

MAKING THE CONNECTION:
AN AIR STRATEGY ANALYSIS FRAMEWORK

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ABSTRACT

This study analyzes and builds on Dr. Robert Pape's framework for analyzing airpower strategies. The analysis shows the underlying value of his *Targets and Timing, Mechanism, Outcomes* construct as well as the considerable clarification and expansion it requires in order to perform comprehensive air strategy analysis for the broad range of strategic air and space tasks. An enhanced framework is proposed, the elaboration of which comprises the bulk of the paper. Considerable time is spent describing the structure and logic of the framework and the models it contains. The three elements of the expanded concept, called the Air Strategy Analysis Framework, are political *Outcomes*, a policy process model called the *Mechanism*, and the last element, describing airpower *Actions*. The new framework's principal addition is the categorization of political outcomes an air strategist should assess. They are *target* entity, *domestic*, and *third party* outcomes. This gives the framework the scope that allows for analysis of a wider range of airpower's political effects in addition to structuring inquiry into competing strategies. The *Mechanism* is the air strategist's *core policy process theory* flanked by *threshold* assumptions and an *action focus*. Next, there is an analysis of the components of the airpower *Action* element that comprises the air strategist's means for stimulating the policy process. It consists of *capability* assumptions, and the strategic *tactics* and *targets* of the air plan. Finally, the paper concludes with a discussion of the utility of the framework that proposes its use as an educational tool for structuring thought and communicating about how air strategists think about, and how air strategies work toward, the accomplishment of strategic purposes.

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CHAPTER 1: INTRODUCTION

Strategy is a constant dialectic between means and ends.

—Colin S. Gray, *War, Peace, and Victory*

This thesis concerns strategy—*air* strategy. The air strategist is confronted with the classic problem that has vexed soldiers and statesmen throughout history: how to link military means to political goals. The complexity and depth of that problem can be daunting to the point of paralysis, yet the real world demands that we take action. Making the connection is the strategist’s dilemma.

There is little help available for the air strategist seeking to address this problem. Colin Gray argues for a scholarly approach that is:

. . . inherently neutral as among the political values that inform policy choice, or as between rival schools of doctrinal thought. That education, rather, should train people to be able to probe rigorously all three elements of the means-ends nexi that define strategy (the suitability of ends, the availability of means, and the tie between the two).¹

There is clearly room for a shared, air-minded strategic frame of reference that is simple enough to grasp intuitively, yet flexibly characterizes the complex strategy process. Ultimately, it must provide a conceptual tool for linking what air forces do (the means) to political outcomes (the ends).

This paper will investigate a framework for thinking about airpower strategy developed by Robert Pape that provides an important basis for such a perspective. He proposed that air strategies can be broken down into three parts: *Target, Mechanism, and Political Outcome*. As

Pape's colleague, Col Ken Feldman, says, "The framework forces the student to focus on the assumed mechanism—the theorist's explanation for how attacking his recommended targets will lead to the desired outcome."² This thesis addresses three questions: First, does Pape's three-part framework for analyzing historical airpower strategies communicate a sufficiently accurate depiction of reality? Second, what are its utilities and shortcomings? Finally, can it or should it be updated to reflect a more accurate and comprehensive viewpoint without sacrificing its simplicity?

The first method of investigation is to assess the intellectual impact of the Pape framework. Because it has resided almost exclusively in the U.S. Air Force's School of Advanced Airpower Studies (SAAS), the reaction of the SAAS students and faculty should provide some indications of its validity. Second, the Pape framework was presented to the students early in this academic year at SAAS. This provided an opportunity to test it longitudinally against the curriculum, which includes in-depth theoretical and historical inquiry into airpower. Should the framework pass the dual tests of an intense exposure to a broad audience and the longitudinal analysis, it must necessarily stand as conceived. If not, it must either be discarded as an ill-conceived reduction or improved to bring it into congruence with the needs of real air strategy and strategists about to enter the next millennium. Air Force Chief of Staff, General Ronald R.

¹ Gray, *War, Peace, and Victory: Strategy and Statecraft for the Next Century* (New York: Simon and Schuster, 1990) 344.

² Ken Feldman, "End of Course Report, SAAS 610 Analysis for Military Decisions," January 1995.

Fogleman, provides clear direction by saying: “Not only must we know how to *do* aerospace power, we also must know how to *think* about it.”³

“Thinking strategy” necessarily brings up the relationship between means and ends, that is, the nature of the dialectic process described by Colin Gray. What is strategy—to the airman?

Perhaps Gray’s definition is an appropriate start. In addition to describing the strategy process, he says strategy is “the direction of power so that it serves policy purposes.”⁴ In this sense, “direction of power” encompasses the breadth and depth of national leverage. As the air weapon reached its strategic potential, it married with modern communications technology to become a political tool so fluid, adaptive, and immediate, that it changed the policy making environment on both sides of the military-political relationship. The change introduced a permeability between the military and the politician that has resulted in politicians directing air tactics, and airmen influencing the political process. Air tactics became routinely strategic, that is, they had direct and significant political effect, and political tactics (short-term, expedient, and often transitory measures) more routinely involved airpower. Air historian Col Phillip Meilinger puts it this way: “Airpower changed things by compressing the line between the strategic and tactical levels.”⁵

³ Edward C. Mann, III, *Thunder and Lightning: Desert Storm and the Airpower Debates* (Maxwell Air Force Base, AL: Air University Press, 1995) x, xi.

⁴ Gray, *War, Peace, and Victory*, 9. Actually, the scope of the uses of airpower suggested in this paper encompasses both strategy and operational art in Gray’s definitions of those terms. In order to keep the relationship between military power applications that do not directly have direct or significant political effect with those that do, the term strategic is used throughout.

⁵ Phillip S. Meilinger, *Ten Propositions about Airpower* (Washington, DC: U.S. Air Force Office of History, 1995) 10.

If, as Colonel Meilinger proposes, airpower is inherently strategic due to its ability to transcend surface obstacles and strike at the sources of national power, then it follows that employment which a surface officer would classify as tactical, such as a single air strike, can be strategic, that is, have significant political effect.⁶ Air operations such as the Doolittle Raid on Tokyo, the interception of Admiral Yamamoto over Rabaul, the Berlin Airlift, and the El Dorado Canyon strike against Libya, among many others, fall into the strategic realm.

A proper definition of *air strategy* must connect the tactical means of airpower with political goals. Thus, air strategy is the use of airpower for achieving political goals. Despite the fact that it can have strategic consequences, the cause-effect linkage of airpower action to political goals is sometimes difficult to assess. Although in Desert Storm, many Iraqi soldiers surrendered to unmanned aerial vehicles, helicopters, and journalists due at least in part to air attacks, the effects of airpower application are rarely so overt. The lack of concrete measures of merit stifles discussion and inhibits thinking about airpower. How can those responsible for an instrument with such intangible strategic impact learn to think strategically? This question is the subject of much hand-wringing and little systematic thought. This paper outlines one attempt to provide structure to the air strategy problem.

Chapter 2 begins the investigation by investigating the impact and substance of Pape's framework. Conclusions about its viability are made, and if improvements are required, they will

⁶ *Ibid.*, 8-13. Colin Gray takes strong exception to this notion: "Notwithstanding popular and official misuse of the adjective 'strategic,' it is an error to think of any weapon as being inherently strategic." Later he adds, "Ground forces, tactical air forces, naval forces, and long-range nuclear strike forces could all, in different ways, contribute strategic effect." Gray, *War, Peace, and Victory*, 33. The point is that American airpower finds itself having the potential for strategic effect more often than other type forces, and it is almost universally a key element whenever U.S. naval or ground forces operate.

be proposed in the remaining chapters. Chapters 3, 4, and 5 analyze in turn the three elements that comprise the framework. Chapter 6 concludes the paper, and contains some implications of the study.

CHAPTER 2: HISTORY, ANALYSIS, PROPOSAL

Strategy depends for success, first and most, on a sound calculation and co-ordination of the end and the means.

—Sir B. H. Liddell Hart, *Strategy*

This chapter investigates a method of analyzing air strategies developed by Dr. Robert A. Pape, Jr.⁷ First it will explore the history and evolution of the framework, then analyzes its present utility and shortcomings. Once this is accomplished, an expanded strategy tool is proposed that will be explored in depth in subsequent chapters.

The Evolution of the Pape Framework

Robert Pape began developing a framework for analyzing air strategies before coming to the SAAS faculty in 1991, but the challenge of teaching a course on strategic airpower to Air Force officers served to crystallize his thinking in preparation for teaching in January 1992. Finding the SAAS faculty dominated by historians, Pape discovered an ally and office-mate in policy analysis professor Col Ken Feldman. When the shell of the framework became apparent to Pape in the fall of 1991, he shared it with Colonel Feldman, who found it fit into an approach he

⁷ Pape came to the School of Advanced Airpower Studies (SAAS) as an assistant professor of comparative military studies in September 1991 to teach the inaugural class. He came to SAAS from the University of Michigan, where he was a post-doctoral fellow in the Program in International Peace and Security Research. He received his PhD in Political Science in 1988 from the University of Chicago, writing a dissertation titled “Coercive Air Power.” His articles concerning the utility of airpower strategies that try to deny the enemy their military strategy were published in *International Security* and *The Journal of Strategic Studies*, and he has a forthcoming book titled *Bombing to Win* (Ithaca, NY: Cornell University Press) based on that same theme.

taught in his policy analysis course. Colonel Feldman incorporated the Pape framework into his course's readings for the next academic year, thus offering it twice during the SAAS curriculum.⁸

In his course titled "Strategic Application of Airpower," Pape focused on five air power strategists—Giulio Douhet, Thomas Schelling, Col John Warden, Ernest May,⁹ and the Air Corps Tactical School (ACTS)—and used the framework to illuminate their similarities and differences. The framework originally consisted of the following elements: "who governs, timing, target, mechanism, and final outcome."¹⁰ Subsequent course notes show a "Structure of targeting strategy" that includes headings "tactics, bombing/timing rules, main target, mechanism, and final outcome."¹¹ The eventual framework used upon Pape's departure from SAAS in 1994 is shown in Figure 1, below, and is the one that will be analyzed later in this chapter. The fact that "who governs" was important to the analysis and yet was dropped from subsequent versions is important and will be discussed later. During his time at SAAS, Pape published more articles and

⁸ "In the fall of 1991, I seem to remember shouting across the partition to Ken Feldman, my office-mate, 'I got it!' I showed him how I could incorporate Warden's arguments along with Schelling, Douhet, Pape, and others in a single framework by using the idea of a mechanism, which I had been playing with earlier. He liked the idea because it fit with the RAND systems analysis framework." Pape letter to Dr. Karl Mueller dated May 7, 1995.

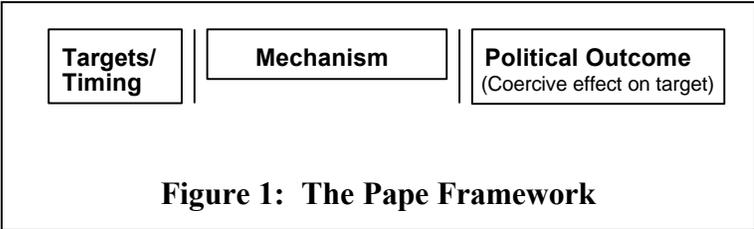
⁹ Ernest May, *Lessons of the Past: The Use and Misuse of History in American Foreign Policy*, (Oxford University Press, New York, 1973) 125-142. May is a less publicized airpower strategist than his companions in Pape's analysis. May, more famous for the important book *Thinking in Time* he co-authored with Richard Neustadt, outlines an interesting air strategy based on aerial coercion exploiting factionalism within the target government. He, like Maj John Pray in his SAAS thesis, "Coercive Air Strategy: Forcing a Bureaucratic Shift," sees the ability countervalue campaigns to cause a change in government that leads to surrender. Lt Col Pete Faber also analyzes May's strategy in his forthcoming Air University Press monograph titled "Air Power Theory: A Language for Analysis" dealing with the establishment of a common strategic lexicon for air strategists.

¹⁰ Pape letter, attachment dated January 27, 1995.

¹¹ Pape letter, attachment containing copies of original class notes dated 27, 30 January 1992.

worked on a book manuscript that used his framework and numerous case studies to focus on the efficacy of denial-based air strategies and the lack of utility of punishment-based air strategies.

The Pape framework was designed to break airpower theories and strategies into the three elements shown in Figure 1. They are: (1) the targets that will be destroyed and the timing of their destruction, (2) the mechanism through which this kind of attack will produce a change in the enemy's behavior, and (3) the desired change in enemy behavior. The mechanism is clearly the focus of the framework. Pape wanted the student to get away from a fixation on servicing targets and focus on the conceptual factors



that would affect airpower's strategic impact. Associated closely with the framework is Pape's taxonomy of coercive air strategies and his theory concerning what particular type has historically produced the desired outcomes.¹²

The story of how this simple, yet elegant idea gained momentum within SAAS is interesting. The first element of the story concerns the faculty. As mentioned previously, Colonel Feldman saw the descriptive and educational power of Pape's framework and directly inserted it into his course on policy analysis. He "was the first to review the basic logic and to recognize that the entire SAAS curriculum should be organized around it."¹³ Several other faculty

¹² He divides coercive strategy mechanisms into four categories: punishment, denial, risk, and decapitation. These are associated closely with Giulio Douhet, Robert Pape, Thomas Schelling, and Col John Warden, respectively. Pape's theory, the subject of his upcoming book, is that only airpower strategies involving denial of the enemy's military strategy can effectively coerce a desired political outcome. *Ibid.*, 1-49.

¹³ Pape letter. Faculty arrivals in 1992, Maj Pete Faber, just finishing his PhD in history from Yale, and Lt Col Pat Pentland, also became disciples due to their participation with Pape in

members, prominently among them Lt Col Pat Pentland and Maj Pete Faber, also found the idea to have significant explanatory power. Thus, the idea gained momentum in the faculty and it would also gain energy due to its concentrated presentation to SAAS students.

By 1994, three classes were exposed to the framework. Students in SAAS Class III listed the Feldman-Pape classes as the most highly valued courses in the SAAS curriculum in a year-end survey, significantly outpacing more classically historical approaches.¹⁴ Several student products also reveal the impact of the framework. Numerous thesis topics (including this one) focused on or referred to the Pape framework or used of the punishment/denial/risk/decapitation lexicon developed in these classes.¹⁵ A compelling example of the impact of the Pape course appeared in an Air Staff (Checkmate) briefing given by two SAAS Class III graduates concerning the redeployment of Iraq's army into positions threatening Kuwait in 1994. As in Desert Shield in 1990, Checkmate was tasked with providing the Air Force Chief of Staff with air options in case the Iraqis decided to attack Kuwait. Although the conflict abated upon the deployment of American forces into the region, the Checkmate plan was briefed as an example of what SAAS

the curriculum review committee for Class II. That review group felt that, "Our students should first understand competing air theories and then evaluate these theories with evidence in our airpower history courses." The Pape framework was one intellectual construct used to impose order on the many theories about how to use airpower. This curriculum concept did not fully take shape until Class III due to faculty resistance. Now an Air Force Academy history professor, Colonel Faber is about to publish a monograph from Air University Press which makes strong use of the Pape framework and uses it as a way of unifying the fragmented Air Force lexicon concerning the application of airpower.

¹⁴ Ken Feldman, "End of Course Report," 1.

¹⁵ Five thesis topics each year, with the exception of six in Class III.

graduates were doing with their education. The plan was based in part on Pape’s framework and the denial/punishment lexicon prescription that accompanied it.¹⁶

Another student who was stimulated by this idea was Maj John Pray. In a thesis titled “Coercive Air Strategy: Forcing a Bureaucratic Shift,” he devotes part of a chapter to the Pape framework and elaborates on the *Mechanism* element. Until this point, the *Mechanism* was not explicitly defined (see Figure 2 below, and notice the simple characterizations of theorists’ *Mechanisms*),¹⁷ and due to the requirements of Major Pray’s “bureaucratic shift” strategy, it required elaboration. He described the *Mechanism* as

<i>THEORIST</i>	<i>TIMING</i>	<i>TARGETS</i>	<i>MECHANISM</i>	<i>OUTCOME</i>
DOUHET	Immediate	Population	Lower morale Revolt	Policy change
ACTS	Rapid	Economy “Industrial Web”	Social Disintegration	Policy change
SCHELLING	Gradual	Population	Future costs	Policy change
WARDEN	Instantaneous	Leadership	Decapitation Strategic paralysis	Policy change

Figure 2: Maj John Pray's Representation of the Pape Framework¹⁸

being “nothing more than a strategist’s model of governmental action,” and went on to say that “It contains a tightly defined assumption of how a particular government *should* make a policy

¹⁶ This briefing was a significant event in the author’s mind because it demonstrated that things being taught in SAAS can, in a matter of months, be translated into options used by senior decision makers. This caused a renewed interest in the framework that led to this paper. Checkmate *Vigilant Warrior* briefing, 26 October 1994.

¹⁷ It should be noted that simplistic characterizations do not speak for the complexity inherent in the concept, however, the lack of any written supporting logic leaves one to guessing based on the depictions Pape and others who use his framework. This table is consistent with how Pape, Colonel Feldman, Colonel Faber, and Major Pray represent the idea.

change decision.”¹⁹ He gives no additional description of what elements comprise the model, but this was an important conceptual advance for the framework because it more precisely defined one of the main elements (mechanism as a model) and hinted at its contents.²⁰

It must be noted that part of the history of this framework within SAAS is the fact that no alternative schemes were presented, although a similar one was being developed right next door. The Air Command and Staff College (ACSC) developed the ACSC Air Campaign Process (see Figure 3), which independently arrived

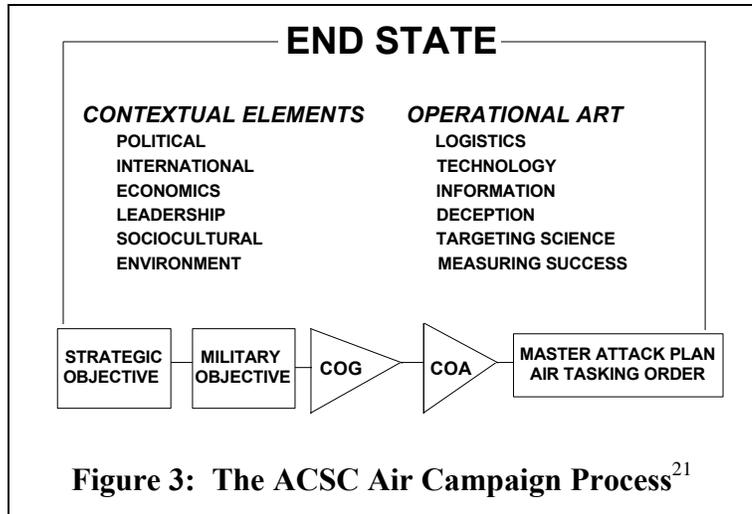


Figure 3: The ACSC Air Campaign Process²¹

at many of the elements contained in Pape’s framework.²² Neither group was aware of the similarity between their ideas. The ACSC Air Campaign Planning Process was developed by an

¹⁸ *Ibid.*, 23

¹⁹ John I. Pray, Jr., “Coercive Air Strategy: Forcing a Bureaucratic Shift” thesis, School of Advanced Airpower Studies, Maxwell AFB, AL, June 1994, 17. Although this shows how he defined the mechanism, it has some problems. First of all, the target of coercion might not be a “government.” Second, outcomes from air campaigns are not always “policy,” that is, explicit statements or actions of governments. There also can be systemic outcomes such as public opinion shifts or economic impacts.

²⁰ It is even more interesting that Pray’s thesis advocates a bureaucratic, or Graham Allison Model II and III perspective on target governments (almost identical to Ernest May’s), yet proposes action on the sender’s part that is wholly unitary and rational (Model I). This conceptual problem is not handled by the Pape framework since it only considers a model for government action for the target state. For a brief description of Allison’s three models for bureaucratic action, see Allison, *The Essence of Decision*, (Boston: HarperCollins, 1971) 2-7.

²¹ ACSC briefing, “ACSC Air Campaign Process,” AIRCAMP1.PPT, 1995.

ad-hoc group of ACSC faculty²³ in response to Colonel Warden's mandate that the ACSC curriculum should focus on problem-solving and strategic air campaign planning.²⁴ This construct was presented to two ACSC classes graduating in 1994 and 1995, and is a tool that concentrates on the operational aspects of the air campaign more than does the Pape framework. It has some valuable elements that deserve further elaboration; yet even more than Pape's idea, it exists without explicit, written justification of its structure or logic. For example, the picture of the process is the best available description. There is scarce documentation available other than personal briefing texts. The manifestations of the concept can be seen in a curriculum heavily influenced by Col Warden's vision. It is a teaching and curriculum organizing tool within which the school communicates his ideas about airpower application, and it continues to evolve within

²² Both frameworks are following independent, yet similar paths. They started out as mainly intuitive constructs, and their exposure in the forum of ideas is resulting in some revision over time. It has to be noted that there has been virtually no exchange of ideas with regard to these two frameworks, despite the fact that they complement each other in some ways. Later chapters will attempt to achieve some merging of structure and concept between the two. The Naval War College uses a strategic model called the "Bartlett Model" developed by faculty member Henry C. Bartlett. It is mainly used as a tool for force planning and acquisition, although it is broadly applicable. See Henry C. Bartlett, G. Paul Holman, and Timothy E. Somes, "The Art of Strategy and Force Planning," *Naval War College Review*, Vol. XLVIII, No. 2, (Spring 1995).

²³ The main group was Lt Col Larry Weaver, "Butch" Tilford, Rich Muller, and Lt Col "Bull" Mitchum. They assembled an air campaign curriculum on short notice that was presented to 103 volunteer students in February 1993. When students asked for a graphic representation of the process outlined in the syllabus, the first attempt, which evolved into the one shown in Figure 2, was produced. The information concerning the ACSC Air Campaign Process came from an interview with Lt Col Larry Weaver, Rich Muller, and Lt Col Gus Liby conducted on June 7, 1995.

²⁴ Col John Warden was the officer most responsible for the air attacks on Baghdad that initiated the allied assault on Iraq in 1991. His "Instant Thunder" campaign reflected many of the ideas he recorded in his book, *The Air Campaign*, (Washington: Pergamon-Brassey's, 1989) and he was later appointed as the Commandant of the Air Command and Staff College. When he arrived in late 1992, he immediately initiated the creation of an air campaign planning course, which was taught to a group of volunteer students in early 1993. Later curricula more fully implemented his vision of strategic problem solving and air planning building blocks.

the faculty as a result of his strong influence.²⁵ In that sense the two constructs converge. The ACSC concept was a tool for communicating Colonel Warden's overall vision of air campaigning, while the Pape framework was still primarily an adjunct to his thesis that denial strategies were better coercive tools than were punishment strategies.

Analysis of the Pape Framework

Pape's framework is a simple, elegant means of analyzing and communicating the linkage between military actions and policy outcomes. Due to its simplicity and descriptive power, the scarcity of competing frameworks, and the role of personal advocacy of Pape, Colonel Feldman, Maj (now Lt Col) Pete Faber, and Lt Col (now Col) Pat Pentland, it has enjoyed a high level of acceptance within SAAS by faculty and students. Air Force officers outlined a real air campaign based on it, and several publications have or will presently use it as an analytical framework.

There is important communication potential for this concept as well. First, it replaces harmful metaphors that are less accurate. Colonel Faber speaks eloquently of this in his forthcoming monograph on air strategy when he says, "Unfortunately, faulty metaphor-based theories have led to faulty employment of air power in war."²⁶ Second, it is a step toward establishing a shared, air-minded lexicon that will facilitate clearer communication among airmen

²⁵ It also forms a common lexicon that becomes ingrained after one year of instruction. Students virtually all come away from the course with the words "contextual elements" and "end state" drilled into their vocabularies, which is indicative of the communication power a framework like this can have. The current SAAS class (1994-1995) is the first to be fully exposed to both concepts.

²⁶ Pete Faber, "Air Power Theory," 6.

about their strategic craft.²⁷ It also provides a political context that more accurately describes the environment in which airpower is used.

Despite its potential, however, the Pape framework has problems that limit its broad applicability. Deductively, it failed to explain many examples of strategic airpower application. Why was the 1942 Doolittle Raid considered a success if it did very little to coerce the Japanese? Why was the Rolling Thunder graduated risk strategy adopted instead of something more powerful? What if we do not want to coerce a nation, just help them with airlifted supplies—what change in government behavior are trying to influence? If the entire reason for the 1986 El Dorado Canyon air strike on Tripoli and Benghazi was to stop Libyan terrorist sponsorship, does its inability to accomplish this goal in the long term mean the effort was in vain? What role does the strategist’s airpower capability assessment—an important element of most strategies—play in the Pape framework? What assumptions does the strategist use to develop his mechanism? These are but a few of the questions that arise when the framework is applied to airpower history.

These questions are not easily answered based on Pape’s writings. Many concepts in the framework are implied or are defined primarily through example, so if one wants to understand a particular concept more fully, there can be relatively little to investigate and much room for interpretation. Sometimes *Mechanisms* are described as an event (in the case of Douhet, “revolt,” or for ACTS, “social disintegration”) and sometimes, as in the case of Thomas Schelling, as a means of influence (“future costs”) (see Figure 3). Pape describes context-specific elements of the mechanism quite specifically in case studies, but does not incorporate any reference to how

²⁷ Anecdotally, the airpower connotations of the terms “punishment,” “denial,” and “mechanism” are understood by SAAS graduates. The inculcation of common terms to only 25 officers every year is a trickle effect that cannot hope to gain wide usage without more aggressive means. Contrast that with the ACSC lexicon, which is adopted by some 500 per year.

they relate to the theoretical elements of his framework. This gives flexibility to the analyst interested in reaching certain conclusions, but it also leaves important questions unanswered. The following paragraphs investigate problems in each element more fully.

Targets & Timing. The main problem with the Targets and Timing element of the framework is that it skirts many of the tactical and operational issues that drive strategic force application. It also focuses on destruction because Pape uses it for case studies of high stakes wartime coercion. Is it, as Major Pray and Colonel Feldman say, simply the Master Attack Plan and the Air Tasking Order?²⁸ If the idea includes the components of airpower that will act upon the decision making mechanism, the use of the terms “targets” and “timing” ignores at least one key element of air strategy, that of capability.

Airpower capability can be defined as the combination of enabling and restraining factors that define the latent potential of airpower. Many strategists’ theories are virtually defined by their explicit capability assumptions. Examples include Douhet with his invulnerable Independent Air Force of battle planes; ACTS by its assumptions about bomber self-protection and bombing accuracy; and Colonel Warden with the duo of stealth and precision.

Mechanism. The mechanism’s importance to the overall framework requires that it undergo detailed analysis. Pape implies that air strategies can be categorized by the nature of the mechanism on which they are based as either *denial*, *punishment*, *risk*, or *decapitation* strategies. Although most of the graphic depictions of Pape’s strategy analysis tool describe the mechanism in one, or a few, words (see Figure 3 above, which is representative), narrative case studies by

²⁸ Pray, “Coercive Air Strategy,” 18. Major Pray credits Colonel Feldman for the idea that the targets and timing element are the air campaign, which integrates it into the strategic plan rather than being a separate military operation.

Pape reveal far more depth. For example, his article “Why Japan Surrendered” includes an extensive discussion of the domination of military elements in the central decision making process and their effect on delaying the Japanese surrender decision.²⁹ Central to his argument about the utility of denial strategies is a belief that until military forces in the field are defeated or their defeat appears imminent, a nation at war will not change its strategic course. That is not, however, explicitly identified as an important element in analyzing the *mechanism* of coercion. His case studies reveal significant logical development concerning why each air strategy succeeded or failed, but do not reveal any further organization of thought as to the framework. Although Maj John Pray’s interpretation of the mechanism as “a model of government action,” is a more sophisticated description, it also leaves a wide range of interpretation. In an end-of-course critique of the framework, a fellow student expressed it this way: “Just insisting that the theorist/planner explain his mechanism is not enough. The framework should, without becoming too rigid, ask for a minimum set of internal elements of the mechanism . . .”³⁰ Without these internal elements, a crucial element to the construct becomes a rather nebulous concept.³¹

Outcomes. A key weakness of the Pape framework is that it uses a policy change by the target government as the only desired political outcome of coercive air strategy. This is

²⁹ Robert Pape, “Why Japan Surrendered,” *International Security*, Vol. 18, No. 2, (Fall 1993), 154-201.

³⁰ Chris Daehnick, SAAS 610 test question, 2.

³¹ Some might scoff and say that the model is intuitively obvious. However, as Colonels Mendel and Tooke say, in regard to strategic linking issues such as center of gravity analysis, “students and practitioners often find themselves guided by little more than intuition. While intuition certainly has its place, a modicum of logic should guide our thinking about important relationships between the fundamental concepts of operational art and the application of the military element of power for strategic purposes.” William W. Mendel and Lamar Tooke, “Operational Logic: Selecting the Center of Gravity,” *Military Review*, Vol. LXXIII, No. 6, (June 1993) 3.

convenient for the conclusion he draws, that only air strategies that use a *denial* mechanism, that is, one that denies the enemy's military strategy, have utility. Airpower may also be used—strategically—in situations where coercion of the target may not be the overriding goal. High-stakes coercion may define some important contexts for the strategic use of airpower, but not all. When seen in a broader, more comprehensive policy environment, there are air strategies that had minimal coercive effect, yet had tremendous utility within a campaign or in the accomplishment of policy writ large. Perhaps air strategists should take into account categories of outcomes other than coercion of the target. Are there other actors in the international environment that are affected by strategic air action, and do they matter?

There is an orientation problem with the model as well. The left-to-right orientation is important to the way issues are considered and to the purpose of the framework. Col John Warden, architect of the Desert Storm air campaign, says, “We cannot think strategically if we start our thought process with individual aircraft, sorties, or weapons—or even with the enemy's entire military forces.”³² Consequently, the ACSC Air Campaign Process puts strategic objectives on the left and airpower application on the right to force the student to think from the general to the specific. On the other hand, Lt Col Pete Faber, one of the faculty members captivated by the Pape framework, asks the air strategist to consider timing and targets before considering the mechanism, and the last step is determining the political outcome desired.³³ The Pape framework is ordered in such a way that the analyst considers the most important element last, which seems intuitively backward.

³² John Warden, “The Enemy as a System” *Airpower Journal*, Vol. IX, No. 1, Spring 1995, 42.

³³ Pete Faber, “Air Power Theory,” 12-19.

Many commentators ask the strategist to consider the enemy strategy in their calculations, and the framework does not address this. Clausewitz said,

To discover how much of our resources must be mobilized for war, we must first examine our own political aim and that of the enemy. We must gauge the strength and situation of the opposing state. We must gauge the character and abilities of its government and people and do the same in regard to our own. Finally, we must evaluate the political sympathies of other states and the effect the war may have on them.³⁴

By ignoring the adversary, other than his *response* to airpower, Pape's framework leaves out an essential element of war theory.

Pape also assumes air superiority is only a precondition of coercive air strategies and dismisses its inclusion in them. In fact, air superiority could be the singular airpower action that achieves the desired strategic result. Pape uses the Battle of Britain as an example of how "Air superiority is not a separate coercive air strategy, but rather a preliminary requirement of all such strategies."³⁵ This is taking the German perspective. For them, obtaining air superiority was an operational step in a broader coercive campaign. From a British strategic point of view, the political object was to maintain freedom of action by maintaining conditions that would deter a German cross-channel invasion. The achievement of air superiority *over England and the English Channel* was the military goal that would lead to that outcome. The German decision to abandon the invasion of England was a significant political outcome that resulted in large measure from the British coercive air superiority campaign.³⁶ Although it is important to consider the role of air

³⁴ Carl von Clausewitz, *On War*, ed., trans., Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1976) Book Eight, Chapter Three, 586.

³⁵ Robert Pape, "Coercive Air Power," 5, 6.

³⁶ See Derek Wood and Derek Dempster, *The Narrow Margin*, rpt., 3rd ed.(1961; Washington, DC: Smithsonian Institution Press, 1990. See also, John Terraine, *A Time for*

action in an overall strategy, it seems shortsighted to dismiss the British action as somehow less than strategic when it almost single-handedly achieved a pivotal political objective. The critical distinction here is that if one wants to investigate *air* strategies, then one has to evaluate the net contribution airpower makes to political outcomes.

In summary, the Pape framework has great potential for the study and analysis of air strategists and air strategies. Its shortcomings are mainly in the exclusion or glossing over of several important factors, the inclusion of which would more completely define the air strategy creation and application environments. A closer examination of the records not only of what air strategists say, but also how air strategies operate in the real world might allow for the creation of a more useful airpower strategy analysis tool.

The Air Strategy Analysis Framework

In response to the shortcomings and omissions of the Pape framework, this paper proposes an expanded and refined framework that includes the explicit and implicit models used by air strategists and those elements disclosed by the application of air strategies. This framework is depicted in Figure 4 below.

Courage: The Royal Air Force in the European War, 1939-1945, (New York: Macmillan Publishing Co., 1985) 169-222.

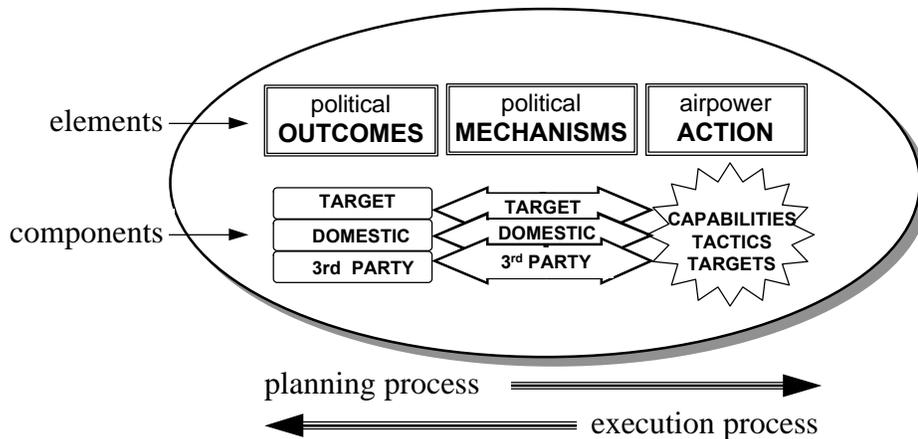


Figure 4: The Air Strategy Analysis Framework

This framework can be used as an educational tool to train the future strategist and to emphasize the primacy of the political objective. For that reason, it is re-oriented so that the planning perspective dominates in the left to right orientation, as in the ACSC Air Campaign Process. This also follows the structure of the influential “Strategies to Tasks” analysis tool popularized by General Glenn Kent.³⁷ “Thinking strategically,” as Colonel Warden advocates, will hopefully be the result.³⁸

Another requirement for the framework was that it be value-neutral. It strives not to drive the analyst toward any particular conclusion about the object, the linkage, or the means of air strategy. It accomplishes this by offering a modular construction into which can be placed all

³⁷ See Glenn A. Kent, “A Framework for Defense Planning,” (Santa Monica: RAND Corporation, 1989, especially Figure #3: Linking strategies to tasks on page 19, and Figure #6: Critical functions for employment of air power in theater war, page 23 and accompanying descriptions. See also, David E. Thaler, “Strategies to Tasks: A Framework for Linking Means and Ends,” (Santa Monica: RAND Corporation, 1993) for valuable frameworks for understanding finer levels of detail with regard to the airpower *Action* element of the Air Strategy Analysis Framework outlined in this paper.

³⁸ John A. Warden, III, “The Enemy as a System,” *Airpower Journal*, Vol. IX, No. 1 (Spring 1995) 42.

manner of assumptions concerning any of the elements or components. For instance, the strategist in question may have made a particular capability assumption that was critical to the strategy. Regardless of the assumption, it falls under military *Action*. It should be noted that the specific components of each *Mechanism* are not shown in Figure 4. Chapter 4, which discusses the *Mechanism* in detail, includes a graphic representation of the expanded version (also shown in Figure 5, below).

Reacting to the narrow applicability of the Pape framework, this model strives to encompass a broader array of possible air strategies, even those that do not involve the application of deadly force. Throughout this work, an attempt is made to use terms and definitions that encompass all air strategies, including those such as that carried out in the Berlin Airlift or other less extreme circumstances. The term “targets,” for instance, can be more broadly defined to encompass sortie rates or tons of coal per day.

There is an interactive nature to the framework represented in Figure 4. In his book on the Royal Air Force in World War II, John Terraine said, “Modern warfare resembles a spider’s web: everything connects, longitudinally or laterally, to everything else; there are no ‘independent strategies,’ no watertight compartments, nor can there be.”³⁹ The three major elements are entwined and are not “watertight compartments.” It is consciously designed to represent a spectrum from political, on the left, to military, on the right, although military and political actors interact within the model. As with any model, it cannot fully represent the complexity of real life, yet the proposed framework strives for a higher degree of integration and modeling of complexity than its antecedents.

³⁹ Terraine, *A Time for Courage*, 515.

Because the Air Strategy Analysis Framework can be used both forward and backward, that is, from the planning or execution perspective, there is either a deductive or inductive quality to it. A generic example illustrates the two-way perspective. An air strategist may (looking from right to left) start with the desired domestic political outcomes.⁴⁰ At this point, those outcomes are only theoretical constructs, or objectives, and are considered in the light of perceived *target* as well as applicable *third party* (for example, allies') political objectives. As Colin Gray simply states, "Policy motives are always mixed,"⁴¹ and that is the guiding principle here. The desired outcomes are projected through their respective *Mechanisms* to arrive at a specific plan of air action. That plan can then be assessed with respect to the upside and downside risks of execution by making a "right-to-left" assessment, most easily described as the chronological execution of strategy, which considers airpower's effects as they work through all the various *Mechanisms* and arrive at related *Outcomes*.

The expansion of the outcomes section, considered by the author to be the most important addition to the Pape framework, requires a three-part mechanism as well. Having three mechanism components asks the analyst to consider the domestic, target, and third party aspects of a strategy so that thinking one dimensionally (usually with regard to the target) is avoided. This paper will describe an example of a recent air strategy to illuminate the utility of this concept (see Chapter 3). Although the unique policy environment of any particular situation will demand

⁴⁰ This language is used explicitly. Domestic *policy* is rarely delineated in times of crisis with any precision, therefore it is often incumbent on the air strategist to divine the desired outcomes from an assessment of the political situation.

⁴¹ Colin S. Gray, *War, Peace, and Victory: Strategy and Statecraft for the Next Century*, (New York: Simon and Schuster, 1990) 16.

different weights be given to each of the three outcome categories, their existence allows consideration of the complex political contexts in which air strategies are carried out.

Additionally, the *Outcomes* element is more broadly and generically defined as encompassing *any* significant political outcome. Coercion of a target nation to make a policy change in our favor as the single goal of air strategy is limiting, and the original Pape framework was not built to consider more complex situations. Many theorists describe *Outcomes* in different ways. One more highly developed theory concerning the scope of military strategies was developed by Lt Col Pat Pentland. Thomas Schelling’s “deterrent” and “compellent” strategies are well defined, but also neglect the broad range of possible air strategies. Colonel Pentland adds an “enabling” strategy that encompasses peacekeeping, military assistance, and other more diplomatic means that attempt to provide “dynamic stability” where it is lacking.⁴² The framework allows the analyst to insert whatever theory the strategist might use.

Next, the mechanism is expanded to explicitly include elements hidden in Figure 4 that are depicted in Figure 5, below. As already emphasized, the mechanism is a substantive focus of the Pape framework, and has proven to be of noteworthy interest to SAAS students. The unpacking of this expansive conceptual element is a tall order. Only by examining the explicit and implicit models proposed by strategists can one hope to accomplish

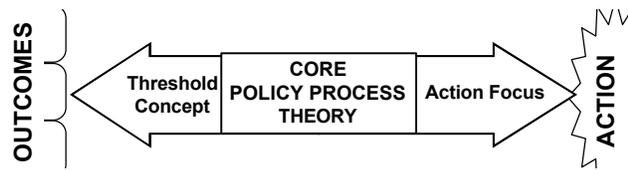


Figure 5: The Mechanism

⁴² Instead of Schelling’s terms “deterrence” and “compellence,” Colonel Pentland uses “Disabling,” “Delaying,” and “Enabling.” Schelling still provides the most useful terms and definitions, but the addition of “enabling” as a strategy rounds out a fairly comprehensive trio of strategies. Pat Pentland, “Operational Centers of Gravity,” briefing slides, (1995) 33.

this task. In Chapter 4, this paper analyzes three air strategists, Giulio Douhet, the planners of AWPD-1, and Col John Warden, using this enhanced *Mechanism*.

Finally, the nomenclature of Pape's Targets and Timing element is changed to airpower *Action* to broaden its utility. This terminology embraces non-lethal means and elucidates the process of determining *what* and *how* aerial vehicles are employed for strategic ends. Despite Major Pray's and Colonel Feldman's conclusion that this element comprises the air tasking order,⁴³ that definition only applies to those cases where a large-scale effort is undertaken. The inclusion of a *capability* section is of particular importance. Under this title, the analyst can include the determinants of airpower application—what the ACSC Air Campaign Process calls “operational art elements”—that most strategists explicitly consider. These include, among others, the constraints and restraints of policy, weather, the enemy, friction, and time. Whether working with existing systems or air vehicles on paper, strategists all consider the actual or anticipated capability to accomplish whatever missions they envision in their strategies.

This thumbnail sketch of the Air Strategy Analysis Framework is a point of departure for the in-depth analysis of each element that follows. Each of the three major elements will be discussed in turn, then the concluding chapter will summarize and discuss the implications of this framework as a tool for educating air strategists.

⁴³ Pray, “Coercive Air Strategy,” 18.

CHAPTER 3: THREE *OUTCOMES*

More than most other forms of military power, politicians find air power easy to manipulate, to employ or withhold, in the hope of achieving nicely measured political effects.

—Eliot A. Cohen, “The Meaning and Future of Air Power”

This chapter attempts to build on the Pape framework by providing a broader and more inclusive vision of what airpower analysts should investigate as the “ends” of strategy. Because strategic outcomes are so important, there is a natural tendency towards fixation on target outcomes, especially coercive ones, given the importance of this task in dire situations. This narrow focus limits the strategic viewpoint. Pape’s original framework contains this limiting feature for a functional reason, because he was investigating scenarios in which high-stakes coercion was the dominant focus of air strategy. As he said, “most coercion occurs in wartime. Coercion is therefore about hard cases.”⁴⁴ To attain more broad applicability, the Air Strategy Analysis Framework expands the *Outcomes* element into three components for analytical consideration (Figure 6).



Figure 6: Political *Outcomes*

Target, *domestic*, and *third party* are the three policy outcome categories the air strategist should consider, and are the categories that the airpower analyst should investigate.

A classic case where target political outcomes could hardly have been the primary policy goal was the Doolittle Raid on Tokyo in April 1942. Only sixteen B-25 medium bombers could

⁴⁴ Robert Pape, “Explaining Military Coercion,” unpublished chapter, *Bombing to Win*, (Ithaca, NY: Cornell University Press, forthcoming) 12.

take off from the carrier *Hornet*, which meant the damage at the target would be minimal. According to historian Michael Sherry, motivations for the attack stemmed from: “Roosevelt’s desire to strike a blow at Japanese morale, at the frustrations and fears of the American public, and the wavering Chinese commitment to carry on their war.”⁴⁵ Most accounts put significant emphasis on the domestic political effects. Carroll Glines, author of *Doolittle s Tokyo Raiders*, said, “The raid on Japan marked the end of five lean months when the American public had been starved for news of a single out-right offensive blow against the enemy in the Pacific.”⁴⁶ He goes on to describe the unintended boost to public resolve that occurred after reports that the Japanese had executed some of the captured airmen: “What had been merely an incident suddenly became a symbol.”⁴⁷ Domestic indignation over the executions was so virulent that they threatened public support for Roosevelt’s primary grand strategic focus on Germany.⁴⁸ If one is studying either the motivations of the planners or the political outcomes of the air action, the Doolittle Raid is one case where a focus on target outcomes masks important elements of the strategy.

Another case that highlights the analytical shortcomings of a singular focus on coercing the target actor is the Rolling Thunder air campaign against North Vietnam from March 1965 through December 1968. The administration of President Johnson implemented an aerial bombing strategy with the twin goals of coercing North Vietnam into participating in peace talks and halting their support of Viet Cong guerrillas in South Vietnam. Pape argues that the air

⁴⁵ Michael Sherry, *The Rise of American Air Power* (New Haven, CT: Yale University Press, 1987) 122-123.

⁴⁶ Carroll V. Glines, *Doolittle s Tokyo Raiders* (1964 rpt., Salem, NH: Ayer Co., 1987) 314.

⁴⁷ *Ibid.*

⁴⁸ Sherry, *The Rise of American Air Power*, 124.

strategy failed because “North Vietnam was largely immune to conventional coercion.”⁴⁹ His analysis passes over the influence of domestic political constraints (as he admits⁵⁰) and only tangentially mentions the coercive possibilities of a sharper, more destructive strategy. His coercive utility perspective fails to include all the reasons why administration officials chose the gradualist approach. Coercive plausibility was a factor, but the decision was significantly influenced by fear of Chinese and Soviet reactions, as well as fear of adverse domestic reaction within the context of imminent presidential elections.⁵¹ These important domestic and third party considerations are keys to understanding the Rolling Thunder planning environment.

As these cases suggest, outcomes can be intended or unintended, desired or undesirable. Airpower action can also influence political outcomes on many fronts. For that reason, a strategic air plan should be seen in the light of all important categories of outcomes. This chapter outlines the basic logic and structure of this framework element by highlighting Operation El Dorado Canyon, the U.S. airstrike against Libya in April 1986, to illustrate the tripartite element of policy outcomes.

⁴⁹ Robert Pape, “Coercive Air Power in Vietnam,” *International Security* Vol. 15, No. 2, (Fall 1990) 130.

⁵⁰ He admits that his analysis has limits. In a footnote within a journal article, he writes, “While my [denial] theory seeks to establish a number of general propositions that hold across space and time, it has limits: non-military variables, such as domestic political, organizational, and psychological factors, can also affect outcomes. I hold these considerations constant in order to study the specifically military elements of coercion.” *Ibid.*, 108, footnote 15. In a later work, he notes “This campaign failed because the political constraints on the Johnson administration ruled out indiscriminate counter-civilian attacks . . .” Robert Pape, “Coercive Air Power,” unpublished chapter, *Bombing to Win*, (Ithaca, NY: Cornell University Press, forthcoming) 22.

⁵¹ “The goals of avoiding Soviet or Chinese intervention, preserving the Great Society, securing a favorable American image overseas, and maintaining the support of Western allies caused him to keep a tight rein of Rolling Thunder.” Mark Clodfelter, *The Limits of Air Power* (New York: The Free Press, 1989) 118. For an in-depth discussion of these issues, see pages 118-146 and the previous two chapters, pages 39-115.

Outcomes Defined

An *Outcome* is a change in the nature or behavior of an actor's political system generated by airpower action. The *Outcome* could manifest itself as either explicit policy directives or systemically. Examples of systemic outcomes would be public opinion shifts or changes in the economy.⁵² A *target Outcome* is a change in the target actor's political system. The "target" in this sense is the political entity against which or for whom the airpower action is taken. It is normally the explicit focus of the strategy and most often is the physical focus as well.⁵³ Related to that idea are the *domestic Outcomes*, which are changes within the political system of the actor who applies the airpower. The remaining set of strategic entities is encompassed by the term *third parties*. A *third party Outcome* is a change in a peripheral actor's political behavior or landscape generated by airpower action. Examples of third parties include allies, potential enemies, or international non-governmental organizations such as the United Nations—anyone other than the sender or principal target of the strategy.

⁵² A theoretical example of a systemic economic outcome would be how an aerial influx of food into a starving region could actually depress farming and create outside dependency that works to the long-range detriment of a country's stability. No policy may be evident, but the system was affected.

⁵³ The reader is cautioned about the multiple meanings of the word "target." Not only can there be confusion with the tactical object (e.g., aimpoint), but there can be semantic confusion within the *Outcomes* section itself. Hypothetically, one could take air action against a nation and the primary focus could be domestic outcomes (some might argue the Doolittle Raid on Tokyo in April 1942 is an example). In that case, the target entity is defined as the physical object of the attack. The term was used because, in the vast majority of cases, physical object and policy focus are the same. As a corollary, the author believes that in the majority of cases, target outcomes predominate as the focus of policy because they have the most leveraged feed-through to other (domestic and third party) desired outcomes. The model is designed to leave those subjective determinations, which are context-dependent, up to the analyst, however.

Structure and Logic of the *Outcomes* Element

The choice of three *Outcomes* is a way of categorizing all the political possibilities. They are joined (horizontally) to their respective *Mechanisms*.⁵⁴ In other words, the political repercussions of airpower application in each political entity will pass through a particular set of mechanisms to produce *Outcomes*. They also communicate “vertically” in the sense that an effect in one entity can influence strategic effects in another. Although this idea is applicable across airpower history, this vertical communication is enhanced by modern information media and is an important factor in assessing strategic impacts in modern political entities.

As mentioned previously, *Outcomes* may vary temporally. For simplicity, the analyst might categorize them as short-term and long-term. One example of this method of analysis is offered by Barry Blechman and Stephen Kaplan, who, in analyzing coercive uses of U.S. military force short of war since World War II say, “The consideration of only short-term outcomes would be misleading insofar as some are likely to be ephemeral. The longer term perspective allows a

⁵⁴ Representative of some characterizations of the vertical communication within the framework is Dennis Drew’s and Donald Snow’s *From Lexington to Desert Storm: War and Politics in the American Experience*. They outline four criteria for a “good” political objective, defined as one the American people will support: “The four criteria are: the objective must be simple, straightforward, and unambiguous; it must be morally and politically lofty; it must be overwhelmingly important; and it must be seen to be in the best interest of most Americans.” If one applies those same criteria to the debate of any major Congressional act, for example, they still apply. This points to the common misperception that *preparation* of public opinion in support of military action, which is a consistent focus of some writings on war, is not really to the point. Focusing opinion is a *means* to the achievement of domestic political ends, which enables greater freedom of action on the target actor, which can lead to more success, which leads back to domestic political success and often to positive outcomes within third party policy processes. Dennis M. Drew and Donald M. Snow, *From Lexington to Desert Storm: War and Politics in the American Experience* (New York: M. E. Sharpe, Inc., 1994), 332.

consideration of “durability.”⁵⁵ The airpower framework does not define short or long-term outcomes, it merely asks the analyst to consider that they may be qualitatively different and that both types could be of material interest.

Analysis: Operation El Dorado Canyon

In 1986, after years of escalating international terrorism and growing evidence that these acts were sponsored by several nations, the administration of President Ronald Reagan decided to take strong military action. Its focus was Libya due to the public pronouncements of its leader, Colonel Muammar Qadhafi, and the direct evidence of Libyan complicity in attacks against U.S. citizens abroad.⁵⁶ Several preliminary incidents of international terrorism that were sponsored or publicly encouraged by the Libyan leader occurred during the early 1980s. But the vicious, random attack on civilians at the Rome and Vienna airports on December 27, 1985, that resulted in the death of an eleven year old American girl were traced directly to Libya, and it “galvanized Reagan into action against Libya.”⁵⁷ Tensions built as a result of escalating diplomatic, economic,

⁵⁵ Barry M. Blechman and Stephen S. Kaplan, *Force Without War: U.S. Armed Forces as a Political Instrument* (Washington, DC: The Brookings Institution, 1978), 68. See also, Stephen S. Kaplan, *Diplomacy of Power: Soviet Armed Forces as a Political Instrument* (Washington, DC: The Brookings Institution, 1981) which includes a similar analysis of the Soviet uses of military since World War II.

⁵⁶ To get a representation of the popular exposure of this situation within the American media, the U.S. military responses, and the degree of public outcry elicited by Iraqi-sponsored terrorist acts, see: William E. Smith, “An Eye for an Eye,” *Time*, 13 January 1986: 26-31. John Moody, “Keeping Fear at Bay,” *Time*, 13 January 1986: 28. Ed Magnuson, “To the Shores of Tripoli,” *Time*, 31 March 1986: 26. Evan Thomas, “Week of the Big Stick,” *Time*, 7 April 1986: 14, 15. Richard Stengel, “Sailing in Harm’s Way,” *Time*, 7 April 1986: 16-24. George L. Church, “Targeting Gaddafi,” *Time*, 21 April 1986: 18-27. Richard Stengel, “Gaddafi: Obsessed by a Ruthless, Messianic Mission,” *Time*, 21 April 1986: 28, 29.

⁵⁷ Tim Zimmerman, “Coercive Diplomacy and Libya,” *The Limits of Coercive Diplomacy* ed. Alexander George and William Simons (Boulder, CO: Westview Press, 1994) 202. A good review of the evidence trail in this case is given in two sources, David C. Martin and John

and military measures, yet no firm results were forthcoming. The day after the LaBelle disco in Berlin was bombed by Libyan-sponsored terrorists on April 5, 1986, killing two Americans, President Reagan authorized a single airstrike against targets in Tripoli and Benghazi, codenamed Operation El Dorado Canyon.⁵⁸

On April 14, 1986,⁵⁹ 28 tanker aircraft and 24 F-111F Aardvarks with their complement of five EF-111 Raven radar-jamming escorts winged their way toward a time-over-target coinciding with an aerial strike force from the aircraft carriers *Coral Sea* and *America*.⁶⁰ Synchronization with tankers along the five thousand nautical mile round trip, the jamming and attack of Libyan air defenses, and takeoff from the carriers were all designed to achieve simultaneity and surprise. Targets were selected either because they had plausible connection to terrorist training, because attacks on them would send a message directly to Qadhafi (his central

Walcott, *The Best Laid Plans: The Inside Story of America's War Against Terrorism* (New York: Harper & Row, 1988) 267, 268 in which they detail Syrian complicity; and Brian L. Davis, *Qaddafi, Terrorism, and the Origins of the U.S. Attack on Libya* (New York: Praeger, 1990) 78-80. Davis noted that this terrorist act was the first to prompt Chairman of the Joint Chiefs of Staff, Admiral Crowe, to plan an air attack against known Abu Nidal hideouts and training bases in Libya. (81)

⁵⁸ The LaBelle disco was a popular hangout for American soldiers stationed in Berlin. Intercepted diplomatic communications from Libya to East Berlin were the “smoking gun” that persuaded Reagan to escalate to the use of an airstrike. Tim Zimmerman, “Coercive Diplomacy and Libya,” 213.

⁵⁹ Coincidentally, the date of the Libyan attack came only four days before the anniversary of a strikingly similar attack on Tokyo by Doolittle’s Raiders on April 18, 1942.

⁶⁰ The naval strike force consisted of over seventy planes of the following types: F-14A, F/A-18, A-6E, A-7E, E-2C, EA-6B. Navy bombers were tasked to strike targets in Benghazi, while the Air Force’s targets were in Tripoli. The most detailed, personal account of the actual strike is found in Martin and Walcott, *Best Laid Plans*, 301-310. See also, Davis, *Qaddafi, Terrorism, U.S. Attack*, 133-139.

command post, Azziziyah, was specifically targeted), or to suppress enemy air defenses.⁶¹ All five target sets were damaged, but one F-111 crashed, killing both crewmen.⁶²

This attack was conducted within the context of the Reagan administration's campaign against international terrorism. The declared political objective of the American attack on targets in Libya was for Qadhafi to end his support for and stimulation of terrorist activities against American and allied citizens abroad.⁶³

El Dorado Canyon Target Outcomes

There is evidence that the bombing caused a reduction of terrorist actions that can be directly attributed to Libya's reaction to the strike.⁶⁴ Terrorist incidents dropped off, but did not cease, over the following weeks and months. Brian Davis, author of *Qaddafi, Terrorism, and the Origins of the U.S. Attack on Libya*, said, "Unexpectedly, Western countries and their citizens

⁶¹ Martin and Walcott, *Best Laid Plans*, 286-288. This was to create a direct link in the target's mind between his behavior and the attack. There were five target complexes selected:

1. Azziziyah--the Qadhafi presidential compound
2. Jamahariyah--Qadhafi's alternate command post in Benghazi
3. The military side of Tripoli airport
4. Tripoli frogman school
5. Benghazi military airfield

⁶² "Initial reports of damage to the targets seemed unimpressive, and some officials advocated a second attack. However, later photographs from British-based SR-71 reconnaissance aircraft were not so impeded by cloud cover as earlier photographs, and it was seen that all five targets had in fact been severely damaged." Davis, *Qaddafi, Terrorism, U.S. Attack*, 139.

⁶³ Admiral Crowe stated, "there was strong sentiment for psychological purposes that we should do something in his personal compound and get his communications center and his headquarters." President Reagan personally ordered the presidential compound be attacked. Martin and Walcott, *Best Laid Plans*, 287, 288.

⁶⁴ Zimmerman, "Coercive Diplomacy and Libya," 222.

enjoyed a quiet summer on the terrorism front . . .”⁶⁵ U.S. public opinion and support for the Reagan administration was extremely strong (see below). The long-term picture, however, is not as clear. In December 1988, Pan Am Flight 103 was the victim of an apparent reprisal attack for the Libya attack when it was destroyed over Scotland by a bomb. Hundreds of mostly Western passengers were killed. The Libyan connection to that bombing is still in dispute, but United Nations sanctions are currently in place against Libya to demand extradition of Libyan nationals implicated in it. Long-term conclusions can only be speculative; and although there is general agreement that Libyan-sponsored terrorism was not eliminated, it never again reached the level of activity seen before Operation El Dorado Canyon.⁶⁶

Domestic Outcomes

El Dorado Canyon also had important domestic political effects. How important are domestic policy outcomes? They can enhance coercive effects on the target, which is often the primary goal. International relations experts Alexander George and William Simons list eight elements that can be used to forecast the utility (on the target) of a coercive strategy. No less than five of the eight elements point to domestic motivations and outcomes, and one is specifically called “*Adequate Domestic and International Support.*”⁶⁷ In a summary of case studies that

⁶⁵ Davis, *Qaddafi, Terrorism, U.S. Attack*, 162. The issue of whether Qadhafi’s terrorist support was hamstrung or just went underground is the cause of much speculation. All the commentators agree, however, that terrorist incidents diminished in the short term. Davis speculates about another effect on Qadhafi, that of his internal political problems. “Qaddafi was at the weakest and most vulnerable point yet in his seventeen-year rule.” (145)

⁶⁶ Zimmerman noted that long term sponsorship of terrorism by Libya is still a problem, but nowhere near the level prior to the attack. Tim Zimmerman, “Coercive Diplomacy and Libya,” 219.

⁶⁷ The factors are, Clarity of Objective, Asymmetry of Motivation, Sense of Urgency, Strong Leadership, Adequate Domestic and International Support, Unacceptability of Threatened

included Operation El Dorado Canyon, they commented that Reagan enjoyed “considerable public backing” after the attack, and that this increased the pressure for Qadhafi to comply.⁶⁸

Support from the domestic political system is recognized as one of the most important factors in any military campaign. Although the military commander may cringe at any operational or tactical infringement by civilians, the air planner not only has to be able to react to domestic political constraints on strategy, but must also plan with domestic effects in mind. The politicians influencing airpower application will assuredly not miss that point. This includes gauging the degree to which the campaign reflects the will of the people and their elected representatives.⁶⁹ In the United States, and increasingly in the world, the media is a powerful force for this very reason, and must not be dismissed as some sort of external irritant. In most cases it is central to the overall success of the campaign.

Domestic effects can hinder or help the domestic political legitimacy of the current government. The Libyan raid is a good example of the use of military force for domestic political signaling. Throughout its tenure, the Reagan Administration dealt with a very disturbing increase in international terrorism that threatened the security of Americans abroad. Reagan was feeling the pulse of the people, for there were numerous expressions of rage and open cries for

Escalation, and Clarity Concerning the Precise Terms of Settlement of the Crisis. Alexander L. George and William E. Simons, “Findings and Conclusions,” *The Limits of Coercive Diplomacy*, 280-286.

⁶⁸ *Ibid.*, 284.

⁶⁹ This assertion contains an interesting alternative question. That is, to what degree are totalitarian regimes driven by this planning factor? There is strong evidence that, regardless of the regime, the maintenance of control over the lifestyle of the people is a central focus of political power. In this sense, both democratic governments and totalitarian regimes share a perspective that gives them cause for keeping an eye on the people. In fact, the truism that both democratic and totalitarian governments use military adventurism to consolidate popular support (often to

retribution in the popular press.⁷⁰ Once the decision to conduct the air attack was made, the “only debate within the administration at this point was over what targets to hit to maximize the coercive impact of the raid while minimizing political fallout.”⁷¹

Public opinion polls gave an extremely high approval rating for the attack, and Reagan’s popularity reached the peak for his Presidency at over 70%.⁷² An illuminating poll also disclosed that 68% of Americans believed that the bombing should have been conducted even if the raid was proven to be an *ineffective* deterrent to terrorism.⁷³ This served to strengthen administration anti-terrorism policies, and had material effect on other important political actors. Despite the unusual consensus on the attack in the near term, the long term mood was moderated by the attack itself and the positive immediate results.⁷⁴

distract them from poor domestic economic conditions) lends some inferential evidence to this thesis.

⁷⁰ Smith, “An Eye for an Eye,” 26.

⁷¹ Zimmerman, “Coercive Diplomacy and Libya,” 213.

⁷² “A *Newsweek* Poll conducted by the Gallup Organization found 71% of Americans approving of the April 14, 1986, U.S. raid on Libya, with 21% disapproving.” George Gallup, Jr., *The Gallup Poll: Public Opinion 1986*, (Wilmington, DE: Scholarly Resources, Inc., 1987) 87.

⁷³ Gallup, *The Gallup Poll 1986*, 87. Also, the unity of this sentiment is remarkable. Regardless of sex, educational level, or political persuasion, majorities adhered to the consensus view, the lowest being Democrats, the opposition party, at 60% approval regardless of effect on terrorism.

⁷⁴ Tim Zimmerman says, “By the end of 1986, however, the domestic political context, from which any coercive policy ultimately must draw its strength, had altered drastically. The American public’s fervent desire to strike back at terrorism had been relieved to some extent by the April 14 raid . . .” Zimmerman, “Coercive Diplomacy and Libya,” 221.

Third Party Outcomes

There are numerous commentators on the subject of third party actors in the strategic equation, and no less than Carl von Clausewitz provides a perspective from *On War*: “Next, we must be certain our political position is so secure that this success will not bring further enemies against us who could force us immediately to abandon our efforts against our first opponent.”⁷⁵ He was not one for Pyrrhic victories, thus the importance of considering the political landscape external to the sender and target actors. J. F. C. Fuller adds this somewhat more contemporary perspective:

Whatever influences a great democratic nation influences the whole democratic world, mentally, morally, and physically. We no longer live in the period of isolated national shocks, but of ceaseless international repercussions. Thus, we find that domestic policy must, in its turn, be correlated with the policies of all other nations—hostile, neutral, and friendly—and that out of this grand correlation springs foreign policy.⁷⁶

The application of force sends signals to several categories of third party actors. In the case of Libya, the two important ones were North Atlantic Treaty Organization (NATO) allies and other Middle Eastern nations.

Allies. There were severe problems getting NATO allies to join the U.S. in employing diplomatic and economic sanctions against Libya prior to April 14. European nations were concerned that military actions would drive more moderate Arab leaders to Qadhafi’s side.⁷⁷ Administration officials dearly wanted allied support for the whole anti-terrorism effort, and this is

⁷⁵ Carl von Clausewitz, *On War*, ed., trans., Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1976) Book Eight, Chapter Four, 597.

⁷⁶ J. F. C. Fuller, *The Foundations of the Science of War* (London: Hutchinson and Co. Ltd, 1926.) 74.

⁷⁷ Church, “Targeting Gaddafi,” 18-27.

part of the reason they adopted a more incremental approach to combating terrorism.⁷⁸ Some European governments did take minor diplomatic measures before the attack in an effort to stave it off, but in the main, the U.S.'s European allies were intransigent.⁷⁹ Because of this policy environment, target selection and tactics to minimize collateral damage had allied reactions in mind.⁸⁰ All targets had direct terrorist links, as testified to by General Richard Lawson, the Deputy Commander-in-Chief, European Command: "Anything else would have been too damn difficult to explain to the international community."⁸¹

In the aftermath of the strike, things got ugly in the international press. Brian Davis noted that the international media response was "overwhelmingly negative."⁸² However, the attack "galvanized the U.S. European allies into adopting the sorts of political and economic sanctions vis-à-vis Libya that the administration had been calling for all along."⁸³ Despite the unfavorable

⁷⁸ Zimmerman, "Coercive Diplomacy and Libya," 206. It would take time for diplomatic maneuvering to achieve unity, and this delayed military action. Interestingly, the Thatcher decision to allow F-111s and tankers to fly from British bases was a harrowing domestic political decision, which brings the complexity of policy outcomes a new twist. She eventually consented due to personal intervention by Reagan and because of her own third party concerns that unilateral U.S. military actions would damage the NATO alliance and the U.S. ground troop commitment on the continent. Davis, *Qaddafi, Terrorism, U.S. Attack*, 125.

⁷⁹ "Amazingly, the European foreign ministers expected these long-overdue half measures to mollify Washington sufficiently to prevent an attack." Davis, *Qaddafi, Terrorism, U.S. Attack*, 127.

⁸⁰ George and Simons say that military operations leading to the airstrike "were intended for European as well as Libyan observation." Simons and George, "Findings and Conclusions," 285.

⁸¹ Martin and Walcott, *Best Laid Plans*, 286.

⁸² Davis, *Qaddafi, Terrorism, U.S. Attack*, 145, 146. Also, Gallup polls showed high levels of disapproval in Great Britain (66%) and Germany (75%), while in France, whose Socialist government refused to allow F-111 overflight, there was a 61% *approval* rating for the strike. Gallup, *The Gallup Poll 1986*, 87.

⁸³ Tim Zimmerman lists mainly stringent diplomatic measures among which include West Germany removing their ambassador from Tripoli and the cutting of Libyan oil imports by major

public opinion, European governments voted with their policies, which almost overnight were aligned with U.S. measures. These policies remained in force far beyond the immediate aftermath of the attack.

Regional. Washington also had Middle East regional powers in mind when fashioning the policies that led to the April strike. Secretary of State George Shultz argued, “If we are to be a factor in the region—if we want countries to take risks for peace relying on our support—then we had better show that our power is an effective counterweight to extremism.”⁸⁴ Some concrete outcomes did occur that hinted at support. The day after the attack, King Hussein of Jordan visited Britain and Jordanian university students protesting the raid were expelled.⁸⁵ Another objective was to send a clear message to other rogue nations in the region. One expert acknowledged this objective, saying, “Officials recognized that Qadhafi was not the whole problem but felt that punishing him could help discourage terrorism by others, including his allies, Syria and Iran.”⁸⁶ Those two nations could not help notice that polling showed 64% of the American people favored follow-on retaliatory bombing raids against Syria or Iran.⁸⁷ This caused

European powers. There were also formal law enforcement measures that increased collective capability versus terrorism. Zimmerman, “Coercive Diplomacy and Libya,” 216.

⁸⁴ Zimmerman, “Coercive Diplomacy and Libya,” 202.

⁸⁵ Iraq also asked for the removal of Libya and Syria from the Arab League. Davis, *Qaddafi, Terrorism, U.S. Attack*, 149.

⁸⁶ Davis, *Qaddafi, Terrorism, U.S. Attack*, 121. He also noted that Qadhafi’s standing within the Arab world was damaged by the attack, which in concert with the loss of a skirmish to Chad shortly thereafter, “delighted the Reagan administration as they further weakened Qaddafi’s regional position.” (168).

⁸⁷ Gallup, *The Gallup Poll 1986*, 87.

significant action within Syria, which was “greatly shaken” by the attack, and where military and air defenses were mobilized to a high and sustained level of alert.⁸⁸

Conclusions

Political *Outcomes*, the policies and systemic effects of airpower application, are the starting point for airpower strategy analysis. One should consider three types of outcomes: target, domestic, and third party. These outcomes are interactive, in that outcomes in one entity can project through the policy process of another actor and have material consequences. This is an important perspective expansion from the original Pape framework, which considered target outcomes only, and therefore could not account for strategic choices made in the Doolittle Raid or Rolling Thunder.

The short case study on Operation El Dorado Canyon was chosen to demonstrate the analytical utility the three *Outcomes* suggested in the Air Strategy Analysis Framework. It also shows that the framework is designed to deal with more than major air campaigns lasting weeks or years. A single airstrike, an airlift operation, the repositioning of space assets, or a comprehensive strategy such as the Combined Bomber Offensive in World War II may all have strategic significance, that is, they produce political outcomes. The examination of an air strategy from this perspective serves as an entrée to the next element of the framework, the *Mechanism*.

⁸⁸ Davis, *Qaddafi, Terrorism, U.S. Attack*, 167.

CHAPTER 4: THE MECHANISM

Constructing a model frequently facilitates communication among those concerned with a policy issue. Perhaps most important of all, experience with modeling helps us develop general insights that can be applied to unfamiliar situations.

—Edith Stokey and Richard Zeckhauser, *A Primer for Policy Analysis*

This chapter focuses on the central element of the Air Strategy Analysis Framework, the *Mechanism*. The point of departure is Maj John Pray’s characterization of the mechanism as a governmental decision model. It thus retains the basic thought of the Pape framework, but attempts to describe it in greater detail.

The *Mechanism* is a descriptive⁸⁹ policy process model that shows how airpower action translates into policy outcomes—the critical linkage of ends and means. In order to expand on that basis, there are two themes to this chapter. First, it is erected on the structure of the *Outcomes* element just investigated. Because the analyst should explore three sets of political outcomes, it follows that there may be at least three sets of political processes to investigate. Second, it breaks that concept down into sub-components that help the analyst zero in on key issues. The mechanism is clearly the most important element of the Pape framework, and this chapter seeks to flesh out the idea and bring it into congruence with the thoughts of air theorists and the requirements of thorough analysis.

⁸⁹ Descriptive models “describe the way the world operates.” These are as opposed to “prescriptive” models, which include “procedures for choosing among alternative actions.” This model, like the rest of the framework, strives not to drive toward a particular conclusion, but to provide a value-neutral ordering tool that illuminates the important elements and relationships in air strategy. Edith Stokey and Richard Zeckhauser, *A Primer for Policy Analysis* (New York: W. W. Norton and Co., 1978) 14.

After the structure and logic of the *Mechanism* unfolds, the writings of three major strategic airpower theorists will serve to illuminate the idea. These are Giulio Douhet, the leading post-World War I proponent of aerial bombing; the authors of Air War Plans Division-One (AWPD-1), which contained the early logic behind the American bomber offensive of World War II; and a contemporary theorist, Col John Warden, the architect of the first phase of the Desert Storm air campaign against Iraq in 1991.

General *Mechanism* Concepts

A graphical depiction of the *Mechanism* as used in the Air Strategy Analysis Framework is shown in Figure 7, below. It is comprised of a core policy process theory, or model, that

identifies the central set of assumptions the strategist uses to characterize the decision making process. Two important sub-components of this model provide the conceptual linkage to

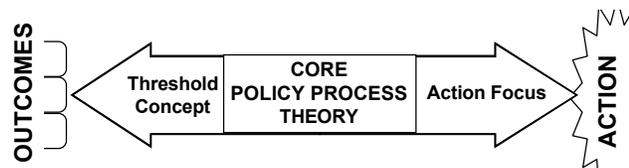


Figure 7: The *Mechanism*

the bordering elements. One is the *threshold concept*, or the assumptions and beliefs about the weight of action that will elicit a desired outcome. On the opposite side is the *action focus*, or the critical points chosen to be directly affected by airpower action. The *Mechanism* is necessarily a broad topic. Barry Blechman and Stephen Kaplan describe it this way: “The sum—clearly a complex one—of the variables influencing a target’s decision is a screen through which the armed

forces used as a political instrument, and other U.S. policy instruments, must usually penetrate in order to achieve a desired outcome.”⁹⁰

Blechman and Kaplan’s focus was on the target entity, but this chapter retains the broad structural perspective from the last chapter. A *Mechanism* theoretically exists for all political actors affected by the application of airpower. The categories for those actors are shown in Figure 8.

Not only must these different categories be investigated, they must be scrutinized from different

frames of reference to avoid mirror imaging. In a



Figure 8: The Three *Mechanisms*

war, for instance, numerous *Mechanisms* must be examined, not only from the sender’s perspective, but also from the point of view of possible enemy strategies. This is done by adopting a planning *and* an execution perspective. By moving in the framework from left (target and domestic political objectives) to right (target and enemy capabilities, tactics, and targets) and back, the strategist can integrate consideration of enemy courses of strategic action.

As this generic example suggests, the Air Strategy Analysis Framework contemplates inter-*Mechanism* relationships—the *Mechanisms* are not discrete and they interact and clash over time. This characteristic is an essential feature in the modeling of reality. All manner of communication occurs between political actors, some formal, through diplomacy, and some informal, through the media. As we have already seen, strong U.S. public support in the wake of Operation El Dorado Canyon plausibly was an added incentive for Libya and other nations such

⁹⁰ Barry M. Blechman and Stephen S. Kaplan, *Force Without War* (Washington: Brookings Institution, 1978) 69.

as Iran and Syria, to gird for a follow-on attack if they believed public opinion was influential in U.S. national decision making.

Another overarching characteristic of the *Mechanism* deserves mention: the importance of unintended consequences. Barry Watts initiated some self-examination among American airmen with his book, *The Foundations of U.S. Air Doctrine: The Problem of Friction in War*. It contains the criticism that airmen neglect the friction of war, reducing air strategy and tactics to an “exhaustingly deterministic phenomenon.”⁹¹ This charge highlights the requirement for the *Mechanism* to consider the possibility of both negative and positive consequences of air action.⁹² The foregoing discussion of Operation El Dorado Canyon described how Reagan administration officials believed bombing key targets in Tripoli and Benghazi would deter Libyan terrorist sponsorship, while European leaders felt strongly that it would only serve to increase Qadhafi’s stature within the Arab world. Although the latter did not happen, either outcome was plausible. It is important to this discussion that those projections stemmed from different expected *Mechanisms*.

Central Policy Process Theory

What are the characteristics of the political system through which the strategic force application will project, and how will that system deflect, absorb, or react to the force? This is the core of the *Mechanism*, because it contains the basic assumptions and beliefs that affect outcomes, from an execution point of view, and airpower action, from a planning point of view.

⁹¹ Barry D. Watts, *The Foundations of US Air Doctrine: The Problem of Friction in War*, Maxwell Air Force Base, AL: Air University Press, 1984, 108.

⁹² The next chapter deals with the capability assumptions air strategists make, which provides an opportunity for the analyst to consider operational uncertainty.

It is essentially a theory that explains the way certain political actors react to stimuli. As mentioned in Chapter 2, Pape considered this early in his thinking by designating an element called “who governs.”⁹³ Although dropped from subsequent formulations, that idea, broadly interpreted, is resurrected here as part of the *Mechanism*. The Air Strategy Analysis Framework’s *Mechanism* does *not* prescribe a checklist for creating a central theory, but its structure, along with specific examples later in this chapter, help bring the *Mechanism* concept into sharper relief.

A brief discussion of two basic international relations perspectives illustrates how a general policy process model can alter one’s views. One common belief is that nations make value-maximizing decisions according to rational calculations of national interests. This is associated with perspectives such as balance of power theory, and with theorists such as Kenneth Waltz.⁹⁴ For example, the idea that a state’s decision making is dominated by rational cost-benefit calculations is one modern scholars use quite often to explain war termination.⁹⁵ A competing perspective is presented by Graham Allison’s explanation of the Cuban Missile Crisis in *Essence of Decision*. He found the rational unitary actor notion inadequate for explaining many policy actions. He argues that organizational inertia and the political pulling and hauling of competing

⁹³ Pape letter, attachment dated January 27, 1995.

⁹⁴ Kenneth Waltz, *Theory of International Politics* (Reading, PA: Addison-Wesley, 1979).

⁹⁵ For a representative explanation, see Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, NY: Cornell University Press, 1984) 27-28. War termination discussions lean heavily on core policy process theories, and are thus helpful in understanding this *Mechanism* component. For an in-depth discussion of three competing war termination perspectives, see Joseph A. Engelbrecht Jr., “War Termination: Why Does a State Decide to Stop Fighting?” (PhD diss. Columbia University, 1992).

bureaucratic actors better explains policy making in some cases.⁹⁶ Although other perspectives exist, strategists' core policy theories are often based on one of these two perspectives.⁹⁷

Mechanisms can also lean heavily on political, social, economic, or cultural beliefs and assumptions. The planner may focus on governmental philosophy, social structures and interest groups, cultural factors, demographic makeup, or the economic system. For instance, the World War II U.S. Strategic Bombing Survey emphasized that the German people “showed surprising resistance to the terror and hardships of repeated air attack.” Survey writers attributed this not to culture, but to Hitler’s totalitarian regime: “The power of a police state over its people cannot be underestimated.”⁹⁸ This reveals just one of the many characteristics that can influence an air strategy’s impact.⁹⁹ The ACSC Air Campaign Process (Figure 2) simply refers to them as “contextual elements.” General John R. Galvin, Supreme Allied Commander, Europe, urged the uniformed strategist to “go beyond history and the purely military sphere” and “develop an

⁹⁶ He did not exclude a “balance of power” or other unitary, rational actor perspective, in fact, he felt it was a useful first start for the analyst. He felt it was not a sufficient perspective, however. Graham T. Allison, *Essence of Decision: Explaining the Cuban Missile Crisis* (Boston, MA: Harper Collins, 1971).

⁹⁷ Barry Posen analyzes these two theories with regard to the military doctrines of three principal political actors in Europe before World War II. He finds both factors have explanatory value, although he finds that they carry different weights and should be used in concert. How a strategist uses either will drive assumptions about what the focus of action the threshold for policy action will be. Barry Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars* (Ithaca, NY: Cornell University Press, 1984) 239-241.

⁹⁸ D’Olier, *et al.*, “Summary Report (European War)” *U.S. Strategic Bombing Survey* (1945 rpt. Maxwell Air Force Base, AL: Air University Press, 1987) 39.

⁹⁹ Some commentators also urge study of the historical and geographical underpinnings of existing political, social, economic, and cultural characteristics. For historical effects on the policy process, see Richard E. Neustadt and Ernest R. May, *Thinking in Time* (New York: Free Press, 1986) and for a historical treatment of geographical and cultural elements of strategy, see Chapter 2, “Of Tigers and Sharks: Geography, Culture, and Strategy” in Colin S. Gray, *War, Peace, and Victory* (New York: Simon and Schuster, 1990) 43-78.

understanding of politics and the political process.”¹⁰⁰ The *Mechanism* allows air-minded strategists to insert the central policy process theory that best describes how they view reality.

The Threshold Concept

Intimately related to the central theory are the threshold expectations in a strategy. The practical role of a threshold in the *Mechanism* is to explain the required magnitude of the effect on the entity. In “Air Power Theory: A Language for Analysis,” Lt Col Pete Faber proposes the “level of destruction or disruption” be a major factor in air strategy.¹⁰¹ The threshold concept answers the question: How much power is enough? Simply put, if an action does not reach a threshold in the political process, nothing happens. Although conceptually the idea is clear—we all understand the perceived action has to reach a threshold to get an outcome—the application and characterization of it is not.

Typically, air strategists only speculate about or assume the threshold. One finds that the magnitude of action required to gain a favorable outcome is usually implied because it is unknowable. What *is* known is that the ability to apply power has limits, and those limits demand efficiency. From a left-to-right planning perspective, air strategists may forecast a time in which their campaign might reach the threshold, but that can only be a guess. From an execution (right-to-left) point of view, the achievement of outcomes suggests that thresholds have been reached.

¹⁰⁰ John R. Galvin, “What’s the Matter with Being a Strategist?” *Parameters*, Vol. XIX, No. 1, (March 1989) 9.

¹⁰¹ It should be noted that destruction and disruption are not all-inclusive as measures of thresholds in air strategy. A supportive, or “enabling” strategy would require a certain level of stability be restored. Pete Faber, “Air Power Theory: A Language for Analysis” unpublished monograph, (Department of History, U.S. Air Force Academy, CO, 1995) 16.

Having said that, some strategists provide an indication of how they integrate their airpower means and their *Mechanisms*. Giulio Douhet focused primarily on the enemy *Mechanism*. He implied in his essay “The War of 19--” that in a fictitious war employing air attacks, the German “Independent Air Force,” which built its air fleet as Douhet prescribed in *The Command of the Air*, essentially reached a French surrender threshold in about 36 hours by destroying French cities and de-housing the people.¹⁰² AWPD-1 forecast a six month effort would, at best, achieve the conditions for surrender.¹⁰³ Col John Warden and his staff estimated that the Instant Thunder air campaign against Iraq would take six to nine days to achieve strategic success.¹⁰⁴ Interestingly, Colonel Warden takes into account the domestic political sensitivity to casualties on both sides by advocating “sharp, decisive action on our part designed to reach a conclusion as quickly as possible—with few or no U.S. casualties and with the least number of enemy casualties consistent with political and military objectives.”¹⁰⁵

Action Focus

A critical part of the policy model is where, in broad terms, the strategist thinks force should be applied to achieve the desired effects most economically. Intelligent application of

¹⁰² Giulio Douhet, “The War of 19--,” in *Command of the Air*, translated by Dino Ferrari (New York: Coward-McCann, 1942) 371-394.

¹⁰³ AWPD-1, Tab 2, 8 September 1941, Maxwell Air Force Base, AL: Air Force Historical Research Agency #145.82-1.

¹⁰⁴ Richard T. Reynolds, *Heart of the Storm* (Maxwell Air Force Base, AL: Air University Press, January 1995) 126.

¹⁰⁵ John A. Warden III, “Employing Air Power in the Twenty-first Century,” *The Future of Air Power in the Aftermath of the Gulf War* ed. Richard H. Schultz, Jr. and Robert L. Pfaltzgraff, Jr. (Maxwell Air Force Base, AL, Air University Press, 1992) 60.

power mandates that the strategist be efficient, and the *action focus* is where leverage should be applied.

Some call this the “center of gravity.” This term has multiple meanings, however. The essential starting point for this discussion is Carl von Clausewitz, who wrote,

. . . one must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed.¹⁰⁶

The remaining discussion revolves around two ideas. Is the center of gravity a vulnerability or a strength? If the true center of gravity is invulnerable, should one still attempt to apply force against it? Lt Col Lawrence Izzo felt that only the key strength, the “hub of all power and movement,” was a center of gravity. This does not say where to apply the force, however. According to Colonel Izzo, the strategist has to choose between two approaches. First, if the true strength is vulnerable, attack it as Clausewitz directs. If it is invulnerable, take what B. H. Liddell Hart called the “indirect approach” through an area of vulnerability that leads to the strength.¹⁰⁷ Regardless of the philosophy of the particular strategist, all are driven by limited means to be efficient.

One example of an airpower action focus in a coercive situation is the enemy leadership structure. In opposition to the rational actor perspective, leadership change adherents propose that leaders become too committed to a course of action to perform judicious calculations of future cost and benefit. Fred Iklé articulates the logic this way: “Government leaders often fail to

¹⁰⁶ Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976) Book Eight, Chapter Four, 595, 596.

¹⁰⁷ Lawrence L. Izzo, “The Center of Gravity Is Not an Achilles Heel,” *Military Review*, LXVIII, No. 1, 72-77.

explore alternatives to the policies to which they became committed, and they may even unconsciously distort what they know so as to leave their past predictions undisturbed.”¹⁰⁸ For this reason, the removal of the leader, either by external (direct attack) or internal (coup or revolt) means, will cause the decision making process to change, hopefully to one more amenable to the strategist’s point of view. Uses of airpower are seen as particularly convenient for this purpose because of their ability to strike any point within the belligerent nation.¹⁰⁹

As an interim review of the *Mechanism*, the air strategist adopts a core policy theory. Scarce resources demand a focus of effort, so the strategist searches for key places that, in broad terms, will stimulate the policy process to get the right effect with the least effort. It is easy for the strategist to focus on the *adversary s* policy process, but a proper analysis of domestic and third party *Mechanisms* require a determination of their respective action focuses as well. For the air strategist, this is an important part of the plan and also a problem due to the sheer number of choices. How this is integrated with the rest of the strategic equation, as with each of the elements and components, is the art of air strategy.

Analysis: Three Airpower Strategists

With the theoretical discussion of the general characteristics that make up the *Mechanism* complete, the paper turns to practical application. A sketch of three theorists, Giulio Douhet, the

¹⁰⁸ Fred C. Iklé, *Every War Must End*, rev. ed. (New York: Columbia University Press, 1991) 16.

¹⁰⁹ Maj John Pray advocates the precisely timed use of airpower to tip a divided internal bureaucratic policy process in the desired direction. He used the example of the internal divisions in the German government in 1938 concerning Hitler’s desire to occupy Czechoslovakia. Some felt the Royal Navy could have intervened to tip the balance away from Hitler, even to the point of overthrow. John Pray “Coercive Air Strategy: Forcing a Bureaucratic Shift,” thesis, School of Advanced Airpower Studies, Maxwell Air Force Base, AL, 1994, 36-44.

AWPD-1 planners, and Col John Warden, regarding the *Mechanism* each employed in their strategies, will help clarify the logic behind the model.

Giulio Douhet

General Giulio Douhet was an Italian who was the first to take the idea of using airplanes as a principal element of coercion and to express this idea at the level of theory. He wrote *Command of the Air* in 1921 with a second edition following in 1927. His basic logic involved first gaining “command of the air” by preemptively bombing enemy air forces on the ground. After that, bombers could strike “vital centers” with impunity, rendering the enemy army impotent and crushing the will of the people to resist, thereby terminating the war.¹¹⁰

Douhet's "Fragile Society" Model. Douhet’s core policy process model was dominated by his view of the evolution of society and its direct, implied connection to the policy process. Based on the experience of World War I, he saw the amorphous “will of the people” as the determinant of surrender or victory. In *The Command of the Air*, Douhet says, “The prevailing forms of social organization have given war a character of national totality.”¹¹¹ He additionally believed that the people would be emotionally weak in the face of aerial onslaught. In contrast to armies and navies that had to fight through disciplined war machines to reach their objective, “The air arm, on the contrary, will strike against entities less well-organized and disciplined, less able to

¹¹⁰ Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (1942; rpt. Washington, DC: Office of Air Force History, 1983)

¹¹¹ *Ibid.*, 5. He also believed the totality of war would negate international agreements against weapons such as poison gas. “He is a fool if not a patricide who would acquiesce in his country’s defeat rather than go against those formal agreements which do not limit the right to kill and destroy, but simply the ways of killing and destroying.” 181.

resist, and the material collapse will come about more quickly and easily.”¹¹² He assumed a direct relationship between the peoples’ fragile collective will and the governmental policy process.

Douhet Action Focus. For that reason, Douhet’s action focus was the people in cities. He saw the enemy urban population as a decisive and vulnerable target for air attack. He said that “aerial offensives can be directed not only against objectives of least physical resistance, but against those of least moral resistance as well . . .”¹¹³ The people, who had this fragile quality, would then be driven to “rise up and demand an end to the war—this before their army and navy had time to mobilize at all!”¹¹⁴

Douhet Thresholds. Douhet never explicitly addressed the threshold for revolt by the people, or for surrender by the government, it was simply assumed. Even the conclusion of “The War of 19--” ended without a solution, only fantastic destruction with the promise of more to come.¹¹⁵ It was up to the nation to build an aerial armada of sufficient size and composition that it could destroy enemy cities. The bombing goal was simple: “the purpose of an Independent Air Force is to inflict upon the enemy the greatest possible damage in the shortest possible time.”¹¹⁶ The real threshold issue for Douhet was the will of the Italian government to build the air force he envisioned.

¹¹² *Ibid.*, 188. He adds, “A complete breakdown of the social structure cannot but take place in a country subjected to this kind of merciless pounding from the air.” 58.

¹¹³ *Ibid.*, 23, 24.

¹¹⁴ *Ibid.*, 58.

¹¹⁵ Douhet, “The War of 19--,” 394.

¹¹⁶ Douhet, *The Command of the Air*, 60, 61.

AWPD-1 Planners

In July 1941, the newly formed Air War Plans Division (AWPD) of the U.S. Army Air Corps was tasked to put together a plan detailing Air Corps requirements for a major war in Europe against Germany. Hitler had already invaded Russia, and the likelihood of all-out war was high. The AWPD assembled the strategic bombing campaign logic that was to be tested by fire in the years to come.

The AWPD-1 Decision Model. The logic contained in AWPD-1 was predicated on ideas developed at the Maxwell Field Air Corps Tactical School (ACTS) in the 1930s. The four AWPD-1 planners were all ACTS instructors who believed the people's collective will was the fundamental determinant of political direction. The goal of bombardment was to "undermine" the will to continue the war.¹¹⁷ The connection to a policy decision, as with Douhet, was assumed. Where Douhet and the AWPD planners diverged, however, was in their expectations about the fragility of the people in the face of bombing.

AWPD-1 Action Focus. Since the will of the people drove the policy process, the action focus must affect their will directly. AWPD-1 planners believed the two determinants of the German people's will were their personal well-being and the condition of their military forces. The plan explicitly stated: "The basic conception on which this plan is based lies in the application of air power for the breakdown of the industrial and economic structure of Germany"¹¹⁸ The way to reach those action points was not primarily through direct population bombing, but through

¹¹⁷ Haywood S. Hansell, Jr. *The Strategic Air War Against Germany and Japan* (Washington, DC: Office of Air Force History, 1986) 7.

¹¹⁸ AWPD-1, Tab 1, page 1, 8 September 1941, HRA #145.82-1.

destruction of the “industrial web.”¹¹⁹ Planners characterized the economy as a series of interlocking connections with key vulnerabilities that could be reduced to a manageable number of targets. Transportation, industry, and other economic centers were analyzed and prioritized according to their paralyzing effects.¹²⁰

ACTS Thresholds. AWPD-1 planners considered thresholds, albeit with less than precise measures of merit. They felt that if all 154 targets were destroyed, a paralysis would come over the German people and army. Bombardment goals were the expression of the threshold, and were designed to “achieve the required degree of destruction, disruption, or neutralization of each system for a period of six months or longer.”¹²¹ If this goal was met, “The maximum effect might bring the German nation to terms.”¹²²

AWPD planners were not entirely sure that industrial bombardment would reach the threshold for surrender, however. In that case, their final gambit would be direct attacks against the population. The plan stated: “Immediately after some very apparent results of air attack on the material objectives . . . or immediately after some major set-back of the German ground forces, it may become highly profitable to deliver a large-scale, all-out attack on the civil

¹¹⁹ “Proper selection of vital targets in the industrial/economic/social structure of a modern industrialized nation, and their subsequent destruction by air attack, can lead to fatal weakening of an industrialized enemy nation and to victory through air power.” Hansell, *The Strategic Air War Against Germany and Japan*, 10.

¹²⁰ ACTS instructors taught that the “system is dependent as a whole upon the integrity of each of its elements.” Notes included that targeting must be based on thorough peacetime analysis. “National Economic Structures.” ACTS lecture notes, 14 September 1936. Maxwell Air Force Base, AL: Historical Research Agency #248.2018A-5.

¹²¹ *Ibid.*, 86.

¹²² Planners felt the minimum effect would be the “significant decline” of the German army in time for the invasion of the continent. *Ibid.*, 85.

population of Berlin.”¹²³ This attack served as the escalatory measure that would achieve the desired political result.

Col John Warden

The Systems Model. The basis for Colonel Warden’s thinking about the application of force in war is the following equation: “(Physical) x (Morale) = Outcome.” Although the morale is “beyond the realm of the predictable,” modern “strategic entities” are highly dependent on the physical aspects of their society. If the physical elements of the enemy “can be driven close to zero, the best morale in the world is not going to produce a high number on the outcome side of the equation.”¹²⁴ In order to understand the physical side of any strategic entity, Colonel Warden uses the “The Five Ring Model.”¹²⁵ It is a systems model that depicts every “strategic entity” as a set of five concentric rings, each of which represents a particular system component: “Leadership, Organic Essentials, Infrastructure, Population, and a Fighting Mechanism.”¹²⁶

Action Focus: Leadership. The Five Ring Model is the starting point for assessing the action focus. The symbolism of using concentric rings (like a target) and placing leadership in the center ring is evident. According to Colonel Warden, this is the “critical ring” and should be the focus of airpower action.¹²⁷ Like Colonel Izzo, he believes the strategist has two general courses of action: “induce the command structure to make concessions or make it incapable of

¹²³ AWPD-1, Tab 2, September 8, 1941, HRA #145.82-1.

¹²⁴ John A. Warden, III, “The Enemy as a System,” *Airpower Journal*, Vol. IX, No. 1 (Spring 1995) 43.

¹²⁵ *Ibid.*, 44.

¹²⁶ *Ibid.*, 49.

¹²⁷ *Ibid.*

leading.”¹²⁸ In other words, if you cannot kill them directly (a very difficult task), then cut them off from the reins of power. Colonel Warden makes frequent use of the term “center of gravity,” saying “the route to the center of gravity may not be a straight line.”¹²⁹ Although every situation will require a different approach, “The essence of war is applying pressure against the enemy’s innermost strategic ring—its command structure.”¹³⁰

Thresholds. Instant Thunder, the Colonel Warden-inspired plan to attack Iraqi leadership and command structure, used a notion called “parallel attack”¹³¹ This is a method of applying pressure to achieve the “desired level” of effect by attacking key targets virtually simultaneously. Using modern weaponry in this manner, air forces can so deeply affect the physical elements of the system that the enemy will be strategically paralyzed. The inability of an enemy to recover from parallel attack is assumed to be the motive for surrender. Col Edward Mann says that, if paralysis from parallel attack occurs, “It seems as though any rational leader would admit defeat and sue for peace.”¹³²

¹²⁸ *Ibid.*

¹²⁹ John A. Warden, III, *The Air Campaign: Planning for Combat* (Washington, DC: Pergamon-Brassey’s, 1989) 132.

¹³⁰ Warden, “The Enemy as a System,” 52.

¹³¹ *Ibid.*, 54.

¹³² Illuminating the difficulty of identifying the threshold, he goes on to say, “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.” Edward C. Mann, III, *Thunder and Lightning: Desert Storm and the Airpower Debates* (Maxwell Air Force Base, AL: Air University Press, 1995) 101.

Conclusion

Maj John Pray noted, “A model’s value, then, lies in its ability to balance our desire for simplicity with the often competing need to forecast actual outcomes accurately.”¹³³ The *Mechanism* of the Air Strategy Analysis Framework is a political process model that links airpower ends to strategic outcomes while attempting to retain the simplicity of Pape’s original mechanism concept. It is the most important element of the framework and contains the strategist’s most consequential assumptions about how decisions are made within target, domestic, and third party political entities. Its main component is a central theory about the essentials of the policy process, from which the rest of the assumptions flow. Important considerations underlying this central theory are the basic characterization of the decision making body along with accompanying political, social, economic, and cultural concerns. Two important parts of the *Mechanism* are the threshold concept and the focus of action. Giulio Douhet, AWPD-1 planners, and Col John Warden all either implicitly or explicitly addressed these issues in their *Mechanisms*, and that analysis led to their expectations about how airpower should be applied to achieve policy results.

This description of the *Mechanism* does not substantially depart from what Pape envisioned for this element. It does pose explicit structural and elementary logic heretofore lacking from his writings. This expanded *Mechanism* proposed in this chapter offers the air strategist a sophisticated but reasonably straightforward series of considerations to examine in determining how important political actors might react to the application of airpower.

¹³³ John Pray, “Coercive Air Strategy,” 17.

CHAPTER 5: AIRPOWER ACTION

But as most of the thinking about war has been done by men of the military profession there has been a very natural tendency to lose sight of the basic national object, and identify it with the military aim.

—Sir Basil H. Liddell Hart, *Strategy*

The last major element of the framework characterizes the airpower *means* that translate into policy *ends*. Air strategy involves *action*, whether it is bombing, the acquisition and deployment of intercontinental ballistic missiles, or the delivery of food and assistance to earthquake victims.

The airpower *Action* element is unitary. It acts on and is affected by the *Mechanisms*, and is composed of three parts (see Figure 9, below). First, there is the overarching concept of aerospace capability. This is a broad topic that includes *what* air vehicles can do, individually and in concert, within the constraints and restraints of political direction, the opposition forces, time, environment, and training. Capability is the core component of airpower *Action* because it shapes



Figure 9: Airpower Action

and defines the tasks airmen and their vehicles perform. Beyond capability are two categories that are keys to strategic airpower application: *tactics* and *targets*. Airpower tactics include the important component of time, plus the different ways aerospace vehicles accomplish missions.

Targets are the operational objects of aerial action. The sum of capability, tactics, and targets is what transfers into the different *Mechanisms*.

Capability

Capability, in the context of this model, includes the strategist's calculations about what airpower can do. Specifically, it is defined as the combination of enabling and restraining factors that define the latent potential of airpower. Every air strategist makes either implicit or explicit determinations of capability that are important to, and in some cases, define the strategy.

The ability to operate in the third dimension is airpower's most obvious capability. The technological potential of aerospace vehicles is important, and the ability of airmen to combine technological capability for enhanced effect exploits that potential. As Eliot Cohen puts it, "What gave American air power such predominance in the Gulf, and what makes the United States incomparable as a military power, is its *systemic* quality."¹³⁴ The capability component of this "systemic quality" is the product of the human and technological ability to take action.

Aerospace capability has technological, doctrinal, computational, and organizational components. The effects of these components should always be measured against resistance, such as the enemy, friction, or weather, and within the conduct of an overall application of national force.¹³⁵ Such calculations involve answering numerous questions. What is the probability of

¹³⁴ Eliot A. Cohen, "The Meaning and Future of Air Power," *Orbis* Vol. 39, No. 2 (Spring 1995) 192.

¹³⁵ In AWPD-1, for instance, under the heading "Air Mission," planners listed "To support a final offensive, if it becomes necessary to invade the continent." AWPD-1, Tab 1, 4 September 1941 (Air Force Historical Research Agency #145.82-1) 1. This was a very big "if" in the minds of the planners. Haywood Hansell, one of the authors of AWPD-1 blamed numerous diversions of air assets as a factor in dilution of a war-winning air strategy. At the least, "The

damage on the target, figuring probability to penetrate, range, accuracy, sortie rate, weather, enemy action, operational friction, etc.? How many tons of food per day can be flown into a country? What is our ability to assess damage and effects? What is the enemy's ability to assess damage and effects? In short, the classic operational and tactical assumptions must be carefully scrutinized, and some can be transferred through other *Mechanisms*. An example comes from El Dorado Canyon. The refusal of Spain and France to allow overflight by the F-111s had concrete capability effects: aircraft had to traverse nearly twice the flight distance to the target from their bases in England. This reduced their bomb loads and the number of aircraft that could strike each target set.¹³⁶ Despite constraints, the attack achieved thresholds for favorable action in the U.S., Libya, and NATO allied political systems.

Constraints will flow in from the three mechanisms as well as more tactical or operational considerations such as weather, enemy capability, the joint force commander-mandated role for airpower in the campaign, and a variety of other context-dependent constraints. Inevitably there are limits placed on aerospace operations. General Galvin argues: "Politics and culture impose a variety of constraints on strategy. These include limitations on the resources committed to defense as well as strictures on the use of military force."¹³⁷ Because of the immediacy and "dialability" of airpower, these limits can easily come in the form of tactical direction. In Operation El Dorado Canyon, for instance, Air Force planners were directed not to use ordnance

'invasion' might have been a major mopping up and occupation operation." Haywood Hansell, *The Air Plan that Defeated Hitler* (Atlanta, GA, 1972) 256-259, 275.

¹³⁶ Tim Zimmerman, "Coercive Diplomacy and Libya," *The Limits of Coercive Diplomacy* ed. Alexander George and William Simons (Boulder, CO: Westview Press, 1994) 219, 220.

¹³⁷ John R. Galvin, "What's the Matter with Being a Strategist?" *Parameters*, Vol. XIX, No. 1, (March 1989) 9.

that would have resulted in more actual target damage in order to permit the overhead imagery crucial to the political success of the effort.¹³⁸

Air strategies will normally be a part of an overarching national strategy. In fact, most commentators count strategy as the total national effort in pursuit of a goal.¹³⁹ In Operation El Dorado Canyon, for instance, the attack was executed in the context of numerous escalatory diplomatic, economic, and military measures. In that case, the stark differences between the political conditions and actions before and after the strike allowed better analysis of airpower's role in achieving outcomes.

Most strategists make pointed assessments of the capability that they believe will allow them to concentrate on the *action focus* defined in the *Mechanism*. Douhet, for instance, goes into great detail in describing the offensive capability of the airplane. He says,

The airplane has complete freedom of action and direction; it can fly to and from any point of the compass in the shortest time—in a straight line—by any route deemed expedient. Nothing man can do on the surface of the earth can interfere with a plane in flight, moving freely in the third dimension. All the influences which have conditioned and characterized warfare from the beginning are powerless to affect aerial action.¹⁴⁰

¹³⁸ F-111Fs attacking Tripoli's military airfield were originally going to carry cluster bomb units (CBU) because of the greater damage they could inflict on Libyan aircraft on the ramp. These weapons were replaced with standard high explosive bombs because damage would be more visible in SR-71 imagery, which was important for psychological effect in Libya as well as domestic and international consumption. Col Arnold L. Franklin, Vice Commander, Air University and Operation El Dorado Canyon participant and planner, electronic mail, June 13, 1995.

¹³⁹ Colin Gray, for one, defines strategy as simply "the direction of power so that it serves policy purposes." Colin S. Gray, *War, Peace, and Victory: Strategy and Statecraft for the Next Century* (New York: Simon and Schuster, 1990) 9.

¹⁴⁰ Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (1942; rpt. Washington, DC: Office of Air Force History, 1983) 68.

He also envisioned the bomber as being relatively invulnerable to enemy pursuit aircraft or anti-aircraft fire.¹⁴¹ An important aspect of his capability assumption was the use of poison gas in conjunction with high explosives and incendiaries.¹⁴²

AWPD-1 planners also leaned heavily on capability assumptions in the prosecution of their plan. Like Douhet, they believed that once they had the airframes, the rest would fall into place. In fact, AWPD-1, which was prepared in only nine days, was mainly a rationale for aircraft acquisition. Their capability assumptions revolved around two ideas. The first was the mutually protecting bomber formation. AWPD-1 author Haywood Hansell argued that “unless the proponents of air power could count on bombers getting sufficient bombs ‘on target,’ without incurring losses that were too high to permit sustained operations, the whole idea was little more than an exercise in futility.”¹⁴³ With little practical experience in these type operations, Kenneth Walker, an instructor at the Air Corps Tactical School and later an AWPD-1 planner predicted, “A well planned and well conducted bombardment attack, once launched, cannot be stopped.”¹⁴⁴ The actual campaign was to prove the bombers quite vulnerable to German fighters.

Their second assumption concerned bombing accuracy. Barry Watts, the critic of what he described as the Air Force’s traditional failure to account for friction, described how AWPD-1 planners were driven by “the belief and doctrine that precision bombardment offered a new,

¹⁴¹ On anti-aircraft fire, Douhet, *The Command of the Air*, 37. On invulnerability to pursuit aircraft, there are many references; for one, see page 45. A technological innovation Douhet did not foresee was radar. His capability assumptions rested heavily on the fact that pursuit aircraft would have to search all over the sky for bomber formations.

¹⁴² Giulio Douhet, *The Command of the Air* 306.

¹⁴³ Hansell, *The Air Plan That Defeated Hitler*, 12.

¹⁴⁴ Hansell, *The Air Plan That Defeated Hitler*, 15.

revolutionary means of warfare.”¹⁴⁵ They performed calculations based on the 154 targets they felt would cause maximum damage to the German industrial system: “Hansell and Major Grandison Gardner gathered bombing statistics from the field and designed elaborate statistical methods for determining the number of sorties required to attain 90% probability of damage on a target. From that, they determined force size.”¹⁴⁶

On the issue of escort fighters being neglected, the following passages taken from the original plan are interesting:

- It is mandatory that escort fighters be developed for test without delay. An escort fighter with a range comparable to the bomber it supports must be developed to insure day bombing missions in spite of opposition by the pursuit developments expected in the near future.¹⁴⁷
- An escort fighter is needed to support day bombardment missions.¹⁴⁸
- It must be assumed that defending pursuit aviation in Germany will eventually be able to out-perform and out number our raiding bombers in any one attack.¹⁴⁹

Although it was not neglected in the plan, it took until June 1943 for extreme pressure to be applied for long-range escort development.¹⁵⁰ Plans and execution do not necessarily agree, as this example attests.

¹⁴⁵ Barry D. Watts, *The Foundations of U.S. Air Doctrine: The Problem of Friction in War* (Maxwell Air Force Base, AL: Air University Press, 1984) 22.

¹⁴⁶ Hansell, *The Air Plan That Defeated Hitler*, 29.

¹⁴⁷ AWPDP-1, par. 5d, September 8, 1941, HRA #145.82-1.

¹⁴⁸ AWPDP-1, Tab 8, page 4.

¹⁴⁹ *Ibid.*

¹⁵⁰ Stephen L. McFarland and Wesley P. Newton, *To Command the Sky* (Washington, DC: Smithsonian Institution Press, 1991) 103.

Tactics

Tactics are the way air forces carry out airpower action. Tactics that can have strategic effects include selection of aircraft type, ordnance, routes, and one subset of tactics highlighted in the following discussion, timing.

Timing was a central feature of the original Pape framework (Targets and Timing, Mechanism, Coercive Outcome) because he found that it differentiated among various air strategists. The main reason that Pape included timing as a component of his framework was probably to include Thomas Schelling's gradualist, escalating, counter-value approach.¹⁵¹ Schelling argued that you should threaten what the enemy values highly and launch gradually escalating attacks until he is sufficiently sure you will continue. The fear of future losses will outweigh the benefits of continuing the present course of action, which will lead to a policy change in your favor. This required not only a high level of communication clarity between the belligerents, but also a timing that allowed for diplomatic pauses.¹⁵² The clearest attempt at a Schelling-type strategy, the Rolling Thunder campaign in Vietnam, was an abject coercive failure.¹⁵³

¹⁵¹ Robert Pape, "Coercive Air Power," unpublished chapter, *Bombing to Win*, (Ithaca, NY: Cornell University Press, forthcoming) 19-22.

¹⁵² Schelling said: "The ideal compellent action would be one that, once initiated, causes minimal harm if compliance is forthcoming, and great harm if compliance is not forthcoming, is consistent with the time schedule of feasible compliance, is beyond recall once initiated, and cannot be stopped by the party that started it but *automatically* stops upon compliance, with all this fully understood by the adversary." Schelling, *Arms and Influence*, (New Haven, CT: Yale University Press, 1966) 89. It must be noted that he went on to say: "It is hard to find significant international events that have this perfectionist quality."

¹⁵³ See specific references to bombing pauses in Rolling Thunder in Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam*, (New York: The Free Press, 1989) 67, 83, 90, 91, 119, 120, 125, 147.

Col John Warden, on the other hand, is in concert with most airpower theorists who advocate swift, simultaneous bombing. His ideas of “hyperwar” and “parallel attack” all have timing dimensions that connote simultaneity.¹⁵⁴ He also believes, from a domestic political point of view, that a quick war is all the American people will support. That same domestically oriented principle was applied in the El Dorado Canyon airstrike discussed in Chapter 3. Brian Davis noted that, “to protect pilots’ lives planners wanted simultaneous and not successive air strikes; the hypersensitivity of Libyan air defenses in the wake of the April 15 attack would vindicate the wisdom of this criterion.”¹⁵⁵

There are other aspects of timing that warrant consideration.¹⁵⁶ There may be phasing, or synchronization with other instruments of national power or other nations’ strategies. For instance, early in the spring of 1945, the entry of the Soviets into the Pacific war, specifically through an offensive in Manchuria, was expected to multiply Allied coercive pressure if conducted in concert with the use of atomic weapons. A U.S. Department of War communiqué on June 29, 1945, stated that dropping the atomic bomb should wait until August because the Soviet entry plus the delivery of additional bombers in Okinawa would provide the appropriate synergistic effect.¹⁵⁷ As the adversarial relationship with the Soviet Union became clear, the

¹⁵⁴ John A. Warden III, “The Enemy as a System,” *Airpower Journal*, Vol. IX, No. 1 (Spring 1995) 54.

¹⁵⁵ Brian L. Davis, *Qaddafi, Terrorism, and the Origins of the U.S. Attack on Libya*, (New York: Praeger, 1990) 120.

¹⁵⁶ A good, in-depth discussion of time from an airpower perspective is Walter Givhan’s “The Time Value of Military Force in Modern Warfare: The Airpower Advantage,” Master’s thesis, School of Advanced Airpower Studies, Maxwell Air Force Base, AL, June 1995.

¹⁵⁷ Michael Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven, CT: Yale University Press, 1987) 331.

desire to achieve surrender unilaterally became more important, and preparation for nuclear attack was accelerated.¹⁵⁸

The El Dorado Canyon strike was a model of synchronization. From a political point of view, it occurred soon after the LaBelle disco bombing so it could be linked directly to that act. Tactical timing also had strategic importance in this case. U.S. Air Force F-111s got behind schedule due to refueling problems, so they violated Algerian and Tunisian airspace to make their time-over-target.¹⁵⁹ They merged perfectly with carrier-launched airpower, both arriving precisely at 2:00 AM over Tripoli and Benghazi. The surprise caused by that synchronization was crucial in achieving the desired effect.

Targets

Targets are the physical, tactical object of air action. The most obvious interpretation of this word is “aimpoint.” For large campaigns such as the Combined Bomber Offensive, the more appropriate meaning could be operational targets. For instance, AWPD-1 planners selected four (possibly five) target sets and 154 aimpoints for destruction. In Operation El Dorado Canyon, the five targets were fairly small, yet advances in weapon system accuracy meant there were also numerous aimpoints.

A more sophisticated view of targets would acknowledge that targets do not necessarily have to be destroyed to be affected. Targeting the enemy air defense system may involve active or passive means of suppression. Modern anti-radiation missiles accomplish their goal whether or

¹⁵⁸ “Quick victory might deny war’s spoils to the Soviets.” *Ibid.*, 333.

¹⁵⁹ Davis, *Qaddafi, Terrorism, U.S. Attack*, 134. It is interesting that, in an echo of Pearl Harbor, an Italian air controller picked up the attack formation and notified Malta, who in turn

not they have an emitting radar. As part of the tactic of target penetration, simply making the enemy turn radars off is important.¹⁶⁰ As with other components of the framework, the concept of a target is bounded only by airpower's substantial moral, mental, and physical capability and the mind of the air strategist.

Military air strategists typically focus on targeting. Douhet sums it up this way: "It is just here, in grasping these imponderables, in choosing enemy targets, that future commanders of Independent Air Forces will show their ability."¹⁶¹ For Douhet, the core policy process in his theory demanded a focus on the population, and to best affect their morale, on certain target sets, or "vital centers":

. . . it is possible today to employ very effective actions against the most vital and vulnerable spots of the enemy—that is, against his most important political, industrial, commercial, and other centers, in order to create among his population a lowering of moral resistance so deep as to destroy the determination of the people to continue the war.¹⁶²

AWPD-1 also specifically refers to target sets and actual targets. The "intermediate objective" was the *Luftwaffe*. Its "bases, factories, and aluminum and magnesium" factories were the prime target groupings. Electric power could "almost be completely shut off" by destroying

radioed Libya some 30 minutes before the attack. Despite this, the strike achieved total tactical surprise. Davis, 134.

¹⁶⁰ For the application of this targeting technique, an important modern air superiority tool, see Eliot A. Cohen and Thomas A. Keaney, *Gulf War Air Power Survey*. Summary Report. (Washington, DC: U.S. Government Printing Office, 1993) 12, 13.

¹⁶¹ Douhet, *The Command of the Air*, p. 60.

¹⁶² In this case, he was speaking specifically of the use of poison gas in his bomb mix. This controversial capability assumption is a view into his narrow understanding of moral inhibitions and the dynamics of deterrence, especially of certain weapons. Douhet, *The War of 19--*, p. 306

“selected switching stations.”¹⁶³ In later iterations of the plan, electric power was lowered in priority due to the inability of U.S. bombers to achieve the necessary precision. Transportation attacks focused on the German railroad system and inland waterways.¹⁶⁴ Also lowered in priority during the course of bombing, this target set rose in importance again as the focus of the campaign to degrade enemy mobility in preparation for the Normandy landing in the spring of 1944. Finally, there is the controversial target of civilian morale. As discussed in the last chapter, planners believed that once the “industrial web” was crushed, there might still be shreds of resistance. Therefore, direct population bombing would not commence until “widespread defeatism had been engendered by heavy air attacks against the systems that supported the means to fight and the means to live, coupled with despondency concerning the prospects of victory.”¹⁶⁵

Conclusion

When questioned about the “meager” bomb damage in the Libyan airstrike in April 1986, Chairman of the Joint Chiefs of Staff Admiral Crowe put together many of these themes by saying, “any time you plan a raid when you’re over the target fifteen seconds, and you have such a high political content to the raid—to reduce your casualties, to reduce peripheral damage, to reduce all these things that are not military but political—you’re not going to have a lot of damage.”¹⁶⁶ Of course, damage—particularly large-scale damage—was explicitly *not* a major

¹⁶³ AWPD-1 Tab 1, September 8, 1941, HRA #145.82-1 4.

¹⁶⁴ *Ibid.*, 5, 6.

¹⁶⁵ Hansell, *The Air Plan that Defeated Hitler*, 85.

¹⁶⁶ *Best Laid Plans: The Inside Story of America's War Against Terrorism*, (New York: Harper & Row, 1988) 311. One cannot help notice the distinction the Chairman makes between “military” and “political.” As with any applications of military power, there is little distinction if one adheres to Clausewitz, Liddell Hart, Fuller, Posen, Gray, *et al.* Despite the Admiral’s understandable defense of U.S. military capability, perhaps the more intrepid and accurate answer

element of the strategy. Colonel Arnie Franklin, who helped plan the attack, asked his superiors what they should target on the Tripoli airport ramp. The response, in his words, was: “It was important to remember that there was NOT a military objective in this attack. The purpose was to demonstrate national resolve to combat state-sponsored terrorism. The target was the ramp!!”¹⁶⁷

As part of thinking strategically, the airpower *Action* element is only the means to the end. As Col John Warden says, “After all, we don’t go to war merely to have a nice fight; rather, we go to war to attain something of political value to our organization.”¹⁶⁸ The airpower *Action* element is composed of capability and the execution components called *targets* and *tactics*. When used by the air strategist, they seek to trigger *Mechanisms*, and through them, political *Outcomes*. This is the final element of the Air Strategy Analysis Tool.

might have been another question about how more damage would have increased the leverage on the Qaddafi regime. In many ways, there was *too* much damage in the case of bombs that went astray and, like the Doolittle Raid, damage was incidental compared to the audacity and resolve--politically and militarily--communicated by carrying it out. The fixation on damage for damage’s sake is certainly contrary to strategic thought.

¹⁶⁷ Col Arnold L. Franklin, electronic mail, June 13, 1995. Exclamation in original.

¹⁶⁸ John A. Warden, III, “The Enemy as a System,” *Airpower Journal*, Vol. IX, No. 1 (Spring 1995) 43.

CHAPTER 6: CONCLUSIONS

We must also recognize that the conclusion reached can be no more wholly objective than any other in war, but will be shaped by the qualities of mind and character of the men making the decision . . .

—Carl von Clausewitz, theorist

We need strategists.

—Gen John R. Galvin, soldier

The hindrances to strategic thinking are legion. General Galvin’s statement does not spring from a feeling that Americans are ill-equipped for the task. It comes from an acknowledgment of its magnitude and consequences. The sheer dimension of the strategic calculus dwarfs human cognitive capability. Its downside risk is substantial. For that reason, military theory and doctrine attempt to bring a semblance of order and simplicity with the hope of achieving greater control over the future. Strategic thinking demands some reductionism, but always at a cost in accuracy. Inevitably, strategy collides with reality.

The aerospace man and machine have such immediate and significant strategic potential that air strategists have a special responsibility to develop sophisticated strategic perspectives. Col Phillip Meilinger says, “The air commander must view war in totality, not in a sequential or circumscribed fashion.”¹⁶⁹ Despite that fact, airpower theories and strategies tend toward oversimplicity and prescription. Reality deals harshly with that kind of reasoning. The goal, long

¹⁶⁹ Phillip S. Meilinger, *Ten Propositions Regarding Airpower* (Washington, DC: Air Force Office of History, 1995) 12.

before Clausewitz linked war to policy, was to gain an objective viewpoint about how military means are linked to political ends. How do we make the connection?

The assertion that airpower strategy is hopelessly context-dependent and only through the ingestion of history would one be equipped for strategic thinking has some shortcomings. As one strategist noted, “We know from hard experiences of the physical and social sciences that if the parts are not ordered in some prior way, are not held up to some broad concept, all we can do is remain the prisoner of raw data.”¹⁷⁰ On the other hand, Barry Watts revealed the risks of turning airpower application into an over-simplified engineering project.

When Robert Pape contemplated the linkage between airpower and policy outcomes, he created a device that more systematically viewed strategic airpower application. His framework broke airpower strategies into three elements: (1) the targets that will be destroyed by air attack and the timing of their destruction; (2) the mechanism by which the attack will produce a change in the enemy’s behavior, and (3) the desired outcome, or change in behavior. His basic framework continues to receive attention because it has fundamental explanatory utility and a simple structure. Despite that, its use as a vehicle for explaining how coercive airpower strategies worked or did not work limits its usefulness in three ways. First, it does not describe the strategy planning environment, or explicitly list what major factors the strategist should consider. Second, it does not encompass the broad range of strategic airpower applications, just the extreme ones. Finally, it does not address the full range of outcomes which strategists seek to achieve or avoid. Nevertheless, it provides the basis for this study’s attempt to create a more inclusive, illustrative tool for organizing strategic airpower thought.

¹⁷⁰ J. C. Wylie, *Military Strategy: A General Theory of Power Control* (1967; rpt. Annapolis, MD: Naval Institute Press, 1989) 12.

The Air Strategy Analysis Framework proposed here (see Figure 10) attempts to encompass the things air *strategies* and air *strategists* actually do. Consequently, these are the same things a strategic airpower analyst should investigate. Like Pape’s framework, its intellectual and structural center is not aerospace operations or policy outcomes, but is the linking element called *Mechanisms*. The

proposed framework can be used for single events or for whole campaigns in which the ends-means dialectic goes through numerous iterations. No categorized, simplified, characterization of human interchange can hope to provide *the* perspective

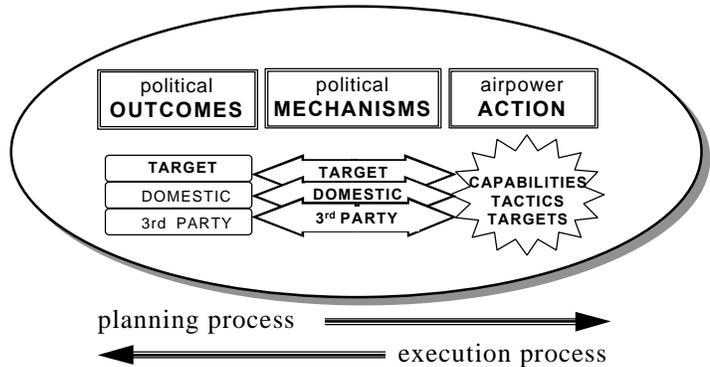


Figure 10: The Air Strategy Analysis Framework

from which the intelligent air strategist must view the world. That must not deter us from making a good effort because the potential payoffs *and the risks* are high.

Review of the Air Strategy Analysis Framework

In summary, the primary Air Strategy Analysis Framework attributes are these:

- There are three elements to the framework. From left to right they are: *Outcomes*, *Mechanisms*, and *Action*. Together, they define the air strategy logic.
- *Outcomes* are the policy manifestations of airpower action following refraction through a political process. There are three categories of outcomes that the air strategist must consider. Those are, *target*, *domestic*, and *third party*. They are interactive and have short and long term characteristics.
- The *Mechanism* is a set of descriptive policy process models that link airpower action to their corresponding policy outcomes. A *Mechanism* is comprised of a core policy process theory with two second-order elements called *thresholds* (the link to outcomes) and the *action focus* (the link to means).

- The airpower *Action* element is a military action model in which assumptions and calculations about *capabilities*, *tactics*, and *targets* of airpower application manifest themselves. This is a unitary element in that it influences each *Mechanism*.

Implications

The primary addition this paper makes to the Pape framework is the additional consideration of domestic and third party outcomes. The analyst will fail to explain certain strategies without this perspective, and the strategist could fail to account for crucial strategic considerations. Among the air strategies which illustrate that point are Operation El Dorado Canyon, the Doolittle Raid on Tokyo, and Rolling Thunder in Vietnam. Although these highlight the domestic component, there are strong target and third party components to them as well.

The mechanism retains its central importance to the analyst in the Air Strategy Analysis Framework. Pape's coercive theories were not based on targeting, but rather on the nature of the mechanism the strategist employed. This focuses the strategy on its political components, which drive and shape the strategic equation. Ignoring key parts or making poor evaluations in this element may lead the student of strategy astray.

The addition of capabilities assessment to the airpower *Action* element is important because it allows the constraints and restraints of the real world to be applied to the airpower means. Without this component, it is difficult to explain deterrent strategies, since capabilities are the primary component that adds stimulus to the *Mechanism*. It is also difficult to describe many air theorist's strategies, which are heavily dependent on the abilities of their forces.

The utility of this framework is that it provides a broad, comprehensive, yet simple perspective from which to order thoughts and communicate about airpower theory and practice. It is a rich source of topics for study about differences between air strategies and their application

in the real world, and the processes that define and characterize different air thinkers. It is *not* an air campaign planning tool. Concerning the many factors going into strategic planning, Clausewitz said, “Rapid and correct appraisal of them clearly calls for the intuition of a genius; to master all this complex mass by sheer methodical examination is obviously impossible.”¹⁷¹ In that regard, the expanded framework does not provide a vehicle for campaign planning that can be broken down for “methodical examination,” but it provides a way of thinking in a more comprehensive way about the important factors that go into air strategy calculations so that future insight might be more fruitful and future air strategy more sound.

Other Issues

Communications. It is said that airmen lack the shared lexicon of surface forces, and that hinders expression. The labels used within the Air Strategy Analysis Framework are an attempt to choose terms that are applicable to operations in the third dimension. More importantly, the logic and structure of the proposed framework are a context from which air-minded people can study, share, and create new ways of approaching the strategic calculus.

Diplomacy and Airpower. The ultimate effect of strategic air action is often dependent on related policy initiatives. This concept is not new. What is different is the way in which the air weapon redefined the permeability between politics and military operations. As a result, airmen have a special responsibility to understand the other instruments of national power that will be used in conjunction with airpower. Blechman and Kaplan observe that “The political use of the military is often accompanied by policy statements, diplomatic communications, the manipulation

¹⁷¹ Carl von Clausewitz, *On War*, ed., trans., Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1976) Book Eight, Chapter Three, 586.

of economic assistance and arms transfers, and covert activities. These other instruments may be more or less important for achieving objectives than the use of armed forces.”¹⁷² Despite the air perspective taken by the proposed framework, it discloses a rich source of topics for further research and investigation that go well beyond the bounds of the aerospace components of strategy.

A Final Word

When one attempts any project with strategic magnitude and scope, there can be many outcomes. Soon after penning *Military Strategy*, Admiral J. C. Wiley said of his strategic thoughts, “It landed with no splash at the time and has lain on the deck ever since.”¹⁷³ The framework proposed here will hopefully stimulate debate. Because the concept’s evolution has previously been limited to a small group, it is also hoped that this thesis has sufficiently broadened and sharpened the original framework to give it wider use. The intermediate objective is expansive thinking, but the *goal* is better strategy, for the ability to make the connection between aerospace means and strategic ends is the *sine qua non* of airpower.

¹⁷² Barry M. Blechman and Stephen S. Kaplan, *Force Without War: U.S. Armed Forces as a Political Instrument* (Washington, DC: The Brookings Institution, 1978) 69.

¹⁷³ J. C. Wylie, *Military Strategy*, 22.

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