, or surprise.”⁵ Nearly 2,500 years ago, Sun Tzu said that “skilful warriors first made themselves invincible and awaited the enemy's moment of vulnerability. Invincibility depends on one's self; the enemy's vulnerability on him.”⁶ Almost from the moment General Horner arrived in Riyadh on 7 August 1990, the nascent coalition struggled to achieve invulnerability. But there are many approaches to providing force security, and several of them would come into conflict in the ensuing weeks.

Initially, the most prominent (and, to many participants, most distressing) threat to the coalition buildup was the Iraqi ground forces massing on the Kuwaiti/Saudi border. Not only were Iraqi intentions unclear, but there wasn't much of a coalition army available to oppose them if they chose to advance into Saudi Arabia (assuming they were logistically capable of such a move). General Horner (the acting CENTCOM commander in-theater at the time) was consumed by the spectre of 27 Iraqi divisions oriented on Saudi Arabia,* and his staff was obsessed with building defensive plans to stop the Iraqis in the event they did launch an assault.⁷

*Even the Marine Corps air commander, Gen Royal Moore, who—as we have seen—was critical of the JFACC and ATO, reluctantly admitted that the process worked: “That we had no blue-on-blue air engagements and no midair collisions attest [sic] to the coordination aspect of the process.” Lt Gen Royal N. Moore, Jr., “Marine Air: There When Needed,” US Naval Institute Proceedings, November 1991, 63–64. Surely such results would have been highly improbable if the people executing the plan had not had a clear understanding of what their mission involved and what was expected of them.

The key disagreement between General Horner and Colonel Warden during the Instant Thunder briefing on 20 August 1990 was over the significance of ground forces (both Iraqi and coalition) to the defense of Saudi Arabia.⁸ While Horner was concerned that launching Instant Thunder prematurely might provoke an Iraqi ground attack which coalition forces would find difficult—if not impossible—to repulse,⁹ Warden thought that the impact of the planned strategic attack on Iraqi leadership and C³I would actually preclude such an invasion. Thus, Warden considered the presence of Iraqi forces and the buildup of coalition ground forces irrelevant to the outcome. First, if Instant Thunder were executed, rapidly deteriorating conditions on the Iraqi home front would rule out an Iraqi reaction against Saudi Arabia (Warden: “People [nations] just don't do that”);¹⁰ second, if Iraqi ground forces did try to move into Saudi Arabia, they could be repulsed by coalition airpower (Warden: “I don't believe they can move under [coalition] air superiority”).¹¹ Horner and Warden did agree upon the value of air superiority, which the coalition was likely to enjoy if it employed its assets wisely.¹²

In the final analysis, the security of Saudi Arabia and of the coalition fielded forces—from the beginning of Desert Shield to the end of Desert Storm (and beyond)—hinged upon a clear superiority in the air. The Saudis themselves maintained a formidable counterair and air defense capability that featured an integrated air defense net incorporating a squadron (five aircraft) of US-made E-3A AWACS aircraft, three squadrons (42 aircraft) of F-15Cs equipped with the latest and most capable export variant of the Sidewinder and Sparrow air-to-air missiles, and 33 late-model SAM batteries (US-made

*Actually, an Iraqi force of this size was not in place until mid-October, when General Schwarzkopf—his forces bolstered by massive deployments of air, sea, and land power—already felt assured of a successful defense of Saudi Arabia. However, the initial Iraqi deployment of 11 divisions, including the Tawalkana mechanized infantry division and the Medina and Hammurabi armored divisions of the Republican Guard (which had led the assault into Kuwait), was clearly more than a match for the light ground forces deployed by the coalition in the first few months. If the Iraqi forces could not be stopped by airpower, they simply could not be stopped. Although Horner was confident that airpower could make the Iraqis pay for an attack, he was not at all sure it could stop them. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1, 3, 46–51 (see note 3); Harvey, 5–6 (see note 11); and Wilson, 25–26 (see note 9).

Improved Hawks and French-made Crotales).¹³ The very first US deployments further augmented this capability: 24 F-15Cs from Langley AFB, Virginia, and five E-3As from Tinker AFB, Oklahoma, arrived on 8 August, just 34 hours after receiving the deployment order.¹⁴ This buildup of counterair capability quickly provided the resources for the 24-hour defensive combat air patrol (CAP) coverage described at the beginning of this chapter.

Such a defensive barrier might not have proven impermeable to Iraq's airpower resources, but it didn't allow the Iraqis much room for maneuver against the coalition. With the border protected against enemy intrusion, air surveillance of the adversary force could begin augmenting data from space-based sensors, while coalition rear areas enjoyed protection from both surveillance and attack by the enemy. As the buildup began in earnest, military vehicles could be parked row upon row, aircraft parked wingtip to wingtip, and supplies stacked pallet beside pallet—without loss to enemy action.* Theater buildup and deployment of coalition forces proceeded beneath this unchallenged umbrella of airpower. When it came time to launch offensive operations against Iraq, skillfully employed modern technology and offensive counter-air operations provided security of near-equal effectiveness to air forces that were thus able to proceed boldly into the lion's den.

*General Schwarzkopf was keenly aware of the problem posed by the Iraqis, as well as the degree of reliance on defensive counterair to protect the buildup. Of Riyadh airport, he said, "Every time I flew into or out of that airport I'd think, 'If one enemy aircraft were to get through and hit this place. . . .' The secondary explosions alone would have destroyed the entire fleet. I would call Chuck Horner and say, 'Guarantee me that not one airplane is going to get through your air defense net.'

"Not one airplane will get through,' he'd say. 'You don't have to worry about that'." Schwarzkopf, 351 (see note 15).

Iraqi Scuds were responsible for the only damage inflicted inside coalition lines from the air. Although these missiles proved militarily irritating and politically significant, they caused only slight physical damage. The loss of 22 American troops to a Scud that leaked through the Patriot defense (after the air war had been in progress for 41 days) was tragic but hardly debilitating to the war effort. This is not to imply that we should have discounted the Scud threat or should discount it in the future. More effective use of even such inherently inaccurate weapons could still inflict significant damage on military installations or troop concentrations, especially if they can be salvo-launched and/or mated to weapons of mass destruction.

There was no clear resolution of the Horner/Warden disagreement over ground forces because, instead of attacking, the Iraqi forces dug in and waited for the coalition to take the initiative. Further, the coalition launched its air attack only after sufficient ground forces were in place for General Schwarzkopf to “guarantee” the defense of Saudi Arabia.¹⁵ As if to validate Horner's concerns, however, the Iraqi attack on Al Khafji occurred 12 days into the air war, while the strategic attack was still in progress (although somewhat reduced in intensity to allow concentration on the objectives of phases 2 and 3).¹⁶ But the attack on Al Khafji was neither well organized nor well executed (perhaps reflective of deteriorating conditions on the home front); once coalition forces were fully alerted to the threat, Iraqi armor did find it impossible—as Warden had predicted—to move under the coalition's air superiority. Al Khafji was liberated by a single Saudi armored brigade and a smattering of other surface forces, while the Iraqis lost an entire mechanized infantry division and major elements of three other armored/mechanized divisions that fled in disarray—repulsed, for the most part, by coalition airpower.¹⁷

Even though the Iraqis demonstrated at Al Khafji that the coalition security net was not impregnable, the incident proved (by exception) the rule that domination of the high ground (i.e., the ability to observe, maneuver, and attack from a sanctuary above and beyond the reach of surface forces) offers enormous advantages. Securing friendly resources from enemy attack, which Sun Tzu called “invincibility,” is just one such advantage. As we have seen, Sun Tzu believed that the enemy created his own vulnerability. But it is possible to nudge him in that direction through deception, thereby creating an environment for surprise, the purpose of which is to “strike the enemy at a time or place or in a manner for which it is unprepared.”¹⁸ Against considerable odds, the coalition managed to do just that.

Given the prevalence of modern technology, one would assume that surprise has become ever more difficult to attain, especially at the higher levels of warfare (i.e., operational and strategic). For example, it proved impossible to mask the flow of coalition forces into Saudi Arabia; even the transition from

a “strictly defensive”* force to one that allowed offensive options was international news.¹⁹ Anyone with a television set, a major daily US newspaper, or access to a public library could have told Hussein by early November 1990 the precise size and general composition of coalition forces in place and en route. Further, the monetary cost of sustaining such a large deployment constrained the coalition's ability to wait for Iraq to get the message. Although the world might expect the UN, the US, and the other coalition members to exhibit the “virtue” of diplomatic patience, there was—of necessity—an upper limit to this endurance. Such a boundary was loosely established when the UN Security Council passed Resolution 678 authorizing “Member States co-operating with the Government of Kuwait . . . to use all necessary means . . . to restore international peace and security in the area” (emphasis added) if Iraq did not comply with all pursuant UN resolutions by 15 January 1991.²⁰ Few people doubted that “all necessary means” equated to armed force. All of these factors, then, made it difficult to hide the fact that a coalition offensive would come—sooner or later. Achieving surprise under these circumstances would not be easy, to say the least.

Yet, when the air attack finally came, it seemed to catch the Iraqis completely off guard. For instance, at H hour, the lights were on in Baghdad (and did not go out for at least an hour);²¹ in fact, ingressing F-117 pilots could see the city's glow from 100 miles away.²² Although tracer rounds did go up from the city about 30 minutes before H hour, as Iraqi AAA probed for an unseen enemy, this action clearly was more a “nervous twitch” than a response to the presence of the F-117s.²³ No evidence indicates that the Iraqis actually detected the approach of the “cockroaches,”* either in this initial attack or at any other time during the war. Perhaps this twitch was occasioned by the death

*Of course, the force structure in place in Saudi Arabia by 8 November 1990 (when the increase was announced) was not “strictly defensive” to people who believed that the application of airpower alone could convince Iraq to withdraw. To them, an offensive option had been available since at least the middle of September—maybe earlier—in the form of the Instant Thunder/CENTAF offensive air campaign plan. Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 30 May 1991, 102, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

rattle of the two Iraqi radar sites far to the south, which were hit by Task Force Normandy aircraft at almost precisely the moment the Baghdad AAA opened up.²⁴ But the Iraqis obviously had no clear sense of what was coming. According to the *Gulf War Air Power Survey: Summary Report*, “stealth . . . restored a measure of surprise to air warfare [and] provided air forces some freedom of action that otherwise would not have been attainable.”²⁵ Surprise, however, entailed much more than the application of a single technological marvel.

The defensive air picture described at the beginning of this chapter was only a small part of the coalition's overall deception plan, which was actually quite elaborate and extensive. As coalition forces built up and prepared for offensive operations, planners drafted a scheme to misdirect the Iraqis at all three levels of warfare. Stealth alone (i.e., F-117s and TLAMs) might have provided surprise at the tactical level, but achieving surprise at the operational and strategic levels required much more. The deception plan was designed to convince the Iraqis that the coalition offensive—if executed—would go straight ahead into Kuwait, supported by an amphibious assault.²⁶

If the Iraqis had studied US Army doctrine or listened to General Moore, they probably would have expected the straight-ahead charge to be preceded by a short (one or two days to a week, at most) artillery barrage, including air-delivered fires. The Iraqis' own doctrine, as well as their recent wartime experience with Iran, would have led to the same general conclusion (see chap. 1). They might have anticipated demonstration strikes against their capital and other cities (as in the “war of the cities” during the Iran-Iraq War), but they had no reason to expect either the strategic onslaught that actually came or the precision with which it was executed. Although the concepts for such an offensive had been around for a long time, the actual event was unprecedented in warfare. The capability to take down literally hundreds of critical assets in just a few hours yet cause only minor collateral damage simply had not existed previously (see chap. 1).

*An unofficial moniker given to F-117s by crew members because of their roach-like profile and the fact that they appeared only at night.

The coalition achieved tactical surprise in both the timing and locus of its attacks. No one foresaw such an action immediately after expiration of the withdrawal deadline, and most of the Iraqi defense system was caught napping.²⁷ Instead of a “rollback” campaign, beginning against fielded forces in Kuwait and supported by an amphibious landing on its eastern shores, the main attack came from the air and focused well to the rear of the Iraqi armies in Kuwait. Early on, these forces in Kuwait were attacked, but only in a harassing manner. Later, however, the attacks became serious, as coalition airpower attempted to meet General Schwarzkopf's goal of attriting Iraqi strength by 50 percent before launching the ground campaign. In the meantime, coalition attacks isolated the field armies in Kuwait and left them helpless to intervene on their nation's behalf.

As described in chapter 7, the fact that coalition aircraft could operate at medium to high altitudes (because they had achieved a high degree of air superiority) served to enhance the element of tactical surprise. Once the coalition offensive began in earnest, the Iraqis could never be sure when the next attack would come—only that it would. If they tried to move—as they did at Al Khafji and Kuwait City—coalition airpower disrupted, disabled, and destroyed them quickly and decisively. If they stayed in place, allied aircraft destroyed them piecemeal—slowly and methodically. The coalition had no intention of bloodying itself on the carefully engineered Iraqi defensive positions in Kuwait. Thus, the long-delayed ground offensive would seem more like liberation than battle to many Iraqi frontline troops.²⁸

Although tactical surprise resulted from almost equal parts technology and planning, operational surprise resulted primarily from planning—especially the deception planning that had indeed reinforced the Iraqis' preconceived notions of warfare and thus made them vulnerable. According to the Gulf War Air Power Survey: Summary Report, “many captured Iraqis stated they thought the air campaign would last several days to a week at most.”²⁹ Instead of using preparatory fires followed by an onslaught into the Iraqis' defensive positions, the coalition began an air war that first bypassed the front line, isolating it from leadership and resupply, and then later—when Iraq remained obdurate—methodically attrited enemy forces throughout the theater.³⁰ Simultaneously, airpower covered the movement of



More Iraqi POWs. Coalition forces “liberate” Iraqi soldiers.

coalition surface forces into positions from which they would conduct operational maneuvers undetected by the Iraqis. When coalition ground forces finally engaged, instead of passing cooperatively through the Iraqi killing zones, they turned the flank and attacked from the rear. Completely surprised, many Iraqi soldiers died bravely but needlessly. At the operational level, then, the decision had already gone to the coalition.

Like tactical surprise, strategic surprise resulted from a substantially equal mix of technology and planning. Never did the Iraqis expect (nor did most of the coalition, for that matter) the nearly simultaneous destruction of so many critical targets. Saddam Hussein's strategy of waiting to inflict casualties in his now much-disparaged “Mother of All Battles” simply did not stand up to the coalition's offensive plan. His strategy implicitly relied upon “graceful degradation” of his fielded defensive forces, but coalition plans and technological capabilities combined to cause catastrophic failures instead. Coalition airpower preserved itself from massive attrition by immediately negating Kari through lethal and nonlethal SEAD and the careful exploitation of stealth technologies (see chap. 7); similarly, airpower helped prevent a

substantial loss of coalition ground forces by isolating and dislocating the Iraqi army in Kuwait and eastern Iraq before G day. “Hunkering down”—a useful Iraqi strategy during the Iran-Iraq War—didn’t work this time, as coalition 2,000-pound bombs fried “nuclear hardened” bunkers and aircraft shelters; Maverick missiles and GBU-12 bombs obliterated buried tanks; and coalition airpower first halted and then annihilated relief columns and escape convoys alike.

Thus, thanks to the mutually reinforcing elements of security and surprise, the war was over, except for the destruction and collection (as prisoners of war) of the Iraqi army in Kuwait (referred to by one author as the “desert roundup”).³¹ This phase proved relatively easy in terms of time and cost to the coalition in casualties. Surely the finale must have come as a great strategic surprise to the man who, only six months earlier, said that airpower had “never been decisive in the history of warfare.”³²

At first blush, the plan that defeated Iraq seems extremely complex, juggling simultaneity, parallel attack, and inside-out warfare against multiple requirements to seize control of the air, create strategic paralysis, attrit Iraqi fielded forces, and support a surface scheme of maneuver. The initial concept of operations for the strategic air campaign alone filled two large loose-leaf binders,³³ and the daily ATO ran to several hundred pages.³⁴ Yet, in accordance with guidance calling for “clear, uncomplicated plans and concise orders to ensure thorough understanding,”³⁵ planners sought to keep things simple enough that everyone up and down the chain of command knew exactly what had to be done.

This effort at simplification dated all the way back to the beginning—to the first week of August 1990, when Colonel Warden imposed strict discipline on Instant Thunder planning. His insistence on first recording the president’s stated national objectives clearly and succinctly and then using the five-ring model to identify centers of gravity and target sets whose destruction would fulfill those objectives tended to encourage a disciplined way of thinking through the air campaign. Further, laying out the entire planning process on a flowchart (see chap. 5, fig. 2) encouraged clear, organized thinking from start to finish. By establishing explicit

relationships between national objectives and target sets, the planners assured that each level of planning—tactical to strategic—connected to a higher level: target to target set, to one or more military objectives, to national objectives.

This process ultimately produced 12 target sets (see chap. 2), all of them derived from the five-ring model and related to specific military and national objectives. Categorizing the targets into sets made handling them much easier, since planners assigned to various tasks now had a much smaller database to deal with (specific target sets instead of the entire intelligence database).^{*} This proved useful in at least two important ways. First, planners could become more familiar with the specific information they needed and used regularly, and could concentrate on their tasking without spending too much time searching through databases (e.g., planners tasked to plan and monitor the attack of strategic air defenses could find their data in one place, not interspersed among all the other target data).

Second, this system of organization helped ease the daily—even hourly—shift in targeting that occurred during Desert Storm. For instance, on the first day of the war, targeting emphasized Iraqi C² and strategic air defenses in order to isolate the national leadership and provide the necessary air superiority for follow-on attacks. Also in support of these goals, the production and transmission of electricity (see chap. 2) came under attack on the first day. Finally, Scud missiles—which could target Israel—were a first-night/-day priority for political reasons (though the success of this effort

^{*}The intelligence community uses a rather cumbersome technique to communicate target information among its members. Each target in the worldwide database is assigned a basic encyclopedic number (BEN) consisting of 10 alphanumeric characters assigned sequentially as the target enters the database. Thus, to the uninitiated, these thousands of numbers corresponding to thousands of targets all over the world appear to have been assigned in a totally random manner. The logic for subdividing a large number of targets into manageable sets that planners can become familiar with seems compelling, yet the intelligence community continues to insist that this would be a perversion of the system. Deptula, 19, 23 (see note 16); and Col James Blackburn, Bolling AFB, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 21 April 1993, 137-54, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

has been seriously challenged³⁶). As priorities shifted over time, first within the strategic categories and then to more tactical considerations, planners found it easier to retrieve information from discrete sets of target data rather than from a general field of information.

To help units understand their designated missions, General Glosson and his planners visited individual field units several times during the buildup to brief them on their roles in the air campaign.³⁷ The effort to simplify didn't stop with preplanning, however. A notable example is the designation of "kill boxes" and "killer scouts," which simplified the problem of utilizing aircraft with limited loiter capability against buried, mobile, or otherwise hard-to-find targets.* The results speak for themselves, especially the figures on fratricide and overall casualties, which



Deptula, Glosson, and Rogers. Black Hole planners worked hard at making the air campaign plan comprehensible to the people who would have to execute it. They did this by involving key personnel from all units and by going to the field to brief units involved in the execution of Desert Storm. Pictured here (left to right) are Lt Col Dave Deptula, Brig Gen Buster Glosson, and Maj Buck Rogers.

speaking loudest of all. Was there confusion in spite of everyone's best efforts? Of course, but Joint Pub 3-0 never expected the proper application of the principle of simplicity to eliminate confusion—only to minimize it.³⁸

0200/17 January 1991/Somewhere over Northern Saudi Arabia

This time, when the Eagle drivers turned north, they had enough adrenaline coursing through their veins to wake the dead. It was show time, and they were leading an air armada the likes of which the world had never seen. Their first job was still security—sweeping the skies of interceptors that might otherwise prey on the “shooters”^{**} and their support packages. The plan was very simple: assume that anything in front of them was Iraqi and destroy it.^{***} The Eagles and their friends had already accomplished their secondary task by catching the Iraqis flat-footed. Although a single Iraqi interceptor managed to slip through the net and down an unlucky coalition flyer on the first

*CENTAF planners divided the Iraqi army's deployment area (Kuwait and eastern Iraq) into kill boxes, defined by latitude and longitude coordinates. OA-10 forward air controller (FAC) aircraft or F-16C/D killer scouts were then assigned to the boxes to find and designate targets of interest to strike aircraft (“killer bees”). Often, the strike aircraft were also A-10s or F-16s, but the scout would already have targets sighted when the strike aircraft arrived, thus maximizing the latter's time in the box. This procedure kept strike aircraft from running out of fuel before finding targets and expending their weapons. Hallion, 155 (see note 2); and Col James Crigger, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2-4 December 1991, 42, 81-83, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

**Planners used this term to refer generically to actual attack aircraft of all types, because none of the standard terms applied universally. That is, not all attack aircraft dropped bombs: some shot missiles, rockets, guns, or various combinations of all four types of weapons.

***Actually, some coalition air assets were indeed in front of them, but the Eagles—for all their air-to-air prowess—were no more likely to see the F-117s and TLAMs that were already approaching or attacking Baghdad than were the Iraqis.

day (see chap. 7), the air armada was otherwise untouched by Iraqi air forces. Coalition aircraft loss rates (to all causes) for the entire war were an astoundingly low 0.035 percent (0.022 percent for USAF aircraft).³⁹ These figures, combined with the casualty statistics presented in chapter 7, indicate startlingly effective security for coalition forces. By the end of this day—thanks to careful application of the principles of surprise, security, and simplicity—the coalition had firmly cemented its dominance in the air and space.

Notes

1. Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War* (Boston: Houghton Mifflin Co., 1993), 42–43; and the author's personal discussion with crew members.

2. Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 166; and *Conduct of the Persian Gulf Conflict: An Interim Report to Congress* (Washington, D.C.: Department of Defense, 1991), 4-15 through 4-17.

3. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 141; Richard Jupa and James Dingeman, *Gulf Wars: How Iraq Won the First and Lost the Second; Will There Be a Third?* (Cambria, Calif.: 3W Publications, 1991), 35; and Bruce W. Watson et al., *Military Lessons of the Gulf War* (London: Greenhill Books, 1991), 64.

4. Joint Publication (Pub) 3-0, *Doctrine for Joint Operations*, 1993, A-3.

5. *Ibid.*

6. Sun Tzu, *The Art of War*, ed. Samuel B. Griffith (London: Oxford University Press, 1963), 85.

7. For example, on 19 August 1991 at the first briefing of Instant Thunder to the CENTAF staff, Maj Gen Thomas R. Olsen, vice-commander and acting commander of CENTAF, said, “[Instant Thunder] is what we would have liked to have done as well, but we ran out of time. . . . When [we] get done with support of the ground war, then we can do some thinking about the deep war.” Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 22–23 May 1991, 11–12, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

8. See Col Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign against Iraq* (Maxwell AFB, Ala.: Air University Press, 1995), chapter 7.

9. Col Steve Wilson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 25–26, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

10. Col John A. Warden III, Washington, D. C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 73, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

THUNDER AND LIGHTNING

11. Notes, Lt Col Ben Harvey, 20 August 1990, 9-10, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information extracted is unclassified.

12. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2 December 1991, 41, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

13. International Strategic Studies Institute, *The Military Balance: 1989-1990* (London: Brassey's, 1989), 112.

14. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 2 (Washington, D.C.: Department of Defense, April 1992), E-23.

15. Gen H. Norman Schwarzkopf with Peter Petre, *General H. Norman Schwarzkopf, the Autobiography: It Doesn't Take a Hero* (New York: Bantam Books, 1992), 348-50. According to General Schwarzkopf, he made this guarantee on 15 September 1990.

16. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 12 December 1991, 8, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

17. Schwarzkopf, 424-27; and *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1, 174-76.

18. Joint Pub 3-0, A-3.

19. See, for instance, Eric Schmitt, "U.S. to Add at Least 100,000 to Its Gulf Force by Late December," *New York Times International*, 8 November 1990, A-15.

20. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 2, B-19.

21. Eric Malnic and Thomas B. Rosentiel, "World Hears War Begin Live from Baghdad," *Los Angeles Times*, 17 January 1991, A-1.

22. Atkinson, 35.

23. Peter Arnett, *Live from the Battlefield: From Vietnam to Baghdad, 35 Years in the World's War Zones* (New York: Simon & Shuster, 1992), 365-66.

24. Atkinson, 33.

25. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report* (Washington, D. C.: Department of the Air Force, 1993), 224.

26. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1, 102, 141.

27. "Conventional wisdom said that President Bush would wait a few days before he ordered the bombers in." Arnett, 365.

28. Keaney and Cohen, 107-8.

29. *Ibid.*, 108.

30. *Ibid.*, 102-8.

31. Hallion, 231-32.

32. Dan Rather, "Excerpts from Interview with Hussein on Crisis in Gulf," *New York Times*, 31 August 1990, A-10.

33. Col Richard D. Bristow, Langley AFB, Va., transcript of interview with Lt Col Richard T. Reynolds and author, 9 November 1992, 27-28, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

34. Keaney and Cohen, 149.

35. Joint Pub 3-0, A-3.

36. Keaney and Cohen, 89–90.

37. Lt Gen Buster C. Glosson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 4 June 1992, 41, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

38. Joint Pub 3-0, A-3.

39. Bill Sweetman and Anthony Robinson, “The Mechanics of Interdiction and Airfield Attack,” *International Defense Review* 24, no. 5 (1991): 472.

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Chapter 9

The First Information War?

Know the enemy and know yourself: in a hundred battles
you will never be in peril.

—Sun Tzu

Into the silence there dropped the notes of the dove: the grasshoppers were still now. Into the silence there dropped the thunder of cannon and the sharp clear sounds of rifles. . . .

Moved by a spirit that was outside ourselves and our captains, we went forward on to the plain. . . . [The leader] kept the pace midway between walk and run. There was a rhythm to the firing of the cannon: as the enemy jumped clear there came a puff of smoke and then the great wind of the bullet. Our leader sent fifty runners to tell the men that they must drop to the ground when they saw the puff of smoke, then the big bullet would go over their heads. The men having caught his words fitted themselves into our enemies' rhythm, and so there were less killed than was expected.

Still, great numbers were left behind on the plain. . . . On and on through the tall green grass, their plumes touched by the wind of death . . . their death-screams were heard above the roaring of the guns. . . . Indeed people were falling so fast that they made a sort of fence behind which the living hid while they fired. . . .

The war cry of Zulu filled the sky and the tread of Zulu shook the earth.¹

The words are fiction, but the scene is real and vividly illustrates the fate of preindustrial warriors opposing industrial-age firepower. Such warriors, though they sometimes win the field, pay a horrible price in blood. Indeed, the industrial-age force would have to be incredibly stupid to lose such a battle. For instance, Lord Frederic A. Chelmsford lost the battle of Isandhlwana in 1879 (the battle described above) because he declined "local advice concerning the adversary and terrain before him on the grounds that 'the broad principles of tactics hold good in Africa equally as well as in Europe'."² The British army paid heavily for Chelmsford's failure to obtain knowledge concerning the enemy and his deployments. Though Chelmsford's main column slaughtered Zulus by the hundreds, only 355 of 2,800 in the British force survived the

battle. Just one day later, however, at Rorke's Drift, a British force of 85 drove off thousands of Zulus, killing 400–500 while losing only 17 men themselves.³ The major difference was that the smaller force knew the Zulu attack was coming and had prepared for it. Chelmsford might have known, but he chose not to.

Perhaps Operation Desert Storm was, as some people claim,⁴ the first information war,* but it wasn't—by a long shot—the first time an armed force perished for lack of knowledge. Sun Tzu recorded the principle for us nearly 25 centuries ago. The struggle to dominate the enemy in terms of information and knowledge is not new, but it has recently taken on dramatically increased relevance in war fighting. It is possible—perhaps even likely—that “information warfare” represents a true revolution in war fighting** and will require new understandings of military force and force application (see epilogue). If so, the overwhelming defeat of Iraq by the US-led coalition in 1991 may be attributable in large measure to the fact that Hussein's industrial-era armed forces ran up against a postindustrial military whirlwind. This chapter examines how air and space power contributed to coalition dominance in the collection, dissemination, and application of information and knowledge, and how this process affected the outcome of Desert Storm.

Rapidly gaining and exploiting information dominance was a goal of both the Instant Thunder plan and the more fully developed Desert Storm air campaign plan. The first Iraqi targets attacked were air defense, leadership (including C³I), and electrical grids,⁵ all of which had the highest priority because of their impact on the flow of information. Kari

*Alan D. Campen makes this claim in *The First Information War* (see note 4). He declares (among other things) that the Gulf War “differed fundamentally from any previous conflict” in that “the outcome turned as much on superior management of knowledge as . . . upon performances of people or weapons” (page vii—emphasis in original). Despite his use of the term *information warfare*, Campen tacitly avers the truth—suggested by Sun Tzu 2,500 years ago—that the ultimate goal of the struggle is to dominate the enemy in knowledge—not information. Collection and analysis of information is, of course, a part—but not the whole—of the issue.

**Or perhaps this is simply an important part of a larger revolution in military affairs (see introduction). A third possibility is that *information warfare* and *MTR/RMA* are simply different names for the same phenomenon.

provided tracking and targeting information for Iraqi fighter and SAM engagements of coalition aircraft. Breaking down this flow of information would fragment the enemy's air defense effort, forcing his SAMs into autonomous mode and leaving his interceptors virtually helpless. This situation allowed coalition aircraft to exploit Iraqi airspace at will. Leadership C³I targets provided linkages between the highly centralized decision-making elements (principally Hussein) and both the Iraqi population and the fielded military forces. Disrupting these systems would upset and discredit the regime, while simultaneously reducing its capability to control military forces.⁶ Without electrical power, communications would be reduced to verbal and handwritten messages conveyed by courier. Thus, a successful attack against the Iraqi power grids would disrupt nearly every kind of information flow within the nation.⁷ Plans called for maintaining pressure on Iraqi "information nodes" throughout the war (see chaps. 4 and 6) to help create an exploitable "information differential."^{*}

To build and maintain this pressure, the US brought a tremendous array of EW systems to the fight. (Other coalition partners contributed a few systems, such as the British Tornado GR1As, but the US provided the vast majority.) Before and during the war, satellites and airborne systems collected electronic intelligence, finding and fixing C³I nodes of all types for later attention from less benign systems such as the USAF's 61 F-4Gs and 12 specially configured F-16 Wild Weasels, highly sophisticated systems capable of detecting and destroying electronic radiation sources (especially radar emissions) with HARM and Shrike antiradiation missiles. The Navy and Marines contributed less sophisticated—yet very capable—F/A-18, EA-6B, and A-7 HARM and Shrike shooters. (These aircraft could detect and shoot at radiation sources but, lacking some of the information available to the Weasels,

^{*}Like several other concepts utilized in Desert Storm (e.g., parallel attack and simultaneity), information differential acquired its name after the war. See Joint Pub 1, Joint Warfare of the US Armed Forces, 11 November 1991, 57. It is worth noting that this concept is specifically tied to "advanced US technologies," a relationship that makes it a perishable advantage, dependent upon continued US superiority in technology development.

could never be sure they had released their missiles within range of the target.) Many strike aircraft carried their own electronic jamming equipment to counter Iraqi attempts to track and shoot them with radar-guided systems; additionally, EF-111s, EC-130s, and/or EA-6Bs accompanied most strike packages, employing even more sophisticated (and powerful) jamming equipment.⁸ The apparent Iraqi fears that radiating was both futile and dangerous were certainly well founded, if not totally accurate.⁹ The enemy's ability to collect and use information was severely disrupted, but creating that deficit represents only half the battle.

According to Col John Boyd's OODA theory (see chap. 7), this kind of offensive effort can "enmesh [the] adversary in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos . . . and/or fold [him] back inside himself so that he cannot cope with events/efforts as they unfold."¹⁰ This factor probably contributed greatly to the mass desertions and surrenders of Iraqi troops and almost certainly to their general ineffectiveness as a cohesive fighting force. Of course, as Boyd also states, this disruption of the adversary's flow of information represents only one side of the equation. The real objective is to complete one's own OODA cycles faster than the adversary completes his; thus, while "stretch[ing]-out [the] adversary['s cycle] time," one must also "compress [his] own."¹¹ Although caught somewhat flat-footed in August 1990, the coalition immediately began working this part of the equation and continued with a vengeance until the air war began in January 1991.

According to Colonel Boyd, "the O-O-D-A loop can be thought of as being the C&C [command and control] loop."¹² Surely, Boyd is actually referring to all aspects of what we call C³I—command, control, communications, and intelligence (or what many people now call C⁴I—the fourth C standing for "computers"). Logically, then, (1) intelligence* provides observation (in accordance with command elements' requirements); (2) working together, intelligence and

*For the sake of simplicity, intelligence is used here to subsume all information sources. The author recognizes that much of a commander's or staff's vital information is not provided by the intelligence system.

command elements provide orientation (i.e., they determine what to observe, which observed information is of greatest value, and how it is to be used in making decisions); (3) command elements make necessary decisions and direct the actions required to execute those decisions; and (4) field units and their discrete elements (aircraft, tanks, people, etc.) execute the directed actions (and contribute to observation through postaction reports, at which point the cycle begins again). All these elements are interconnected through the communications element of C³I (and computers of C⁴I). The whole can be only as strong as the weakest link. Even though at least one of its links was very weak indeed (i.e., orientation, discussed below), the coalition—after weathering a slow start—would eventually dominate in every element of this cycle.

The slow start resulted in part from the orientation of US operations planning—and, therefore, intelligence collection—for the Middle East prior to early 1989. Before that time, planners concentrated on a potential Soviet threat in the region. That orientation, combined with the “aggressive security and counterintelligence policies of the Iraqi regime,” meant that the US (therefore, the coalition, since the US owned the vast majority of intelligence assets which could be brought to bear) did not have a full complement of information on Iraq.¹³ Much of the available data was old, of poor quality, and/or incomplete.¹⁴ The US had satellites in place that could and did monitor military activity, but little was known about the regime's intentions.¹⁵ Consequently, there was no consensus on the probability of the Iraqi invasion before it actually occurred.¹⁶ Neither was there a consensus on Saddam Hussein's intentions beyond the occupation of Kuwait. Some people thought that he would continue the attack into Saudi Arabia in early August, while others thought he had already overextended himself and would now only dig in and try to hold.¹⁷ The coalition immediately began the scramble to improve the flow of information.

As mentioned in chapter 8, the first deployments to theater included US AWACS aircraft to enhance the development of an “air picture” for coalition military leadership and forces. This knowledge not only was critical to the defense of Saudi Arabia

against air threats, but also helped monitor Iraqi training activity and improve coalition understanding of the Iraqi air force's readiness levels and sortie-generation capability. Behind the initial air defense force deployments came a plethora of reconnaissance and surveillance aircraft to monitor Iraqi activities and define orders of battle. These included RF-4s, RC-135s, TR-1s, P-3s, E-2s, RF-5s, and specially configured F-14s and Tornado GR1As—a total of more than 100 such aircraft. Additionally, Pioneer unmanned aerial vehicles flew nearly 300 reconnaissance sorties.¹⁸ Two experimental E-8 JSTARS contributed their own brand of near-real-time battlefield reconnaissance. Though using them was a risky gambit (because of their developmental status), these aircraft provided tracking of both friendly and enemy ground forces, thus reducing fratricide and making possible some spectacular—usually one-sided—air-to-ground engagements such as the one that produced the now-famous “highway of death.”¹⁹ On top of all that, a significant array of military and civilian space systems augmented air-breathing



Pioneer remotely piloted vehicles picked up some of the slack in tactical reconnaissance by flying over 300 missions during Desert Shield/Storm.

reconnaissance and surveillance systems, providing meteorological information and imagery of various types.²⁰ Even this massive reconnaissance and surveillance capability couldn't satisfy the coalition's insatiable appetite for information on Iraq and its army's field deployments, so several other types of fighter aircraft "flew reconnaissance missions in an attempt to overcome the shortage."²¹

But coalition military leaders still couldn't seem to get sufficient information quickly enough. Throughout the war, theater planners had to contend with an unacceptable lag in information flowing to them through normal intelligence channels. Furthermore, the people who assigned priorities for imagery collection were often not involved with target planning (and, therefore, not in touch with the decision makers' priorities). Because required information, once collected, frequently arrived too late to be useful, planners had to use out-of-channel work-arounds to assess bombing results within the 72-hour planning cycle.²²

Some vital information—such as the location of mobile Scud missile launchers—proved to be just too difficult to obtain. Highly effective Iraqi deception efforts and employment procedures made targeting the Scuds very difficult; confirming successful attacks was almost impossible.²³ The only indication of success against the Scuds was the gradual reduction in the number of missiles fired, although a resurgence in firings during the last week of the war tended to cloud this assessment. (Nonetheless, the last week's firings were still less than half those of the first week.)²⁴

Though far from mobile, Iraqi nuclear research facilities proved nearly as difficult a problem. Coalition intelligence uncovered only eight known or suspected nuclear facilities before or during the war, yet postwar inspections by the International Atomic Energy Administration turned up at least an additional 18. The fact that 16 of the 26 were considered "main facilities"²⁵ means that at least eight major nuclear facilities escaped detection until after the war.

Although these intelligence "failures" were significant (especially the timing lag for national systems, which was never really fixed), the coalition totally dominated the Iraqis in terms of information collection (i.e., observation). Hussein's

forces had nothing to rival the coalition's collection capability and no means of countering it other than tactical deception (which, though used effectively by Iraq, clearly has limits). The gap in information collection—huge at the outset of hostilities—grew rapidly over time. This was especially true after the opening of the air war, when the coalition expanded its collection efforts while quickly altering force deployments and carefully denying useful information to Iraq. With regard to observation, the coalition held all the cards.

Orientation gets nowhere near the attention from US military forces that observation does, yet it is probably the most critical element in the entire OODA loop. Colonel Boyd notes that “the second O, orientation—as the repository of our genetic heritage, cultural tradition, and previous experiences—is the most important part of the O-O-D-A loop since it shapes the way we observe, the way we decide, the way we act” (emphasis in original).²⁶ In effect, orientation is the real starting point of the OODA loop, even affecting what we decide to observe (and then, what we decide to do). Lord Chelmsford, for instance, decided not to observe anything about the Zulus he would face or about the terrain on which he would face them. Saddam Hussein made a similar decision (though less overtly) and therefore had no resources with which to observe coalition activities beyond his own front lines (other than international sources such as radio and television, which were considerable but nowhere near sufficient).²⁷ For this lapse, both Chelmsford and Hussein paid an enormous price. Orientation is the critical link between information—which is nice to have—and knowledge, which (when properly considered and acted upon) saves one from peril.

The difference between information and knowledge may seem very subtle at first, but in warfare it is truly critical. On the one hand, information is passive and always exists (at least in the abstract) whether anyone pays attention to it or not. Among other things, it can be collected, collated, analyzed, “fused,” packaged, disseminated, and even managed. Of particular relevance to the Gulf War, it can be stored, protected, and concealed or suppressed, sometimes even from one's own decision makers. It can also be jammed up in a system of data flow that will eventually deliver it to decision

makers but perhaps not in time to be useful to them. Knowledge, on the other hand, is active and must be possessed if it is to exist—let alone be useful. Somewhere, someone must process the collected raw material—information—into something recognizable and useful for decision making. For example, the location of a tank is information, whether anyone knows it or not; it becomes knowledge only when someone has seen and taken note of it. Such knowledge becomes useful when it is fitted into a scheme of operations (are tanks to be destroyed or left alone to support a potential coup d'état?) to make informed decisions. One need not do this perfectly—only better and faster than the adversary.

Knowledge processing, then, requires the ability to orient on the right information (e.g., using surveillance systems to collect data about Iraq instead of the Soviet Union) and then on discrete elements of information necessary to the decision at hand (e.g., examining a particular set of pictures or documents such as those that reveal Iraqi nuclear facilities). Thus, the true purpose of information dominance (which requires proper orientation on information collection and dissemination) is to provide an exploitable knowledge dominance.

The ability to discriminate between useful information and background “noise” (i.e., orientation) may have been the weakest link in the US-designed C³I system used by the coalition in the Gulf.* In fact, US national intelligence appears to be biased toward forcing all available information through channels and shows little regard for shifting priorities in the field. Often, discrete elements of information needed by commanders and planners were already collected and available but engulfed in a much larger stream of data that was working

*If so, the problem is nothing new. Roberta Wohlstetter, for example, points to the US failure to anticipate the Japanese attack on Pearl Harbor in 1941. “To discriminate significant sounds against this background of noise, one has to be listening for some - thing or for one of several things. In short, one needs not only an ear, but a variety of hypotheses that guide observation” (emphasis added). In other words, if one is to determine which specific elements of information are important to the issue at hand and then turn that information into useful knowledge, one must have specific orientation on key questions—not simply indiscriminate collection and dissemination. Pearl Harbor: Warning and Decision (Stanford, Calif.: Stanford University Press, 1962), 55–56.

its way through the system.* However, if planners requested these elements from key individuals within the system, they could be extracted and forwarded hours-to-days faster than normal. Dave Deptula, one of the Black Hole planners, cites an example of “normal time delays involved in getting information [through the formal system]”:

We wanted a photo of a particular target. . . . Glosson picks up the phone, calls [Joint Staff deputy chief of staff for intelligence (J-2) Mike] McConnell, and we get the photo in about 4 hours. . . . Twenty-four hours later, about, he gets a photo from CENTCOM or CENTAF/IN [Intelligence]. About 24 hours after that, 48 hours later, we get the same photo from CENTCOM/J-2.²⁸

Data from the Gulf War Air Power Survey confirm such scenarios.²⁹ Obviously, this was not an observation problem since the required information was available in the system and eventually would have reached the planners—whether they needed it or not!

Nor can the delays be blamed on lack of communications (although they often are, especially by apologists for the national intelligence system)³⁰ because once the specific need had been identified to the “right” people in the system (i.e., once proper orientation was provided), delivery was nearly immediate. Of course, communications problems existed, especially during the early deployment phase. The CENTCOM area of responsibility was an immature theater, and communications suffered from the common initial deployment problem of Desert Shield: incomplete OPLAN 1002-90 time-phased force and deployment data.³¹ The US did not have much in the way of communications capability in-theater when Iraq invaded Kuwait, and Saudi telecommunications systems were of limited use for a large military operation such as Desert Shield/Storm. But communications systems began moving right alongside the combat forces on 8 August 1990.³² In fact, by war's end,

*Maj Gen James R. Clapper, Jr., assistant chief of staff of Air Force Intelligence during Desert Shield/Storm, says that the flow of US intelligence operates on a “push” rather than a “pull” system. That is, field units receive mostly what analysts deign to give them rather than what they need. According to General Clapper, the intelligence community is fixing this particular problem. James R. Clapper, “Desert War: Crucible for Intelligence Systems,” in *Campen*, 81–85 (see note 4).

CENTCOM had greater electronic communications connectivity than US European Command, according to Lt Gen James S. Cassity, the Joint Staff director of the Command, Control and Communications System Directorate (J-6) during Desert Shield/Storm.³³ At its peak, the system could handle over 700,000 telephone calls and 152,000 messages per day. In addition, communicators managed and monitored over 35,000 frequencies to ensure interference-free radio connectivity for the theater.³⁴

Much of the system that communicators ultimately cobbled together was vulnerable to interference, yet—for whatever reason—it was never successfully attacked by the adversary. Hussein's forces probably could have seriously stressed coalition capabilities with a moderate investment of time and effort. In particular, they apparently could have interfered with tactical satellite communications (TACSATCOM—ultrahigh frequency [UHF] and superhigh frequency [SHF] radio communications) but either never tried or were unsuccessful.³⁵ Since the overall theater communications architecture, as it evolved, depended heavily upon TACSATCOM, successful jamming would have severely degraded coalition communications capability.³⁶ Iraq's almost total lack of opposition in the electromagnetic spectrum allowed the coalition to very quickly build and maintain a system capable of delivering required information.* The fact that Glosson could get a call through to McConnell at all—not to mention receiving a photograph from him within four hours—indicates that sufficient communications were available to deliver what planners needed. Faster data transfer will always be desirable, but it is not the root of the intelligence problem in Desert Shield/Storm. Nor does the solution lie in increasing the flow of data.

The problem lies in a systemic orientation that favors data flow over user need. This at least partially explains the debate

*This capability is a luxury the US should not take for granted because it creates a distinct vulnerability that an aggressive adversary can readily exploit. In fact, children with the latest gizmo from Radio Shack could probably wreak havoc on many of our information systems. Professionals with leading-edge technology systems are a real threat, and this capability probably would not cost a great deal today or in the near future. (See discussions of information warfare in the epilogue.)

between intelligence and operations over the intelligence system's Desert Shield/Storm performance. That is, intelligence delivered “tons” of information as fast as possible (IN's self-imposed measure of merit), while operations wanted “pounds” of it delivered much more quickly than the system was capable of. Operations planners, unable to get a satisfactory resolution within the intelligence system, resorted to unofficial work-arounds and informal arrangements outside the system.³⁷

Examples of these external sources include General Glosston's special relationship with Admiral McConnell and the Black Hole connection to Checkmate for targeting information, mentioned previously. Planners also used unofficial, informal arrangements to get battle damage assessment (BDA) and measurements of battlefield attrition levels (a subcategory of BDA that became very contentious during the war) that intelligence was not providing.³⁸

Fortunately, Hussein did not experience a similar problem with information sorting. Indeed, coalition efforts to deny him useful information were so successful that once the war started, he couldn't even follow the positions of his own forces—let alone those of the coalition.³⁹ Hussein's intelligence was oriented on internal, not external, issues.⁴⁰ He possessed no space-based observation capability of his own and failed to arrange access even to commercially available products such as the French SPOT. Of course, since France was a member of the coalition, it was not likely to sell information to Hussein, but he could have availed himself of more surreptitious means of obtaining such products. These sources certainly would have exposed the movement of two reinforced US Army corps 150 miles to the west. That single piece of information, received and properly processed, would have revealed the hopelessness of his force deployment in terms even he could understand and thus might have altered his subsequent actions.

Like other two-dimensional thinkers, Hussein failed to see the implications of Warden's “air-Schlieffen” plan, but even he could not have failed to understand the seriousness of a powerful two-corps surface force deploying beyond his right flank, with nothing standing between it and Basra (or

Baghdad, for that matter). But, then, that was the major implication of air-Schlieffen: because Hussein and his forces could not observe, they could not orient and therefore could not decide sensibly and therefore would act stupidly or not at all. The only sensible action open to Hussein—acceding to coalition demands—escaped him at this point. When the moment came, many of his forces would try to fight, but their situation was hopeless. To reiterate Colonel Boyd's assessment, they were enmeshed “in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos” and folded “back inside [themselves] so [they could not] cope with events/efforts as they unfold[ed].” The coalition had unquestionably met Boyd's requirement of operating inside the Iraqis' observation-orientation-decision-action loop, sometimes by a matter of days.

With observation platforms such as the TR-1 and JSTARS linked directly (or through AWACS) to both command elements and fighting units, coalition forces could spot, target, attack, and destroy Iraqi armor and supply columns, literally in minutes. This sequence of events occurred at Al Khafji, on the highway of death outside Kuwait City, and—somewhat less dramatically—elsewhere in Kuwait and southeastern Iraq. Even information from national systems (satellites) could sometimes affect events in near--real time. A phone call from Checkmate or Admiral McConnell, for instance, could put bombs on the “building with the Mercedes parked out front” within minutes.⁴¹

This was possible not only because of the rapid observation and orientation cycles (relative to those of Iraq), but also because Generals Schwarzkopf and Horner delegated decision making to the lowest possible level consistent with centralized control of airpower. Before execution—and for most of the 42 days of the air war—decisions about targeting were made in the planning cell (first in the Black Hole and tactical air control center [TACC] and later in the two GAT planning cells—see chap. 4). Only after the Al Firdos bunker incident did high--level decision makers (probably Schwarzkopf, Powell, or both) intrude themselves by withholding most Baghdad* targets.⁴² Other than that, decisions did not require specific approval at multiple command levels and therefore could be made quickly.

The division of targets into categories (see chap. 2)—combined with careful explanations of the categories and associated objectives, as briefed to senior officials—helped desensitize leaders such as Schwarzkopf and Powell (perhaps even Secretary of Defense Dick Cheney and President Bush) to specific target selections. When a target clearly fitted one of the categories, everyone assumed that it served a legitimate military purpose (and ultimately, therefore, the political objectives)—an assumption that seems vindicated by results. Glosson and his planners had free rein to make adjustments as they saw fit. Schwarzkopf and Horner gave support and general guidance—as well they should—but specific targeting decisions were made in the GAT.⁴³

General Glosson's delegated decision-making authority extended downward to the flying units by virtue of General Horner's position as JFACC. By selecting Glosson for the position of chief air campaign planner with the concomitant authority to control the ATO (upon which all overland flights had to appear—see chap. 3), Horner delegated him authority over flying units' wartime taskings. The reorganization of CENTAF in December 1990 further enhanced Glosson's authority by making him commander of 14th Air Division, comprised of the USAF fighter and fighter-bomber wings (see chap. 4). At the same time, Glosson was named CENTAF director of campaign plans, a position that expanded his role from directing strategic offensive planning in the Black Hole to controlling all CENTAF planning functions in the newly formed Campaign Plans Division. Thus, Glosson had both functional authority (as the JFACC's campaign plans director) and service authority (as commander of 14th AD) over all USAF fighter units. There was no confusion whatsoever concerning his direction of their activities.⁴⁴

*Even in this case, however, the GAT planners retained a great deal of latitude, since they were left to define the limits of Baghdad for themselves. They appear to have chosen a relatively narrow definition that allowed them to continue attacking the outskirts of Baghdad and surrounding areas without specific approval. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 23 May 1991, 64–67, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

Just as Glosson's authority and the role of the Black Hole planners evolved from strictly informal to ever more formalized modes, so did their ability to provide the orientation necessary to the collection and dissemination of intelligence. Increasing at much the same rate was their ability to impose decisions on the rest of the CENTAF plans division and the flying units that would execute the plan. Following the December reorganization, Glosson and his planners were powerful enough and sufficiently "connected" to control the OODA loop for the entire air campaign. Their innovative, informal approaches eventually overwhelmed and, in some cases, swallowed up the formal system—witness the December reorganization of CENTAF's plans division under Glosson's direction and the key roles played by Black Hole planners in the new organization. They also formed their own BDA cell, which—by using gun-camera video and other information obtained outside intelligence channels—bypassed the formal system almost entirely. In other words, they "drove" their own OODA loop from the Black Hole/GAT and made it respond to their 72-hour planning priorities. Indeed, they made it responsive enough to handle immediate priorities as well. They then aggressively and continuously attacked and further degraded Iraq's capability to OODA. A decision cycle similar to one that moved from observation to action in minutes or hours for Horner's men probably took days for Hussein—if it could be completed at all.⁴⁵ As Col John Boyd would say, the outcome was all but inevitable. Victory was assured over 30 days before coalition ground forces moved to contact.

A new chapter in warfare was written on 17 January 1991. With the advent of postindustrial warfare, information warfare, or knowledge warfare—whatever one might choose to call it—a window opened, giving discerning people an opportunity to gaze into the future. Although the view remains blurred and imperfect, warriors who make the most of it increase their chances for victory in the next round.

Notes

1. Daphne Rooke, *Wizards' Country* (Cambridge, Mass.: Houghton Mifflin Co., 1957), 253–54.

2. Andrew Duminy and Charles Ballard, eds., *The Anglo-Zulu War: New Perspectives* (Pietermaritzburg, Natal: University of Natal Press, 1981), 65.

3. John Young, *They Fell like Stones: Battles and Casualties of the Zulu War, 1879* (London: Greenhill Books, 1991), 52–69, 88–89; and R. Ernest Dupuy and Trevor N. Dupuy, *The Encyclopedia of Military History from 3500 B.C. to the Present* (New York: Harper & Row, 1986), 851.
4. See, for instance, Alan D. Campen, ed., *The First Information War: The Story of Communications, Computers and Intelligence Systems in the Persian Gulf War* (Fairfax, Va.: AFCEA International Press, 1992).
5. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 156.
6. *Ibid.*, 126–27; and Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, D.C.: Department of the Air Force, 1993), 36–37.
7. *Conduct of the Persian Gulf War*, vol. 1, 127.
8. Keaney and Cohen, 195–97.
9. Col S. D. Ramsperger, cited in Alan D. Campen, “Iraqi Command and Control: The Information Differential,” in Campen, 173.
10. Col John R. Boyd, “A Discourse on Winning and Losing,” 1987, 177. Unpublished set of briefing slides available at Air University Library, Maxwell AFB, Ala.
11. *Ibid.*
12. *Ibid.*, 222.
13. Keaney and Cohen, 122.
14. Col James Blackburn, Bolling AFB, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 21 April 1993, 102–4, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
15. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 2 (Washington, D.C.: Department of Defense, April 1992), C-2.
16. See, for example, Bruce W. Watson et al., eds., *Military Lessons of the Gulf War* (London: Greenhill Books, 1991), 146; and H. Norman Schwarzkopf with Peter Petre, *General H. Norman Schwarzkopf, the Autobiography: It Doesn't Take a Hero* (New York: Bantam Books, 1992), 293–94.
17. Schwarzkopf, 310, 313–14; Col Steve Wilson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 17, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and *Triumph without Victory: The Unreported History of the Persian Gulf War* (New York: Random House, 1992), 97–98.
18. Keaney and Cohen, 184, 195.
19. *Conduct of the Persian Gulf War*, vol. 2, T-84 to T-87.
20. Keaney and Cohen, 194.
21. *Ibid.*, 195.
22. *Ibid.*, 140–41.
23. *Ibid.*, 83.
24. *Ibid.*, 83–84.
25. *Ibid.*, 123.
26. Boyd, 222.
27. Campen, “Iraqi Command and Control,” in Campen, 172.

28. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 12 December 1991, 103-4, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
29. Keaney and Cohen, 131-32.
30. See James R. Clapper, Jr., "Desert War: Crucible for Intelligence Systems," in Campen, 82.
31. Larry K. Wentz, "Communications Support for the High Technology Battlefield," in Campen, 8.
32. Conduct of the Persian Gulf War, vol. 2, K-27 to K-28.
33. "The services put more electronic communications connectivity into the Gulf in 90 days than we put in Europe in 40 years." Quoted in Conduct of the Persian Gulf War, vol. 2, K-26.
34. Ibid., K-26 to K-27.
35. Alan D. Campen, "Information Systems and Air Warfare," in Campen, 27; and idem, "Iraqi Command and Control," in Campen, 175.
36. Wentz, in Campen, 10-13.
37. Keaney and Cohen, 129-30.
38. Ibid., 138-39; and Deptula, 12 December 1991, 25-27, 54-64, 89-92, 101-3.
39. Conduct of the Persian Gulf War, vol. 1, 215.
40. Ibid., 94; Campen, "Iraqi Command and Control," in Campen, 174; and James F. Dunnigan and Austin Bay, From Shield to Storm: High-Tech Weapons, Military Strategy, and Coalition Warfare in the Persian Gulf (New York: William Morrow and Co., 1992), 348-49.
41. Deptula, 12 December 1991, 32-34.
42. Maj Gen Buster C. Glosson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 29 May 1991, 81-88, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Keaney and Cohen, 68-69.
43. Glosson, 29 May 1991, 81-84.
44. Lt Col Dave Deptula, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 28, 30-31, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.
45. Campen, "Iraqi Command and Control," in Campen, 171-73.

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Chapter 10

Conclusions: What Is Air (and Space) Power?

The pertinent question is not which argument is right—several may have truth—but what are the implications if they were right?

—Carl Builder, *The Icarus Syndrome*

In August 1990 the United States Air Force was adrift from its historical moorings, lacking an understanding of its past and present. Consequently, those of us who serve in the Air Force also lacked a common vision of our future. We were a conglomerate of specialists with greater loyalty to machines and sleeve patches than to any single unifying theme or to the Air Force itself. We held no common perception of mission except perhaps “to fly and fight,” a calling that left most of us on the outside looking in. Individually and collectively, we were experts in our trades—acknowledgedly the best in the world, whether pilot, mechanic, logistician, or missileer. But we did not value the profession of arms enough to study it.

Over the years, we in the Air Force had cloistered ourselves in occupational monasteries, efficiently performing the rites of our orders with no sense of the church's mission. Fighter pilots flew jets, maintenance people readied the jets for on-time takeoffs, supply people had 30 minutes to get parts to the jets, and cooks fed fighter pilots.* There were other monastic orders—those dealing with bombers, tankers, missiles, logistics, intelligence, and so forth. Dr Donald B. Rice, former secretary of the Air Force, stated the problem most tellingly in December 1991: “I felt when I came into this role that that was

*Note the isolation of specialists by their perceived mission. For example, this writer can testify from personal experience that supply people always knew how much of their 30 minutes was left. The part might be in a truck at Burger King, for all they knew, but it didn't matter, so long as the part order had reached their desk less than 30 minutes earlier. This is no indictment of supply people but merely an indication that we (nearly all of us in the Air Force) viewed our missions in terms of our professional specialties—not in terms of the institution or its constituency.

the single biggest problem in the Air Force as an institution; that when you poke a person in a light blue suit, they talked [sic] about their airplane or their command. They don't talk about air power."¹ If we didn't talk about airpower (or think about it), what were all the jets for? Flying and fighting, of course—and don't you ever forget it!

Indeed, while we all tinkered away in our trades and professed our loyalty to them, we secretly looked up to the people from whose ranks came the institutional power brokers—once bomber pilots but most recently fighter pilots. In our Air Force, the thing to be—or emulate—was a fighter pilot.² The general blue-suit apathy toward intellectual development that Dr Rice had “felt” was reflected and reinforced by the fighter pilot community. Intellectualism came to be viewed as somewhat “unmanly” and perhaps even detrimental to one's career.

For example, Gen Robert D. Russ, commander of TAC at the time of Desert Shield/Storm, described himself in an interview as a “professional fighter pilot” for whom “getting a PhD is a nice thing to do, but it has nothing to do with flying and fighting airplanes, and I have chosen to do that.” Getting a PhD would have been all right, he said, “as long as no one knew about it.”³ There is nothing wrong with being a fighter pilot or with flying and fighting when necessary. But Russ's statement hints at the disdain held generally by professional fighter pilots (and the people who would emulate them [i.e., most of the rest of us]) for intellectual endeavors. Particularly telling is his description of himself as a fighter pilot—not as an Air Force officer or a professional at arms. Further, his “profession” entailed flying and fighting airplanes—not some larger mission like defending his country. Certainly, he would agree to the alternatives just mentioned, but he did not instinctively describe himself in those terms. General Russ's response is not unique, nor are these comments meant to fault him personally. Rather, his response is symptomatic of our institutional malady, and the problem is not confined to fighter pilots. Most of us would respond similarly.

Part and parcel of this syndrome was the short shrift many Air Force officers (even some very powerful general officers) gave Air Force basic doctrine as another non-fly-and-fight intellectual exercise. It was “dull, boring, and useless” or “important but [not read by warriors]” or just plain “bull_ _ _.”⁴ Boring or not,

when the popes (chiefs of staff), cardinals (four-star generals), and archbishops (three-star generals) disdain doctrine, the faithful will follow suit. When the faithful no longer know their doctrinal precepts, the institution is in serious trouble. Doctrine provides the unifying theme that Secretary Rice (and others)⁵ found missing among blue suiters. We had no institutional *raison d'être*—in our case, no airpower (or aerospace power) theory. Without such a unifying theme sufficiently powerful to bind its people together, any large institution is doomed to fragmentation, and its people gravitate to lesser visions that promise personal fulfillment—as a matter of survival.

Such was the state of the Air Force when Saddam Hussein's forces invaded Kuwait. Although the service was fragmented into many occupationally oriented groupings—such as those mentioned above—when it came to war fighting and issues of war fighting, two major orders dominated: strategic and tactical, each based on a distinct subtheory of airpower (see chap. 2). By this time, strategic and tactical no longer bore much relationship to their original meanings (see chaps. 1 and 3). On the one hand, strategic had come to mean global thermonuclear war, to be waged by Strategic Air Command (with some help from the Navy's nuclear “boomers,” of course) with strategic bombers and missiles. Interestingly enough, SAC's mission was to deter this type of war by being supremely well prepared to wage it. On the other hand, tactical now denoted conventional theater war (the kind likely to occur under unwritten rules of the cold war, precisely because thermonuclear war had been deterred), to be

*At this point, we would do well to clarify the distinction between SAC and TAC with regard to war fighting. As a specified command, SAC was the Air Force “strategic community.” Unified and specified commands have war-fighting responsibilities, either for a theater of operations or a specialized type of operation. At the time of Desert Storm, SAC was a specified command with direct responsibility for executing the SIOP and with collateral responsibility to supply forces for conventional theater conflicts (these forces returned to SAC at war's end). TAC, though, was an Air Force major command responsible for training and supplying air forces for theater operations. Thus, TAC had no war-fighting responsibilities, and—for purposes of war fighting—the “tactical community” was represented by tactical air forces (such as CENTAF) that reported to unified commands (such as CENTCOM). In peacetime, the numbered air forces reported to TAC for administrative purposes, but—when constituted—they belonged to the CINCs. In an interesting twist, during Desert Shield/Storm, TAC became “CENTAF Rear” (self-designated by official message), thus subordinating itself to its own peacetime subordinate.

fought by tactical air forces (TAF)* with tactical fighters and fighter-bombers.⁶

The wars in Korea and Vietnam led TAC to perceive its mission (and that of the tactical air forces it supplied for theater commanders) as inextricably linked with that of the US Army. In fact, a direct linkage for doctrine development was established between the Army's Training and Doctrine Command (TRADOC) and TAC, through the biservice Air Land Force Application Agency. This linkage was unequal, however, since TRADOC speaks authoritatively for the entire Army on doctrinal issues, while TAC legitimately speaks only for itself. This arrogation of authority by one powerful constituent went unchallenged—perhaps because it served the purposes of one of the two most powerful commands without infringing on the other's. To TAC, this action probably didn't seem an arrogation at all, since it saw itself as the Air Force's agent for support of the Army—and since no one else seemed interested in this mission.*

This unequal linkage led to an interesting outcome, however. The precepts under which TAF's perceived mission would be executed were dominated by AirLand Battle—the Army's doctrine for corps--level war fighting. This lesser vision of airpower proved functional in coordinating air and land forces at and below corps level, but above that point—where some of air forces' most powerful applications lie—AirLand Battle offered no answers. According to Army doctrine, only in the event of thermonuclear war did airpower have a larger, independent role. If the conflict were conventional, however, airpower served as “fire support” (see chap. 2).

As a result of this unholy alliance between TAF and the Army, when the US began to respond to Iraq's invasion of Kuwait, CENTAF planners delimited their thinking to

*The general who commanded TAC in August 1990 believes that “tactical air power's primary role is to support the Army. . . . We are charged to support the Army. Now, what is the first thing the Army wants you to do? It is to gain air superiority. If you are off gaining that air superiority, that is supporting the Army! It really is because they can't be employed until you have that. Now the fact that you don't ever have to use [Army forces] doesn't make any difference. It is support.” Russ, 9 December 1991, 23, 80 (see note 3).

subtheater operations. They fixed their attention upon the enemy's massed ground forces in Kuwait and prepared defensive operations in support of almost nonexistent friendly surface forces.* Knowing that they could not destroy all elements of an advancing Iraqi force—at least in the early days of the deployment—CENTAF planned to concentrate on attacking frontline logistics support—a known weakness in Iraqi field operations.⁷ If CENTCOM were successful in stopping such an attack, it presumably would have mounted a counteroffensive, as practiced in the Internal Look exercise. Airpower would have coordinated itself with Army schemes of maneuver and concentrated on close air support and interdiction throughout the Kuwaiti theater of operations but would have omitted strikes against strategic targets in Iraq. Retaliatory strikes against strategic targets would occur only if Hussein did something “heinous.”** The CENTAF commander's proposal to “build a hose and point it where the ground commander sees it's needed” (see chap. 2) is precisely how a US Army corps commander, trained in AirLand Battle, would want the air commander to envision his mission. In August 1990 the CENTAF staff was prepared to fulfill the ground commander's wish, but other Air Force people had different ideas.

Logically, one would expect strategic bombing zealots to come from SAC, but that command limited its involvement in theater planning to providing support-staff augmentees and resources, as requested by CENTAF/CENTCOM (and the Air Staff—see chap. 2). Although some people in SAC still believed that strategic bombardment theory was central to the Air Force mission (as had Hap Arnold, Hal George, and Curtis

*General Horner: “The best thing to do was to fight a ground war of maneuver and use air power to cut the sustainment since they were vulnerable there. Q: Did anyone ask you if air could have done it without the ground forces? A: No. You see, there is going to be ground in place because the Saudis are going to have some Army up there.” Horner, 2 December 1991, 13 (see note 7).

**In this case, General Horner envisioned nothing like the strategic attack proposed in Instant Thunder but something more akin to a “reserve punishment” plan for use if Hussein resorted to chemical or biological weapons. Horner later regretted using the term strategic, believing that he had planted the seed in General Schwarzkopf's mind for the strategic air campaign the CINC requested from General Loh on 8 August 1990. Horner, 2 December 1991, 5 (see note 7).

LeMay), deterrence theory had largely displaced airpower theory. Strategic (read nuclear)* bombardment was the “court of last resort” for national survival—so horrible to contemplate that it would be used only in extremis. Strategic nuclear forces would stand by, on alert, in case the conventional war got out of hand and went nuclear. If that happened, the war would belong to SAC,⁸ which already had the plan for that war—the SIOP.

But Vietnam had also taught us that we could use strategic weapon systems for conventional warfare. We had even modified some of the bombardment fleet and identified that portion for use in theater conventional warfare. These aircraft routinely practiced conventional bombing in case they were called off nuclear alert to assist in a theater conventional war. Part of the SAC tanker fleet was identified for the same purpose. Thus, any theater engaged in a conventional war could expect reinforcements from SAC—but only reinforcements. Gen Jack Chain, commander of SAC when the Gulf War started and the man most responsible for SAC's conventional preparation, had no intention of running the theater commander's war for him—that was not his business.** With tactical people wedded to supporting Army maneuver schemes and with strategic people committed to thermonuclear deterrence, the true believers in strategic bombardment theory found themselves without a natural home.

The fact that the old-school strategic bombardment zealots presumed to plan an air campaign from Washington was as heretical to many people in the tactical community as the plan they proposed. Theater planning should not—nay, could not—be done in Washington. Surely, everyone had learned the

*According to Col Steve (“Foose”) Wilson, who first briefed General Horner on the Instant Thunder concept, Horner alluded to this strategic/nuclear connection in reference to strategic targeting. “Strategic targeting, by the way—he reminded me—meant nuclear, and we weren't going nuclear.” Col Steve Wilson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 17–18, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

**“The best role that I think SAC could do, or any other command could do, is allow the theater commander to make his plans and then execute his plans while we supported them.” Chain, 12 August 1991, 5 (see note 8).



B-52 and KC-10. Although designed to deliver nuclear weapons, long-range bombers can add significant punch to theater conventional operations. Here, a B-52 bomber refuels from a KC-10 tanker.

chief lesson of Vietnam—that theater war planning must be done in-theater, by war fighters. From TAF's perspective, even TAC's participation in this arena was unwelcome.⁹ Incensed by the Air Staff's involvement in the form of Instant Thunder, the generals at TAC responded with their own proposal. But Schwarzkopf had already approved Warden's initial briefing (see chap. 2). Beaten to the punch, the TAC staff put their plan in a safe drawer, extricated their people from the Air Staff planning effort, and contented themselves with the more comfortable role of running "CENTAF Rear."¹⁰

By then, the zealots in Checkmate were rolling and apparently had enthralled Schwarzkopf with a plan radically different from anything CENTAF had done or was doing. In fact, to some people in the tactical community, Instant Thunder looked a lot like a throwback to Douhet and Mitchell—or at least matched their perceptions of these early theorists' "pie-in-the-sky" claims for airpower as a solo war winner. In their view, the plan was another overpromise for strategic

bombardment and might even endanger the existence of the Air Force as an institution.* The TAC people thought it unrealistic that six to nine days of bombing in downtown Baghdad and other areas of Iraq (all the while ignoring the Iraqi army poised on the border of Saudi Arabia) would cause Saddam Hussein to withdraw or be overthrown.** Nonetheless, that appeared to be what Warden and company were promising to Schwarzkopf and Powell.¹¹ More importantly (or perhaps more dangerously, from some perspectives), the plan seemed to be what Schwarzkopf thought he wanted. General Powell had approved it as well—though less enthusiastically. In fact, Powell had already briefed the president on Instant Thunder.¹²

Who was right? Who was wrong? Everyone. And no one. We were all so busy defending the rites of our orders that we had lost track of the church's mission. We thought that we ascribed to the true faith and that aerospace power belonged especially to our cloister. But we had lost sight of the overarching lessons of our experience in several wars—especially those of World War II—that FM 100-20 had so carefully recorded for us. Most of the Army Air Forces' fundamental beliefs—forged in the fires of combat—were faithfully preserved in Air Force basic doctrine, but the latter, as we have seen, was “dull and boring” and “[not read by warriors].” Lacking a common understanding of our past, we found ourselves debating the same old questions:

1. What is airpower capable of accomplishing, either alone or in conjunction with other military forces?
2. Can airpower alone be decisive in warfare?

*According to Gen Larry Welch, former Air Force chief of staff, Generals Horner, Russ, and Glosson had masterfully hidden the danger posed by Instant Thunder—which the CINC had ill-advisedly approved—within the context of a much larger air campaign that dealt with the “real” threat: all those Iraqi ground forces in Kuwait. In short, he felt that support of surface maneuver elements was the real war-winner after all. Gen Larry Welch, USAF, Retired, Institute for Defense Analysis, Washington, D.C., discussion with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, May 1991.

**“Well, I guess it sort of reminded me of, ‘Let's send all the bombers to the ball-bearing factory.’ It reminded me of 8th Air Force. ‘You do this 6-day attack plan—the Iraqis will fold.’ The Germans didn't fold and neither would the Iraqis.” Henry, 2 June 1992, 37 (see note 11).

3. Does airpower have an independent role in warfare?
4. How is airpower best employed?
5. Do we need an independent Air Force?

The questions raised prior to, during, and after the Gulf War were merely variants of these long-standing issues. Could an “independent” strategic air campaign waged against Iraq bring Saddam Hussein and his regime to their knees? Could airpower alone stop an attack by Iraqi armor? Could airpower effectively attack in the absence of powerful, friendly ground forces, or was it best to wait for the ground scheme of maneuver? What would achieve the best results in the shortest time: strategic attacks against leadership and key targets or direct attacks on Iraq's fielded forces? Since Air Force people could not agree on answers to these questions, the other services understandably challenged our beliefs and doctrine. We were at war with ourselves—however unnecessarily.

The disputants could have found answers to these questions had they merely turned to AFM 1-1, Basic Aerospace Doctrine of the United States Air Force (1984), and its supporting series of subordinate doctrine manuals, which were designed “to impart to all Air Force personnel a basis for understanding the use of aerospace forces, in peace and war.”¹³ Although some of the answers in AFM 1-1 were not as well developed as they should have been and some were not so good at all, most of them were sound and easily accessible to anyone who bothered to read our basic doctrine. For example, the following passages from AFM 1-1 address the persistent questions mentioned above:

1. What is airpower capable of accomplishing, either alone or in conjunction with other military forces?

[It can] win the aerospace battle . . . gain and/or maintain control of the aerospace environment and . . . take decisive actions immediately and directly against an enemy's warfighting capacity. . . .¹⁴

engage or support land, sea, and other aerospace forces. . . . [and]

apply combat power against all elements of an enemy's structure. . . .¹⁵

[It permits] direct application of force or the movement, resupply, or support of deployed aerospace and surface forces. . . .

THUNDER AND LIGHTNING

[It can] react quickly. . . .
project combat power worldwide. . . .
deploy quickly and sustain . . . for extended periods. . . .¹⁶
provide unparalleled observation of the Earth's surface and the
aerospace environment. . . .¹⁷
act rather than react. . . .
[protect] friendly military operations from [attack and observation]. . . .¹⁸
maneuver [to mass] combat power and [disengage] forces. . . .¹⁹
dominate the action, remain unpredictable, and create uncer-
tainty. . . .²⁰ [and]
attack [the enemy's] potential in depth through strategic and tactical
aerospace actions.²¹

These statements are impressive but still don't reflect every-
thing aerospace power can accomplish, according to AFM 1-
1.* In 1990–91, some of us didn't believe that all these things
were really possible or important; nonetheless, they were
officially sanctioned beliefs of our institution at the time.

2. Can airpower alone be decisive in warfare?

As a critical element of the interdependent land-naval-aerospace team,
aerospace power can be the decisive force in warfare. . . .²²

Considering the nature of modern war, airpower can dominate not only
the air but the land and sea as well. . . .²³

Aerospace superiority . . . is prerequisite to the success of land and
naval forces in battle. . . .²⁴

Close air support enhances surface force operations by providing the
capability to deliver a wide range of weapons and massed firepower at
decisive points.²⁵

Although these excerpts suggest that aerospace power can be
decisive in a number of ways, it does not act alone but as a
“critical element of [an] interdependent . . . team.” True or not,
this was an officially sanctioned belief of the Air Force in
1990–91.

*Notice that not all of these items are directly related to putting ordnance on tar-
get. Some noncombat capabilities of aerospace forces are critical to achieving national
objectives.

3. Does airpower have an independent role in warfare?

An air commander may conduct these [strategic and tactical] actions unilaterally or with other component forces. . . .²⁶

Although an air interdiction campaign can be an independent air effort, an air commander normally coordinates an interdiction campaign with a surface force commander. . . .²⁷

Airpower can exploit speed, range, and flexibility, [sic] better than land and sea forces, and therefore, it must be allowed to operate independently of these forces.²⁸

Although the 1984 version of AFM 1-1 does not specifically address the independence of a strategic offensive, it stands to reason that if an air interdiction campaign could be independent, then a strategic offensive would almost certainly be so. The offensive counterair portion of a counterair campaign would also seem to meet all the criteria for independence. Perhaps this point does not arise with regard to these missions because their independence is so obvious. The main sections of the manual seem carefully to skirt this issue, stressing instead the interdependence of air, land, and sea forces. The appendix, however, describes the independent operation of airpower as one of several “fundamental beliefs” that have “remained imbedded in Air Force doctrine” since 1943.²⁹

4. How is airpower best employed?

The basic objective of aerospace forces is to win the aerospace battle. . . .³⁰

[The attributes] of speed, range, and flexibility . . . [allow aerospace] forces to apply combat power against all elements of an enemy's structure. . . .³¹

The shock effect inherent in aerospace power is the product of an unequaled capacity to concentrate combat power in time and space. . . .³²

An air commander has the capability to [conduct simultaneous] strategic and tactical . . . actions. . . .³³

[An air commander can attack] an enemy's warfighting potential. . . .
in depth. . . .

[and] relentlessly. . . .³⁴

[An air commander can] mass aerospace firepower at decisive points.³⁵

5. Do we need an independent Air Force?

Aerospace doctrine provides all airmen with a basic reference for why we have an Air Force. . . .³⁶

A military force exerts [the fundamental] effects [of neutralization, destruction, and capture] to gain or maintain control of its operating medium. . . .³⁷

[The USAF has] primary responsibility for providing this country with the airpower needed to defend it at home and meet its commitments abroad. . . .³⁸

For airpower to be employed for the greatest good of the combined forces in a theater of war, there must be a command structure to control the assigned airpower coherently and consistently and to ensure that the airpower is not frittered away by dividing it among army and navy commands. . . .³⁹

Airpower . . . must be allowed to operate independently of [land and sea] forces.⁴⁰

The need to control airpower separately from land and sea power is another “fundamental belief imbedded” since 1943, at which time the newly published Army Field Manual 100-20 noted that “land power and air power are co-equal and interdependent forces; neither is an auxiliary of the other.”⁴¹ The logical conclusion, then and now, is that the US does indeed need a separate Air Force.

Although our basic aerospace doctrine saw nine revisions between 1943 and 1990,* there were striking continuities in the fundamental and enduring beliefs about the central principles of airpower (or aerospace power) application. Unless these principles were horribly wrong, there was no need for any of the debates that occurred during or after Desert

*In 1990 AFM 1-1 was already being revised at Air University's Center for Aerospace Doctrine, Research, and Education (CADRE). Part of the effort was a deliberate attempt to make the influence of FM 100-20's vision of airpower more explicit in our formal doctrine than it was in the 1984 version. Many people seem to think that AFM 1-1 of 1992 was a response to Desert Storm experiences. In fact, the latest version was already in final draft at the time of the Gulf War and reflected nothing specific from Desert Shield/Storm. The common thread between the new AFM 1-1 and Desert Storm operations is not the influence of the Gulf War on Air Force doctrine but the parallel influence of FM 100-20 and similar writings on thinking airmen.

Shield/Storm, because an abundance of doctrinal and historical examples addressed every point of contention.

The results of the compromise that melded the two initial approaches to air campaigning in the Gulf War (see chap. 4) validated Air Force doctrine on almost every point. From the opening moment, CENTAF forces struck fast, hard, and relentlessly to induce shock and strategic paralysis. Early concentration on offensive counterair operations, SEAD, and leadership targeting decided the outcome of the aerospace battle within minutes, assuring the success of land and naval operations. Aerospace forces maneuvered to mass firepower at decisive points. Strategic-, operational-,* and tactical-level aerospace operations applied combat power against all elements of the enemy's structure by attacking them simultaneously and in depth. Aerospace forces of all types provided movement, resupply, and support of deployed aerospace and surface forces, including unparalleled observation of the earth's surface and the aerospace environment. They also engaged the enemy both unilaterally and in coordination with other component forces.

Finally, air planners defined the military conflict without reference to surface operations plans** but did so in such a way that the air campaign plan would eventually meld perfectly with schemes of surface maneuver to be developed later. This feat required a theaterwide view (not the corps-level perspective of AirLand Battle) characteristic of people who knew how to gain leverage from the power of combat systems that can range the entire battlefield and beyond. These planners were airpower people, steeped in the broad, strategic views of an independent Air Force and independent of and

*Partially because of the institutional schism between the tactical and strategic communities, AFM 1-1 of 1984 did not address the operational level of war (see chap. 4). (In circular fashion, this omission also exacerbated the schism.) The 1992 edition of AFM 1-1 corrected this oversight (see especially, vol. 1, paragraph 1-4).

**Offensive air campaign planning began on 6 August 1990 with the Checkmate effort and continued steadily thereafter. The CENTCOM theater campaign was briefed to President Bush on 11 October 1990, at which time he approved the air campaign portion but not the ground campaign. Subsequent planning for the ground campaign altered dramatically, changing from a broad-front, straight-ahead plan to the massive flanking maneuver finally executed in February 1991. The air campaign plan underwent no dramatic alteration in response. Horner, 2 December 1991, 42-46 (see note 7).

coequal with colleagues who worked from a two-dimensional perspective. If airpower “zealots” had not inserted themselves into the planning process, the offensive air campaign plan likely would have developed in concert with the plans for ground operations during November 1990. It is also likely we would have suffered the 17,000–30,000 coalition casualties predicted by analytic simulations developed for AirLand Battle scenarios.

This is not to suggest that AirLand Battle is bad doctrine. It is effective when applied as intended (i.e., for describing interactive combined-arms operations at and below the corps level). But to read it as joint doctrine for theater-level and strategic operations is a serious mistake. Army people wrote AirLand Battle from a two-dimensional perspective and defined aerospace operations only in terms of support for surface maneuver elements. When this doctrine is extended to theaterwide or global application, it still suitably describes coordinated air and surface operations but falls far short of describing the full range of aerospace operations. But since AirLand Battle is Army doctrine, written for Army operations, we should not expect such a description. Soldiers and airmen view war in very different ways, primarily because armies are restricted in many ways that aerospace forces are not.⁴²

For instance, enemy surface forces can position themselves to form a barrier to prevent friendly forces from reaching their objectives, as Iraq tried to do along the Kuwaiti/Saudi border in August and September 1990. Friendly surface forces have only two alternatives in this case: (1) attack into the defensive barrier or (2) go around the barrier to find an exposed flank or seam. The former approach usually results in heavy loss of equipment and lives. The second approach usually takes a long time, and while the forces maneuver laterally to the enemy's flank, their own flank is exposed and vulnerable. In the Gulf War, coalition ground-force planners considered both options, finally electing to flank the Iraqi positions—a maneuver that took over 30 days to complete. While they were moving into position, coalition aerospace forces protected their flank (see chaps. 7 and 8).

Other restrictions to surface maneuver also affect the soldier's view of warfare more profoundly than the airman's.

The natural boundaries and obstacles of the earth's surface (e.g., coastlines, mountains, valleys, ridgelines, lakes, and rivers), the conditions of the surface itself (e.g., soil texture, moisture, rocks, and ocean depths), the relatively ponderous nature of surface movement, and other limiting factors channel soldiers' thinking into essentially rectangular patterns—areas of responsibility, areas of operations, areas of interest, and so forth. Soldiers tend to fight primarily within the corps area of operations and, to a lesser extent, the corps area of interest. Multicorps operations require extensive boundaries to deconflict and coordinate what are essentially independent operations of separate corps.*

Aerospace forces are not significantly bound by most impediments to surface maneuver, nor are they most efficient when operating within imposed boundaries. Their relatively high speeds and rapid maneuver capability allow them to attack from any direction and altitude of their choosing (within the operational capability of the specific system, of course). Interposing any kind of physical barrier (especially a ring of combatant forces) between such systems and their objectives is practically impossible,** unless one possesses overwhelming air superiority. Thus, coalition aircraft and missiles were able to flank the Iraqi surface forces after only minutes of maneuvering from their original deployed positions (hours for some elements but certainly not even a whole day for any of them). From that time forward, these aerospace forces were able to bring decisive firepower to bear on critical Iraqi elements throughout the theater of operations

*They are not independent in the sense of not relating to other operations of the past, present, and future, but in the sense that corps commanders have virtual autonomy—within their sectors—to achieve their specifically assigned military objectives as they see fit. Of course, telling subordinate commanders what to do—but not how to do it—is a well-established tenet of successful military operations. What is significant in this case is the extent to which autonomy is tied to a roughly rectangular piece of turf. See, for example, FM 100-5, Operations, May 1986, 101, 102-5, 107, 113. The Army has tried to move away from this linear perspective (see FM 100-5, June 1993), but multicorps operations on the current US Army model will always require extensive coordination boundaries.

**Hardened concrete bunkers are practical barriers, but only for relatively small point-targets; further, as demonstrated in the Gulf War, they are vulnerable to penetrating, precision weapons.

from (relatively) secure positions of advantage. Aerospace forces care little whose corps area they are in (or even whether they are in anyone's corps area) and are free to roam across most surface boundaries at will.* This freedom from most physical constraints to surface operations also causes airmen's thinking about warfare to differ considerably from that of soldiers and sailors.

Massing a surface maneuver force sufficiently powerful to undertake major objectives can take days to weeks. Once the attacking force is assembled, shifting the main effort from the original objective to one significantly removed from it is extremely difficult. For example, once the two American corps had begun their maneuver to starting positions for the left hook, shifting the main effort from the left to the right flank would have been quite arduous—if not impossible. Given the configuration of coalition forces at that point, assembling the maneuver and firepower capability of VII Corps (with its M1A1 tanks and Bradley armored fighting vehicles) on the right flank would have been impossible without completely realigning the coalition order of battle, a task that certainly would have taken weeks—maybe months.

In contrast, the flexibility that Generals Horner and Glosson had built into both their operations/planning staff and the Desert Storm air campaign plan would have allowed them to shift the main air effort from Baghdad (well beyond the extreme left of coalition surface force positions) to Kuwait City (to the extreme right of coalition ground forces) in a matter of hours. In fact, they could have diverted the first strikes with just minutes' notice. They demonstrated this ability time and again (e.g., at Al Khafji and the highway of death). Shifting the main effort across multiple corps boundaries is a major undertaking for surface forces; for aerospace forces, it takes only a radio call. As AFM 1-1 put it, "the speed, range, and flexibility of aerospace forces allow commanders to move quickly from one course of action to another and to influence military operations with extensive, fundamental combat capabilities."⁴³ But if one is to exploit

*In fact, airmen are inclined to view enemy operational boundaries as seams for them to exploit and are thus skeptical of all boundaries.

the speed, range, and flexibility* of modern aerospace forces, the structure that commands and controls them must remain independent from and coequal with the structure for land and sea forces.**

Modern aerospace forces must not be tied directly to the ponderous movement of surface forces or to the vision of a surface commander whose AOR is 120 x 300 kilometers or so. Rather, they must be controlled by someone who is looking beyond corps boundaries—all the way to Baghdad, so to speak. This is the sense in which airmen seek to be independent—not from national or theater objectives, commander's intent, or joint/combined operations, but from a surface commander whose vision is naturally and correctly focused on a corps-sized (or division- or brigade-sized, etc.) “rectangle.”

It is only natural that corps commanders—empowered as they are to conduct their own independent operations—covet as much control as possible over the fundamental combat capabilities of modern aerospace systems. This desire was and remains the root cause of targeting controversies between the Army and Air Force during and after Desert Storm. Army corps commanders reportedly considered the targeting process “fundamentally flawed” because they had insufficient control over the “effects and timing” of interdiction efforts in front of their corps areas.⁴⁴ According to Brig Gen Robert H. Scales, in the Army-sponsored report *Certain Victory: The U.S. Army in the Gulf War*, “the Army recognized competing priorities such as air-to-air and air interdiction* of deep theater targets.”⁴⁵ Perhaps, but the complaint implies that the

*Some modern theorists have suggested adding such attributes as precision, lethality, penetration, or stealth to this short list of key attributes of aerospace power. See, for instance, *The Air Force and U.S. National Security: Global Reach—Global Power* (Washington, D.C.: Department of the Air Force, 1990), 5; and Col John War - den, “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, Ala.: Air University Press, July 1992), 78–81. But these characteristics do not seem to distinguish aerospace power from land and sea power as clearly and consistently as do speed, range, and flexibility. Surface systems are far more likely to match aerospace systems in terms of the proposed additional characteristics than they are the original three.

**The exact proposal of FM 100-20 (1943).

Army component considered itself better able to establish proper priorities than the CINC, who established them for the JFACC to execute.⁴⁶ In fact, early in the air campaign, it is apparent that General Schwarzkopf deliberately withheld some of the Army corps commanders' "battlefield preparation" to avoid tipping his hand on the left hook.⁴⁷

The wisdom of viewing the air war from a theater rather than a corps perspective is apparent in the outcome of the Desert Storm ground campaign: "only 140" soldiers killed "in direct combat" during the "largest single land battle in American history won in the shortest time."⁴⁸ Flexible airpower, able to range the battlefield in minutes, made possible the impressive surface advance of 24–28 February 1991. But the role of aerospace power in the defeat of Iraq was much larger than merely shaping the battlefield, which was the chief concern of Army corps commanders.

Such debates over the proper role of airpower all too often devolve to arguing about which aerospace operation is most valuable—strategic strikes, counterair, CAS, interdiction? Worse, the divisions on this issue are often greater among airmen than between airmen and their surface-bound brethren. But the truth is, none of airpower's capabilities is most important. The combination of all three-dimensional capabilities puts the power in aerospace power. Yes, coalition aerospace forces did destroy some enemy surface units and decimate others during Desert Storm. But they also gained and maintained control of the "new high ground" (the aerospace), "blinded and battered" Iraqi leadership elements, helped to create and maintain an "unblinking eye," and constructed and maintained the air portion of a "global air and sea bridge."⁴⁹ Even all these feats don't do justice to the accomplishments of air forces in the Gulf War. Yet, airmen shouldn't be surprised; after all, we understood and articulated the concept over 50 years ago:

*According to General Scales, "less than half of [the] . . . targets [requested by corps] made it to the ATO." Scales, 180 (see note 44). The underlying issue in this debate is the extent to which corps commanders—instead of the JFACC—exercise control over interdiction and CAS sorties.

The inherent flexibility of air power, [sic] is its greatest asset. This flexibility makes it possible to employ the whole weight of the available air power against selected areas in turn; such concentrated use of the air striking force is a battle winning factor of the first importance. Control of available air power must be centralized and command must be exercised through the air force commander if this inherent flexibility and ability to deliver a decisive blow are to be fully exploited. Therefore, the command of air and ground forces in a theater of operations will be vested in the superior commander charged with the actual conduct of operations in the theater, who will exercise command of air forces through the air force commander and command of ground forces through the ground commander.⁵⁰

Truly, when aerospace forces engage all their capabilities in appropriate sequence, “aerospace power can be the decisive force in warfare.”⁵¹

War remains a human enterprise, just as it was in the time of Clausewitz.⁵² We have no reason to believe it will be otherwise, because war is a political act designed to convince or compel a nation (or other political entity) to change its behavior or allegiance. As such, war is subject to all the vagaries of the human mind, spirit, and will. So long as this is true, ideas, concepts, philosophies, and doctrines will always matter. People who ignore this truth “are certain in every battle to be in peril,”⁵³ but people who best apply concepts carefully gleaned from experience and history will own the future.

Notes

1. Dr Donald B. Rice, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 32, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

2. Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (New Brunswick, N.J.: Transaction Publishers, 1994), 180–88.

3. Gen Robert D. Russ, Alexandria, Va., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 9 December 1991, 76, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

4. See, for instance, Gen John M. Loh, Langley AFB, Va., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 16 October 1991, 87–88, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Dr Perry Jamieson, Dr Rich Davis, and Dr Barry Barlow, 4 March 1992, 61, Desert Story Collection, US Air Force

Historical Research Agency, Maxwell AFB, Ala.; Gen Charles A. Horner, Peterson AFB, Colo., transcript of interview with Dr Diane Putney, 26 April 1994, 87, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala. (Secret) Information cited is unclassified; and Russ, 9 December 1991, 27-28, 74-76.

5. See Builder, xiii, xvii-xviii. Builder hypothesizes that "air power theory was a crucial element in the evolution and success of the Air Force . . . but the subsequent abandonment of air power theory in the face of competitive means (missiles and space) and ends (deterrence theory) cast the Air Force adrift from precisely those commitments that had propelled it to its institutional apogee in the 1950s" (page xiii).

6. See Builder.

7. Lt Gen Charles A. Horner, Shaw AFB, S.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 2 December 1991, 13, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

8. According to Gen Jack Chain, commander of SAC,

the concept was to give the theater planner assets when the war started.

Nuclear—different ball game. That was our theater. As far as conventional operations, the different theater commanders needed to have and plan for those assets.

Gen Jack Chain, Fort Worth, Tex., transcript of interview with author, 12 August 1991, 5-6, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

9. See, for instance, Horner, 2 December 1991, 30, 37, 66-67; and Maj Gen Michael Ryan, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 4 September 1992, 13-14, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

10. See Col Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign against Iraq* (Maxwell AFB, Ala.: Air University Press, 1995), chap. 6.

11. See Col John A. Warden III, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, 22 October 1991, 57, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; Brig Gen Larry Henry, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 2 June 1992, 37, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; and Maj Gen Buster Glosson, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 29 May 1991, 47-48, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

12. See Reynolds, *Heart of the Storm*, chap. 6.

13. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, 1984, iii.

14. *Ibid.*, 1-3.

15. *Ibid.*, 2-2.

16. *Ibid.*, 2-3.

17. *Ibid.*, 2-4.

18. *Ibid.*, 2-6.
19. *Ibid.*, 2-7.
20. *Ibid.*, 2-8.
21. *Ibid.*, 2-11.
22. *Ibid.*, 1-3.
23. *Ibid.*, 1-4.
24. *Ibid.*, 2-12.
25. *Ibid.*, 3-4.
26. *Ibid.*, 2-11.
27. *Ibid.*, 3-3.
28. *Ibid.*, A-6.
29. *Ibid.*
30. *Ibid.*, 1-3.
31. *Ibid.*, 2-2.
32. *Ibid.*, 2-4.
33. *Ibid.*, 2-11.
34. *Ibid.*, 2-13.
35. *Ibid.*, 2-15.
36. *Ibid.*, vii.
37. *Ibid.*, 1-3.
38. *Ibid.*, 1-4.
39. *Ibid.*, 4-2.
40. *Ibid.*, A-6.
41. FM 100-20, *Command and Employment of Air Power*, 21 July 1943, 1.
42. See Col Dennis M. Drew, "Joint Operations: The World Looks Different from 10,000 Feet," *Airpower Journal* 2, no. 3 (Fall 1988): 4-16.
43. AFM 1-1, 1984, 2--2.
44. Brig Gen Robert H. Scales, Jr., *Certain Victory: The U.S. Army in the Gulf War* (Washington, D.C.: Pocket Books, 1993), 181.
45. *Ibid.*, 175.
46. Horner, 2 December 1991, 62-64, 66-67.
47. *Ibid.*, 56.
48. Scales, 174-75, 181, 383.
49. *Ibid.*, 368, 190, 164-74, 376.
50. FM 100-20, 2.
51. AFM 1-1, 1984, 1-3.
52. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 148-50, 184-85; and AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, March 1992, vol. 1, 1.
53. Sun Tzu, *The Art of War*, ed. Samuel B. Griffith (London: Oxford University Press, 1963), 84.

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Epilogue

A View of the Air Force Today and Tomorrow

The general who understands war is the Minister of the people's fate and arbiter of the nation's destiny.

—Sun Tzu

Although the “airpower compromise”* of 1990–91 validated nearly every major tenet of Air Force basic doctrine, the internal debates that sparked this compromise seemed to reinforce a sense of institutional uneasiness that had been growing for some time. An increasing number of airmen, some in lofty positions, were beginning to believe we had “lost the bubble” on the nature and meaning of our profession. In 1989 some Air Staff officers wrote (though never published) a white paper entitled “A View of the Air Force Today” and circulated it in the Pentagon. The paper expressed “growing concern and frustration by many who serve [the USAF]” and a vague uneasiness about “institutional problems that needed attention.”¹ According to Carl Builder, senior analyst at the Rand Corporation, these problems concerned “careerism . . . stovepiping . . . [and] loss of professionalism at arms”² (see chap. 10). In the wake of “probably the most effective air campaign [in history],”³ Air Force senior leadership thus set about rebuilding the institution—almost from the ground up.

The nature of the problem that former secretary of the Air Force Donald Rice had sensed about the service (see chap. 10) is supported by Builder's detailed analysis, which concludes that the Air Force suffered from intellectual and professional hollowness rooted in a lack of institutional vision. Senior Air Force officers decried a perceived lack of professionalism

*This term refers to combining the “strategic air campaign” (as represented by Instant Thunder) with tactically oriented planning (as represented by Internal Look and the D Day Plan) to produce a comprehensive air campaign that attacked tactical, operational, and strategic targets.

among junior officers who they felt were consumed by obsessive careerism. But the real problem lay with the senior officers themselves, who failed to comprehend and articulate a unifying vision of airpower and the profession of arms (i.e., airpower theory).⁴ Worst of all, according to Builder, we hadn't lost this conceptual framework—we had abandoned it.⁵

The pope, cardinals, archbishops, and we parishioners had struck a devil's bargain with our civilian masters and sister services. We denied the concepts upon which we had so painfully forged our independence, in order to retain what we really loved: the air-breathing flying machines that set us free from the bounds of earth. The concept of conducting the profession of arms in a new medium and potentially decisive manner gave way to the profession of “flying and fighting.”* Builder says that

once the concept of air power no longer served as the altar for common worship by aviators and groundlings alike, the unifying sense of mission, purpose, and cause within the institution began to evaporate. People found themselves in an institution because that was the place to do what they wanted to do—to fly airplanes, to work on rockets, to develop missiles, to learn an interesting or promising trade, etc. The institution fractured; and a hundred mischiefs were turned loose to bedevil the Air Force. (Emphasis added)⁶

The demons who bedeviled us were the numerous, fragmented visions of our *raison d'être*. Gen Merrill McPeak, Air Force chief of staff, observed that, “absent a clear understanding of overarching purposes, some people give their loyalty to the next best thing—their particular job or their equipment.”⁷ Later in his remarks, General McPeak included an official mission statement for the Air Force—one momentous occurrence in a series of events designed to reshape our institution and correct the problems Dr Rice had detected on his arrival at the Pentagon in 1989.

“We are doing everything we know how to try to move this institution away from its stovepipe mentality and its focus on instruments of warfare onto the objectives of warfare” (emphasis added), Dr Rice said in December 1991.⁸ “Everything we know how” apparently began with placing

*Builder develops this thesis eloquently in *The Icarus Syndrome*, 179–89 (see note 1).

intellectually inclined general officers in positions of high responsibility. The chief of staff, the commander of Air University, and the commanders of other major air commands selected during Dr Rice's tenure were "handpicked" for their "greater understanding of air power and its role."⁹ This step was a logical one. If senior leadership could once again provide the institution with a unifying vision of airpower theory, the focus of junior officers (and everyone else in the Air Force) should rise above personal career concerns. But placement of senior leadership was only one of a number of initiatives designed to heal the institutional malady.

The first initiative was "Global Reach—Global Power," a white paper of June 1990 designed to "set the Air Force on a path toward an integrated view of itself and airpower."¹⁰ This paper highlighted the "inherent strengths" of airpower—speed, range, flexibility, precision, and lethality—and the truly global impact of "the world's foremost aerospace power."¹¹ It has since been circulated to a wide audience inside and outside the Air Force. The second initiative called for the Air Force to implement modern business principles, including a vision for the future and a complete organizational restructuring.¹² The vision statement and reorganization plan were released in December 1991, both stressing unifying elements. The vision statement involved a team effort: "Air Force people [all of us, not just fighter pilots] building the world's most respected air and space force . . . global power and reach for America."¹³ As for reorganization, Dr Rice emphasized that this part of the initiative was just as important as the concept of global reach—global power in terms of its desired impact on the Air Force.¹⁴

Much of the reorganization dealt with economy and the efficient use of resources. However, according to "Reshaping for the Future," an Air Force white paper of February 1992, the combat command restructure was specifically designed to eliminate the "old, artificial distinction between tactical and strategic weapons and organizations." Strategic Air Command, Tactical Air Command, and Military Airlift Command were dismantled and their constituent elements reassembled as Air Combat Command and Air Mobility Command (AMC). This change reflected an "integrated vision [whereby] airpower should be treated as a unified whole in order to bring its full

capability to bear.” The white paper went on to say that, thanks to the reorganization, “[combatant] commanders . . . will now control all the assets they need to make airpower a unified whole.”¹⁵

One major goal of reorganization was to achieve greater unity within basic fighting elements. The motto One Base, One Wing, One Boss exemplified this goal, and the basic operational wing structure (the “objective” wing) sought unified control of all assets and resources required for mission accomplishment. Additionally, the reorganization eliminated “autonomous ‘stovepipe’ support organizations, such as those for maintenance, weather forecasting, and communications.”¹⁶ That is, since everyone on base now answered to one senior commander (normally a brigadier general), who could focus on mission accomplishment, occupational stovepiping became less attractive or tolerated. The thinking was that such changes would encourage all Air Force people to embrace the profession of arms once again and adopt the broader vision of everyone working together to build the world's most respected air and space force.

Just as reorganization was taking hold, General McPeak issued an official Air Force mission statement, which was arguably the linchpin of the entire effort to revitalize our institution. After asking the question “How can you reorganize, restructure . . . build a Quality Air Force if you cannot say, in clear, simple language, what the purposes of our organization are?” the chief proclaimed that the mission of the United States Air Force is to “defend the United States through control and exploitation of air and space.”¹⁷ Deceptively simple, the statement captures the comprehensive nature of an Air Force approach to airpower: “Our attitude about the whole mission . . . our approach to control and exploitation of air and space . . . and the requirement for comprehensive air and space capabilities . . . make us unique, provide the essential rationale for a separate Air Force” (emphasis in original).¹⁸ Like Secretary Rice, McPeak seemed to articulate what Carl Builder would later conclude in *The Icarus Syndrome*—that the rationale for a separate Air Force springs from a comprehensive airpower theory. Perhaps we were on the right track.

The first test of the initiatives commenced in March 1992 with the release of a new manual of Air Force basic doctrine, grounded in “what history has taught us works in war.”¹⁹ But would Air Force warriors read it? Certainly, the structure of the manual encouraged them to do so. Volume 1—the “bare bones” of Air Force doctrine—consisted of fewer than 20 pages, designed for leisurely scanning, and included numerous cross-references to the essays in volume 2, a system which made for easy access to the supporting documentation. In the foreword, the chief of staff wrote that he expected “every airman and . . . every noncommissioned and commissioned officer to read, study, and understand volume I and to become fully conversant with volume II.”²⁰

Further, a multimedia advertising campaign informed Air Force people about the new manual and prepared them for its release. News stories and op-ed articles appeared in the Air Force Times and other publications. The chief of staff narrated a videotape for mandatory viewing throughout the Air Force, declaring doctrine the “heart and soul” of the institution and therefore even more compelling than the global reach—global power/reorganization initiative. Every Air Force unit and every officer and senior NCO in both active and reserve components would receive a copy, as would officer and senior NCO accessions for several years to come.

Despite all this effort to encourage higher-level thinking via white papers and statements of vision and mission, the Air Force appears to have failed in its first post-Desert Storm test of commitment to the profession of arms. Witness, for example, the following scene, as related by a young student-pilot:

March 1993, one year after the AFM 1-1 publication date, in “Nacho” Flight of the 87th Flying Training Squadron “Red Bulls,” 47th Flying Training Wing, Laughlin AFB, Texas. A box of plastic-wrapped AFM 1-1s is passed among a dozen to 15 students and a handful of instructors milling about, preparing for the day’s flight-training activities. Each pilot and student pilot takes one, individually setting it aside or turning it in hand, not sure what to do with it. Someone—probably the flight commander or assistant flight commander—says, “According to the foreword, the chief expects each of us to ‘read, study and understand’ this.” Laughter ripples through the room, and spontaneously a trash can is passed. In turn, each member of the flight delightedly drops his still-wrapped copy of 1-1 in

the can. Now they are ready to get back to the business at hand—flying and fighting.²¹

Rumor has it that similar incidents occurred all over the Air Force.* Apparently, some of us remain apathetic toward the “heart and soul” of our service. If so, it hardly seems likely that we have expanded our commitment to the larger profession of arms. Further evidence—though much more subtle—suggests that this is indeed the case.

Before the ink could dry on the reorganization plans, some Air Force people began to use the new structure to splinter the “integrated view of [the Air Force] and airpower” promoted by the concept of global reach—global power. In much the same way that SAC and TAC divided us into strategic warriors, tactical warriors, and everybody else, so ACC and AMC seemed to divide us into “power” warriors, “reach” warriors, and everybody else (once again leaving most of us on the outside looking in). If, as many senior Air Force leaders have declared, ACC provides the power and AMC the reach in global reach—global power,²² what do the other six Air Force major commands do (not to mention the field operating agencies and direct reporting units)? If we are not part of global reach—global power, where will our loyalties ultimately settle? Perhaps with our particular jobs or equipment? Dividing ourselves over reach and power seems no more functional than the old strategic/tactical shibboleth. Given the ever-rising emphasis on military operations other than war (MOOTW), the arbitrary lines drawn between reach and power are likely to become as blurred over time and as detrimental to institutional cohesion as those between strategic and tactical.

In the international community, power is the ability to obtain one's will through persuasion, coercion, or compellence. The destructive capacity of the military represents power only insofar as it accomplishes or assists in accomplishing these goals. But nondestructive military capabilities

*Shortly after the 1992 version of AFM 1-1 appeared, the author heard about a similar incident. A young lieutenant—a fighter pilot—at Eglin AFB, Florida, was standing in the operations room, holding his new doctrine manual—still wrapped in plastic. “What is this?” he asked a captain who had wandered in. “Oh, it's that doctrine _ _ _ _ . I threw mine away.” Predictably, the lieutenant promptly dropped his copy—still in its wrapper—into the wastebasket.

also represent power. The Berlin airlift achieved major national political objectives in the face of opposition from an implacable foe without the firing of a single shot. Is that reach or power? In Operation Desert Storm, bombers that had flown over 7,000 miles nonstop from the US launched critical opening salvos. Is that reach or power? Neither of these events could have taken place without supporting systems for procurement, training, education, intelligence, materiel, supply, transportation, and so forth. Are the people who do all these things outsiders looking in?

All of these points raise two key questions: (1) is it possible to exert global power without global reach? and (2) is there any value in global reach if it does not produce global power? The answers seem obvious and lead us, once again, to embrace the comprehensive view of aerospace power.

The versatility of that power makes it a national treasure—not just one or two things we do, but all the myriad options we offer national decision makers in defense of the United States through our control and exploitation of air and space. The ability to deliver precision firepower anywhere in the world overnight (demonstrated [once again] during Desert Storm) is part of the powerful presence the United States casts across the international community. But an equally important part of that presence (and one that will probably grow in the future) is the ability to rapidly organize, transport, and construct vast infrastructures over thousands of miles (demonstrated during Desert Shield and Desert Storm). Indeed, Carl Builder believes that during the Gulf War “it was not our combat aircraft that set us so apart from our allies or enemy in capabilities; it was our projection of essential infrastructures for modern, precision warfare.”²³ Airlift provides not only reach but national power. Nor do bombs on target equate directly to global power. Without global range, our fighters and bombers could exert nothing beyond local or regional power. Neither airlift nor combat aircraft represent anything at all without the help of many other functions.

As the future of global affairs begins to take shape, this comprehensive view of aerospace power's contributions and potential contributions to national security becomes even more vital. The future security environment shows signs of

being even more complex than the extremely complex one of the recent past and present. Nongovernmental organizations (NGO)—such as transnational corporations, drug cartels, international crime organizations, and ethnic tribes—seem destined to play an ever-enlarging role in what were formerly international affairs. Integration and disintegration of nationalistic ethnic and religious groupings are already placing severe pressure on the old international system.²⁴ As information technologies proliferate throughout the world, information control becomes an increasing problem for national governments, as well as for individuals and businesses.²⁵ Kurds in Turkey will correspond freely—and in real time—with Kurds in Iraq and Iran, and none of the governments in those countries will be able to exert significant control over what they say to one another. “Hackers” will penetrate government and nongovernment electronic systems, collecting and disseminating “protected” information and perhaps attacking these systems with extreme subtlety. Not nearly so subtle is the growing threat of weapons of mass destruction in the hands of malevolent governments and NGOs.*

Warfare is changing, and revolutionary application of knowledge and information technologies seems to be the key to success in the new environment. NGOs and individuals are gaining access to information sources and knowledge nets nearly equivalent to those available to national governments. “Gangs” and paramilitary organizations may soon emerge all over the globe and connect with each other, primarily through electronic networks. The tribal warlord will be able to “reach out and touch someone” almost anywhere in the world, perhaps in ways so subtle that finding the perpetrator will prove impossible or nearly so. Consequently, national governments may lose much of their power.²⁶ Ensuring

*Examples of both these incipient threats appeared recently in the New York Times. Hackers have already managed to penetrate a number of nonclassified but sensitive Defense Department computer nets, and some 264 pounds of weapons-grade plutonium were apparently available on the European black market to the highest bidder. See Peter H. Lewis, “Hackers on Internet Posing Security Risks, Experts Say,” and Ferdinand Protzman, “Germany Reaffirms Origin of Seized Plutonium in Russia,” New York Times, 21 July 1994, A1, A11, and A6.

national security in the future will require extreme flexibility, versatility, and agility—attributes that have always defined aerospace power.

In the postindustrial world, “wars” may be conducted on electronic networks, with the losers finding their information systems ransacked, their internal and external communications curtailed, and their control over even simple civic functions such as electrical power and telecommunications gone. Open warfare—even the old, industrial variety—will see the struggle for information and knowledge dominance rise dramatically in importance. Control and exploitation of information and knowledge will be crucial to victory, as was the case in Desert Storm.* In the future, tremendous flexibility and agility will become hallmarks of all military operations in the new global security environment.

Surely the “world's foremost aerospace power” ought to be better prepared than any other military organization in the world for the security environment described here. US Air Force doctrine and theory provide a comprehensive, global view of the application of military power—especially aerospace power—in support of national objectives. Of necessity, the Air Force is more technologically oriented than its sister services and is heavily invested in information technologies. The inherent speed, range, flexibility, and versatility of aerospace forces naturally foster a “big-picture” (i.e., operational- or strategic-level) mind-set, characterized by agile thinking and planning. In nearly every way, the United States Air Force is better prepared to face the future than any other military organization in the world. If we should lose this birthright, it will be because we failed to commit ourselves faithfully to the profession of arms and failed to understand and develop our own history, experience, and theory.

Our bias against intellectualism in our ranks has put us behind the power curve. It is already past time to begin

*In the context of this discussion, the answer to the query about whether the Persian Gulf War of 1990–91 represents the last of the old or the first of the new appears to be “both.” Arguably, the opponents were primarily industrial-age military forces (last of the old), but the victor (possessor of the field at the end) prevailed on the strength of postindustrial capabilities—information and knowledge dominance (first of the new).

preparing ourselves for a rapidly emerging and very complex future, but we are still lost in debates that our predecessors thought they had resolved in the 1930s and 40s. We do not understand our heritage because, in our fly-and-fight culture, it is “unmanly” to develop one's intellect. Yet, without a thorough understanding of what our past is and how we came to be the way we are, we cannot hope to divine what we ought to be or how we can become that way. Many years ago, Billy Mitchell, Hap Arnold, Hal George, Ken Walker, and their colleagues stretched airpower thinking so far that not until Operation Desert Storm did available technology match their theories closely enough to finally put them to the test. Even so, in 1990–91 we had to relearn in five months much of what they already knew by 1943. The future may not give us that much time again. Nor may it be so amenable to 50-year-old solutions. We must push aerospace power thinking into the future now—as far ahead of current technologies as it was in 1930. Like it or not, that means that many of us will have to undertake certain unmanly pursuits.

Notes

1. Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (New Brunswick, N.J.: Transaction Publishers, 1994), 3–4.

2. *Ibid.*, xvi.

3. Secretary of Defense Dick Cheney, Associated Press release, 17 February 1991.

4. Builder, xv–xviii.

5. *Ibid.*, 29.

6. *Ibid.*, 35–36.

7. Gen Merrill A. McPeak, “Does the Air Force Have a Mission?” text of speech delivered at a dining--in, Maxwell AFB, Ala., 19 June 1992, 3.

8. Donald B. Rice, Washington, D.C., transcript of interview with Lt Col Suzanne B. Gehri, Lt Col Richard T. Reynolds, and author, 11 December 1991, 31, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.

9. *Ibid.*, 31, 33.

10. *Toward the Future: Global Reach—Global Power*, U.S. Air Force White Papers, 1989–1992 (Washington, D.C.: Department of the Air Force, 1993), 3.

11. *Ibid.*, 3, 17.

12. *Ibid.*, 36.

13. *Ibid.*, 61.

14. Rice, 31.

15. *Toward the Future*, 44–45.
16. James W. Canan, “The End of the Stovepipe,” *Air Force Magazine*, June 1992, 32, 34, 36.
17. McPeak, 1, 5.
18. *Ibid.*, 9.
19. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, March 1992, vol. 1, v.
20. *Ibid.*
21. The young officer who provided this account wishes to remain anonymous.
22. See Barbara Opall, “U.S. Air Force Planning Shifts with Commands,” *Defense News* 7, no. 23 (8–14 June 1992): 34; Gen John M. Loh, Langley AFB, Va., transcript of interview with Lt Col Suzanne B. Gehri and Lt Col Richard T. Reynolds, 16 October 1991, 89, Desert Story Collection, US Air Force Historical Research Agency, Maxwell AFB, Ala.; Gen Ronald R. Fogleman, “Air Mobility: A Key to Success in Joint Warfare,” *Vital Speeches of the Day* 59, no. 14 (1 May 1993): 418–19, 421; and Julie Bird, “Restructuring: Leaders Confident New Shape Matches Changed Environment,” *Air Force Times*, 18 May 1992, 13.
23. Builder, 264.
24. Alvin and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century* (Boston: Little, Brown and Co., 1993), 242–45.
25. Builder, 239–40; and Walter B. Wriston, *The Twilight of Sovereignty* (New York: Charles Scribner's Sons, 1992), 33–54.
26. For a succinct discussion of the socioeconomic impacts of the revolution in information technologies and their implications for the new security environment, see Builder, 240–57. The most basic implication is the new permeability of states and the devolution of socioeconomic power to individuals and NGOs. According to Builder, “the source of wealth and power is increasingly from information and human mental creativity, with physical resources and production declining in relative value” (pages 242–43).

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Glossary

A

AAA	anti-aircraft artillery
AADC	area air defense commander
ACA	airspace control authority
ACC	Air Combat Command
ACTS	Air Corps Tactical School
AD	air division
AFM	Air Force manual
ALCM	air launched cruise missile
AMC	Air Mobility Command
AOR	area of responsibility
ARCENT	US Army Forces Central Command
ASARS	advanced synthetic aperture radar system
ATO	air tasking order
AWACS	airborne warning and control system
AWPD-1	Air War Plans Division—Plan 1

B

BDA	battle damage assessment
BEN	basic encyclopedic number

C

C ²	command and control
C ³	command, control, and communications
C ³ I	command, control, communications, and intelligence
C ⁴ I	command, control, communications, computers, and intelligence
CAFMS system	computer-assisted force management
CAP	combat air patrol
CAS	close air support
CENTAF	US Air Forces, Central Command
CENTCOM	US Central Command
CEP	circular error of probability
CIA	Central Intelligence Agency

CINC	commander in chief
CINCCENT	commander in chief, Central Command
CJCS	chairman of the Joint Chiefs of Staff
CNO	chief of naval operations
COMCENTAF Command	commander, US Air Forces Central
COMNAVCENT	commander, US Naval Forces Central Command
CONPLAN	contingency plan

D

DIA	Defense Intelligence Agency
DOD	Department of Defense

E

EW	electronic warfare
----	--------------------

F

FAC	forward air controller
FEBA	forward edge of battle area
FLIR	forward looking infrared
FM	field manual
FOFA	follow-on forces attack

G

GAT	guidance, apportionment, and targeting
-----	--

H

HARM	high-speed antiradiation missile
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I

IADS	integrated air defense system
IIR	imaging infrared
IN	intelligence
IR	infrared

J

J-2	Intelligence Directorate
J-3	Operations Directorate
J-6	Command, Control and Communications System Directorate
JFACC	joint force air component commander
JFC	joint force commander
JSCP	joint strategic capabilities plan
JSTARS	joint surveillance target attack radar system
JTF	joint task force

K

Kari	Iraqi integrated air defense system
KTO	Kuwaiti theater of operations

L

LANTIRN	low-altitude navigation and targeting
infrared	for night
LGB	laser guided bomb
LOC	lines of communications

M

MAC	Military Airlift Command
MOOTW	military operations other than war
MTR	military-technical revolution

N

NAVCENT	US Naval Forces Central Command
NBC	nuclear, biological, and chemical
NCA	national command authorities
NGO	nongovernmental organization
NIC	National Intelligence Council

O

OODA	observe, orient, decide, act
OPLAN	operations plan

P

PGM	precision guided munition
PK	probability of kill
POL	petroleum, oil, and lubricants
PSYOPS	psychological operations
Pub	publication

R

RAF	Royal Air Force
RMA	revolution in military affairs

S

SAC	Strategic Air Command
SAM	surface-to-air missile
SEAD	suppression of enemy air defenses
SHF	superhigh frequency
SIOP	single integrated operational plan
SOC	sector operations center
SPINS	special instructions

T

TAC	Tactical Air Command
TACC	tactical air control center
TACSATCOM	tactical satellite communications
TAF	tactical air force
TLAM	Tomahawk land attack missile
TPFDD	time-phased force and deployment data
TPFDL	time-phased force and deployment list
TRADOC	Training and Doctrine Command (US Army)

U

UHF	ultrahigh frequency
UN	United Nations
USAAF	US Army Air Forces

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