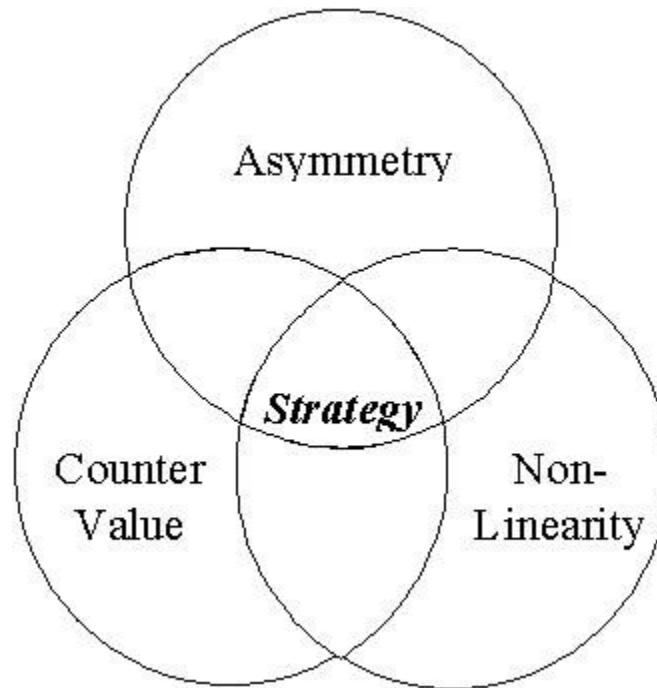


# *Airpower Against Chaos*



SAAS 680

Formulating Airpower Theory

Final Paper!

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Today's airpower strategist faces a rapidly evolving strategic environment: an environment of limited objectives and will, of conflicting ideology and ethnicity, and of economic and social upheaval. These challenges are forcing a shift from full-scale war to peace-making and humanitarian assistance, where each strategy option for coercive airpower has dramatically different effects. To better understand how these forces shape strategy, this paper will begin by presenting a crisis strategy model (CSM). An evaluation of the strengths and weaknesses of airpower will follow, and the paper will conclude with general recommendations for the application of airpower in a range of settings. I do not specifically address spacepower, because

in the near future it will continue to be a command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) enabler of airpower operations.

### **The Crisis Strategy Model**

The crisis strategy model (CSM) analyzes the international environment to determine if the military instrument of power (IOP) is useful, and if so, how it should be applied. The CSM's three components are an asymmetry analysis, a nonlinearity model, and a countervalue assessment. Each component contributes a critical piece to the strategy puzzle, and their interactions determine how to focus military operations.

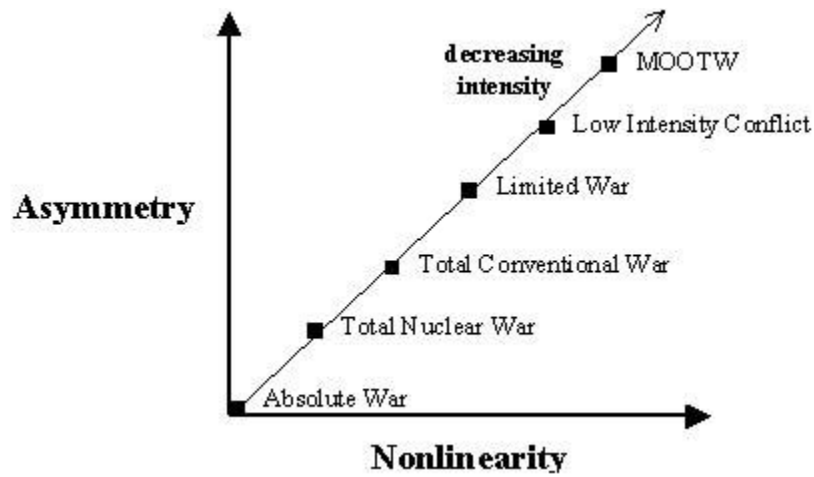
#### **Asymmetry**

Asymmetry compares the will, objectives, and capabilities of all participants, to include combatants, international organizations, and non-state actors. An attempt is made to measure willpower and commitment by focusing on cultural, historic, religious, social, political, and economic factors. The assessment also looks at past and present actions to determine the interests and objectives of each actor. Finally, a capability study estimates the military, economic, and political resources of each of the players and/or coalitions. The outputs of the asymmetry component are strengths and vulnerabilities, possible elements of value, and variables necessary to create the nonlinearity model.

#### **Nonlinearity**

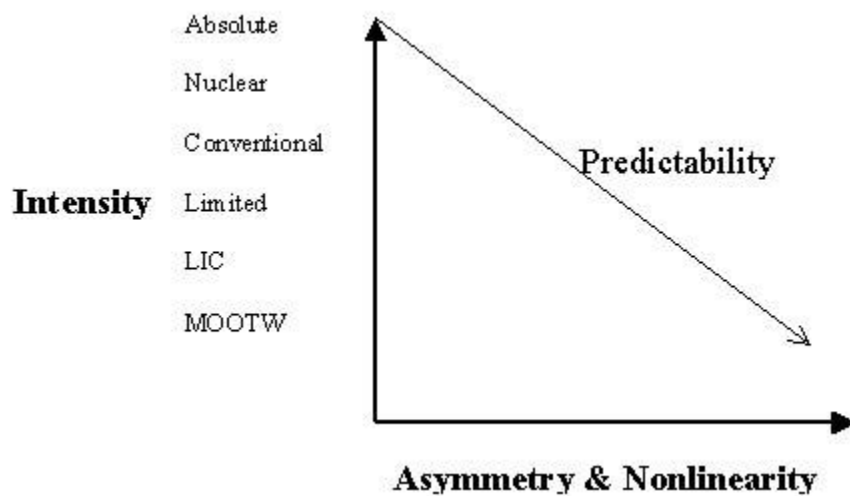
Nonlinearity is probably the "fuzziest" component of the CSM. If a system is linear, an output can be predicted, given a definitive input. Antithetically, a nonlinear system's inputs create an unpredictable output. A common example is the weather forecasting. Forecasting a few days ahead is possible, because the major variables are relatively linear in the short term. Beyond three or four days, the major and minor forces combine in infinite possibilities, which rapidly degrade the predication model from a linear function to a nonlinear one.

Alan Beyerchen described Carl von Clausewitz as a nonlinearist, because Clausewitz insisted the effects of uncertainty, chance, and friction would drive war away from its absolute form. The farther we move down the scale from major war to military operations other-than-war (MOOTW), the more nonlinear, or chaotic, the system becomes. In low intensity conflicts - where major asymmetries in will, objectives, and capabilities exist - the acts of a single soldier can dramatically affect the outcome of an operation. Conversely, in a major war, symmetrical influences smooth the nonlinear curve. This does not imply that uncertainty and friction are absent, or the value of the individual commander is not important, it only describes an environment where the vast majority of participants have little individual impact on the outcome of the conflict. Why is this important to the CSM? The asymmetry assessment matches the attributes of the participants, but it is the nonlinearity model that predicts how these attributes interact. Figure 1 provides a notional example of this iteration. As the intensity of the conflict varies from the maximum of absolute war to low intensity conflict (LIC) and MOOTW, asymmetry and nonlinearity increase.



**Figure 1. Asymmetry and Nonlinearity**

Figure 2 indicates that as intensity decreases, and nonlinearity and asymmetries rise, individual events become less certain. As an example, consider the US reaction when twelve Army rangers were killed a firefight in Somalia. In a war with national interest at stake, this incident would not have caused a ripple in US policy. In Somalia, however, where there were no vital concerns, support quickly evaporated.



**Figure 2. Predictability Vs Nonlinearity**

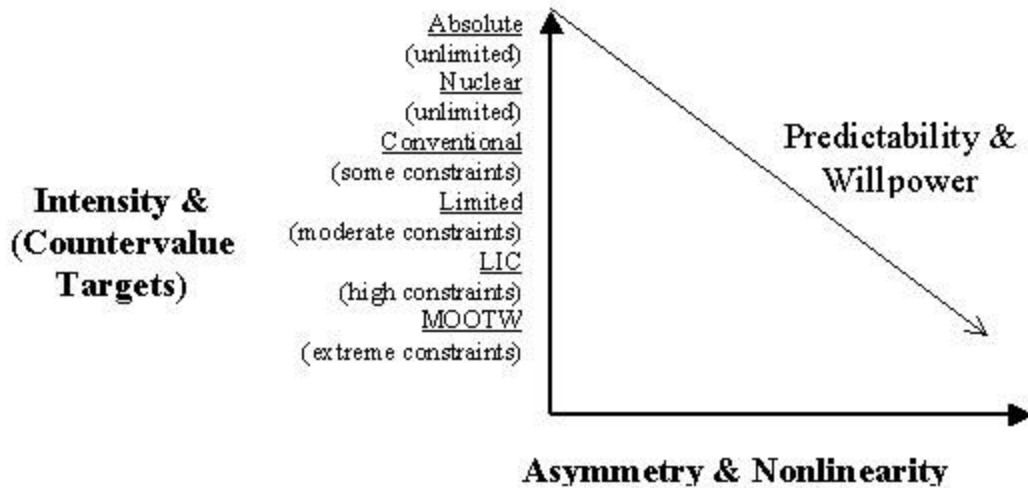
Decreasing predictability could be due to differences in the strengths and weaknesses of the opponent's IOPs, or perhaps that the relatively fewer participants have a smaller "averaging" effect on individual actions. The most likely answer, though, is that war is a contest of wills as Clausewitz suggested. As a nation's willpower falls, so does its desire to put forces in harms way. Unfortunately, asymmetries in the will to achieve desired objectives are not only difficult to estimate, but their interaction will produce less predictable results. This conclusion is not only important in determining if airpower should be used, but also how to select appropriate countervalue targets. Additionally, wavering political willpower and increasing nonlinearity has the ability to make centers of gravity (COGs) fluid, and therefore more difficult to target.

Framing a conflict using a nonlinear foundation can aid in determining three effects. First, it estimates the level of conflict by assessing the intensity and commitment of the participants, and any possible political influences. Second, it estimates how decisions are made, both domestically and internationally. Although it cannot tightly focus on which of Allison's models is dominant, it attempts to predict their interaction by observing major trends within the governmental decision process. Third, it seeks to uncover what is causing player behavior: are they realists, concerned with security; are they liberals, wanting to expand economically; or are personal ambitions their driving actions? The goal of the nonlinearity evaluation is to produce a model that estimates possible outcomes, given discreet inputs. Though its fidelity will be coarse, comprehending the nonlinear nature of the crisis may assist leaders in better understanding the situation and in tailoring their response.

### Countervalue

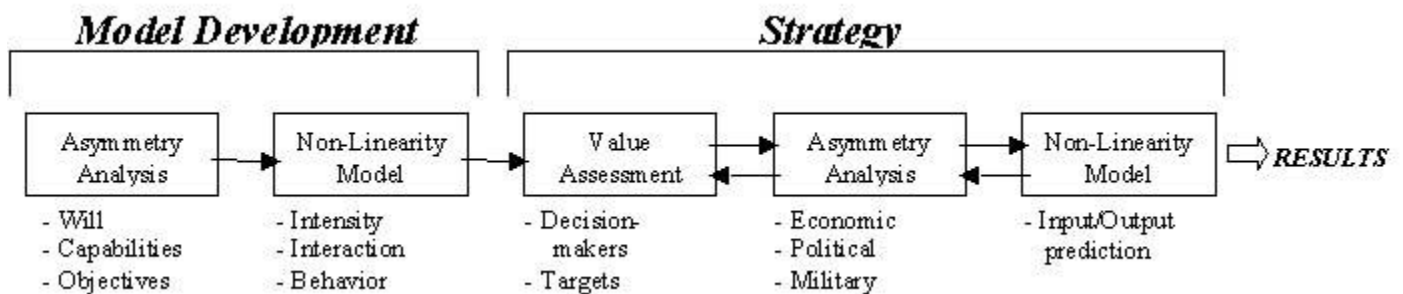
The last component of the CSM is countervalue. All coercive strategies are countervalue strategies. Whether the goal is annihilation, denial, decapitation, punishment, or risk, the target is always valued by the decision-makers. The countervalue appraisal uses the interaction of the two previous components to determine who sets policy and what is of value to that person or group...what is their COG. Once identified, they become the 'target' of our strategy, and what they value becomes the 'target' of our weapons. While a number of strategies for the application of airpower may be useful, their target set will vary with the resolve of the participants.

Figure 3 complements figure 2, by suggesting that as willpower for a conflict declines the number and types of countervalue targets will diminish. For instance, firebombing cities was an acceptable practice in the total war environment of WWII. Five years later, though, in the limited environment of the Korean War, airpower's role was largely confined to military interdiction targets. As we move down the scale to an even more limited US role, such as Bosnia, rules of engagement (ROE) become tightly constrained.



**Figure 3. Countervalue Vs. Nonlinearity**

The final portion of the crisis strategy model is the interaction of the three components in reaching equilibrium. At equilibrium, a strategy is identified that economizes the use of all IOPs, the military IOP, and specifically, the use of airpower. The interaction of the CSM's three components is presented in figure 4. Once an initial asymmetry analysis is complete and a nonlinearity model is developed, the three components conduct an iterative process to determine the optimum strategy. This process is revisited throughout the crisis and only completed when the objectives are met.



**Figure 4. Crisis Strategy Model**

### **What Airpower Can and Can't Do For You**

A major consideration when developing a strategy is evaluating the contribution made by airpower. This next section looks at airpower's strengths, weaknesses, and strategy options.

#### **Strengths**

Airpower's greatest attributes are speed, adaptability, and simultaneity. Speed provides the commander with a rapid ability to mass, attack, and surprise the enemy. Adaptability allows the commander to select a variety of targets and strategies across the theater. Airpower is used from

the strategic to the tactical level, it can engage in missions from nuclear attack to MOOTW, and it can apply varying degrees of destruction or assistance. It can also be the theater's brain, eyes, and ears through advanced C4ISR. Last, the simultaneous attack of diverse targets can degrade or paralyze enemy operations and slow the enemy's orient, observe, decide and act (OODA) loop.

## Weaknesses

Contrary to the belief of some advocates, airpower also has weaknesses. First, airpower cannot alter the nature of war. Clausewitz's uncertainty, chance, and friction will always dominate the battlefield. The enemy adapts to attempts at long duration or widespread paralysis, he frustrates plans to completely isolate the battlefield, he resists occupation by air, and he defies attempts to break his will through aerial attack. Likewise, it is doubtful that airpower alone can stop massive armor movements. Air Attacks may strategically disrupt and tactically stop movement, but given our limited assets, it is unlikely that airpower could quickly immobilize a determined army moving over a large front. Finally, achieving absolute air superiority across the theater is not only extremely difficult, but also unnecessary. In Desert Storm, the coalition lacked the willpower and need to achieve daylight air superiority over high value areas like Baghdad. Additionally, even in the lopsided balance of capability, coalition forces never achieved strategic paralysis, although they were able to induce tactical, and over time, operational paralysis of theater forces.

## Strategy

Given these strengths and limitations, what is the best strategy to use in applying airpower? The SAAS answer prevails, "It depends." The optimum countervalue strategy depends on the situation, the participants, and the changing conditions on the battlefield. To ensure clarity, I will first present my definition of three coercive strategies. Contained within each of these strategies are the traditional missions of strategic attack (SA), air superiority (AS), air interdiction (AI), suppression of enemy air defenses (SEAD), and close air support (CAS), as well as a multitude of C4ISR duties. A helpful tool in understanding strategy options is Pape's cost-benefit equation (figure 5). The goal is to make the equation a negative number and thus compel the enemy to stop resisting a policy change.

$$R = Pb(B) - Pc(C)$$

R=resistance Pb=probability of benefits B=benefits Pc=probability of costs C=costs

### Figure 5. Pape's Cost-Benefit Equation

## The Strategies

1. **Annihilation.** The strategy of annihilation has been executed successfully by few in the history of warfare – though it has been attempted with zeal. Its goal is the complete elimination of the opponent's society; its target is directed solely towards cost (C). For example, nuclear confrontation has the potential of erasing a society through its

pervasiveness and destructive power. Because willpower will be high, few targets will be exempt from possible attack. Additionally, there is the possibility that total conventional war could take on an annihilation strategy, as the Hutus and Tutsis may have attempted. Nevertheless, willpower and capability make "successful" annihilation difficult.

2. **Risk.** A risk strategy can be pursued across the spectrum of conflict and peace operations. The essence of a risk strategy is to increase the opponent's probability of additional costs ( $P_c$ ) as well as inflicting pressure on his direct costs ( $C$ ). Falling under the rubric of risk could be punishment missions to inflict pain, decapitation sorties to threaten the lives of leaders and cause friction in the command and control structure, and strategic attacks against high countervalue targets. The target set, depending on asymmetry and nonlinearity, can be nearly unlimited, covering the gamut of civilian and military targets.
3. **Denial.** Closely related to a risk strategy is denial. It seeks to reduce the opponent's probability of achieving perceived benefits ( $P_b$ ) and in the process affects the direct costs ( $C$ ). Denial targets are generally focused on reducing the opponent's military capabilities through direct attack and interdiction. Interdiction targets can extend from the front line to industry and leadership supporting the military complex. Again, most civilian and military targets are included, but the goal is to physically prevent the enemy from carrying out his strategy. Missions generally associated with denial include CAS, AI, SA, and AS. To maximize the psychological effects, both risk and denial must be closely integrated with the other IOPs to maximize the psychological effects.

Three points arise from the previous discussion of strategy. First, the goal of the CSM process is not to determine the ideal strategy, but how to integrate the strategies and apportion airpower to achieve the desired effects. Second, the CSM not only provides the initial course of action, but it is used to continually assess the effectiveness of the chosen course. Finally, airpower does not work in isolation. If the Army had not been holding the Iraqi ground forces in Desert Storm, airpower could not have decimated the enemy. If non-governmental organizations (NGOs) had not been in Rwanda, US military efforts would have been in vain. If the political and economic IOPs had not been coercing China, the Soviet Union, and the North and South Vietnamese, Linebacker II would have flopped. Bottom Line: To be effective, airpower is applied in a concerted effort with all resources available.

### **The Application of Airpower**

The final section of the paper will address the various levels of war and peace, and recommend possible strategies. The cases of nuclear war, total conventional war, limited war, LIC, and MOOTW, representing the spectrum of crisis, will be examined. Of course, the infinite variations of symmetry and linearity can produce dramatically different outcomes in each category, but the following generalizations are helpful in understanding airpower's use. For each category, I list the CSM factors, recommend a strategy, and offer an example. These recommendations are based on operations between the US and an adversary.

#### **Nuclear War**

In total nuclear war, asymmetry is very low due to the commitment and capabilities of both sides. Nonlinearity is also very low, since rapid actions and high intensity allow little adaptation

and uncertainty. Countervalue targets are broad, because there are few political and physical constraints to limit target selection. All three strategies are implemented and contribute to the outcome of the war; how each strategy is apportioned depends on the capabilities of the US and its enemy. Airpower provides flexibility and control in targets attacked or threatened, as well as contributing to the robustness of the US nuclear triad.

Since there have been few nuclear wars over the past few years, it is difficult to describe a suitable example. Perhaps the closest operation came in the defeat of Japan. While nuclear weapons were only a small portion of the firepower rained on Japan and its forces, a combination of strategies had the cumulative effect of breaking the willpower of the ruling elite. A risk strategy targeted industry and civilians across the home islands. Denial operations supported front line troops, interdicted lines of communication, and projected firepower forward in the campaigns across the Pacific. Arguably, an annihilation strategy may have also been attempted at the operational level against the home islands to minimize resistance to a US invasion.

### Total Conventional War

I define total conventional war as complete mobilization of a country's resources with few constraints on how the war is prosecuted. Again, asymmetry and nonlinearity are low and the intensity and size of the conflict smoothes the actions of individual participants. As with nuclear war, a countervalue plan can incorporate all three strategies, though annihilation will become politically unacceptable. Airpower's strength is in isolating the battlefield and eliminating the opponent's offensive capability. I therefore recommend emphasis on a denial plan to stifle the enemy's strategy and cripple his military potential.

Depending on the conflict, targets could range from the military industrial complex, to second echelon interdiction. Close air support will also be necessary, but should be limited to protect severely exposed troops and assist in exploiting major breakthroughs. Additional CAS pulls air assets from more effective interdiction missions. As with all the levels of conflict, strategic attack against critical theater targets will also be required. WMD and time sensitive targets of strategic value will top the target list. A punishment strategy could be pursued if civil unrest is high, but not to the detriment of the interdiction campaign. Decapitation may also be useful, given the political and physical vulnerability of the regime, but not beyond the point of diminishing returns.

Germany and Japan's defeat in W.W.II provides an example of the necessity of defeating the enemy before the country's capitulation. Risk strategies were ineffective in creating a domestic uprising and changing the cost-benefit equation, and decapitation was largely impotent in preventing large-scale operations or eliminating leadership. Only crushing the enemy's military capability made victory possible.

### Limited War

A limited war will most likely occur when the US has the predominance of capability, and enemy has a superiority of will. Asymmetry and nonlinearity are moderate, meaning isolated actions and individuals may have an effect on the outcome of the war. The countervalue target



set becomes smaller due to political constraints. The option of attacking the civilian population or their supporting infrastructure may no longer be viable. Decapitation has probably also become socially unacceptable. However, risk could have a larger role to play than in total conventional war. In limited war, willpower and objectives may be reduced, so punishment attacks could have a greater impact on the political environment. The focus of the campaign, though, should continue to be denial. The enemy's ability to carry out his strategy will be eliminated through selective strategic and interdiction strikes. In conjunction, risk strikes will exploit vulnerabilities in the opponent's political armor.

An example of an effective denial strategy in limited war is Desert Storm. Although the Gulf War may be a strategic anomaly, it does provide some insight into the effectiveness of a denial campaign. Saddam Hussein and his people were undaunted by a risk strategy against the population, nor was Hussein isolated from his troops. Instead, Kerney and Cohen concluded that airpower was successful in disrupting the flow of supplies, in preventing coordinated attacks, and in breaking the moral and confidence of the commanders and their troops.

### Low Intensity Conflict

Examples of low intensity conflict (LIC) are activities involving guerrilla warfare, peace making, and other operations where there is a significant threat of hostilities. Asymmetry and nonlinearity are high due to the vast separation in will, capabilities, and objectives of the actors. Individual US participants making unofficial comments on the news or committing crimes against the local population can influence national policy. Likewise, as predicted by figure 3, the type of warfare and numerous ROEs narrow available countervalue targets. As asymmetry and nonlinearity rise, variation in strategy becomes more situation-sensitive. This fluid nature of the conflict and COGs makes close cooperation with political, NGO, and SOF components even more critical than at previous levels of conflict. Covert decapitation may become a viable option to breaking the enemy's will, but it could also have the reverse effect of martyring the leader.

Furthermore, a risk/punishment strategy may alienate the local population and will be largely unacceptable to an American audience. The best strategy should be supporting the government in winning the legitimacy, and in reducing the enemy's capability through a closely controlled denial strikes. Specific roles for airpower include mobility of troops and aid, C4ISR, punitive strikes, psychological operations (PSYOPS), confidence building and shows of force.

One interesting anomaly of LIC is the return of annihilation as a viable strategy. It may be in the best interest of the US, and fully supportable by the American public, to eliminate threats from terrorist organizations, drug cartels, and related non-state actors.

Operation Deliberate Force provided the US with an opportunity to operate in a peace-making operation. Strategic and interdiction air strikes, a massive ground offensive, and political and economic pressure brought participants to the negotiation table. The effects of nonlinearity were demonstrated in the US reaction when a US F-16 was shot down over hostile territory. In addition, great care was taken by intervening forces to gain the support of the local population and audiences abroad through strict ROEs, which were closely linked to political machinations.

## Military Operations Other-than-war

MOOTW extends from peacekeeping to humanitarian assistance. Possible hostile threats may exist, but a military presence should suppress violent intentions. The primary purpose of the military is to establish order and provide initial humanitarian aid. Asymmetry and nonlinearity are very high due to the vast differences in will and capabilities, international interest, and scrutiny by the US public and leadership. As the operation evolves, care must be taken to ensure the will, objectives, and capabilities of the US are not overcome by those hostile factions. A combination of risk and denial countervalue strategy will most likely be required to discourage hostilities. At the same time, Air Force assets provide a capability to add value where it is needed. Airpower missions are similar to those of LIC, although the emphasis is no longer on repressing violence, on providing aid. The primary functions are to provide lift and C4SIR, and conduct PYSOPS in support of ground operations, but a need may still exist for mobility of troops, punitive strikes, and shows of force. Above all, interagency cooperation is essential in managing nonlinearity's volatility.

Humanitarian assistance to Rwanda offers an example of a successful MOOTW operation. Air Force personnel successfully reopened and established airlift operations in three major regions of the country, they supported NGO and Army activities on the ground, and they aided SOF forces in disseminating information. Due to the relative weakness of US will, great care was taken to protect troops, avoid mission creep, and maintain the confidence of the afflicted people. Limited violence in refugee camps was quickly repressed and sustainment operations were transitioned to NGOs as soon as possible. Had violence erupted and endangered US troops, or if those troops had acted unprofessionally in executing their duties, US support would have vaporized and the mission would have failed.

### **Organizing, Training, and Equipping**

As we move away from the period of détente and towards limited-objective operations, there is increasing asymmetry and nonlinearity. Instead of optimizing for full-scale conflict, we must prepare for flexibility across a diverse set of crisis options. This paper has attempted to address airpower's role in these future conflicts, but these roles must be complimented by improvements in organizing, training, and equipping for the nonlinear environment.

First, we must integrate the capabilities of sister services, other US agencies, coalitions, and NGOs through exercises, exchanges, and doctrine. Additionally, the military should restructure to retain some of the traditional hierarchical decision core, but create flatter operational command and execution organizations, and leverage vertical coalitions.

Second, we must develop and empower our people. Clausewitz said that only the wisdom of genius can combat uncertainty; wisdom is developed through experience, the experience of others, logic, and intuition. In future engagements - where everyone can make a difference - we need people on the front line with the wisdom and power to make time-critical decisions and take advantage of the information revolution.

Last, we must develop technologies that aid our people in making decisions and in exploiting asymmetries and nonlinearity. Specifically, systems must provide better situational awareness through an intuitive grasp of the battlefield. These may come in the form of next-generation space and airborne ISR assets, greater adaptability and integration of C4 capability, and better understanding of the man-machine interface. We must also prevent the enemy from exploiting our asymmetrical weaknesses including information protect technologies, long range stand-off weapons, and a family of ISR, space, and combat unoccupied aerial vehicles. Finally, the Air Force must technically and doctrinally prepare for a transition to space offensive and defensive operations in support of ground and space vital interests. Though space is currently only a supporting function, our dependency on the medium and its resources, along with our growing ability to access space, suggests that it may soon become an area of military operations.

The CSM offers a framework to analyze the major players involved, to predict their interactions, and to determine a strategy and target set that will achieve national objectives. Airpower's contribution must be weighed against its strengths, weaknesses, and strategy alternatives to determine its most effective application. Finally, through organizing, training, and equipping our forces for the nonlinear environment, the US will be prepared to take its place as the political, economic, and military world leader in the 21<sup>st</sup> century.