THE MILITARY CONFLICT INSTITUTE (TMCI)

TO FOSTER PUBLIC UNDERSTANDING OF THE NATURE OF MILITARY CONFLICT

A PHILOSOPHY OF WAR

First Edition

Roger Mickelson, Editor

Primary Authors:

Frank Benedict
Rosser Bobbitt
Ted DuBois
Chuck Hawkins
John Honig
Wayne Hughes
John McIver
Roger Mickelson
Clayton Newell
Itzhak Ravid
Russ Vane
Gene Visco
Greg Wilcox

Library of Congress Cataloging-in-Publication Data ISBN: 978-0-9762550-3-1
Printed in the United States of America

The Military Conflict Institute

A Philosophy of War

Contents

FOREWORD

This abbreviated work, ***A Philosophy of War***, was developed as a companion piece to ***Anatomy of a Combat Model***, prepared in 1995, and ***A Concise Theory of Military Combat,*** published in its first edition in 1997. The ***Philosophy*** has evolved significantly from more than 30 lengthy chapters by multiple authors into a more distilled product that is intended to appeal to general audiences (not just studious researchers). The three works are products of The Military Conflict Institute (TMCI).

This is a time of high public interest in war, especially World War IV—the current global armed conflict with Islamic extremists—particularly the ongoing campaigns in which the United States has been so heavily involved. In that context, it is increasingly important to provide a sound basis for understanding war in general terms without inventing new terminology to revise supposedly outmoded language. The relevance of this philosophical description of war lies in an underlying theme of TMCI:

All wars are alike in the same ways, and each war is unique in different ways.

This theme isn't as trivial or as simple as it appears. What is important for people to understand is that wars throughout history have many commonalities—what they are, why they are, and how they are. Too many people, even responsible and authoritative people, seek new labels, "different" tactics, and asymmetries that really aren't new in the history or tradition of war. Therefore, this work presents "A" philosophy of war…a description…without purporting to be "The" philosophy of war. It is a long-thought-out consensus of views by many TMCI members intimately familiar with war through personal experience and intellectual study.

There are many constants in war and warfare…things that abide. These are the universal truths about war that need to be described and explained so that the public can better understand the nature of military conflict—the purpose for TMCI's existence. Understanding the political bases of wars, their nature, strategic purposes, causes, operations, and effects in the broad sense provides a much needed basic perspective. These are the constants that apply to all wars, all places, and all times throughout (and, implicitly, prior to) recorded history, especially at the tribal, national, and strategic levels of military-political struggle.

There are also variables, particularly at the operational and tactical levels of warfare, that provide the context for individual wars, campaigns, and battles. The variables include technological adaptation and especially socio-economic trends that affect why and how political leaders either conduct wars or seek "peaceful" options to resolve perceived threats to vital interests. Variables include trends toward casualty avoidance, "stand-off" attacks that face the dilemma of precision strikes or collateral damage, constraints on the use of military forces, effective application of new technologies, and integration of the elements of power (sociological, economic, political, diplomatic, military, religious, cultural, etc.) into a cohesive war effort.

THE MILITARY CONFLICT INSTITUTE - PURPOSE

TMCI is a non-profit professional organization dedicated to developing a fundamental understanding of the nature of military conflict and to communicating the results to the public. The overall purpose is to reduce the likelihood and dangers of warfare and military conflict through a better understanding of their nature.

TMCI members are a diverse group of professionals who have been involved with wars, conflicts and national security planning. Most TMCI members are from the United States but TMCI has had members from other countries as well.

TMCI holds that there is a general hierarchy for understanding military conflict. First, there is a "theory of combat" with a direct focus on military combat and battle outcomes. Second, there is higher and broader order "philosophy of war" that describes war in its political context—with its derivative goals, forces, strategies, operations combined with human, economic, political, social and cultural factors. A third perspective is a theory of military conflict that encompasses a general field theory and is geo-strategic in nature.

And of course, while addressing concepts, modernity will have its own impact. Oddly enough, as much as has been written about war, little has been written that would pass as a philosophy of war—a summary description that educates the public on fundamental bases of a highly complex form of violent conflict.

The primary reason for this work—***A Philosophy of War***—is the lack of such a document. There are many books and studies about war, military operations, forces, participants, etc. Most of what has been written has been a history of events, campaigns, or wars. While those studies are fundamental to understanding broader questions about war, they tend to be isolated in time and context from the broader sweep of history. Some classic works such as Sun Tzu's ***Art of War*** and Clausewitz's ***On War*** are well known, but neither is a philosophy as we think of it. There are few books that encompass the same spectrum of topics in the manner we have attempted, nor with the same effort to relate "military" considerations to the driving political context.

We have tried to be objective in writing this book. We have tried to eliminate value judgments. And we have tried to ignore national or ideological biases. Even so, we recognize that these elements creep into our thinking and writing. While addressing concepts, modernity will have its own impact. While we have tried for an understanding that is essentially universal and durable, it seems obvious that future readers will find that much of what we believe today may become subject to change.

We also clearly recognize that much of the thought, study and history of warfare stems from Euro-centrism. The reality is—we believe—that the Greek and Roman empires impacted major developments in what is referred to as the Western World. We think that those influences are still affecting European and world history. So we have summarized much of what we are writing about as "Euro-centric" while integrating non-Western understanding to balance that bias. We also acknowledge the ancient and persisting influences of Asian versions of conflict—

particularly those of China. We've tried to at least mention those ideas, but we have aimed *A Philosophy of War* toward our presumed readers in the West.

The Christian Church organization, powers, doctrines and history are also major considerations in the Western view of war. Christian church doctrines have affected political philosophies, government powers, and concepts of warfare. Consider also the history of warfare between Christian "crusaders" and Muslim "infidels" (our Western view, although militant Muslims consider Christians to be the infidels). Philosophical struggles within the church have often caused warfare—such as those religious wars that occurred in Europe after the Reformation. We also recognize that many wars have occurred without major causes of religion.

We do not overlook major trends in political and military operations that are different. It is unrealistic to think about war without recognizing the impact of other cultures, socio-economic influences, political philosophies, and evolving and revolutionary technologies. We can—and have—looked to ancient oriental and other writings for insights, and we heartily recommend that any serious student of a war philosophy do the same.

We recognize the vastly different political philosophies and methods of conducting warfare used by warriors of the steppes, to include Genghis Khan and his descendants (e.g., the Golden Horde, Kublai Khan, Tamerlane), the Turkic tribes that founded the Ottoman Empire.

We believe that all forms of warfare have a political basis and that political considerations provide the context for war operations. We believe that this is true whether warfare is viewed from the aggressive side or the defensive side, or internally or externally. Political considerations are universal. In other words, we believe that all wars are political in nature.

The political context determines "reasons" for war, strategies, objectives, limitations, forces, and the major conditioning factors.

This work is not a "history" of war. There are many excellent military histories already in existence. But the viewpoints herein attempt to reflect major historical developments as they have impacted on wars.

This work has a heavy flavor of land military operations. Historically, the context for war has been on land, with naval operations usually in support of those campaigns. However, we have attempted to reflect similarities and differences in naval, air, and other military operations.

ACKNOWLEDGEMENTS

TMCI gratefully acknowledges the pioneering efforts of the small group of founders of TMCI in the late 1970s and early 1980s. In particular, the work and efforts of two distinguished officers deserve special recognition. Those two are Dr. Donald S. Marshall (Colonel, AUS, Ret.), and Trevor Dupuy (Colonel, USA, Ret.). Much of the TMCI effort stems from early efforts by these two scholars to develop an analytic theory of combat based on historical research.

There have been hundreds of contributions by members of TMCI in the form of research papers, presentations, advice, questions, thorough critical reviews, and insightful suggestions.

And earlier writers throughout written history have contributed so much to the understanding of war. But in an effort to make this a TMCI product, we have relied heavily on our own experiences and understanding, with the subconscious lingering of study and research into the classics as well. We believe that relying on another writer for our authority is too much like writing a research paper. We have done our research, but use references or notes only when useful for clarification. When appropriate, there are some additional suggested readings provided.

Part I. Fundamentals of War

This writing deals with two important concepts: philosophy and war. Both concepts deserve some definition before elaborating (and summarizing) more detailed aspects of an understanding of military conflict and war.

PHILOSOPHY

Philosophy is derived from the composite Greek noun *philosophia* that means the love or pursuit of wisdom. Early philosophical thinkers have also developed concepts of natural philosophy and moral philosophy. As a start point in this writing, philosophy is defined as a search for knowledge and wisdom. Thus, a philosophy of war is a search for knowledge and wisdom about war. A philosophy of war is not a set of moral values or judgments**.**

WAR

The rich historical record of wars spans millennia, almost all cultures and societies (the exceptions are a few small, remote family-tribal groups), and most areas of the populated world. Each of the wars throughout history differs from all others in particular ways, yet all wars are alike in fundamental ways. Finding the commonalities among all wars is the task that we face in this book. The following statements define and describe war.

- War is an act of force to compel an enemy to do our will in a state of declared or undeclared armed conflict between states or nations, or a violent clash between hostile forces. War is undertaken to accomplish political purposes that have value to the political entity.
- As used in this work, war is a state of violent conflict involving the use or threat of use of deadly force employing armed, organized forces between or among political entities to accomplish specific goals of value to each adversary. Each side may employ all elements of power available (e.g., economic, military, diplomatic, cultural, political) to achieve its war aims.
- War is a *de facto* state of military or other conflict between two overt or covert polities that may be formally declared or informally recognized.
- War can be formally declared, or it can exist without a formal declaration.
- Rebellions, civil wars, terrorist acts, and threats of conflict are forms of war.

The governments or politically motivated groups involved normally employ all of their elements of power (e.g., economic, military, diplomatic, religious, cultural, political, public will) to achieve their war aims and objectives.

Development of a philosophy is a quest for understanding. Trying to understand war in its entirety is a daunting challenge.

- War is a human activity, and understanding war is at least as difficult as understanding humankind in the broadest sense. One must try to understand people—how they think,

how they feel, how they can be manipulated, and how they can be effective in deadly conflict.

- War is a political activity. Individuals—as individuals—do not fight wars. Groups or organizations that are led, inspired, or coerced by events and decisions based on political activity and political ambitions fight wars.

There are many kinds of war, and a partial listing includes: international wars, inter-alliance wars, civil wars, imperial wars, religious wars, and revolutions. By definition, a universal element of war is the threat or the actual use of force. And of course, the probability that there will be combat means likely injury and/or death

Lessons from history and warfare go hand in hand. Many historians study wars, campaigns, battles, revolutions, evolution of tactics and weapons, and sometimes they write in exciting detail of wars long past which they can bring to life through painstaking research of the recorded events, eye witness accounts, as well as the study of forces, strategies, battles, participants, or causes of war. Much of what has been written does not go beyond partial description, and records of events in particular limit researchers. What is not recorded is lost to history and cannot be used for reference. And records are almost always biased and written with an eye to future historical research.

Most accessible writings on war are products of European (or European derived) thought, experience and culture. Wars fought by non-European derived cultures tend to be ignored by European thinkers—often to their detriment when encountering those forces.

Chapter 1 Political Foundations

Development of the theory and science of war has been incorporated as part of a philosophy of war. A theory—if proven correct—can be used to bolster "scientific" approaches, but in too many examples, the scientific approach is that used in the physical sciences. The physical world, as complex as it is, is predictable and can be confirmed by rigorous experimentation, compared to the complex interactions among physical, human and operational worlds. As we get into the description of these complexities, we will start with some cornerstones derived over time that have become part of military thinking.

WAR IS A POLITICAL ACTIVITY

War is not only an extension of politics, but also its very essence is political, although many instigators of war cloak the activity as something entirely different. Most warfare is justified as "defense of the country," a "just cause" or moral or religious crusade. Sometimes it is justified as upholding a nation's honor.

It is usually easy for political leaders to justify warfare in response to aggression, but it is more difficult for political leaders to justify war in democratic societies if it is aggressive, expansionist, or for personal ambitions. Even in democratic states, the combatants who actually fight the war are not usually asked if they want to participate in the war.

MORALITY OF WAR

The writers of this book would be remiss if, in attempting to explore a philosophy of war, they did not address, albeit briefly, the topic of moral behavior related to war. It is a subject of considerable history. In a recent book on the subject, Brian Orend, a Canadian scholar, said:

> *People have wrestled with the ethics of war and peace since the beginning of human history, not just in Western civilization but worldwide. Almost all major civilizations—from the ancient Egyptians to the Aztecs, from Babylonia to India, from China to an ancient and contemporary Europe—have featured fairly fixed beliefs about acceptable reasons for going to war, and permissible means of fighting it.*
>
> *Nearly all the major religious documents—from the Bible to the Bhaavadgita, from the Tao-te-ching to the Koran—refer to warfare and moralize about it. The Old Testament, for instance, is filled with fierce battles. Yahweh and the prophets repeatedly permit, or even command, the Israelites to go to war against their enemies, such as the Canaanites. Sometimes the commands seem quite bloodthirsty, other times restraint in fighting is urged. Jesus, by contrast, fills the New Testament with words and actions which seem at least anti-war and are, perhaps, at most pure pacifism. The Prince of Peace, as Christians know him, once famously commanded Peter to put away his sword. Sun Tzu's The Art of War—from ancient Oriental civilization, yet often taught in today's Western business schools—details various kinds of battle, and the strategies required for victory. Yet it too, includes a kind of ethic: of fighting only smartly and with honour, and not with*

> *rage, blunder and bloodlust. So, in a way, the ethics of war is everywhere, and is as old as the hills. (The Morality of War, Broadview Press, 2006)*

It is sufficient for the present to summarize the essential features of the modern view of the morality of war. The topic is divided into three stages: *Jus ad Bellum* (referring to the justification for going to war), *Jus in Bello* (referring to behavior in war), and *Jus post Bellum* (referring to behavior following war). [It is unclear why today's scholars discussing the morality of war continue to use the Latin titles but they usually do. The literal translations of the three phrases are, respectively: the justice of war, justice in war, and justice after war. It would seem acceptable and perhaps more useful to apply the English translations but there you are.]

There is some commonality between the perspectives of the morality (or ethics) related to war and international law dealing with war. There are also divisions or differences between the two sources guiding or influencing the nations of the world in their behaviors towards one another. For example, international law, codified by the United Nations, sees that aggression is a bad thing and member nations are authorized to go to war to deal with aggression against other members, but there is no attempt to justify war against aggression. We will deal here only with the general characteristics of the moral notions without further explication of the similarities and differences between the morality of war and international law dealing with war.

A nation is morally justified in going to war against another nation if the former is a victim of aggression (or is assisting another nation to resist aggression); if it is a minimally just, hence a legitimate, nation; and if its use of armed force does not, in turn, violate human rights. A minimally just nation is one that is acknowledged so by its own people and the international community, does not violate the rights of others, and seriously attempts to meet the rights of its own citizens. Orend summarizes six rules for *jus ad bellum*, to wit: just cause, right intention, public declaration of war by a proper authority, last resort, probability of success, and proportionality.

While the matter is somewhat less clear, the concept of *jus ad bellum* can be applied to the murkier cases of civil and irregular war, terrorism, preventive war, and humanitarian assistance (intervention in another state), as long as the rules are followed.

Just conduct during war (*jus in bello*) is more complex and rife with contradictions or complications. The central issue is moral consistency between means and ends during war. It is also important to note that the three facets of moral behavior are not independent; that is, one cannot have an immoral reason for going to war and subsequently behave morally during war. The moral behavior must obtain, according to the theorists, in all three phases.

Just conduct in war requires careful distinction between legitimate targets and illegitimate ones; unnecessarily targeting civilians, for example, are illegitimate targets. Civilians engaged in war materiel production, however, are legitimate targets. One of the complexities of just conduct in war has to do with situations in which unavoidable damage can be caused to illegitimate targets when engaging legitimate targets.

The moral theorists call for an assessment of the good and bad effects and provide criteria for judging the morality of the attack: the target must be a permissible or legitimate one; the

intent is to achieve the good effect, not the bad; the bad effect is not a means to achieve the good effect; and the good effect is worth the effort or is proportionately greater than the bad effect or outcome. Other dimensions of moral behavior during war include proportionality (proportionate use of force); denial of the use of certain weapons (here there is considerable overlap with international law and, perhaps, one of the more argumentative topics in the subject of morality of war; see, for example, the discussion elsewhere in this book on chemical and biological weapons); and respectful behavior towards one's own people (non-violation of domestic human rights justified by the exigencies of war).

The third category is justice after war (*jus post bellum*). Issues here deal with compensation (from the aggressor to the victim); sanctions; rehabilitation (military and political); apologies; war crimes trials; and publicity (the case for and against full public disclosure of all elements of the agreements to end the war).

As suggested at the outset of this section, we do not intend this review of the morality of war to be comprehensive. The subject is a profound, complex and important one, worthy of careful study, analysis, discourse, and debate. Such coverage is available through a variety of useful sources. Our intent here is only to introduce the topic for completeness of the present volume.

Chapter 2. Nature of War

The nature of war includes the phenomenon of war, the forces that produce and control war, and the essential character of war. This chapter discusses relevant war principles, types of wars, and the fundamental processes that pertain to the most violent form of human and societal behavior.

"Only the dead have seen the end of war."
Plato

AXIOMS OF WAR

Axioms are self-evident statements asserted as indisputable facts.[1] As such, they need to be concise and simply stated. These axioms form the theoretical foundation of war.

1. War involves profound, usually violent interaction between political entities, groups, or societies.
2. Each side seeks to achieve war aims and objectives that have perceived value.
3. A society's several elements of power have potential and actual capabilities to assist in achieving that society's war aims.
4. Each side activates the potential of its elements of power in furtherance of its war aims.
5. Domination of the enemy (imposition of one's will on the opponent) is the ultimate means of achieving war aims.
6. Uncertainty is inherent in war.

PRINCIPLES OF WAR

The principles of war are empirical precepts formulated as guides to the conduct of war and combat. Versions of principles have been set forth by many writers and by official military organizations. The versions differ in detail as to the number of principles and wording, yet there is remarkable similarity over the centuries. In effect, the principles represent wisdom developed over many years by those who have engaged in war—the distilled lessons learned from successes and failures. This paraphrased list has appeared in slightly different words in several doctrinal publications; the terminology focuses on military aspects, but applies as well to economic, diplomatic, and other elements of power.

- **Objective -** Direct every war operation toward a clearly defined, decisive, and attainable aim or objective; know in advance what you want to accomplish.
- **Offensive -** Seize, retain, and exploit the initiative; aggressively exploit enemy vulnerabilities.

[1] Axioms, principles, and other theoretical constructs pertaining to war in this chapter have been adapted from parallel material in TMCI's book, ***A Concise Theory of Combat***, printed by the Naval Postgraduate School Institute for Joint Warfare Analysis, 1997 and 1998.

- **Mass -** Mass and concentrate the cumulative effects of overwhelming elements of power at the decisive place and time.
- **Economy of Force -** Allocate minimum essential power to secondary and supporting efforts; efficiency requires massing of power on the primary target.
- **Maneuver -** Place the enemy in a position of disadvantage through the flexible application of power.
- **Unity of Leadership -** For every war aim and objective, ensure unity of effort and central direction.
- **Security -** Never permit the enemy to acquire an unexpected advantage; protect, hide, and defend your society, its people, its territory, its beliefs and goals, and its relevant vital information.
- **Surprise -** Strike the enemy at a time or place, or in a manner, for which he is unprepared.
- **Simplicity -** Prepare clear, uncomplicated plans and clear, concise orders to ensure thorough understanding in the execution of those directions.

Another set of Principles of War[2] includes:

- **Purpose -** Similar to the Objective. Decisive political objectives and complementary military aims selected to satisfy valid security interests.
- **Initiative -** Similar to the Offensive. Act rather than react at times and places of the attackers' choice.
- **Flexibility -** Develop multiple, alternate strategies to deal with uncertainty.
- **Concentration -** Similar to Mass. Ability to concentrate overwhelming force against vital enemy weaknesses. Mao Zedong described his guerilla "grand" strategy as one revolutionary against many in the Government's favor and his tactical strategy as ten revolutionaries against one defender.
- **Economy -** Similar to economy of force, but broader. Prioritization of strategic missions and allocation of always scarce resources; sequential strategic missions versus simultaneous missions (e.g., the U.S. and British strategic decision to defeat Germany before turning full attention to Japan in World War II).
- **Maneuver -** Same as Maneuver above. Mobility with agility.
- **Surprise -** Same as Surprise above. Secrecy, speed, deception, distraction, disruption, disinformation, originality, and audacity. Not just military surprise (e.g., Pearl Harbor), but economic (e.g., the Great Depression), political (e.g., crash and dissolution of the Soviet Union), and technological (e.g., long bow, breech-loading weapons, torpedo, atomic bomb).
- **Security -** Same as Security above. Preservation of elements of power and strategies; defensive and counteroffensive measures; intelligence and counterintelligence; bold offensive action too fast to be countered by defensive reactions.
- **Simplicity -** Same as Simplicity above. For example, the directive issued to General Dwight David Eisenhower in February 1944: "You will enter the continent of Europe and, in conjunction with other United Nations, undertake operations aimed at the heart of Germany and the destruction of her Armed Forces."

[2] ***Military Strategy: Principles, Practices, and Historical Perspectives***, John M. Collins, Brassey's Inc., 2002.

- **Unity -** Similar to Unity of Command, but broader. Coordination of the use of all elements of power (e.g., political, diplomatic, economic, military—air and ground and sea forces) toward a common goal.
- **Morale -** Both von Clausewitz and Napoleon emphasized the importance of morale—derived from compelling war purpose, professionally trusted leaders, discipline, esprit, perseverance, tenacity, shared pain, and loyalty.
- **Time -** Both patience and initiative—willingness to wait out unfavorable situations and willingness to act in a timely manner.

WHERE DOES WAR FIT?

There is a hierarchy that encompasses all human conflict, part of which involves military conflict, which in itself includes war. The figure below illustrates that hierarchy. There clearly are exceptions that are implicit in the figure (e.g., war might exclude military action; there can be single engagements or battles that are not part of a larger campaign or even war). But looking at the nature of war over the ages, across many cultures, and in many areas of the world, this is the predominant structure, showing that war is a subset of military conflict.

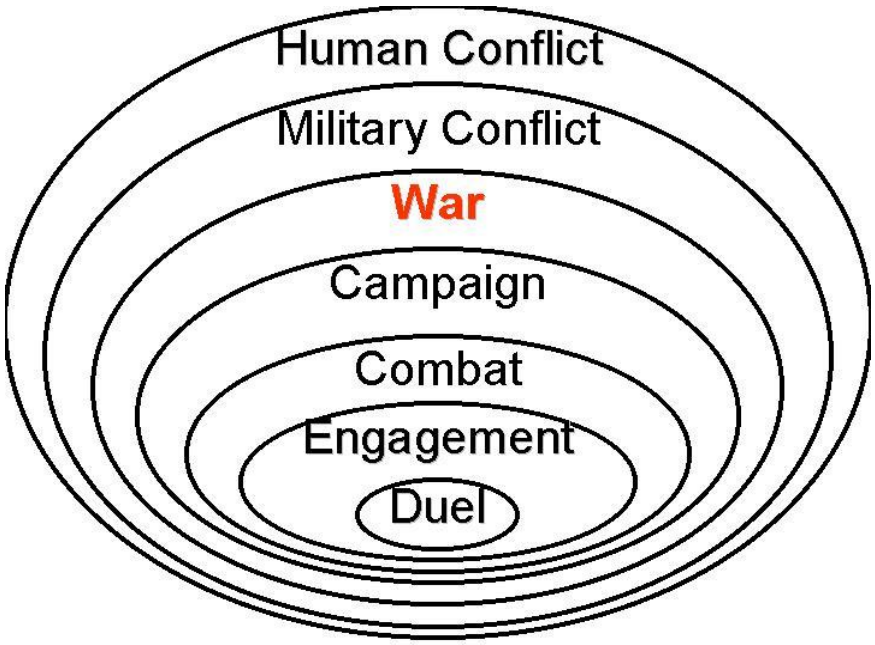

Figure 1. Hierarchy of Conflict

POLITICAL BASIS OF WAR

War exists and is conducted to achieve the political goals of a government, nation, or other group—a polity. At least one opposing force involved in a war is responsive and responsible to an organized society's governing body or ruler. The war leader might be a Tribal Chief, Clan Leader, War Commander, or Emperor; he need not be both the political and military leader, but both are usually responsible to a political entity if the political and military responsibilities are split. The difficult decision to wage war involves weighing a society's vital

interests, threats to those interests, enemy intentions and capabilities versus one's own capabilities, risks, costs, and values. This analysis applies to all of a society's cultural goals, political objectives, and elements of power, not just the military element of power. The decision process is necessarily complex (and increasingly so in the 21st Century, where time-space constraints of the past have diminished), and the logical, rational analysis involved has frequently been avoided or truncated to accommodate egos, emotions, and external influences.

TYPES OF WAR

Wars can be categorized in several ways—by size, by duration, by geographical scope, and by other characterizations. However, it may be more useful to concentrate on the primary purposes of war. The purposes are complex, and historians frequently mask the primary purposes with propagandized statements that suggest rationality, justice, moral behavior, and logic, when in fact a war might have begun through errors in judgment, irrationality, madness, or emotion.[3] The types of war in the following list are not collectively exhaustive. The list simply provides a convenient set of labels for identifying the primary purposes of wars. The table below provides a categorization of some 287 wars from the time of Emperor Constantine until 1900.[4]

Table 1. Purposes of War[5]

Category (Primary Purpose)	Number of Wars
Civil Wars	55
Wars of Conquest	44
Wars of Succession	41
Wars of Foreign Intervention	31
Wars of Religion	28
Wars of Reprisal	24
Wars of Political Propaganda	23
Wars for Tribute or Indemnity	22
Wars of Honor	8
Wars for the Adjustment of Frontiers	6
Wars for Commercial Interest	5

Most of these are briefly explained below; reprisal, propaganda, and frontier adjustment are self-descriptive. Any particular war will involve aspects of more than one of the categories; the purposes are not mutually exclusive. Wars are initiated, conducted, and terminated for political purposes. Most importantly, every war has political goals and objectives, even though there might appear to be another seemingly dominant purpose for that war.

CIVIL WAR

Those who are governed frequently are in opposition to those who govern. Civil wars are the most common type of war. Divisive politics or cultural beliefs frequently split a society into opposing groups with non-negotiable mindsets.[6]

[3] Perhaps the simplest statement of the cause of war is hubris—overbearing pride and arrogance. See, for example, ***The Causes of War***, by Geoffrey Blainey, The MacMillan Press Ltd., 1973.
[4] Laffont, Robert, *Ancient Art of Warfare*, Volume 2, 1966.
[5] Note that Chapter 3 focuses on the causes of war, a different categorization that the purposes listed here.

WARS OF TERRITORIAL CONQUEST - IMPERIAL WARS

This may be the oldest type of war, and it has both political and economic aspects. But the primary objective of a war of conquest is normally to conquer another society and to occupy their territory—to expand the sphere of influence of the society that begins the war.

RELIGIOUS WARS

Wars often have the primary goal of exporting a society's belief system, forcing a religion (or form of government approximating a religion) on one or more other societies. Examples include the initial, rapid, and violent spread of Islam in the First Jihad (624-750 A.D.); the Crusades[7]; the Thirty Years War; and the many wars between Catholics and Protestants in Europe.

WARS OF SUCESSION

Throughout history—and undoubtedly before—there have been wars to determine who should succeed a deceased, ill, or deposed political leader. Competing siblings, political leaders, and warlike strongmen with visions of power seldom see a succession as a peaceful transition.[8]

WARS OF FOREIGN INTERVENTION

Throughout history, powerful nations have felt the necessity to interfere in situations external to their own borders, often inventing "threats" to counter, wrongs to right, and oppression to defeat. Intervening in the sovereign affairs of another nation or society may also have other payoffs (e.g., economic, self-aggrandizement of the victors, expanded territory). One can argue that recent United States "wars" have been wars of intervention (e.g., Kosovo, Bosnia).

WARS OF REPRISAL AND HONOR

These often derive from tribal feuds, with historical claims to territory, religious dominance, and cultural heritage underlying as the true political purposes. The putative rationale may be clear (e.g., "they" humiliated us after defeating us last time; their unprovoked attack and swift victory were "unfair"), or it may be masked by rhetoric (e.g., we seek to restore the *status quo ante*; the enemy is barbaric). One common objective is revenge for the killing by a member of another tribe of one of the revenging tribe.

WARS OF TRIBUTE OR INDEMNITY

This category should perhaps be a subset of commercial interest or economic war. Societies at times threaten or attack other societies to exact ransom, to collect tribute (from a conquered or subjugated polity), or obtain and hold hostage individuals or wealth to prevent an attack on the threatened society.

---

[6] One of the earliest civil wars was in 745 BC, when the Assyrian throne was occupied by Tiglath-Pileser III, a ruler who deliberately decided to build Assyria into a world empire. He began by reasserting the authority of the throne and reducing the power of the troublesome court nobles and expelling dissident factions, who then rebelled.

[7] Many would argue that religion was the stated primary purpose of the Crusades, but opening trade routes, pillage, colonization, and "thinning" of the class of knighthood may have been the real reasons for the series of "Christian" Crusades from 1095 until the late 13th Century.

[8] Many of the European wars in the last millennium were basically conducted to determine which of the competing parties would rule. The same is true in other areas of the world (e.g., Mongols after about 1350, China).

COMMERCIAL INTERESTS OR ECONOMIC WARS

This type of war includes wars to open or protect trade routes, to capture natural resources or wealth from another society, and to violently dominate commerce against a competing society.

INTERESTS

Each society develops a commonly agreed set of interests based on its people, culture, beliefs, and convictions. Most societies hold some standard goals—to protect and defend their citizens and property—in order to promote and defend the health and economic welfare of the population, ensure domestic tranquility, and preserve their "way of life." Most societies have additional interests that each might define as vital, having to do with interactions between other societies and its own citizenry. These goals might be the export of a religion, spread of an economic system, imposition of a type of political government on others, elimination of an oppressive or "bad" type of government, expansion or conquest, protection or imposition of economic stability and free trade, provision of humanitarian aid to others, and many other aims. Vital interests shift over time due to changing political, cultural, and economic pressures, just as threats to those interests change due to (primarily) external pressures and circumstances. Each society therefore continuously assesses its interests and threats to ensure that the underlying political goals and objectives of the society are current, supported, and supportable.

THREATS

Conflict and challenge are natural states of the human environment. One society's goals may conflict with those of another society—preservation versus expansion, one religion versus another, defending one's resources versus capturing additional wealth. The threats to a society's interests represent dangers to a society's interests. In general, a society assesses the capabilities and intentions of potential adversaries to determine the degree of threat and to define the potential responses to counter the threat. Each society assesses the threats to its vital interests, and those threats lie on a spectrum ranging from minor crises, conflicts, and influences that may or may not threaten vital interests to the most serious threats that could destroy a society and its people.

THREAT ASSESSMENT

Identifying threats to vital interests is only the first step in assessing potential effects. A society must objectively examine its own vulnerabilities, strengths, resources, defenses, allied commitment and capabilities, countermeasures, and strategies. Only then can the threats be matched against vulnerabilities and judgments made concerning the risks implicit in each threat. The assessment must be both quantitative (e.g., size of armed forces, economic strength) and qualitative (e.g., commitment, willingness of the population, morale) and should produce a range of conclusions—not just a single measure of each threat. The results can be used to reallocate resources, to revise policies and strategies, and to develop counter-strategies and plans, the next step in the interests-policy-strategy-tactics process.

Several considerations apply when rating threats, often involving consideration of each threat's potential effects on a society's many elements of power—for example, the threat of an oil embargo has potential short and long-term economic, political, and military implications.

More complex threats, such as terrorism, involve more complicated assessment processes due to greater uncertainties and breadth of the threat.

CONTEXT OF WAR

There are many variables inherent in the interaction of a society, within itself and externally, that provide a context. These include:

- National[9] (and alliance) war goals
- National (and alliance) will and support of the war effort
- War leadership
- War strategy and objectives
- Warfighting doctrine
- Available manpower resources—quantity, quality, morale, readiness, leadership, motivation
- Available material resources—quantity and quality of weapons, communications, support
- Future availability of manpower and material resources
- Intelligence systems and intelligence available
- National situation immediately prior to war
- Objectives subsequent to war termination

PURPOSE, VALUE, MISSION, OUTCOME, COSTS

There must be a purpose for going to war that has value to the society weighing that decision. The purpose generally is to achieve fundamental political and societal goals (e.g., defend its people, gain resources, expand trade). The achievement thereof has a value that must be measured against the risks of failing to achieve success. Once the decision threshold of "going to war" is past, derivative missions are assigned that promote achievement of purposes. The conduct of a war involves preparation, operations, termination, and an outcome. Post-war assessments determine the costs of the war, which are then compared with the pre-war determined value to the society. The figure below summarizes the steps involved in this chain of logic. The same steps apply to individual campaigns within the war and to individual battles.

[9] The word "national" is intended to encompass all forms of "government" and "society" from family, through tribe and clan, to city-state, nation, and empire. This list is adapted from TMCI's book, ***A Concise Theory of Combat***.

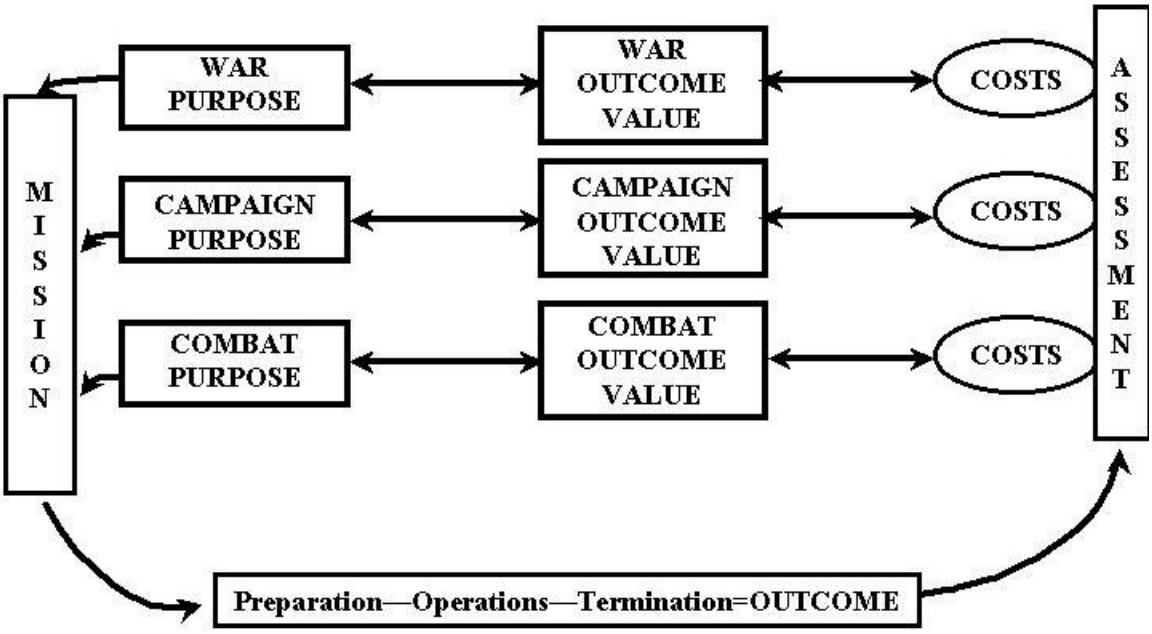

Figure 2. Purpose, Value, and Outcome

ELEMENTS OF POWER

Every society has the benefit of having several well-developed elements of *potential* power that can be brought to bear in a war, at which time they become *actual* elements of power. Most texts and historical "art of war" books concentrate on the military and political elements of power, but there are other highly useful potential and actual strengths that a society can direct and control to more effectively accomplish its political goals and objectives. Every element of power has the intrinsic potential to achieve a society's political goals with varying degrees of effectiveness. In concert, all elements of power can do so when applied before and during a war. There is a natural synergism among a society's elements of power, such as the strengthening of military power through the infusion of economic wealth, the acquisition of allies by application of political and diplomatic pressures, and the strengthening of public support and external favorable opinion through public diplomacy.[10] During the analytic process of deciding to go to war, political leaders must objectively assess how each element of power can be applied to contribute to (a) increasing the society's aggregate power, (b) diminishing an enemy's aggregate power, and (c) avoiding interference by other societies.

[10] Public diplomacy includes propaganda, media management, publicity, and other influences of opinion.

WHAT ARE THE ELEMENTS OF POWER?

Simply put, any potential lever, force, means, or strength available to a society is an element of power when actually put into use to achieve that society's war aims. In peacetime, the potential exists and can be strengthened; in war, the potential is activated. These are some of the primary elements of power relevant to achieving war aims:

- Economic
- Military
- Political
- Cultural
- Corporate entities
- Banking entities
- Allies
- Diplomacy (covert and overt)
- Social institutions
- Use of surrogates
- Personal contacts
- Religious
- Public support
- External support

CHANGING THE STATE OF THE ELEMENTS OF POWER

The fundamental purpose of war is to achieve political purposes by changing the state of the elements of power of one's own society and those of its enemies to achieve political purposes. Recognizing that the myriad elements of power related to "war" can be mutually supportive and reinforcing; actions taken to strengthen one element of power usually involve activities performed by other elements of power. For example, in order to increase the military potential of a society, leaders use and direct political and economic elements of power to facilitate growth in the military sector. Political war leaders control and direct all of their society's elements of power to take part in activities that change the state of their own elements of power (strengthen) and the state of an enemy's elements of power (weaken). The results of war activities actually change the state of elements of power on both sides, but the results are imperfectly perceived—and the distorted information flows back to the war leaders, who redirect their elements of power as shown in Figure 3.

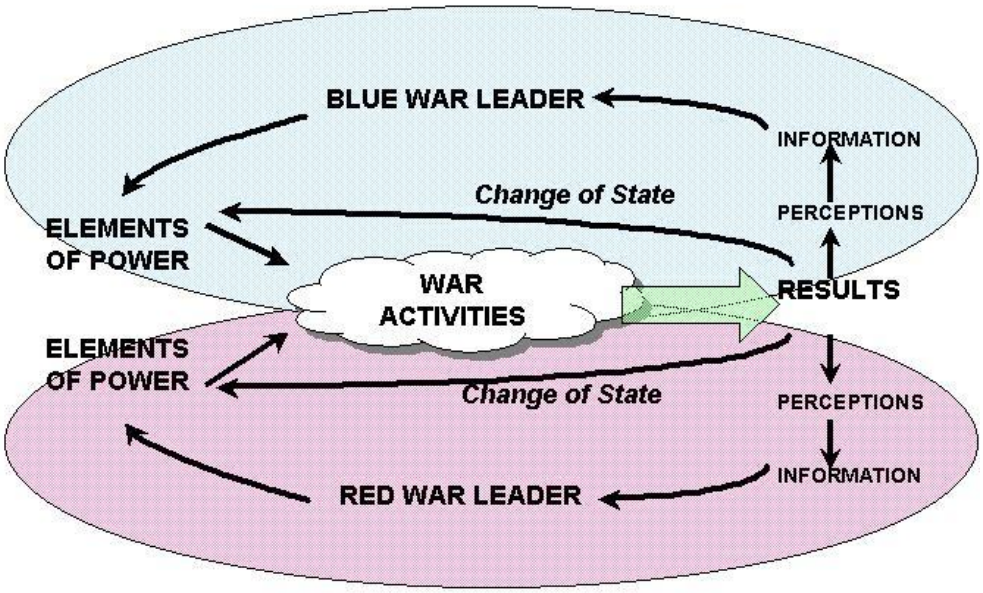

Figure 3. Changing the State of Elements of Power

But war activities, results, perceptions, information, analysis-decisionmaking, and redirection of elements of power involve a dynamic process that ebbs and flows, not quite continuously. The dynamic "cycle" depends on the scope and extent of a war (e.g., small vs. global, proximate vs. distant, few battles vs. many campaigns, short vs. prolonged) and many other factors (e.g., changing purposes, external influences, internal dissension, political and public will). The dynamic cycle shown in Figure 4 below is similar to the static portrayal above, but indicates the "flow" of directions, actions, and results for changing the state of internal elements of power and those external (enemy) elements of power.

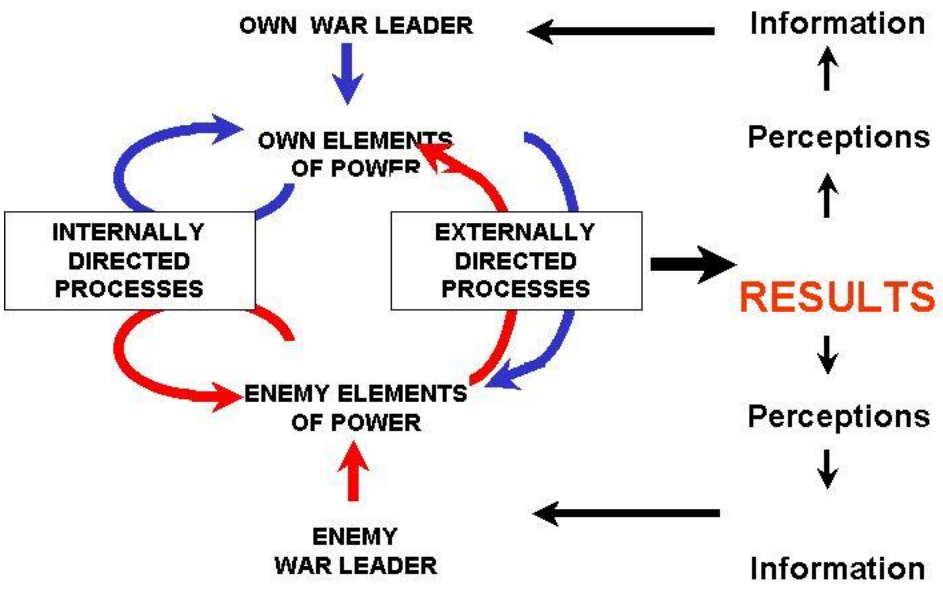

Figure 4. Dynamic Cycle

PROCESSES OF WAR

War leaders direct their own elements of power to strengthen their own power (through the internally directed processes in Figure 4) and to weaken the enemy's elements of power (using the externally directed processes). So what are these Processes of War?

INTERNAL PROCESSES OF WAR

There are several things that war opponents do to bolster their own war potential. This is accomplished through their internally directed processes to change (increase, improve) the state of the war potential of their own elements of power. These include:

- Command and control. The exercise of authority by war leaders to direct and coordinate all of the other processes.
- Motivation. The infusing of patriotism and support of the war effort by the citizenry and wielders of the elements of power, not just military forces.
- Sustainment. The resources and materiel to support the war effort over protracted periods of time, including national will, natural resources, wealth, industrial or manufacturing might, and manpower.
- Movement. The transportation and physical repositioning of people and things in support of the war effort. This includes electronic and other intangible transfers.
- Protection. In anticipation of an enemy's reaction, preemption, or natural catastrophe, war leaders must provide security and preserve the means of conducting a war.
- Information Acquisition. Without understandable data, information, and knowledge, a society is virtually helpless in deciding to go to war, preparing for war, and conducting wartime operations.

- Communication. This is the complex process that enables all of the processes; the flow of information supports every process of war.

EXTERNAL PROCESSES OF WAR

Both sides also want to decrease their opponent's war potential and power by applying externally directed processes against his elements of power—to change (eliminate or decrease) the state of the enemy's elements of power. These include:

- Demoralization. Destroying the motivation and will of an enemy society and its people, especially those who exercise their elements of power.
- Suppression. Suppression diminishes the effectiveness of an opponent's military forces, economic might, diplomatic skills, and other war-supporting resources.
- Disruption. Interfering with, interrupting, distracting, or disrupting an opponent's activities to decrease an opponent's effectiveness.
- Destruction. The obliteration, annihilation, or devastation of an enemy's resources, facilities, military forces, economic structure, or population.
- Neutralization. Activities undertaken to render critical capabilities useless, short of destruction.
- Deception. Misleading, tricking, or hiding one's own capabilities and intentions from an opponent.

OVERALL PROCESSES OF WAR

The internally and externally directed processes of war are conducted under the authority and direction of the war leaders. In addition, there is the mass of information communicated in, to, and from the external world—neutrals, allies, trading partners, and others who have varying interests in the conduct of the war. This external environment, not directly under the control of either war leader, imposes constraints and pressures and provides reinforcing support, often in an ill-defined and complex manner—but the "rest of the world" strongly influences the decision processes associated with war. All of the processes are illustrated in Figure 5, showing the two-sided yet parallel processes involved.[11]

[11] The figure is not meant to suggest that each war leader will use all of the processes in the same way, to the same degree, or at the same time as the opponent.

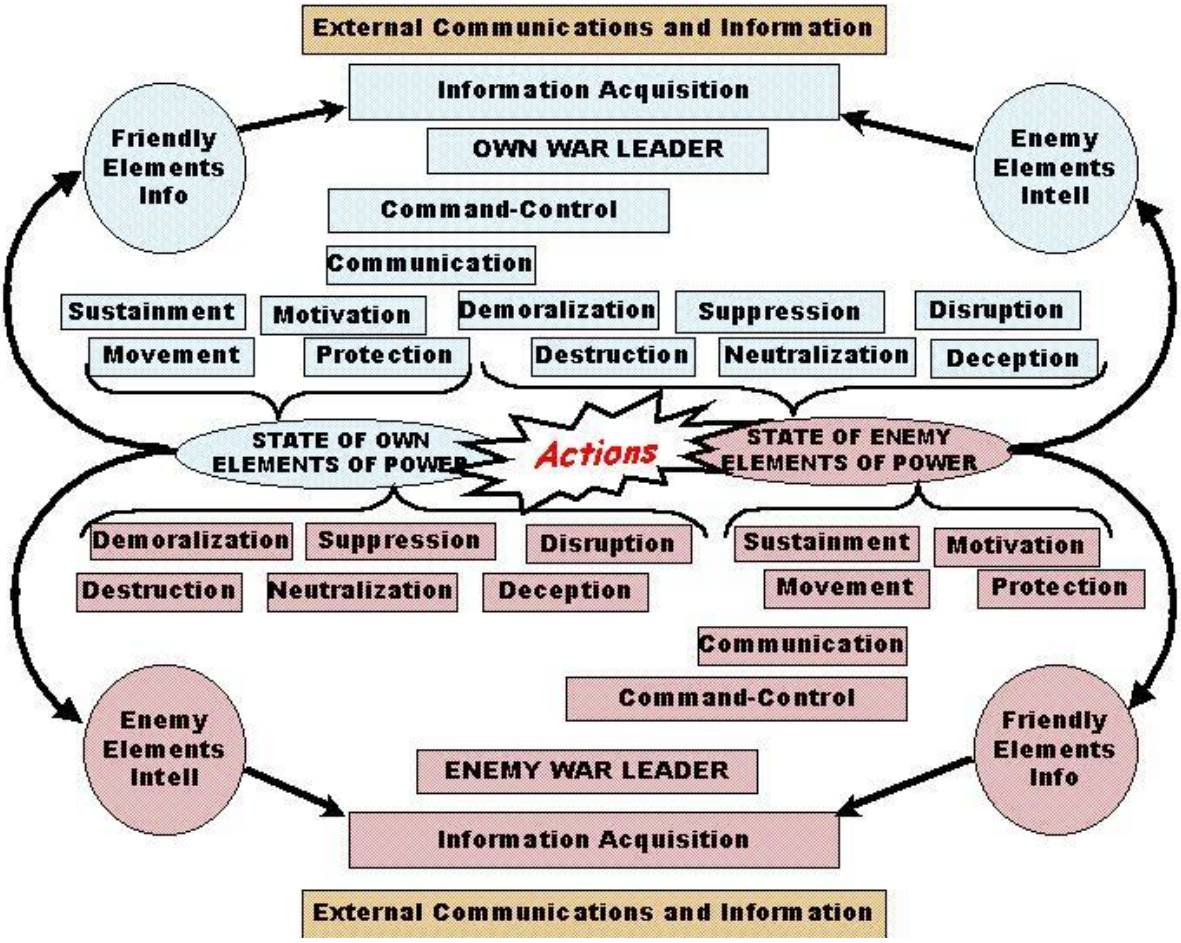

Figure 5. Processes of War

ENEMIES AND ALLIES

There have been many cases of one society warring on another society without encumbering alliances on either side. Since every society has had and will have enemies, war is a common (normal) state of societal relations[12]. At the same time, most societies tend to affiliate or trade with other societies with similar values, interests, cultures, and "friendly" attributes. One-on-one warfare has become increasingly rare as inter-societal contacts have, over the centuries, increased and become more complicated.

CONSERVATION OF ENEMIES

Whether a political entity tends toward aggression or pacification, threats to its vital interests (or furtherance of its vital interests) will naturally generate one or more enemy societies. But even for the most aggressive society, with high-ego war leaders, overwhelming power of all types, and a history of conquest or combat, there is a principle that suggests that no society

[12] Historical research shows that peace has prevailed (no recorded wars) for only 268 years in the written, multi-millennial history of civilization.

should bite off more than it can chew. That principle, conservation of enemies, holds that a society should not war on more societies than it can handle. Despite the most careful pre-war analyses, it is possible, even likely, to fail to understand that the alliances of a potential enemy could increase the number of enemies and hence overall enemy capabilities.

There is an associated maxim that one should befriend one's enemies. The idea is that a warring society might ameliorate post-war situations (whether you win or lose) by showing commendable human traits (e.g., consideration, mercy, parole, concern, tolerance) during a war.

CONSERVATION OF ALLIES

There is a balancing principle that suggests that any society contemplating a war should not acquire "too many" allies. Each ally brings an accompanying burden. That is to say, securing an alliance with another society is a two-way negotiation, with each party to the agreement "wanting" something out of the alliance. The society deciding to go to war wants each of its allies to provide economic, military, political, diplomatic, and other support in furtherance of its war aims and objectives—the political basis for going to war. But each of those allies will agree to that support only on the condition that there is a *quid pro quo* involved. The "payoff" may be economic (e.g., favorable trade arrangements, loans), political (e.g., recognition of an ally's colonial rights), military (e.g., long term stationing of military forces on or near an ally's territory for protection; bilateral military training agreements), or some similar "payment" for allied support.

The difficulty for the warring society mounts as allied needs begin to contradict or modify the warring society's political purposes and war aims. For example, a society may have the goal of destroying an enemy's military forces, but a potential ally might want to limit damage to the common enemy, insisting on "neutralizing" the enemy's military forces or securing a political accommodation. The warring society then has the choice (after deliberations and negotiations) of modifying its initial war aims by accepting the potential ally's position or of adhering to its initial war aims and foregoing support from that potential ally.

There is an associated maxim that one should threaten one's allies during a war. They will tolerate ultimata better than enemies will, and they will (according to the maxim) habitually respond to demands by acquiescence.

DIFERENTIATING BETWEEN ENEMIES AND ALLIES

As international commerce, globalization, information age technologies, and international relations have grown more complex and more common, there is a corresponding complexity in determining whether any other society is an enemy, an ally, or something else (e.g., neutral, trading partner, generally only friendly). And, with the complexities introduced by multinational corporations, open and covert trading agreements, international banking, and layered diplomatic agreements, another society may be an ally in the economic realm, neutral in the military sense, and an enemy in the diplomatic arena. The political challenge becomes one of negotiating on specific goals in narrower zones of potential mutual advantage.

There is the famous assertion that nations do not have allies; they only have interests. Alliances shift; today's ally may become tomorrow's enemy.

CONVERTING ENEMIES INTO ALLIES

History is replete with examples of wars against enemies that produced allies in the post-war time frame. Alexander the Great, Genghis Khan, and other great war leaders assimilated or integrated many conquered societies into their empires—sometimes placing conquered leaders to govern in their stead as they departed for further conquests.

CONVERTING ALLIES INTO ENEMIES

In a similar vein, there are many examples of ill-treated allies who either resigned from their alliance with a warring power for diverse reasons, and also those whose post-war demands were not adequately satisfied. In some cases, this creates an unfriendly polity that previously had supported a warring society. In cases of crumbling empires or political coalitions (e.g., Holy Roman Empire, Ottoman Empire, Union of Soviet Socialist Republics), states that had been loyal members reverted to pre-empire animosities and war with their former allies (e.g., Chechnya, Bosnia, Kosovo).

SUMMARY

Certain axioms and principles of war have survived centuries of societal conflict and have remained valid across cultures and throughout regions of the world. The central basis for war is political—the leaders of a tribe, clan, city, nation, alliance, or empire pose goals for the collective group and set forth the political interests, the threats to those interests that "require" going to war, and the general policies and strategies for prosecuting the war. There are many types of war, depending on the primary purpose and cause for a society's decision to go to war.

The political decision to go to war must consider the purpose and aim of the war, the value of a favorable outcome (or loss of value due to an unfavorable outcome), missions to be assigned throughout the society (e.g., military, economic, religious, commercial), preparation for war, war operations, war termination, and possible outcomes—which ought to be assessed and costs compared to the original value determined at the beginning of the overall process.

A society has several elements of potential power that can be used in a coordinated strategy to achieve the desired political goals. Most people think that war is dependent only on military power; however, the political, economic, cultural, corporate-commercial, diplomatic, financial, manpower, and other elements of power can directly and indirectly contribute to the war effort. The basic purpose of a war is to change the state of the enemy's elements of power—to destroy his army, to disrupt his financial system, to demoralize his people, and so on. By directing war activities in a supportive, cohesive manner, each side's war leaders apply their elements of power to weaken the opponent's elements of power and to strengthen their own elements of power.

War leaders employ the internal processes of war to change the state of their war potential and power. Based on information (derived from perceptions of the actual situation and

results of war activities), a war leader commands, motivates, controls, sustains, moves, protects, and communicates with his own elements of power. He directs those elements to demoralize, suppress, disrupt, destroy, neutralize, and deceive the enemy and his elements of power.

Every society has enemies that threaten its vital interests and may have allies to assist in protecting, defending, and preserving those interests. But a society should never generate "too many" enemies (the principle of Conservation of Enemies) lest the several enemies' elements of power completely overwhelm its own. Allies help, but there is also the principle of Conservation of Allies that warns of the dilution of a society's political goals and purposes by having to accommodate the goals and purposes of its allies. The classification of other societies into neat lists of enemies and allies is a transient—yesterday's enemy can become tomorrow's ally. Even worse, today's ally can become a future enemy. History is replete with many examples of shifting alliances. In a more globalized world, there are few simple sortings—another society might be a commercial ally, but a political enemy, and maybe religiously neutral or antagonistic.

Chapter 3. Causes and Effects

This chapter discusses the reasons why wars occur and what the results of wars are. The intervening acts of war initiation, operations, and termination are covered in Part II.

One certainty—perhaps the only one—in this matter is that each war is unique and has its own causes and consequences. We hold that **all wars are alike in the same way**[13]. The latter statement reflects the basic "likeness" of the causes and consequences of wars throughout the ages, including the purportedly "unusual" wars of the 21st Century.

Moreover, wars tend to have multiple causes and multiple effects. Nevertheless, in most cases it is possible to order the causes and effects in terms of their underlying value to the initiator. It is possible (and important) to generalize from the historical records and to posit basic causes and consequences of war—commonalities throughout history.

CAUSES OF WAR

Since war pervades recorded history, military theoreticians, political scientists, sociologists, statesmen, and philosophers have postulated the causes of war. Each list is based on an individual viewpoint that reflects a particular time and place.

An example of this approach is Jomini's list of the reasons why governments go to war:[14]

1. To reclaim certain rights or defend them;
2. To protect and maintain the great interests of the state (as commerce, manufactures, or agriculture);
3. To maintain the balance of power;
4. To propagate political or religious theories, to crush them, or to defend them [wars of opinion;
5. To increase the influence and power of the state by acquisitions of territory;
6. To gratify a mania for conquest.

Jomini's list helps us understand the values and outlook of the age in which he lived. Lists such as these are common in historical literature, and they frequently have value. However, merely listing self-evident causes of war does not explain the phenomenon for all times, all places, and all forms of social organization.

[13] And the corollary, that **each war is different in its own way**.
[14] Antoine Henri Jomini, ***Precis de l'Art de la Guerre***, 1838.

A MORE GENERALIZED APPROACH

Our approach is to regard war as a sub-system of military conflict, which itself is a sub-system of human conflict. As explained in *An Overview of Military Conflict*, we begin with human behavior and try to explain why some conflict becomes deadly and leads to war.[15]

Wars usually have multiple causes, which fall more or less discretely into four primary categories. Wars can be sorted according to primary cause, with the secondary causes noted. Our method is to observe primary causes, subdivide them into sub-categories, and use historical examples to illustrate this technique.

HUMAN TRAITS

War is results from the violent expression of human conflict. We organize human conflict in four general traits.[16]

- **Greed**
- **Passion**
- **Power**
- **Fear**

The effects of these traits can move them from the relatively benign area of human competition to conflict to military action with killing, destruction, disruption, and treachery. Individual human "motivating factors" can aggregate into group behavior, establishment of societal values, creation of group goals, and form the basis for protecting those values and achieving those goals through, among other routes, war.

When the traits lead to war, they are exhibited in a ruler, a government, a ruling elite, a segment of a society[17], or an entire population of a society. In contemporary Western societies, war is usually seen as being too expensive a matter to be started (or ended) as the whim of one person or a small group, no matter how powerful. Significant numbers of the people have to support the publicized or nominal causes of the war in order to initiate and sustain it.[18]

Societies may go to war solely because of a leader's motivation (e.g., greed, revenge, ambition, hubris). The army of a society may go along with the leader because they are greedy too, such as is seen in Attila's warriors. In Attila's case, the army was a self-contained society with its own resources. The support of the people left at home was almost irrelevant.

When a leader needs the support of the population in order to go to war, the passion of the people must be aroused—whether the motivating factor is greed, power, or fear. It is possible to go to war when nobody in the population cares very much or ignorance of the circumstances

---

[15] See the *Overview of Military Conflict* at www.militaryconflict.org for an explanation of TMCI's approach to organizing the subject of military conflict and the place of war in that system.

[16] These four human traits are not intended to be a list of causes. They are a scheme for organizing the rational discussion of causes. There is difficulty even with this list. It is hard to distinguish, for example, greed from power. We believe that this method provides the basis for a useful discussion of the subject.

[17] The segment may be a vocal minority, rebellious in nature, forming insurrections, civil wars, guerilla wars, or terrorist activities.

[18] It is possible for a large segment of the population of a society to oppose a war. Such was the case in the United States war with North Vietnam after the Tet Offensive of 1968.

prevails. A leader's passion (as seen in the decision by Serbian leaders to initiate a small war in Kosovo) doesn't have to contain a public reward if there are sufficient forces and resources in place to wage such a small war.

The degree of acceptance by a society to violent activities depends on who wants them. When it is a ruler or a government, they are attributed to governance and accorded the status of warfare. When individuals kill or steal, they are treated as criminals. When small, motivated groups of people perform them, their acts become terrorism—considered legitimate by the attacking groups but illegal by the groups that are attacked. When large, organized groups perform them under the auspices of a recognized governing body of some sort, they become legitimized as war…but not necessarily lawful war.

PERSPECTIVE

Whether lethal violence is characterized as heroic, patriotic, despicable, or cowardly depends on who is characterizing the actions. Trials for war crimes are conducted by the victors, who tend to condemn their opponents using "laws" that may or may not be valid. Despite the existence of rules governing the conduct of war, those who break them usually believe that they are doing the right thing

.

GREED

One of the primary reasons for waging war is to increase wealth, either for personal benefit or for the benefit of a group. Chiefs, kings, emperors, and presidents have believed that they can benefit their respective tribes, kingdoms, empires, or republics by conquering another society to gain land, natural resources (e.g., metals, oil, crops), additional population, and money (e.g., gold, silver, precious gems). Wars caused by greed include wars of conquest, colonial wars, and trade wars. This is a simplified characterization that differs from the broader categories in Chapter 2.

- Wars of conquest are fought to gain land, goods, and slaves.
- Colonial Wars are fought to expand the wealth and power of a tribe or state by gaining territory.
- Trade Wars are fought to obtain or maintain markets.

PASSION

A second cause of war is passion—emotional enthusiasm for a cause. When the adherents believe that advancing that cause is important enough to warrant the use of organized violence, the result is military conflict. If the conflict is extended, the result is war. Wars spawned by passion include religious wars, ideological wars, imperial wars, and compassionate wars.

- Religious Wars are fought to expand the ranks of "true-believers" or followers of the only true faith. Strangely enough, the Greek and Roman pantheons did not exhort their believers to wage war on their behalf, but the priesthoods of other gods have. A true religious war is not for wealth or power under the cloak of piety; it draws its energy from the thrill of converting others to the true faith and killing those who do not convert. In this sense, religious wars are particularly satisfying to those spreading the faith and particularly distasteful to those resisting the spread.

- Ideological Wars are similar to religious wars, except that the fighting is done in the name of a particular economic or political concept instead of a religion. For those to whom religion is but another ideology the difference is moot. Great movements have inspired great conflicts. Recent examples are Marxism-Leninism, whose followers killed millions in the name of achieving social equality in a utopia of the masses. Another example is the fascist ideology of the National Socialists under Hitler.

- Imperial Wars are inspired by the urge to increase the size and wealth of a particular society, incorporating enough tribes, kingdoms, and countries to constitute an "empire." Although these wars are often disguised as wars of passion, they are often simply ways to increase the wealth and power of a ruler or ruling class and often are the result of greed. Examples include Roman domination of Europe and the Mediterranean, European (e.g., Spanish, English, Dutch, Portuguese, French) colonization of underdeveloped parts of the world, and Soviet absorption of Eastern Europe.

- Compassionate Wars are designed to do good. Very often in war, each side claims to be righteous. Wars pursued by European powers to save the souls of poor heathen are the religious variety of "do-good" wars. It may be, as some assert, that a "good war" is a rationale invented after the war starts to justify to the participants their sacrifice of blood and treasure.

POWER

Thirdly, some wars have been waged to increase or sustain the power of individuals, ruling elites, or even entire polities. Power based wars include those that seek to feed the ego or salve the pride, or the hubris of rulers or ruling groups. Wars started by the ego of one person or a small group of a ruling class, because they simply ***like*** war, are not very plentiful. Wars caused by the desire for power include:

- Wars to feed ego
- Wars to salve pride (e.g., to regain lost territory)
- Wars to revenge real or imagined slights and insults
- War based on hubris
- Wars to make the ruler look good
- Wars for immortality and fame

Wars started by the ego of one person or a small group of a ruling class because they simply *like* war are infrequent…but they do occur.

FEAR

The fourth cause of war is fear—often of the consequences of not waging war. Fear can entail misunderstanding, miscalculation, or miscommunication. Fearful of possible consequences if there is no action, wars are sometime initiated by polities for whom the prospect of war is less awful than what they believe would happen if there were no war. It is likely that the Japanese started a war with the United States because they concluded that their ambition in Asia would fail if the United States continued to bring economic pressure to bear. Fearful of the consequences of not attacking, the Japanese gambled, and lost. Wars caused by fear include

preemptive wars, reactive wars, wars to prevent external oppression, and wars to prevent internal oppression.

TRANSFORMATION OF CONFLICT INTO WAR

Greed, passion of all sorts, lust for power, and fear create conflict. Most conflicts are resolved without violence. Some conflicts involve violence but are managed without resort to organized, military violence and war. Conflict that causes a war has to exist in a situation conducive to war. Certain preconditions are needed to spark a war. The preconditions for transformation to war encompass the means, opportunity, and motive. If the preconditions don't exist, resolution of the conflict may be less violent. The peacemaking process, however, has been notoriously prolonged and difficult, with the danger of war always lurking in the background.

MEANS FOR WAGING WAR

War, even at the tribal level, is normally an expensive, inconvenient, complicated, and dangerous undertaking. It requires the existence of key means. If they are not present on at least one side, then war is unlikely.

- A group organized into a clan, sect, tribe, city, province, nation, kingdom, empire, republic, alliance, or other form of human association. These societies may also be called polities in that they conduct political activity—as opposed to solely economic, spiritual, or cultural activity.
- A political leader or governing body that rules a society.
- Leaders who know, or think they know, how to wage war.
- Funds or other emoluments to pay for the troops, equipment, and supplies of an armed force.
- A body of people to fight.
- Natural resources adequate to provide food, fuel, and other supplies for the armed force.

OPPORTUNITY FOR WAR

Wars usually occur at what are thought by at least one side to be propitious moments, although war can also occur by accident. Wars may (or may not) be examined or determined in advance, and the calculation may be rigorous or less thorough. The participants usually estimate the risks and value of going to war. The calculus of going to war or not may be more visceral than rational, but the calculation is normally made. There may be a miscalculation based on faulty information or assumptions. Even if the pre-conditions for a war are present, war may not necessarily occur.

There are some general rules that apply to the determining of whether the situation and circumstances provide an opportunity for war:

- Those who start wars believe they can win, or at least they conclude that attacking preemptively and losing is better than other alternatives, such as surrendering. It is a matter of historical record that in most wars the aggressors had faith that they would prevail.
- Those who are threatened and who believe that the survival of their society is at stake will often fight out of desperation, hoping to achieve a strategic stalemate or even victory. This was the calculation that led the Japanese to attack Pearl Harbor.

- Those who are attacked and who foresee ultimate defeat will usually fight to protect their society, their people, their property, and their wealth rather than pre-emptively surrendering to the attacker.

MOTIVE FOR WAR

Each war has, in addition to a primary cause, an underlying motive that provides the *raison d'etre* of that particular conflict. It is not easy to define a motive for war in general. However, there is a unique motive for each war that can be identified, usually after the fact. The necessary deception, obfuscation, and political cover that accompany war initiation make it hard to accept at face value the declarations of combatants as to why they are fighting. The motive for each war, however, falls into one of the general categories discussed above—greed, passion, power, and fear.

In summary, the conditions necessary for conflict to be transformed into war are:

- The expected outcome is positive or at least not overwhelmingly negative. The value of achieving fundamental goals has to outweigh the cost of failing. The anticipated risk has to be acceptable.
- The society has the means to wage war.
- The society perceives that there is an opportunity to satisfy a powerful motive or meet an important need.

CONSEQUENCES OF WAR

Consequences of war may be aggregated into the following categories:

- Death, destruction, misery
- Enhancement
- Impoverishment
- Extinction
- Survival
- Security
- Continued endangerment
- Peace

For any war the results are almost always a mixture of two or more of these.

DEATH, DESTRUCTION AND MISERY

The direct consequences of war lead to death, destruction, and disruption, and, for the winners, glory, enhanced patriotism, wealth, position, prestige, gain, etc. Note that the winners usually suffer destruction, financial loss, and grief—war isn't a zero sum game. People on the losing side are killed, maimed, and suffer. People on the winning side are made to feel courageous, strong, successful, and justified. Property, crops, and infrastructures are invariably damaged or destroyed. Society is disrupted. This has been accepted as the price for waging war, although there have been long-standing efforts to ameliorate these direct consequences of war in various ways.

ENHANCEMENT

Sometimes the winner of a war actually gains increased wealth and power. The side that benefits may or may not be the side that initiated the war out of a desire to achieve political

objectives. By definition, the side that loses does not enhance their wealth or power. However, post-war recovery and rehabilitation can in time overcome the losses in wealth and power.

IMPOVERISHMENT

A more common consequence of waging war is impoverishment by losing territory, wealth, population, raw materials, or credit. It is understandable that the losers of wars should emerge impoverished by the cost of fighting and then indemnification. In past wars, the winners have required the losers to forfeit people into slavery, treasury in loot, territory, and other value. Payments have been made in people and things. In modern times, the winners have forced losers to pay in cash. It is also true, however, that winners may be impoverished by a war. A good example of this is World War II, in which the United Kingdom emerged victorious but bankrupt.[19]

EXTINCTION

One consequence of war has been extinction of the losing society. This was the fate of both Troy and Carthage when they lost savage wars to the Greeks and Romans respectively.

SURVIVAL

Another outcome of war is survival, which may the condition determined by participants who, while not winning, also have not lost completely. The consequence of the American War of Independence was survival of the newly born United States of America.

SECURITY

Another consequence of war for the winners (and paradoxically sometimes for losers) is increased security, at least for a time. This appears to have been the case for Israel, whose repeated military successes in four wars with the various Arab nations surrounding it have led to initiation of a process of negotiation seeking a long-range *modus vivendi*.

ENDANGERMENT

The future well-being of both winners and losers may be endangered as a consequence of a war. The winner may be endangered if the war ends in such a way as to make implacable enemies of the losers. This was the case after World War I, when the demands of the victorious Allies so enraged the losing Germans, that the urge for revenge became a major factor in German politics of the 1920s and 1930s, leading ultimately to the rise of Hitler and the advent of World War II.

PEACE

Sometimes, the consequence of a war is an extended period of peace—the absence of war. This is a relatively rare outcome, for wars tend to breed subsequent wars because of resulting hatreds, resentment, and desire for revenge.

[19] It is true that the Soviets bore the brunt of the fighting against the Axis after Hitler's forces invaded the Soviet Union, but the British earlier stood alone against the Germans in the West after France capitulated. Had the British surrendered or made peace with Hitler, the German invasion of the Soviet Union might have succeeded.

WAR AND POLICY

War is clearly a continuation of policy, because war is waged by political groups that establish policy. Only organized groups with some form of governance can find the means to conduct war. All polities have some arrangements for internal and external security. A fundamental duty of all polities is to establish a security policy. This policy specifies how the government will organize, equip, train, and employ armed forces. Related duties include strategies for their use and for political, economic, cultural, and other elements of power.

In principle, wars are conducted by both sides in accordance with their policies. After wars start, it is difficult to change military policy, so policies should be sufficiently flexible to adapt to changed situations. Usually a belligerent starts with war objectives, but goals frequently change during a war, depending on the perceived outcome at different times.

GENERAL EFFECTS OR OUTCOMES OF WAR

For simplicity's sake, consider the results of war that affect both the winner and loser…usually in opposite ways. The major factors to consider in assessing the effects of war include:

- Military
- Economic
- Political
- Sociological and cultural

MILITARY OUTCOMES

In examining the military outcome of wars, members of a defeated military force are killed, maimed, captured, or disarmed and released with promises that the losers will no longer engage in combat with the victors. Defeat of an opponent's military forces is usually a primary objective of the war.

ECONOMIC EFFECTS

Winners gain and losers forfeit. But not always. The winning side in a war may, through its extraordinary commitment of wealth and resources that enable victory, bankrupt itself. More normally, the losing side is pillaged and looted; wealth, natural resources, surviving industries, and anything else of value are confiscated by the victors as the "spoils of war." For example, on August 13, 1713, the Spanish treaty with Savoy was concluded, ceding the former Spanish possession of Sicily to Victor Amadeus II, Duke of Savoy, as his share of the spoils of war.

POLTICAL RESULTS

Since war arises from political conflict, the results usually change the political environment. Nations rise and fall; countries yield or conquer; and tribes or other entities survive or perish. Revolutions, at least those that are successful, provide the best examples of such changes. The larger the conflict, the more adversaries, and the broader scope of a war, the greater the changes in the political situation at war's end. Recognize that there are often wars that fail to bring about the intended political results, frequently leading to a troubled "peace" followed by yet another war.

SOCIAL AND CULTURAL SHIFTS

Conquest contributes to significant social and cultural adjustments among those who live in conquered areas. But defeat doesn't always create an acceptance by those who are conquered. Conversion of a defeated population to conform to norms of the conquering armies and their national or cultural foundations is generally slow, reluctantly achieved, and often forms the basis for a subsequent armed conflict in rebellion. There are many examples of conquest leading to fundamental changes in culture (especially religious conversions, such as the Islamic Jihads), and there are others (e.g., Alexander's campaigns, Genghis Khan's appointment of satraps) that interfere minimally with those who are defeated. In general, despite the examples to the contrary, wars create extensive social and cultural shifts in both the defeated group and to the conquerors as well.

Part II. Conduct of War

The preceding chapters provide a description of the underlying political nature, characteristics, and causes of war. The following chapters will show how **political goals** are translated into more specific **policies** (e.g., social, economic, political, military) of a political entity. Those policies set the stage for a strategic goal-setting process into more detailed statements of objectives in military, economic, political, and other terms—**strategies**. In turn, those strategies are the source of **planning**, preparing for, **conducting**, and ending war. This hierarchy of policy-strategy-planning-conduct provides increasingly detailed guidance, culminating in the end of war and assessment of the results.

As pointed out earlier, The Military Conflict Institute holds that there is a general hierarchy of conflict. Human conflict, ever present when beliefs, goals, and cultures clash, includes Military Conflict, and Military Conflict includes War. War includes campaigns, and campaigns include combat.

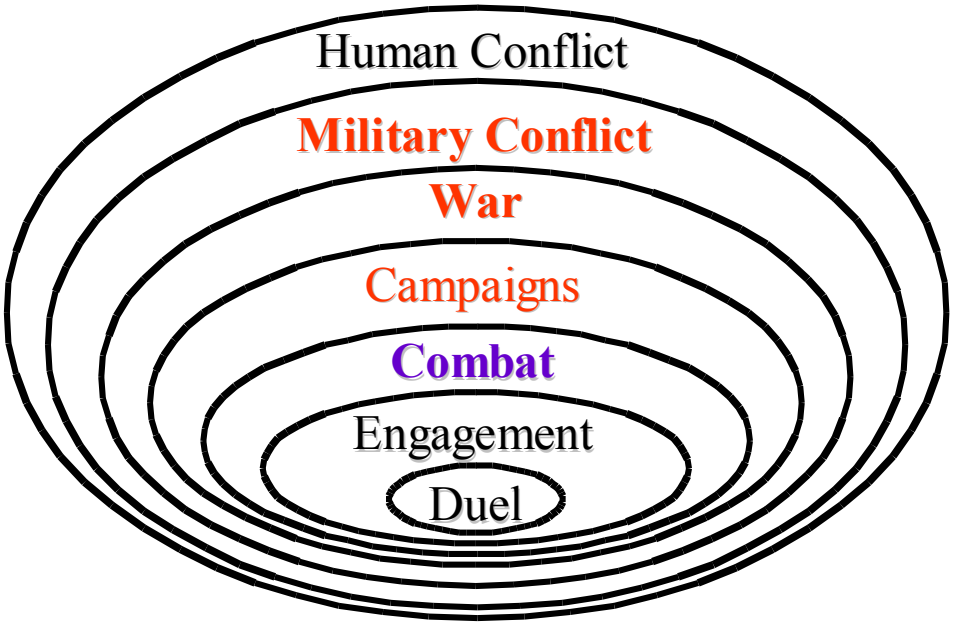

Figure 6. Hierarchy of Conflict

This hierarchy is not precise—there can be engagements outside of campaigns, and "wars" outside of military conflict (e.g., economic warfare, war on poverty, counter-drug war)—but this hierarchy serves to organize one's thoughts about conflict, war, and combat.

The definitions and descriptions below serve to distinguish the three primary categories:

Military Conflict: An antagonistic state between two or more parties in which military forces and weaponry of each of the parties are used or are available for use and use is intended if needed.

War: A state of open, armed, often prolonged conflict carried on between nations, states, or parties; it can be formally declared, or it can exist without a formal declaration. A war can be considered to be the period of such conflict. A violent clash between hostile military forces to accomplish political purposes. An act of force to compel our enemy to do our will.

Combat: Purposeful, controlled violence carried out by direct means of deadly force between opponents, each attempting to carry out a mission, the achievement of which has value to that side and the achievement of which is opposed in some way by the other side. The period of actual fighting.

This part of ***A Philosophy of War*** focuses on military aspects, recognizing that military power is only one element of power that needs to be coordinated with the other (sometimes dominant) elements of power (e.g., diplomatic, economic, religious, cultural).

These chapters and their sequence in the process of going to war are shown below, indicating the relative violence inherent in pre-war, wartime, and post-war activities.

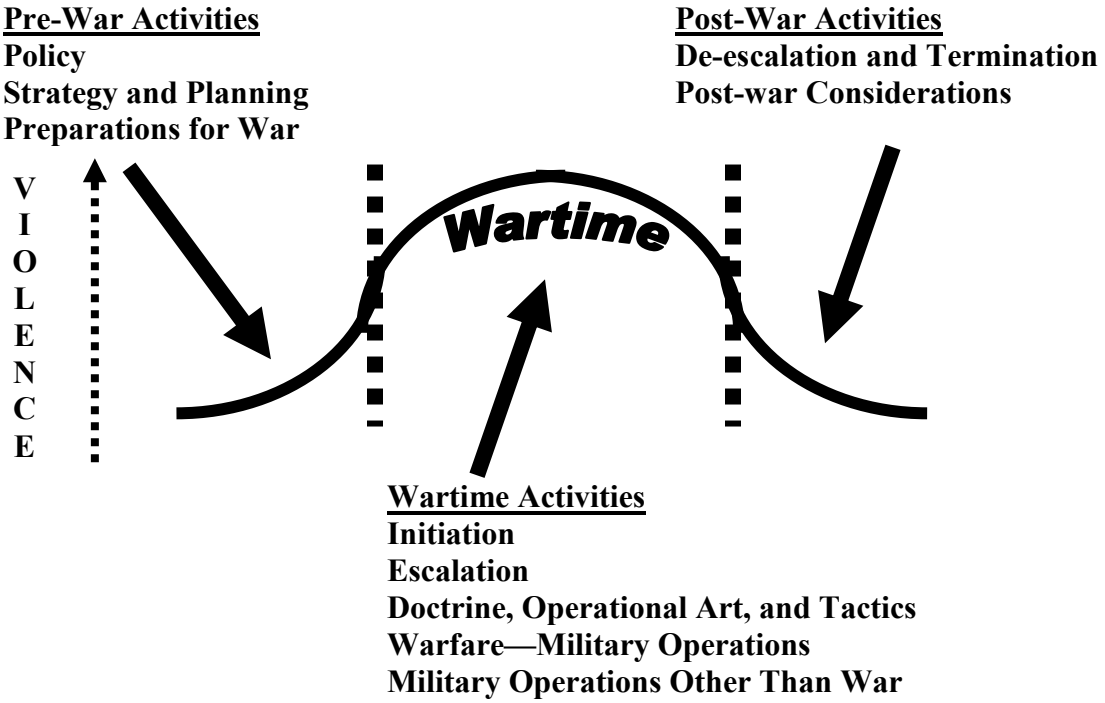

Figure 7. Sequence of Activities

These descriptive categories of the broader subject of the Conduct of War are not equally applicable in every case of the application of military means to achieve political goals, since wars are different in different ways, just as wars are alike in the same ways.[20] It is this latter case that ***A Philosophy of War*** concentrates on—the underlying, fundamental commonalities that define war across the ages, in diverse cultural environments, and throughout history.

PRE-WAR DECISION FOR WAR

After all the necessary assessments and preparations for war, there is the "pre-war" (or first step in "wartime" activity in which judgment must be applied. How best can we achieve our aims? Again, Blainey suggests a priority of means:

- Achieve all aims peacefully.
- Achieve part of the aims peacefully.
- Achieve aims by forceful action short of war, but that creates some risk of war.
- Achieve aims by a short, small-scale war.
- Achieve aims by a long, large-scale war.
- Sacrifice some aims peacefully.
- Achieve nothing by war.
- Sacrifice most aims peacefully.
- Sacrifice most or all aims by war.

Obviously, the analysis and judgment of war leaders in a society would prefer fulfillment without war, but serious societal conflict seldom offers that option. Note also that "judgment" seldom equates to "objectivity" in this decision process—emotions, patriotic fervor, cultural and societal biases, and many other factors color the "analysis."

WARTIME ACTIVITIES

Presuming that the pre-war activities and processes result in a decision to go to war, one side has to decide how to start the war—preemption, deliberate confrontation, surprise attack, declarations, posturing and resorting to violence—all are options. Once initiated, the next step is escalating the war, either in depth (going for the opposing group's heart) or breadth (attacking his allies). And how do you conduct the operational phase of the war? Certainly, in conformance with war plans laid out prior to hostilities, although no plan survives the first shot in anger. But also in accordance with your society's military doctrine—the "proven" successful methods to achieve your war aims. In Chapter 11 of ***A Philosophy of War***, we've lumped doctrine with "operational art" (a bridging term between strategy and tactics that has been adopted from the Soviet doctrine) and tactics, the latter being the techniques and procedures involved in battles.

Actual operations, the chapter on Warfare[21], describes those aspects inherent to ground, sea, air, and other environments, concluding with the interoperable aspects of joint and combined operations[22]. Then there's another set of military operations that could be conducted prior to,

---

[1.] Common characteristics provide the foundation for understanding war; differences relate to specifics in history.

[21].. Some, notably the Armiger-Cromwell Center, use the term warfare as those activities or the situation between peace and war. TMCI uses the term to mean the set of all lethal and non-lethal activities undertaken to subdue the hostile will of an adversary or enemy.

[22]. James F. Dunnigan, a long-time member of TMCI, compiled an excellent overview in ***How to Make War***, third edition (1993).

during, or after the "real" war—military operations other than war. Looking through history, fighters (warriors, soldiers, sailors) frequently have been involved in semi-civilian operations such as occupation, governance, nation building, peacekeeping (in the more recent past), and non-traditional military functions on behalf of their societies.

POST-WAR ACTIVITIES

War ends when both sides objectively conclude that their (depleted) relative strengths are fully understood by both sides. Often, there are on-going diplomatic, economic, cultural, and religious contacts between the opponents prior to and during a war. But most frequently, their purpose is to avoid or soften the violence. At some point, the results of negotiations during war reach a point of agreement that continuing the war is disadvantageous to both sides. This sense of objectivity, if present during the war-decision process, would likely preclude most wars. So the war ends. So, how do you turn this thing off? Preemptive surrender? Quit? Go home? Win decisively? These simple questions and their answers have historical precedents.

But, it isn't always that simple. As Dunnigan states in the first sentences of ***How to Stop a War***, **"All wars end. Some wars never start. And some wars that might grow, stay small."** The first steps involve decreasing the violence—de-escalation—a most complex and unsatisfactory (in the eyes of the competing war leaders) process preceding termination. And there are the messy post-war considerations—treaties, reparations, restoration, looting, domination, and recovery. The chapter on Post-War Considerations can only scratch the surface of perhaps the least well understood set of activities associated with war (or peace).

There aren't any commandments, rules, or dictates in activities associated with war, although the descriptions in the following chapters might spark some ideas (or memories) of guidelines and benchmark methods common to many cultures, all times, and myriad locations throughout history. Just follow the logical sequence of aims-policy-strategy-operations-results as a means of better understanding the nature of war (and conflict), recognizing that the descriptions are generally restricted to the military element of a society's power, with hints of the utility of other elements of power in a cohesive manner.

Chapter 4. Vital Interests, Goals, and Policy

Each society (e.g., tribe, clan, nation, alliance, group) has structure in the form of a hierarchy and common, binding goals. These goals (nations call them vital interests) form the basis for societal policies, the more detailed elaboration of fundamental goals into component parts. Societies also have "power" in the form of economic, military, diplomatic, and other cultural capabilities—in reality, societies have "potential" that, when activated, creates power.[23] So the several "elements of power" that are discussed throughout ***A Philosophy of War*** are the central core of a society's strength—in many dimensions. Frequently, a nation will establish policies in the domain of each element of power as an organizational means of supporting the overall goals and objectives.

But policies are ethereal—slogans that reflect a society's values, goals, and objectives. Policies define the "what" that must be followed by more detailed action statements of "how," and those comprise strategy. Yet again, a statement of strategic import requires elaboration through the development of plans—the structured actions that should lead to achieving the strategy, the policy, and ultimately the goals and objectives of the society.

However, planning must rely on inherent capabilities. Therefore, assessing and improving one's own elements of power as a preparation for war includes a requisite set of actions that must occur in parallel with development of policies, strategies, and plans. In the military aspect, there is an iterative process of assessing capabilities and context (of both sides) as planning proceeds. These preparations for war create war potential, the threat of use being an external perception of a society's strength, vis-à-vis the opposing group's strength in the large. Actions must then be taken to improve one's own potential and, to the extent it can be done, degrading the potential of the opposing group. Paraphrasing Geoffrey Blainey's[24] suggestions, assessment of relative strength is influenced by:

- Military potential and the ability to convert that potential to war power.
- How external parties may behave in the event of war between two other groups.
- Perceptions of internal unity (support) of the war and discord of the other group.
- Recollections of the realities and suffering of previous wars.
- Perceptions of societal resources.
- Patriotism and ideology.
- Capabilities of the war leaders making the decision to go to war.

There is a general hierarchy of human and group purpose that stems from fundamental goals (the basic purposes of an individual or group) through policies (more detailed statements of purpose supporting achievement of the basic goals in diverse areas) to strategy (how the individual or group intends to accomplish the policies to achieve common goals). This chapter

[23] See Chapter 2, Nature of War, for a more thorough description of the theory and practical applications.
[24] ***The Causes of War***, original edition of 1973 and Third Edition of 1988, in the chapter, "Abacus of Power." Blainey, an Australian, addresses the causes of war and peace, as well as neutrality.

describes this process of translating goals into policies, leading to the subsequent and increasingly complex interactions in setting strategies to achieve national and international goals and policies. These pre-conflict processes are the peaceful, non-violent predecessors to, *inter alia*, war—the subject of this book. Additional chapters will describe the execution of strategies.

The idea is to move from broad and fundamental goals of an individual to understand the interactive formation of common goals and purposes of groups—political goals, then to describe how those common purposes form the basis for policies—a more detailed statement of objectives—and implementing strategies. When these strategies "require" military (and other) action resulting in war, the activities associated with forming, training, and employing military forces take place.

THE NATURE OF MAN

There are some basic historical and psychological presuppositions that underlie human behavior related to government, politics, and war.[25] At least in Western culture[26], every man is believed to be entitled to have substantial control over his own destiny by his very being, since he has certain inalienable rights. By nature, every individual is in conflict with others, since their goals, objectives, and "policies" differ—this conflict may become violent in the attempt to resolve differences and attain goals, and, when directed by a larger group's political goals, war can be the result. Man is an admixture of good and bad, though he is capable of adhering to the good if he is placed under a disciplined system of government designed to cultivate the good, control the bad, and channel bad impulses into actions for the overall good.

THE NATURE OF GOVERNMENT

Government exists in every society to keep men from destroying each other, or at least destroying each other needlessly. Good government can guide the individual toward the good, aiding in the development of better natures and actions. However, government is necessary and useful to man only when it is controlled—when uncontrolled, government is destructive. This is particularly true in autocratic systems, whether that be a tribe, family clan, empire, nation, or alliance. Unfortunately, as power accrues to any government, it tends to get out of control unless proper care is taken to restrict it.

Government both restricts individual liberties and provides certain people with benefits, so the basic problem of forming a government is to balance which liberties to restrict; how much to restrict them; and what benefits should be provided, from whom, and for whom. Government, to be just, must be popularly supported so that the governed have a significant voice in determining its course, controlling its effects, and restricting its actions.

PRIMARY GOALS

Fundamental needs of individuals, family members, and the groups to which they belong define basic goals—preservation of life, protection of the group, and enhancement of their way of life, for example. [Maslov's hierarchy of individual needs describes personal priorities in a

[25] Adapted from an outline on The United States Political System by Daniel J. Elazar at Temple University in 1970.
[26] Other cultures support this principle; however, some clearly place the individual's needs subordinate to those of the group or the rulers.

somewhat more basic list, with fundamental needs for those things that permit an individual to live—breathing, sustenance, belonging, respect in general terms.]

FORMATION OF GROUPS

"No man is an island" is a truism, just as "There is strength in numbers." It is therefore natural that individual needs should merge with those of other individuals to form common purposes. As prehistoric families joined together to form clans and tribes, their values and goals undoubtedly developed based on group consensus, a sense of cohesion, and solidarity. Leaders emerged or were selected; a system of simple governance evolved; common traditions and basic rules developed; youths learned proper behavior and cultural norms by watching their elders' and leaders' actions and understanding their verbal language and non-verbal gestures; and group cohesion solidified, even when norms had to be adjusted to accommodate changes. Each small group formed a set of common purposes, although their tribal purposes and goals might differ from the clan in the next valley, which evolved its primary goals in a different environment, with different values and personalities of leaders. At the core level, clans and tribes sought to preserve the lives of conforming members of the group, obtaining food, water, and safety sufficient to achieve this primary goal. As a fundamental objective, individual and group preservation generally persists throughout history—even into the next century.

It is when perceived threats to explicit or implicit vital interests develop that the group feels compelled to take violent action—going to war—and is self-justified in taking that violent course of action to protect those vital interests.

Policy may be too grand a term to apply to prehistory, but there certainly were more detailed objectives supporting the primary group goal of preservation. These might have included rules or traditions relating to succession in tribal leadership, matriarchal or patriarchal lineage of ancestry, taboos (evolving into religious policies and customs), territorial or nomadic tendencies, and group behavioral practices. At the even more detailed level of strategy, early families and clans might have delineated how they would accomplish the primary goal of preservation by allocating tasks to individuals (e.g., hunters, gatherers, fishers, weavers, water carriers) and by determining how the group would act collectively to defend itself.

CONTEXT

Although the chain of purpose, goals, policy, and strategy is an almost universal logic, some cultures lived in environments which either fostered conflict and war, while others were more isolated and less threatened. As one examines the history of warfare, it becomes obvious that certain geographic areas tend to bring conflict more easily. For example, the "fertile crescent" from Babylon (in more general terms, the area between the Tigris and Euphrates rivers) up and across ancient cultures to the shores of the Mediterranean Sea was the location of many competing commercial empires that had (a) needs to defend or expand territory to support their populations, (b) sufficient or excess resources (people, sustenance, wealth in general) to support military actions, and (c) convincing internal arguments to justify taking those aggressive actions.

From the earliest times, the sequence of adventure—trade, raid, war—depended on natural pathways, principally rivers and seas, water travel being "preferable" to slower, more

burdensome land travel. Basically, it is more efficient to carry large groups of people and heavy supplies (for trade or war) by water. In addition, rivers provided a source of potable water to sustain the movement of traders, raiders, and warriors. Three of the historic commerce routes that also supported troop movements for war are shown in the map on the following page.

The warriors of the steppes traveled from lake to lake and along rivers; however, their speed and endurance over land, coupled with very austere accompanying supplies, seldom relied on water as transport, although it was crucial for sustenance of raiders and conquerors into China, Europe, the Mid East, and India for more than two millennia.

The Vikings, less conquerors than traders and raiders, relied on the sea and navigable rivers to surge into the British Isles and beyond (principally for new territories in which to farm, fish, and prosper) to Iceland, Greenland, and North America; into Europe, conquering and assimilating with French and Germans, but exacting ransoms and "gifts" from many other countries as well; deep along the river routes into far eastern Europe to rule (e.g., the Rus kings in Kiev were of Swedish stock), to exact tribute, and to trade, even to Byzantium and the Caliphate in Muslim territories.

Spanish colonization of the Americas similarly mounted from the sea and followed navigable rivers inland from the coast. Where the beaten paths deviated from water sources or transport, as in the arid lands of North America, those routes aptly described the consequences—the Jornado del Muerto (journey of death) and the Llano Estacado (staked plains, where vertical mountain peaks looking like tall posts led traders and military forces to water).

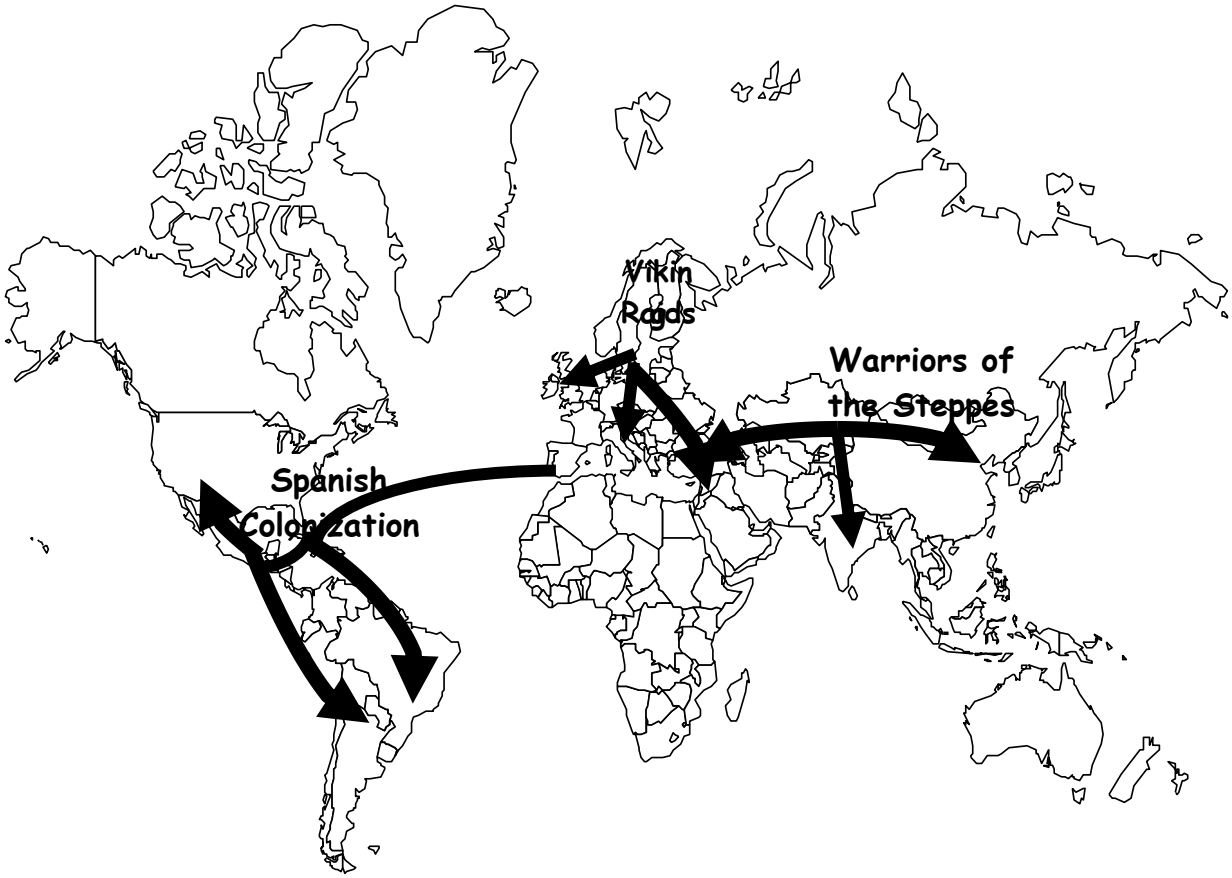

Figure 8. Trade and Raid Routes

Many additional river and sea routes have been used over centuries—throughout Europe (e.g., along the Rhine), in Africa (e.g., Nile, Congo), and between islands and coastal cultures in the Pacific. Overland routes also supported the extension of trade and the projection of forces by land—the easy path in both directions around the east end of the Mediterranean, the ancient Silk Road, the east-west major attack route across Poland (often the unintended victim of grand strategies and movements of hordes of attacking forces), and others.

The presence of natural resources in "target territories" and in the intervening invasion route territories facilitated the movement of armies and, in some cases, became a significant factor in choosing those routes and the time of year in which to move forces (e.g., near the end of the harvest season, when agricultural production peaked). Invasion by sea relied equally on the natural and processed resources along the coast lines and in ports along the way. An excellent example of coordinated land-sea route planning was the movement of forces under Alexander from Macedonia to the east and south around the Mediterranean (a traditional invasion route), where the land forces secured fresh water for resupply ships that rendezvoused with shore parties bearing supplies.

DOMESTIC CONSIDERATIONS

Some tribes and nations just seem to be "warlike," while others are peaceful and even pacifist. The nature of cultural values and the establishment of defensive or expansionist

common purposes are critical to the formation of a militaristic or peace-loving group. For example, the Chinese have certainly had their share of internal wars—primarily of conquest and formation of a central government, but their religions permeate both political and military policies. Confucianism, Buddhism, and other ancient cultural foundations have led the Chinese to a primarily defensive posture, with an indirect strategy that absorbs, accommodates, and integrates invaders. The fate of conquering Steppe warriors (e.g., Genghis Khan and his successors) was that of becoming more Chinese than the people they conquered; as they became complacent and peaceful, other invaders became the aggressors in their stead. This absorption and assimilation is not peculiar to the Chinese—Vikings became settled rulers in England, France, and elsewhere[27] and integrated into the local populace, and Alexander adopted more of the culture of India than his Generals appreciated.

Where nations appointed war chiefs (sometimes the ruler was also the General), it usually indicated a predisposition toward militaristic adventurism. Some religions led to wars (e.g., Aztecs needed to capture people for human offerings to their gods, Christianity evolved to seek the forcible conversion of "heathens" in Europe and especially in the Americas). The nature of government induced biases toward warfare when the system of government becomes autocratic under an expansionist ruler who finds new "reasons" to go to war to achieve national goals and policies.

Where such governments are credible (that is, convincing to the populace), the steady march to war seems rational, logical, and unavoidable—justified in the eyes of the people who will have to fight and those who will have to sacrifice their comfort to support the war effort. Where a government becomes less credible, less supported, the authority of even an autocrat is challenged through revolution, insurrection, and assassination. War must have popular support to persist.

Even in participatory governments, rulers must have the support or at least acquiescence of the ruled. Using the example of World War II, Russia followed Stalin despite his mass executions and imprisonment of millions of dissidents and opponents; Japan worshipped Emperor Hirohito; England was emboldened by Winston Churchill; and the United States strongly supported pre-war preparedness and post-Pearl Harbor leadership by Franklin Roosevelt. Even the strongest and most revered leaders must seek the support of their followers—Alexander twice had to exhort his forces to continue his long conquering march through much of the known world.

EXTERNAL INFLUENCES

National goals, purposes, and policies must consider the unavoidable considerations of friendly nations, allies, and potential or actual enemies. Compromises in public policies, careful exceptions in private or secret agreements, and articulation of policies consistent with allied goals are the norm in both ancient and modern international affairs. Sometimes, it is easier to persuade allies to accommodate national goals and policies due to their natural affiliations and

[27] The rulership of England in 1066 was based on the outcome of battles between the descendant of Vikings on both sides (Duke William the Conqueror from Normandy and Earl Harold Godwinsson, who had just defeated Kin Harald of Norway, who had hoped to rule England); prior to that date, most of northern and eastern England was ruled by governors of Viking ancestry.

history of cooperation than it is to convince even friendly nations to support semi-congruent policies of another nation. Enemies may even mitigate their actions through diplomatic pressures and "side agreements," outright threats and demonstrations of strength (e.g., the Great White Fleet, major military maneuvers), or bribes (e.g., negotiated trades so that each opponent appears to win. The complex balancing of allied goals and policies and the counterbalancing of enemy purposes and policies seldom ensures complete satisfaction of any nation's goals—the desired end state is always subject to reinterpretation and renegotiation.

TRANSFORMING GOALS INTO POLICY

As summarized earlier, every nation[28] has underlying and fundamental purposes, goals, and objectives that form the basis for national policies for economic, diplomatic, political, sometimes religious, military, and cultural elements of power that can be applied to achieve those purposes. In a very real sense, policy is the wise management of government, definition of desired end states, and articulation of common purpose of the governed.

POLITICAL GOALS AND POLICY

National goals usually include economic stability and growth of trade, defense of populace and property, preservation of the existing regime and form of government, and recognition and credibility of its sovereignty. The bases for policy are broad, sweeping statements reflecting the beliefs and culture of the people, autocratic leader, or other political leaders—policy reflects more precise intentions for public consumption (recognizing that "secret" policies exist in most political entities). For example, the United States Constitution sets forth its fundamental purposes to ***"…provide for the common defence, promote the general Welfare, and secure the Blessing of Liberty to ourselves and our Posterity…"***

POLITICAL DECISIONS FOR WAR

In any case, the decision to go to war to support national goals as reflected in political objectives is the most important decision of a ruler or government, and this fact has been recognized as such for centuries.

> Athenian ambassadors cautioned the Spartans, urging, "Take time…over your decision, which is an important one…Think too of the great part that is played by the unpredictable in war. Think of it now, before you are actually committed to war. The longer a war lasts, the more things tend to depend on accidents…And when people are entering on a war they do things the wrong way round. Action comes first, and it is only when they have already suffered that they begin to think."
>
> And Archidamus, the Spartan King, responded, saying to his subjects, "Spartans, in the course of my life I [and many of you] have taken part in many wars…[we] have had experience, and so are not likely to share in what may be a general enthusiasm for war, nor to think that war is a good thing or a safe thing."[29]

[28] National and nation are used as collective terms to describe tribal, clan, city-state, alliance, and other forms of cultural and political entities that govern, establish goals, and prosecute war.
[29] *History of the Peloponnesian War*, Thucydides.

CULTURE AND TRADITION

Political goals are influenced by the cultural, traditional nature of a people—their nation. Some nations are inclined toward alliances to internationally legitimize their political actions, even though the national policies of the participants in an alliance may differ in fundamental ways. By seeking some rational set of common goals and alliance policy, the allies compromise some of their individual policies to establish a set of acceptable alliance policies.

Other nations tend toward isolationism—independent defense of political policies. The reasons for isolationism may include geographic or economic conditions (e.g., Bolivia, Burkina Faso, Paraguay), wealth and economic self-sufficiency (e.g., Switzerland, Sweden), and protection by friendly states (e.g., Monaco, Andorra). Nations may fluctuate between these extremes based on perceived political desires of the governed (e.g., as in the case of the United States following World War I) or on changing international conditions (e.g., demise of the Soviet Union).

Similarly, some "warlike" nations seek expansion, conquest, and domination at times in their existence. Assyria, Persia, Greece, Rome, Russia, Spain, Portugal, and England are examples of the empire builders who sought to colonize, rule, and extract the wealth of other nations or groups for the betterment of their nation and its peoples. The narrow difference between trade and military or economic adventurism, as evidenced throughout history, illustrates the thin edge between political policies devoted to peaceful economic expansion through commerce and those policies that sought economic advantage regardless of the methods.

These "trade and raid" tendencies that sometimes led to conquest are perhaps best described by the far reaching excursions of the Warriors of the Steppes who, for more than two millennia, ranged out of central Asia to ravage, destroy, and often conquer established empires and nations including China, India, Persia, and parts of Europe. For over three hundred years, the Vikings also traded, raided, and conquered across England, Ireland, Scotland, Frisia, parts of France, and deeply into eastern Europe where they established a "Rus" tribal capital in Kiev.

Less adventuresome nations have adopted political policies of preservation—maintaining the status quo with little thought to conquest or expansion. An excellent example is China, which for many centuries was the scene of many internal wars of unification and defensive wars against invaders, some of whom conquered and ruled, but were assimilated and "civilized" into the bamboo-like culture that accommodated change rather than forcing their own subjugation through resistance after defeat.

FLEXIBILTY AND CHANGE

Political policies are seldom rigid or permanent; national goals and policies are influenced by both internal and external change. Fundamental goals may persevere—preservation of the nation and its citizens may remain as a national goal—however, political policies change as the government moves from isolationism to alliance policies, from expansionism to satisfaction with the status quo, and from militaristic tendencies to peaceful co-existence.

MILITARY GOALS AND POLICY

This section describes policy as it is related to "war," so we should examine that concept first. Clausewitz (a favorite source in Western thinking about war, although his militaristic theories are significantly, perhaps successfully, challenged by Sir Basil H. Liddell Hart) defines war as "a continuation of [political] policy by other means," an often quoted, somewhat incomplete statement, and as "an act of violence intended to compel our opponent to fulfill our will." Clausewitz recognizes that war is a conscious choice of national leaders and underlines the point that war takes place within a political milieu from which it derives *all* of its purposes.

Clausewitz stated that wars are of two kinds, those that seek the overthrow of the enemy, and those that seek merely to achieve some conquests on the frontiers of the enemy's country. Much earlier, the Chinese[30] tersely described war, in general, as "a question of the strategic balance of power...a question of having Heaven, material resources, and excellence." This merger of moral, materiel, and skill attributes has been paralleled in Western political thought with "just war," forces, popular support, and leadership, colored by the natural human tendency toward combativeness.

> Hereby it is manifest, that during the time men live without a common power to keep them all in awe, they are in that condition which is called war; and such a war, as if of every man. For war consisteth not in battle only, or the act of fighting; but in a tract of time, wherein the will to contend by battle is sufficiently known: and therefore the notion of *time*, is to be considered in the nature of war; as it is in the nature of weather. For as the nature of foul weather lieth not in a shower or two of rain; but in an inclination thereto of many days together: so the nature of war, consisteth not in actual fighting; but in the known disposition thereto.
>
> Thomas Hobbes, *Leviathanh an enemy*

MILIYARY FORCE POLICY

A nation and its military component may have armed force tendencies and preferences, just as the government may have political tendencies. The interaction of political and military policies generally produces supportive, consistent direction, although this may not always be so. A politically aggressive, conquest-oriented nation may produce military policies that are more cruel and decisive—annihilation and total destruction of enemies, including non-combatants, seeking to completely support the political goals of complete domination. Other nations may produce military or armed force policies that seek defeat of an enemy's strategy or that adopt an indirect approach to upset alliances, promote internal dissension, and seek to "win" without combat.

Because of geography or tradition, nations often have armed force preferences that favor sea power or land power or, if recent combat actions influence military policy, air power. For example, Persia and Assyria, essentially land-locked empires, developed strong armies that carried out conquests throughout Asia, Egypt, and the Mid-East. England, surrounded by the sea,

[30] *The Methods of the Ssu-ma Fa*, fourth Century BCE. Note that most Chinese texts are accumulations of the work of many authors, usually an original author (e.g., Sun Tzu), sometimes staff, and subsequent revisions and interpretations for up to eight Centuries after the original work. This raises questions of authenticity.

early adopted a military policy that emphasized naval power, as did other colonizing European nations. Most politically isolationist nations tend toward defensive, border protecting ground forces. But nations can adapt, such as when the predominantly ground force-oriented Romans captured enemy galleys and rapidly developed a considerable naval force.

MILITARY SUPPORT POLICY

Nations and their military face a rich menu of support options. National and natural resources, commercial strength, political policies, and military force tendencies may lead to military equipment and materiel acquisition and support policies favoring extensive military production (e.g., the early American military depot and arsenal system), purchases from the private sector of the nation or from arms exporting nations, leases or other temporary arrangements (e.g., Lend-Lease programs of the late 1930s and early 1940s, military assistance programs with developing friendly nations), donations or tribute for materiel and supplies, loans or borrowing of equipment and materiel, or capture or confiscation of materiel from others.

Similarly, a nation may adopt military policies for creating and maintaining the warrior element of an armed force. The menu in this case includes mandatory service (e.g., as in Rome), conscription or other involuntary service, voluntary service, induction of slaves or captives, hiring of mercenary forces, or combinations of these. An associated military support policy relates to the permanence of the armed force—should it be a large standing force, a cadre with augmenting forces, or a force in reserve? Again, the nation's wealth and proclivities as reflected in political policies will influence these decisions.

THE NATURE OF WAR AND POLICY

War is perhaps intrinsically "evil," in that it diverts and consumes a nation's wealth (not just money), results in physical and moral carnage, and violates most fundamental beliefs in the sanctity of the life of other human beings. But the conduct of war in support of political policy may in fact be a necessary choice. It inflicts wanton destruction of unarmed civilians and of armed "innocents" who are forced by their government and rulers to participate in this most violent political act toward the achievement of political and military policies. A ruler may denounce wars as evil, but there is often a discrepancy between those words to the people and the actions that he later takes in the advancement of national political purposes, which may or may not be consistent with lasting national policy goals. National and cultural views about war policies may change over time.

For example, the Stoics influenced early Christians to adopt an ideal of anti-militarism, but as Rome declined and the Church became legitimate and stronger, it became more militant and increasingly oppressive—culminating in Inquisitions and Church inspired (or religiously ignored) atrocities, conquests, and forced conversion throughout Christian history. Saint Augustine was a primary change agent in setting aside earlier antiwar teachings (e.g., the *Pax Ecclesiae* that governed the Church's antiwar policy from about 1000 through 1300) by invoking the thought that war's cause lay in man's sin and in God's answering punishment, although His punishment of men necessarily had to be meted out by other men. Ultimately, even Popes (e.g., Julius II) became warriors and leaders of warriors, satirized by lingering antiwar proponents.

Desiderius Erasmus indicted Pope Julius II in *Praise of Folly* (*Encomium moriae*) in 1509, with a satirical description of his military policy, "devising a way whereby it is possible

for a man to whip out his sword, stick it into the guts of his brother, and nonetheless dwell in that supreme charity which, according to Christ's precept, a Christian owes to his neighbor."

According to Webster, policy was originally synonymous with "government" or "polity," having the meaning of political wisdom or cunning. More commonly, it is ***the wise, expedient, or prudent conduct of management or government in the form of a principle, plan, or course of action as pursued by a government, organization, or individual***. Policies may then seek to achieve national goals (protection of the people and their property, economic well-being, etc.) in more specificity. Most successful policies are forward looking, focused on future betterment of a nation and its people. [NOTE: the United States experience with national security policy had been essentially reactive for almost two centuries until immediately after World War II, when the Cold War forced a more prescient examination of a coherent and durable national policy.]

POLICY BEGETS STRATEGY

The interrelationship of national policy and supportive military strategy seems obvious, although many examples of conflicting policies and strategies reflect the inability to grasp this critical concept. For this reason, national policy should not set a rigid desired end state; alternative futures and flexible policy ends are needed. When the ruler and commander differ in interpreting fundamental policy and the implementing means, the internal conflict overshadows the conflict with an enemy.

> The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish by that test [viewing war as an act of policy] the kind of war on which they are embarking: neither mistaking it for, nor trying to turn it into, something that is alien to its nature. This is the first of all strategic questions and the most comprehensive.
>
> Clausewitz, *On War*

> We will suppose an army taking the field: the first care of its commander should be to agree with the head of state on the character of the war.
>
> Jomini, *The Art of War*

> In discussing the subject of 'the objective' in war it is essential to be clear about, and to keep clear in our minds, the distinction between the political and the military objective. The two are different but not separate. For nations do not wage war for war's sake, *but in pursuance of policy*. ***The military objective is only the means to a political end.*** [Emphasis added.] Hence the military objective should be governed by the political objective, subject to the basic condition that policy does not demand what is militarily—that is practically—impossible.
>
> [Liddell Hart then goes on to say that "objective" is not really a good term; suggesting that political policy defines the ends and that military strategy and tactics provide the means.]
>
> Liddell Hart, *Strategy*

Many cultures have developed national policies that support fundamental objectives of "surviving and conquering," perhaps the two primary goals of any clan, tribe, or nation. For example, in the face of a growing Ch'in consolidation of power and desiring to overthrow the Shang rulers, the emerging Chou dynasty needed a grand strategy[31] to build a strong, economically sound material base, to undermine their enemy, and to create a government that could function effectively in peace and war. The Chou's major policy, strategy, and tactical document, T'ai Kung's *Six Secret Teachings*, proposes the single fundamental policy of benevolence by the ruler, with emphasis on the welfare of the people. [*Six Secrets* was probably written in the fourth, or perhaps third, Century BCE and updated over the next 7-8 centuries to accommodate innovations in warfare and cultural goals. It is in the form of a dialogue between King Wen (King Wu's father) and T'ai Kung, his learned adviser and teacher. The analogies, allegories, and obtuse language[32] in T'ai Kung's *Six Secret Teachings* have been interpreted to discover the underlying meanings.]

The T'ai Kung advocated a national policy of benevolence based on the belief that a well-ordered, prosperous, and satisfied populace is necessary to physically and emotionally support the government, even in an autocratic society. He saw that only such a government-protected society, with sufficient or surplus material resources, can provide and train its people and military forces; generate the morale and provide supplies to support military campaigns; and establish the cultural environment necessary to furnish truly motivated soldiers. In addition, benevolence on the part of the Chou government attracted immigrants from more oppressive and despotic neighboring states, adding to its national resources. The "six" secret teachings (T'ao) are Civil, Martial, Dragon, Tiger, Leopard, and Canine; the last four focus on excruciatingly detailed military organization and tactics. The T'ai Kung basic policies and strategic concepts of relevance to war include civil and military affairs:

Civil T'ao

- **Profit the People**. Stimulating agriculture, increase productivity, avoid government actions that interfere with the growing season, minimize other negative implications of any government actions, provide an adequate material base. A prosperous, well-governed state inhabited by a contented people will inevitably be respected by other powers.
- **Institute a Strong Bureaucracy and Impose Controls**. Create and implement a system of clear, immediate, universal rewards and punishments; tolerate different cultures of neighboring states; restrain and limit laws; punish [and reward] fairly without respect to rank; motivate the citizenry.
- **Personal Example and Sympathy of the Ruler**. The king and all government officials cultivate universally acknowledged virtues (e.g., benevolence, righteousness, loyalty, credibility, sincerity, courage, wisdom); develop and foster these virtues in common with the people; perceive public needs and gather information to alleviate those needs; maintain impartiality [personal emotions are not to influence governance]; eliminate every vestige of personal evil; present the people with

[31] Liddell Hart wrote that grand strategy is "practically synonymous" with "the policy that guides the conduct of war."

[32] Some of these might have come from Officer Efficiency Reports of the period: "He appears profound but lacks all sincerity," "He appears guileless but is not trustworthy," "He appears courageous but is afraid."

diametrically opposed alternatives; share hardship and pleasure; bind the people to the state [and ruler]. **NOTE:** Unlike most nations and other Dynasties, King Wu was both the nation's ruler and military commander—unusual in Chinese history.

- **Total Warfare**. Use every available means to achieve victory; anticipate the possibility of hostilities; plan to use normal production for warfare; feign and dissemble to deceive the enemy and allay their suspicions; use bribes and gifts to induce disloyalty among enemy officials and to cause confusion; debilitate the enemy with "tools for self-destruction" (e.g., wine, women, music, rarities); mandate secrecy; and, when war occurs, impose no constraints.

Martial T'ao

- **The Generals**. Select carefully, invest them properly and ceremoniously, delegate military matters and do not interfere (see NOTE above), exhibit proper and balanced personal characteristics (enumerated throughout *Six Secrets*).
- **Organization and Unity**. Both civil and military organizations must be marked by unity and integration. Individual sections are assigned single tasks that contribute to the overall goal. A military command hierarchy with a full staff of generals and administrative and technical specialists must be created, imposed, and allowed to function.
- **Battle Tactics**. Myriad principles, strategies, policies, and guidelines are included in *Six Secrets*, including deception, surprise, fortifications, formations, night attacks, escape, psychological warfare, probes, ways to induce fear in the enemy, use of terrain, and tactics for fighting in varied environments. In a later T'ao, T'ai Kung compares combat effectiveness—when fighting on easy terrain, one chariot is equivalent to 80 infantrymen; one cavalryman is equivalent to eight infantrymen; and one chariot is equivalent to ten cavalrymen [a mathematically consistent ratio].

INTEGRATION

Military policy is normally, but not always, subordinated to and supportive of national policy. Its objectives should reflect coordination with other elements of national power:

- To enhance our security with effective diplomacy and with military forces that are ready to fight and win
- To bolster…economic prosperity
- To promote democracy abroad.[33]

Similar integration of means is reflected throughout history. Sun Tzu recognized that national policy ("grand strategy" in his terminology) must focus on the development of a prosperous, contented populace whose willing allegiance to the ruler is unquestioned. Thereafter, diplomatic initiatives can be effected, but military preparations should never be neglected. The primary objective should be to subjugate other states without actually engaging in armed combat, thereby realizing the ideal of complete victory. This should be achieved through diplomatic coercion, thwarting the enemy's plans and alliances, and frustrating its strategy. The government should resort to armed combat only if the enemy threatens the state with military action or refuses to acquiesce without being forced into submission through warfare. This early

[33] A National Strategy for A New Century, May 1997 and October 1998 (second objective is summarized).

formulation of Chinese national policy reflects China's defensive nature and ability to absorb attacks and even successful attackers, integrating and bending while maintaining a fundamental national culture.

There's no reason for it—it's just policy.

Anonymous

Chapter 5. Strategy and Planning

Political policies and objectives are the highest-level statements of broad purpose. These are translated by the strategic goal-setting process into more detailed statements of objectives in military, economic, political, and other terms. The strategic military goals and objectives are translated into actions through the military planning process. This hierarchy of policy-strategy-planning provides increasingly detailed information and direction, culminating in the conduct of military operations in war.

Strategy, the "goal setting" aspect of war, is the starting point for discussion of the actual conduct of war—the violent application of forces to support policy and strategy "when things go wrong." This major part of ***A Philosophy of War*** includes subsequent chapters on the activities associated with conducting military operations in war to achieve the goals of any group—pre-historic clans, ancient empires, modern states, international alliances—across many cultures.

STRATEGY

Strategy is frequently (and falsely) interpreted as being primarily military in nature. Moltke (the elder) termed strategy "the practical adaptation of the means placed at a general's disposal to the attainment of the object in view [political ends]." Clausewitz first defines tactics as, "the theory of the use of military forces in combat," then defines strategy as, "the theory of the use of combats for the object of the War." This traditional militaristic view of the 19th Century ignores the other elements of national power (e.g., economic, political, diplomatic, religious, cultural) that must be coordinated to carry out the policies of the nation.

THEORETICAL STRATEGY

Herakleitos of Ephesus, the first Western strategic thinker (500 BC), stated that, "war is the father of all things." He further explained that, "Men do not understand [the coincidence of opposites]: there is a 'back-stretched connection' [in war and peace] like that of the [composite] bow." Sun Tzu recognized the point-counterpoint paradox, stating that, "those skilled in war subdue the enemy's army without battle" and "what is of supreme importance in war is to attack the enemy's strategy; next best is to disrupt his alliances; next best is to attack his army." The Romans acknowledged the paradox by stating that, "if you want peace, prepare for war." This long recognized paradox has continued throughout the ages. The best defense of a tribe or nation is military preparedness—not military action. The most modern example involves the basic nuclear deterrent strategy—nuclear weapons are most useful when they are not used.

PRACTICAL STRATEGY

It is not the paradoxical logic of strategy that is needed when a nation must go to war facing an enemy of equal or greater physical resources and military strength. In practice, grand strategies can be compared by the extent of their reliance on costly military forces and materiel as opposed to the leveraging of potential force by diplomacy, suasion (both persuasion and dissuasion), economic pressures, deception, and other means of national power. If a clearly

superior strength nation faces an insignificant enemy, there is no need at all for strategy—brute strength is sufficient to impose the nation's will and achieve its policies and goals.

> ***Phyrrus used to say that Cineas had taken more towns with his words than with his arms.***
> ***—Plutarch***

> ***For to win one hundred victories in one hundred battles is not the acme of skill. To subdue the enemy without fighting is the acme of skill.***
> ***—Sun Tzu***

> ***In theory, there's no difference between theory and practice. In practice, there IS.***

STRATEGIC HIERACHY

Just as there is a hierarchy of conflict-war-campaigns-battles[34], there is a structure that applies to the "levels" of strategy.

GOVERNMENTAL OR SOCIETAL STRATEGY

At the highest level, there must be a tribal or governmental strategy (National Strategy in the modern nation-state environment) that seeks to correlate the overall, high-level commercial, economic, military, political, social, cultural, technological, and societal pathways to satisfy the political goals and objectives set by the leaders of the people. There must ultimately be a consensus of the ruler or leaders of a political entity that balances and reconciles competing sub-optimized objectives of particular power circles (e.g., businessmen, soldiers, bankers, clerics), each of which focuses on narrower considerations.

INTERMEDIATE STRATEGY

Therefore, there may be subsets of a group's overall strategy (e.g., National Security Strategy, National Strategy for Homeland Defense, National Military Strategy) that focus organizations and elements of power in narrower areas, and these constitute an intermediate, more detailed level of strategy—even though these strategies must be coordinated and rationalized with each other. These are not peculiar to modern nation states, but can be seen in earlier empires, where diplomatic, military, commercial-trade, religious, and other intermediate strategies sometimes conflicted and detracted from the higher level strategy (e.g., British Empire, Holy Roman Empire, Assyria, Spanish Empire). These may not be as formal, perhaps not even written or communicated well, but each power circle naturally translates the Governmental Strategy in terms with which they are familiar, often ignoring those broader aspects that their members don't understand as well as they do their particular "specialty."

REGIONAL STRATEGY

For major political powers with global or even regional interests (e.g., Spain in the 1500s, modern Japan within the Pacific Rim, Superpowers), there are Regional Strategies, often developed and supported in coordination with alliances and friendly powers. History tells us that even small, growing powers formed alliances and established common goals that assisted in the development of increased power, strength, and domination—for example, the growth of Greece involved many years of rivalry and cooperation of the political city-states in the region. A Regional Strategy may be unilateral, especially if they are narrowly focused as was the Spanish

[34] See Chapter 2, the Nature of War.

colonization strategy in the 17th and 18th Centuries, but increasingly they must accommodate the goals and objectives of allies.

THEATER OPERATIONAL STRATEGY

For larger empires, there may be more localized strategies to adapt to special situations and environments. For example, the Spanish strategy for colonizing Nuevo Mexico differed markedly from the strategy applied in the conquest of Peru and from the strategy for exploiting New Spain (Mexico). It is at this level that strategy begins to transition to operational art and tactics.

STRATEGIC PROCESSES

Given the general hierarchy above, there are other factors that mold strategy in a logical process. There are fundamental, vital interests for any society that create the foundation for implementing strategies. The vital interests are translated into political, military, diplomatic, and other goals and objectives—the basis of implementing strategies. The overall Governmental Strategy (or each of the sub-strategies) requires an estimate of the resources needed to carry out the strategy and satisfy the policies. And there are external and internal threats to those basic "valued" interests that must be assessed in the light of derivative strategies. When resource requirements are not matched by available resources, risk is incurred, and the degree of that risk must be assessed and changes made to the strategy or adjustments made to increase resources, since there's never enough to do everything that a society "wants to do." If strategy cannot be reasonably diminished without compromising the society's vital interests and the resources cannot be increased to carry out the strategies completely, the risks must again be assessed and accepted and the resources must be allocated to minimize the risks. The overall process is shown below.

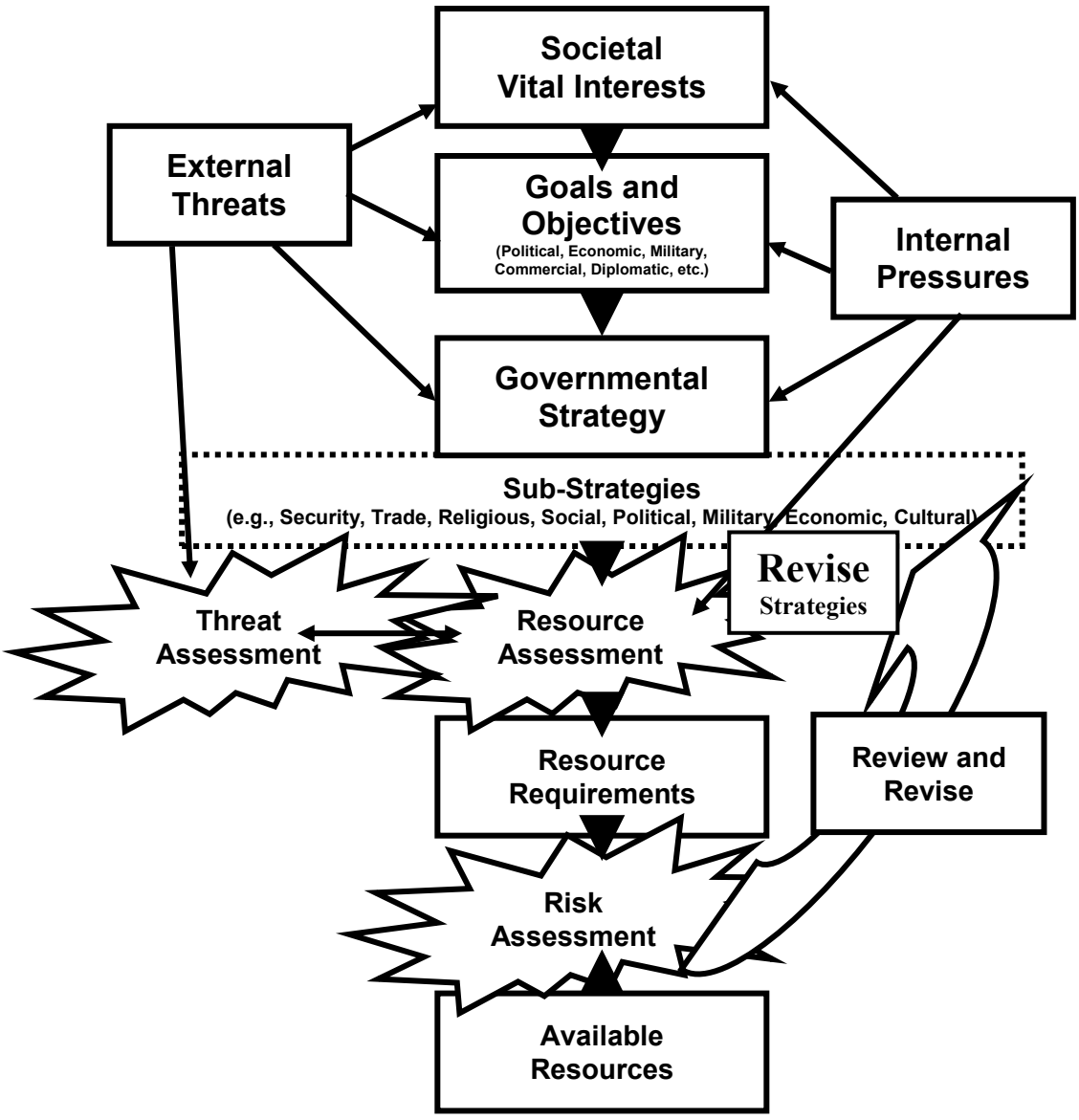

Figure 9. Strategic Processes

MILITARY STRATEGY

Hans Delbruck, famed German military historian, drew on Clausewitz's "two kinds of war" and suggested that there are two kinds of military strategy: the strategy of **annihilation** that seeks the overthrow of the enemy's military power; and the strategy of **attrition**, exhaustion, or erosion that is usually employed by a strategist whose means are not great enough to permit pursuit of the direct overthrow of the enemy and who therefore resorts to an indirect approach.

The indirect approach, postulated by several renowned military strategic thinkers, provides many examples of applied strategies that take advantage of a nation's strengths and threaten or attack an enemy's weaknesses. The use of Allies, inducements, unorthodox operational strategies, and propaganda often allow a weaker nation to carry out its national policies in the face of significant threats to its vital interests.

More recently, Colonel (USA, Ret) John M. Collins wrote a broad-ranging "textbook" entitled ***Military Strategy: Principles, Practices, and Historical Perspectives***, published by Brassey's, Incorporated in 2002. Some of his wide-ranging thoughts have been adapted to update this chapter, which had initially been prepared two years earlier.

NAVAL STRATEGY

Some cultures naturally adopted boats for travel, commerce, and military purposes—especially those bands or clans that lived beside rivers for food gathering, fishing, and hunting purposes and that evolved those into cultivation and herding for sustenance and population growth. Rivers afforded a means of travel to expand food production and trade, and boats allowed the travelers to carry more than they could by any form of land travel. As trade became more lucrative, it had to be protected from loss or capture; although tribe members naturally carried hunting weapons adaptable for defense, traders began to employ specialists who were more inclined to the use of weapons—the first Marines appeared in pre-history. Later civilizations created larger vessels, more valuable cargo, and, eventually, armed escort vessels crewed and manned by trained "soldiers of the sea." Escort vessels and ships designed for war deviated from the traditional broad beam, cumbersome commercial vessels of trade and transport, finally evolving into dedicated naval forces in search of naval strategy.

Thucydides, in his *History of the Peloponnesian War,* stresses the importance of sea power…and there was an underlying asymmetry in the Greek forces of competing Athens (naval force strategy) and Sparta (ground force strategy).[35] Later, Rome adopted an integrated ground-naval strategy that was built in part on the reverse engineering of a captured Greek warship and production and manning of a 600 ship navy to counter Greece's control of the sea, ultimately defeating Greek naval and ground forces.

"***He who commands the sea has command of everything.***"
Themistocles

The Phoenicians, being an ocean-going trading nation at the eastern end of the Mediterranean before the emergence of Remus and Romulus (the founding of Rome), adopted a purely naval military strategy until their later defeat on land and move to become Carthaginians in North Africa and the western Mediterranean. They used a ground force military strategy supported by their significant naval power to conquer and build commerce around the western and northwest Mediterranean (e.g., north Africa, Spain, southern France, Sicily) until the Romans defeated them in the Punic Wars, defeated Hannibal and his generals throughout the Carthaginian-controlled territory, and conquered Carthage, demolishing the city and spreading huge amounts of salt on the ruins to prevent future agriculture contributing to rebuilding the city or empire.

Chiang Chi's *The Myriad Stratagems* (including both naval and military ones), written in about 225 A.D., Li Chuan's *Manual of the Martial Planet* (759 A.D.), and Tseng Kung-Liang's Collection *of Military Techniques* (1044 A.D.) all propound naval strategies spanning several dynasties. Much later and in a far place, the anonymous *Libelle of Englyshe Polycye* (mid-

[35] Portions of this section on naval strategy were adapted from an article by Paul Halpern.

Fifteenth Century) expressed the need to control the Strait of Dover, the beginning of England's long-term naval strategy and domination of far-flung colonies by naval power. In the next century, Sir Walter Raleigh proposed and used sea power and colonization as the best means of sapping Spanish strength by cutting off wealth from the New World. His thoughts on naval strategy and power were echoed by Alonso de Chaves (Spain), Pantero Pantera (Italy), and Cardinal Richelieu (France), who also produced influential treatises on naval warfare. One of Richelieu's maxims: ***"He who is master of the sea is master of the land."***

During the roughly 500 years of European colonization of much of the world, every successful European empire applied naval strategy as a means of conquest and domination, as well as a means of attacking neighboring states in Europe (the defeat of the Spanish Armada in 1588 is an excellent example of major naval warfare). But warfare was not exclusively conducted at sea—ground warfare was a violent continental hobby for most of the same period.

Technological progress has expanded and extended traditional naval strategies to accommodate steam, oil, and nuclear propulsion of more specialized vessels:

- surface combatants armed with a broad array of anti-air, surface to sub-surface, and bombardment weapons, including aircraft carriers
- attack submarines armed with increasingly long range torpedoes and cruise missiles
- ballistic missile (strategic) submarines
- support vessels tailored for both single purpose (e.g., oilers) and multipurpose roles
- transport ships, both military-owned and leased
- cable laying vessels
- intelligence collectors
- and hordes of strange looking waterborne or hovering metallic objects.

U.S. Secretary of War Henry Stimson remarked during World War 11 that the Navy Department "frequently seemed to retire from the realm of logic into a dim religious world in which Neptune was God, Mahan his prophet, and the United States Navy the only true Church," referring to American's primary naval theorist and strategist, Alfred Thayer Mahan. Mahan's publication of *The Influence of Sea Power on History, 1660-1783* made him famous. Mahan fired imaginations because of his principles of warfare at sea. He preached that:

- capital ships (at that time, battleships) are the most important vessels in the navy
- blockades are valuable instruments of economic and political policies
- a central position and interior lines are favorable
- overseas bases are important, perhaps essential, for naval operations.

In World War II, when confronted with the fact that the Russian Navy's huge submarine force (biggest in the world) lost more than one submarine for each enemy ship sunk by its submarines, Josef Stalin is reported to have said, "**The only successful Russian Admiral was John Paul Jones."** And he may have been correct, since our Revolutionary War hero became an Admiral in the Russian Navy after the United States won its independence.

According to Mahan, one obtained command of the sea by concentrating one's naval forces at the decisive point to destroy or master the enemy's battle fleet; blockade of enemy ports and disruption of the enemy's maritime communications would follow. In Germany, Alfred von

Tirpitz made sure that translations of Mahan were widely distributed as support for his naval bill. Tirpitz echoed Mahan in his emphasis on the decisive battle and primacy of battleships, and his *Risikogedanke* (doctrine of risk) claimed that once the German fleet reached a certain size, the British would be deterred from attack. However, Tirpitz tended to consider a large navy and sea power to be primarily an expression of national greatness and a factor in diplomacy—military power in support of political objectives.

In Britain, Captain John H. Colomb argued that the navy was the most important component of imperial defense; his brother, Admiral Phillip Colomb, sought to establish general rules applicable to modern naval warfare in *Naval Warfare* (1891). Sir Julian Corbett turned to naval history in his mid-forties. His lectures at the Royal Naval War College, Greenwich, eventually evolved into *Some Principles of Maritime* Strategy (1911). Corbett's strategic thought emphasized the interdependence of naval and land warfare and tended to concentrate on the importance of communications rather than the battle.

But technology, especially air warfare and guided missiles, changed many of the traditional naval theories. Bernard Brodie's *Sea Power in the Machine Age* (1941) and *Strategy in the Missile Age* (1959) addressed the problems brought to naval warfare by technological advances in weaponry. Admiral Sergei Gorschkov, commander in chief of the Soviet navy (1956-1985), wrote *The Sea Power of the State* (1976) that supported an unprecedented (and ultimately unsustainable) buildup in both surface and undersea craft. The classic age of theories of naval strategy essentially ended in World War II. Post-1945 strategic theorists abound, but naval strategy has been merged with general joint strategy involving ground and air warfare.

"'Better' ***is the enemy of 'Good Enough.'*** "
Motto that hung on Soviet Admiral Sergei Gorschkov's wall.

GROUND FORCE STRATEGY

The oldest form of military strategy evolved from hunting. Weapons and tactics used to kill animals were readily adapted to humans as prey—the differences lie in motivation and purpose. Hunting for food is a survival-based necessity, while inter-clan violence involved other motives. In pre-history, these motives included driving less advanced clans from good hunting territory and more fertile land in the quest for expanded food production of the attacking clan. And of course, the attacked group justifiably defended themselves against an aggression that they may not have understood. Throughout history, the training of military forces for war has involved the application of proven hunting techniques—perhaps the best example is the elaborate animal drives practiced by the Mongols under Genghis Khan. Standard military organizations commanded by war leaders would encircle a large area known to be full of wild game in an envelopment maneuver, then, in a series of coordinated attacks, the Mongol forces would maneuver in a spiral manner, causing the animals to retreat in their defense. When the animal density reached a critical point, it was left to Genghis Khan to order that the killing begin. And it did, with Genghis Khan and his royal family making the first choice kills, then senior commanders and their subordinate leaders, then immediate leaders and their cavalry troops. Mistakes in tactics or protocol were punished as severely as similar mistakes in war. This was not just no-fault practice of military strategy, orders, and tactics. This afforded the Mongol armies with training as well as huge reserves of food.

Ground force strategy was most attractive to those clans, tribes, and cultures that recognized the need to defeat enemies and **to occupy their territories** (or subjugate the people and their territorial production through taxes, levies, and tribute—the same result without long-term commitment of ground forces). Naval forces, and later air forces, had the common strategy to kill or defeat their enemies, but neither could "conquer" without ground forces. As with early naval strategy, the clans and tribes that could divert manpower and other resources to develop commerce began to trade via land caravans with emerging civilizations, often leaving archeologists with mysteries—like the tartan-clad Caucasian bodies recently discovered in western China, dated thousands of years before recorded trade or exploration. As the caravans grew larger and carried more valuable trade goods, they required defenses beyond the expertise and training of armed traders—and the first ground forces were formed and trained to protect the caravans and, in growing villages and cities, to defend the general population.

As great civilizations emerged, their high efficiency food production permitted more and more of their populations to perform non-food producing functions—full-time leaders, trained soldiers, merchants, scholars, and others who could concentrate their minds on enlargement of their power and territories. The Assyrian empire created the first standing army, with full-time career soldiers and officers dedicated to define military strategies to satisfy political goals and objectives within and expansionist policy. The Mongols and their allies sought to reach the policy goals of conquest and pillage through a purely ground military strategy; they crossed rivers and generally avoided lakes or seas, using the significant military power of their cavalry (e.g., mobility, maneuver, endurance, speed, self-sufficiency, lethality) against lesser capable populations.

"***It is not the big armies that win battles, it is the good ones.***"
Marshal General of France Maurice de Saxe

Other cultures and polities adopted a mixed ground-naval strategy. For example, Alexander led a primarily ground strategy conquest of most of the civilized world of his time, but he orchestrated the naval resupply of his ground forces at pre-planned rendezvous along the shoreline of the eastern Mediterranean. He also confiscated vessels and acquired allies with naval capabilities for troop transport and resupply on the rivers in the mid-East and along the shores of the Indian Ocean at the eastern extremes of his journey.

Over time, the lessons of history caused later civilizations to adopt those military strategies that suited their culture, geography, and nature. Those tribes and nations that had land borders with competing tribes and nations unfettered by geographic obstacles generally emphasized a ground force strategy…or a complementary ground-naval military strategy.

"***Battles are won by slaughter and maneuver. The greater the general, the more he contributes in maneuver, [and] the less he demands in slaughter.***"
Winston Leonard Spencer Churchill

Ground force strategy—deriving from the Continental School, as the traditional primary military strategy of most great nations, seeks to identify broad objectives that support policy—in

more detail, in component parts that comprise the larger goals, and in purely military terms that, in conjunction with the other elements of power discussed later in this chapter, satisfy the political strategy and policies. Strategy is developed by understanding the policy objectives, then building a narrower set of military goals at the strategic level that serve as the foundation for military planning for war.

AERONAUTICAL STRATEGY

Technological advances frequently changed the military strategies of warfare throughout history. But the advent of the armed aircraft had perhaps the most profound impact on both ground and naval strategies and tactics. What had been two-dimensional geographic considerations acquired a third dimension—attack or observation from above.

> "***To conquer the command of the air means victory; to be beaten in the air means defeat.***"
>
> Giulio Douhet

Some argue that military aviation has been a technology in search of a meaningful place at the same level as ground force and naval strategies. Originally used as a means of observation, that general mission continues, albeit technological improvements and engineering breakthroughs have refined that role from the hot air balloon of the mid-1800s to today's intelligence satellites.

Armed aircraft on two sides of early 1900s wars initially "discovered" their dual roles as air-to-air interceptors and air-to-ground attack in support of ground operations. Both of these roles have similarly advanced as mechanical means progressed. And variations of both roles created specialized strategies (e.g., mass bombing, deep interdiction, fire-bombing). Some countries and some military forces emphasize one or the other of these roles in their air strategy.

Additional roles emerged as privately owned commercial aircraft grew from single engine "kites" to multi-engine passenger and cargo aircraft (e.g., air mail). The military application of civilian developments produced drab colored copies of proven commercial aircraft with bright military insignia painted on the wings, tails, and bodies. Air transport was seen as a means of rapid deployment and resupply of deployed forces—yet another role within the air strategy. The natural competition of rapidly moving forces, equipment, and supplies by costly air missions versus slower, but cheaper sea or rail or wheeled transport required an economic analysis prior to adoption in a comprehensive military strategy. But many nations, especially the United States, have adopted air transport as a major part of national security strategy, trading off the higher costs against the costs of forward stationing major forces in every overseas area that constituted vital national interests—the ability to react quickly in many areas saved basing costs and force structure, since fewer air transportable forces could respond to multiple, sequential political decisions. Adoption of strategic airlift as a strategy also fueled ground force and naval strategies—ground forces strive to get "lighter" to maximize short-term combat potential in a crisis area, and naval strategy increasingly involves fast sealift (e.g., SL-7s) and forward deployed pre-positioning ships of equipment and supplies to offset lengthy transit times.

Air strategy has been integrated with ground force and naval strategy in different ways by different modern nations. Some have chosen to separate the command of air forces from other military forces—creating natural tendencies to view the use of military aircraft in combat missions from a narrower perspective. When integrated into or coordinate with ground or naval forces, air support becomes focused on close combat support and domination of the airspace over the battlefield—a "tactical air" strategy. Perhaps the best example of integration is that adopted by the U.S. Marine Corps, with command and control of aviation and ground forces combined at a relatively low level, and the coordination of naval support is similarly conducted at tactical levels, permitting a combined air-ground-naval military strategy that fulfills political objectives.

Increasingly, the use of air power as the primary (or sole) implementer of military strategy is gaining credibility. The mass bombing and guided missile attacks of World War II have evolved into strategic bombing, precision weapons, standoff cruise missiles, and intercontinental ballistic missile weapons that promise to defeat the political will of adversaries through destruction of their infrastructure.

ASTRONAUTICAL SCHOOL OF STRATEGY

The frontier of space is rapidly becoming useful in a military sense. Early visionaries foresaw the value of space-based sensors and weapons that were safer from enemy attack, even though the sensors were not initially as effective as lower altitude intelligence platforms—but they cost a lot more to launch and operate. Early imagery satellites (e.g., KH-4, KH-7) exposed huge areas of the earth's surface that had previously been accessible to intelligence organizations only through human sources or the occasional high-altitude aircraft (e.g., U-2, SR-71). Technological improvements in optics, multi-band sensors (e.g., infrared, communications channels), guidance systems, more efficient rocket fuels and motors, secure communications downlinks, and automated processing over the last 40 years have brought space-based sensors to the forefront of the intelligence gathering systems.

Weapons-in-space is a less developed field, since international treaties and technological difficulties have hampered development. The exclusion of nuclear "weapons" from space, which was once touted as a potential anti-ballistic missile (ABM) and electromagnetic "blackout" system, has halted any major applied research and development in that field. However, the airborne laser weapon research and development programs could, in the future, create an enormous asymmetric advantage to the nation that launches and controls orbiting laser weapons.

There is a small, growing school of space strategists seeking an overarching rationale and means of satisfying some slice of the vital interest, national security policy goals and objectives. For the last 20 years, the view has been refined into a strategy for dominating, through space-based armed forces, the entire Earth-Moon system by positioning those forces in orbit 60 degrees ahead of and 60 degrees behind the moon in its orbit around the earth. But that concept has yet to nurture any viable implementing operational capability. Unlike the gradual transformations in traditional ground/maritime/aeronautical schools of strategy, space strategies have the potential for quantum improvements in military power and capabilities—the wave of the future.

WHAT DOES THE FUTURE PORTEND IN THE AIR AND SPACE ARENAS?

In the realm of air and space strategies, the unglamorous use of transport, cargo, observation, and support aircraft will continue. Air space domination above ground and naval forces may evolve to surface-to-air defenses versus the historic "dogfight" approach. Similarly, close air support (attack of enemy forces in contact and immediate reserves) could take on a cloak that minimizes the use of manned aircraft. Observation and intelligence roles will probably continue—witness the more than 50-year use of U-2 aircraft.

The major air strategy issue of the future involves the political acceptance of the use of long-range aircraft, standoff weapons, and ballistic missiles to attack and destroy primarily civilian infrastructure targets (e.g., electric power generation plants, rail and road structures, warehouses, communications sites) to satisfy the political objective of convincing an adversary that continuing whatever it is that the enemy is doing will lead to total economic and political destruction—a moral issue more than a military strategy issue.

SPECIAL OPERATIONS

There are a lot of threats that are not easily dealt with through the traditional strategies. For many centuries, there have been strategies, plans, military forces, and "unusual" applications of the other elements of power that are more appropriate than traditional responses. From the Greek strategic example of enveloping, small forces at Thermopylae (strangely echoed in the Battle of Glorieta Pass in 1862) through special operations strategies and forces to current anti-terrorist strategies, there has always been a place for complementary concepts, particularly when covert, clandestine, and supporting overt means were required.

UNIFYING STRATEGIES AND DOCTRINE

The traditional and historic schools of strategy, as well as the exotic Astronautical and adjunct Special Operations concepts, focus on narrow strategic and implementing solutions. Increasingly, single-solution strategies have been less satisfactory to accomplish national and international policy goals. The hide-bound traditionalists of the Continental School see ships as transport for troops and aircraft as transport and fire support; those of the Maritime School see ground and air forces as lesser "helpers" in the sea-dominated land masses…and of even less value in keeping critical sea lanes open. Those of the aeronautical school declare the growing disutility of both ground and naval forces. But, as in any solution to an operations research issue, the best solution has proven to be a mix of strategies and capabilities. Alliance strategies complicate the integration issue, since allies often have diverging views. Massive coalition efforts (e.g., World War II, Desert Storm) have shown the need for a unifying strategy…and the results of imperfect joint and combined strategy, doctrine, and operational tactics.

THE INDIRECT APPROACH

Liddell Hart is the recognized Western dean of the school of the "indirect approach," drawing on many historical examples to show that more than military dominance is involved in achieving political ends.

> The following definitions are offered:
> National Strategy. The art and science of developing and using the political, economic, psychological, and other powers of a nation, together with its armed forces, during peace and war, to secure national objectives.

> Military Strategy. The art and science of employing the armed forces of a nation to secure the objectives of national policy by the application of force or the threat of force.
>
> Strategy. The art and science of developing and using political, economic, psychological, and military forces as necessary during peace and war, to afford the maximum support to policies, in order to increase the probabilities and favorable consequences of victory and lessen the chances of defeat.[36]

However, these definitions mask the fact that, throughout over 200 years of history, the United States has generally had a very thin "national" strategy, tending to use its military forces in reaction to threats to the nation—stressing the Clausewitzian "military" strategy, "the art of bringing forces to the battlefield in a favorable position." Other cultures foresaw the longer-term need to plan ahead; these will be described in the section below on Military Elements of Power.

Michael Handel, in *Masters of War*, applied Occam's razor[37] to the last definition and defined strategy as "***the development and use of all resources in peace and war in support of national policies to secure victory***." If victory is defined as achieving political policy goals, this may be a reasonable and adequate definition.

Other proponents of the indirect approach described strategies that avoided combat, at least on unfavorable grounds, focusing on alternative means of imposing one's will on an enemy and furthering the nation's political goals and policies. Most of the Chinese strategists, having a common understanding of Confucianism, reflected the "bamboo bending accommodation" and use of uncommon tactics in their writings—the Chinese "absorbed" invading forces and assimilated them into their culture.

Many successful nations used an indirect strategy of dividing their enemies, pitting one against another, using allied military forces for the most dangerous tactics, coercing neutral nations into becoming supportive, and dissuading unfriendly nations into becoming neutrals. The grand military strategy of the British naval ascendancy was supported by the political strategy of maintaining a "balance of power" throughout Europe, especially supporting those economic, political, and military actions that tended to keep potential enemies at each other's throats. Therefore, the continental powers spent their disposable resources on ground forces, leaving few resources for navies, which the British could then easily defeat, both militarily and economically in the competition for trade and commerce.

THE DIRECT APPROACH

Early military strategy involved the rapid maneuver of major forces deep into enemy areas, even when the strength of the invading force might have been less than the overall strength of the defender—concentration, mobility, and speed were critical to this strategy. Campaigns up and down the Nile, Assyrian conquests, and Greek military strategies were generally based on that direct approach. However, greater success accrued to leaders who augmented direct military strategy with "soft" diplomacy or political pressures. For example, Alexander fought many hard

[36] *The Dictionary of United States Military Terms for Joint Usage*.
[37] "*essentia non sunt multiplicanda praeter necessitatem*." The simplest answer is a sufficient solution.

battles in his lengthy invasion and conquests, but often relied on political diplomacy (especially of Persian-held former Greek cities) and explicit and implicit threats as he advanced into Asia. He also applied diplomacy and social power after his conquests, promoting intermarriage between his Macedonian troops and the conquered population.

The direct approach was favored by the Greeks in their naval strategy and by the Romans, as they conquered much of the known world for an extended period. But the Romans and, to a greater degree the Byzantine (East Roman) Empire, relied on a combination of diplomacy, deception, use of client states and forces, and political and religious integration to conserve their forces.

The warriors of the Steppes showed how rapid and direct attacks, penetration of enemy societies, and the exploitation of inculcated fears created a winning war machine for hundreds of years. For example, Genghis Khan captured walled cities without any siege-craft, because rulers and merchants recognized the value of Mongol-enforced safety over long trade routes. Similarly, the Arab invasion of the Byzantine Empire was aided by dissident Monophysite Christians, who saw the promise of religious tolerance.

Most of the empire building, colonial nations applied the direct approach. After the fall of Rome and the slow emergence of other European nations, Spain, Portugal, France, and England adopted naval military strategies to extend their empires around the world. Their clearly dominant military strength permitted domination of huge populations of more primitive peoples, until over the longer term, their colonies acquired military strength to permit indigenous political rebellions, revolutions, and independence. Latter day European quests for empire (i.e., Germany in the 20th Century) faced more evenly matched enemies, with military might, political commitment, formation of alliances, and coordinated opposition to the blitzkrieg invasion that in many ways resembled the fast, violent, and deep penetrations reminiscent of Alexander, Attila, and Genghis Khan.

OTHER STRATEGIC PAIRINGS

Just as the Indirect/Direct approach strategies offer choices, there are some other strategic concept alternative choices worthy of mention.[38] These elemental alternatives have historical precedents that prove or disprove the utility of each of the choices, depending on external factors in large part. And they are not true alternatives, since military strategy usually relies on both choices within a pairing to take advantage of the utility of all options.

[38] See ***Military Strategy*** by John M. Collins, especially pp.62-64.

Table 2. Alternative Strategies

Strategies	Comments and Examples
Sequential	Successive steps, each contingent on the preceding steps. Spanish conquest of the New World. World War II decision to defeat Germany prior to the final push to defeat Japan. Conforms to the principle of Conservation of Enemies—limit your risks.
Cumulative	Gradual extension, concurrently conducted operations with limited linkage. Strategic bombing campaign strategies in World War II and Viet Nam. Many naval interdiction strategies and operations against commercial shipping.
Active	Open and exploit strategic and tactical opportunities. Rapid growth and expansion of Nazi military might and political domination of neighboring countries prior to World War II.
Reactive	Generally defensive, protectionist strategy. Mutual Assured Destruction strategy was based on inaction, but with a large nuclear capability during World War III (the predominantly economic and political Cold War).
Maneuver	Mobility, flexibility, surprise are emphasized. North Vietnamese and Viet Cong guerilla strategy and operations during the Viet Nam War. Desert Storm.
Attrition	Relies on mass, toe-to-toe wearing down of enemies—not just militarily. World War I, especially the trench warfare stalemate. Non-violent attrition, wearing down the political will of Britain, by Mahatma Gandhi leading to the end of British rule in 1947. U.S. and Allied bombing, ground force sweep, and artillery H&I strategy and operations during the Viet Nam War
Arms Control	Disarmament strategy to make war a less attractive option; usually has economic advantages as well. President Woodrow Wilson included disarmament as one of the 14 points in his peace proposal; echoed by the League of Nations. Strategic Arms Limitation Talks (SALT) treaties reducing U.S. and Soviet nuclear forces. Mutual and Balance Force Reductions limiting ground and air forces along the NATO/Warsaw Pact frontier.
Arms Competition	Outspend and try to threaten/dominate a military enemy. North Korean arms race while the U.S. discouraged South Korean military expansion.

HISTORIC STRATEGIES

History is replete with forms and use of strategies, particularly military strategy of empires and conquerors. Most readers will be familiar with modern military strategies and authors (e.g., von Clausewitz, Douhet, Mahan) and some are familiar with older, more

fundamental strategists. Three sets of strategic concepts are summarized below to broaden the descriptions above.

STRATEGY OF ANCIENT CHINA – WU-TZU

Fundamental concepts and strategies were expounded by Wu-Tzu (b. ca. 440 BCE, murdered in 361 BCE; originally named Wu C'hi) who proved to be an able general and statesman during the time that China evolved from seven kingdoms into a single empire. As the military commander for the kingdom of Wei, he defeated encroaching enemies on four fronts (Ch'in the west; Ch'u in the south; Chao in the north; Ch'i in the east) with Yen at the rear of Wei and Han at its front. His early immersion in Confucianism (perhaps with one or more of the original teachers who transformed those beliefs into succinct behavioral guidance) contributed greatly to his thoughts and deeds, occasionally to an extreme (some commentators reported that Wu-Tzu killed his wife, who was from an enemy kingdom—Ch'i, to prove his loyalty).

Wu-Tzu's acts, writings, and character were chronicled extensively, unlike other semi legendary Chinese authorities. The present six chapters of the *Wu-Tzu* focuses on strategies and other matters related to civil and military affairs:

1. **Planning for the State**
2. **Evaluating the Enemy**
3. **Controlling the Army**
4. **Tao [way] of the General**
5. **Responding to Change**
6. **Stimulating the Officers**

Wu-Tzu, like many Chinese military strategists in prescribing numerical lists for many aspects of war, cites five reasons for raising troops [going to war]:

1. **To contend for fame**
2. **To contend for profit**
3. **From accumulated hatreds**
4. **From internal disorder**
5. **From famine.**

Wu-Tzu's was exceptionally successful in planning and executing strategies (i.e., victorious in 64 of 76 battles protecting and expanding the West River territory of the Wei kingdom, with 12 draws and no defeats). He coupled the state to the army, pointing out four disharmonies and advises on how a ruler must deal with them:

- **If there is disharmony in the state, you cannot put the army into the field.**
- **If there is disharmony within the army, you cannot deploy into formations.**
- **If you lack harmony within the formations, you cannot advance into battle.**
- **If you lack cohesion during the conduct of the battle, you cannot score a decisive victory.**
- **For this reason when a ruler who has comprehended the Way is about to employ his people, he will first bring them into harmony, and only thereafter embark on great affairs. He will not dare rely solely on his own plans, but will certainly announce them formally in the ancestral temple, divine their prospects by the**

great tortoise shell, and seek their confirmation in Heaven and the seasons. Only if they are all auspicious will he proceed to mobilize the army.

STRATEGY OF ANCIENT CHINA - SUN TZU

Sun Tzu provided a wealth of guidance and direction in ***The Art of War***. Many students of war and military strategy are familiar with his teachings[39], including:

- **Thus, what is of supreme importance in war is to attack the enemy's strategy.**
- **The supreme excellence in war is to attack the enemy's plans. [Li Ch'uan revision]**
- **He who knows the art of the direct and indirect approach will be victorious. Such is the art of maneuvering.**

STRATEGY OF ANCIENT CHINA – HUANG SHIH-KUNG

The *Three Strategies of Huang Shih-kung* reflects concepts of government, methods of nurturing a sound material foundation, administration of forces, unification of the people, characteristics of a capable general, motivation of subordinates, rewards and punishments, ways to foster majesty, and balance. This last topic focuses on the need to balance softness (Virtue), hardness (the brigand), weakness, and strength; the tendency toward one extreme or the other causes instability, and "the state will perish."

These strategies reflect how to carry out the policies of national government at the time of consolidation by the Han Dynasty. This 2000-year-old document contains fundamental Confucian themes (e.g., benevolence, righteousness, humanitarian government, welfare of the people, rule by Virtue) tempered with Taoist strategies (e.g., passivity, harmony, preserving life, evilness of warfare), but accepts the reality of righteous [just] warfare and contending for harmony. Some pivotal measures include strengthening the state, rigorously enforcing laws, strictly implementing rewards and punishments, ensuring that the ruler retains power and exercises authority—not dissimilar from the United States Constitution and National Military Strategy.

The three strategies interweave religion, governance, propriety, and other complex aspects of policy and strategy. A thorough understanding of the "Superior Strategy" enables a ruler to employ the Worthy and seize his enemies. Mastery of the "Middle Strategy" allows a ruler to employ and control his generals and unite the people. If he thoroughly understands the "Inferior Strategy," he will be able to understand the regulations for governing a state and to discern the sources of national "flourishing" and decline.

CONSISTENCY

Again, the themes of motivation of populace, securing material means and resources, integration of all elements of national power, and indirect military strategy are consistent with later, Western views of strategy. Both Huang Shih-kung and Sun Tzu emphasize that military strategy must focus on swiftness, a combination of disciplined speed and intuitive decisiveness, rather than duration. Thucydides wrote that, "opportunities in war don't wait." Machiavelli stated, "In war, the power to recognize your chance and take it is of more use than anything

[39] Although *The Art of War* is attributed solely to Sun Tzu, it is probable that early texts were compilations of writings by other authors as well. Surviving copies of old texts also suggest that others added interpretive sections.

else." Sun Tzu wrote, "If courageous [a commander] gains victory by seizing opportunity without hesitation…" Livy wrote, "Fortune favors the bold."

TRADING, RAIDING INVADING – PROGRESSIVE STRATEGY

There is a natural progression of the economic strategy of expanding tribes from the self-sufficient groups to contact and commerce with other groups. This leads to trading, often over natural routes (e.g., the Silk Road, along rivers and coastlines) between growing towns. As external commerce and trading benefit both the roving and stationary cultures, their population grows and standards of living improve. Since richly laden trade caravans constitute attractive targets for more impoverished tribes through whose territories they cross, the traders must increase their defensive capabilities, adding armed escorts and arming the merchants themselves. Therefore, the primary economic strategy of foreign commerce became increasingly tainted with the military strategy of defending the means of commerce and, frequently, the routes of commerce. As the size of caravans and convoys increases (to add military might against smaller groups of bandits or of pirates at sea, the caravan begins to resemble an army on the march, albeit with a central core of trade goods, and the convoy begins to look like an armada. When trading becomes less profitable, or when trade goods are lost to bandits or pirates en route to or from a destination, the natural economic inclination is to "make up" for those losses by using the armed force in an offensive role—a military strategy. Thus, the staunch defenders of the merchant trader or voyager becomes itself a gang of armed bandits or pirates, seized with the goal of enriching themselves (and the merchants who employ them)—raiding in lieu of trading.

VIKING NOTION OF STRATEGY

Some cultures, such as the Vikings from about 500 AD, traded over great distances by sea (all of the North Sea, Eastern Atlantic seacoast in Europe, well into the Mediterranean) and along rivers (from the Baltic south along the Volga to Byzantium and even into the Caliphates; down the Rhine and Seine well inland in western Europe). These successful trading ventures became more arduous and less profitable over time, so the traders increasingly relied on raiding to make up the difference in return on investment [maybe they didn't look on it in that way]. Over the next century or so (perhaps 600-793 AD), although the Norse, Swedes, and Danes continued with external trading, fishing, and internal agriculture, they increasingly mounted raiding expeditions to augment the wealth of their clans. These took the form of sea raiders (from which the term "going a-Viking" translates) as well as inland excursions from such sea raids. They clearly exercised a sophisticated set of tactical maneuvers and conducted military operations in accord with some sort of doctrine; however,

> **They did not really recognize a higher abstract 'art of war' in any modern sense of the term, although they doubtless followed certain general principles in a practical and instinctive way. Instead of constructing high-faluting theories about an art of war, they would almost always have tended to play things according to their pragmatic self-interest mixed with a basic code of honour, loyalty to one's lord, and probably even to law, custom, religion, and tradition.**
>
> **Paddy Griffith, *The Viking Art of War***

As the shore-side base for land raids became increasingly larger and the success of deeper raids inland became more fruitful, the Vikings transitioned their military strategy from raiding to invading—the difference generally being that a raid is an "in and out" expedition with temporary goals, while an invasion has the intent of more permanent occupation and exploitation of territory, imposing a political control over the conquered populace. In those areas that had smaller populations, weaker defenses, relatively valuable booty, and warmer living climates, the Viking invasions established major domains (e.g., most of Ireland, Isle of Man, Orkneys, Normandy—named for the Norsemen, almost all of England until 1066 AD). For analytic purposes, there are four types of Viking warfare[40], as shown in the table below.

Table 3. Types of Viking Warfare

Type	Description
Saga Warfare	Small scale, blood feud duels, clandestine night raids to burn halls or farm buildings, ambushes, cattle rustling, declared semi-legal killings, secret undeclared murders—organized violent action to exact justice or vengeance.
Royal Household Warfare	Tax collectors, bodyguards, conspicuous symbols of power, evidence of control, enforcers of the King's decisions, loyal band of warriors to oppose dissent or political rivals—sometimes bigger battle forces than saga warfare.
'Going A-Viking'	Freelance plundering expeditions, piracy, bandit raids ashore—one or a small group of ships with armed crews and a leader.
Royal Army Campaigning	Military action of a specially-mustered host, campaigns by a major part of the military resources available to a King, dynastic wars, major invasions, conquests, colonization—occupation of major portions of Belgium, Northern France, England, and island territories was the political objective.

This progressive strategy, evolving from economic goals to military missions, does not always follow the complete cycle. It was generally true for the Persians, Greeks, and Romans, but other civilizations of the same era did not fit this mold. For example, the tide of the Egyptians up and down the Nile was more of a raid and invade set of strategies, with not much previous trade influence.

As another example, this of the "trade and invade" nature, the Phoenicians were a wide ranging commercial trading nation, with lengthy sea routes of commerce throughout the Mediterranean, along the coasts of Africa and Europe, and well beyond [some say even to the Americas]. Their sea-going culture and national policies did not envision expansion, encroachment on neighbors, or acquisition of foreign lands in those early centuries, although when their homeland in the eastern Mediterranean was pressed by other invaders, they invaded and occupied an initially small area on the north coast of Africa that became Carthage. At this point in their political development, evolving from centuries of "trade only" policies and economic strategy, the (now) Carthaginians invaded and conquered Sicily and most of what is now Spain to extend their commercial base through an offensive military strategy.

[40] Adapted from *The Viking Art of War*, Paddy Griffith, Greenhill Books, London, 1998.

STRATEGIC ENABLERS – CIVIL ELEMENTS OF POWER

When a ruler or government perceives that a nation's vital interests are threatened, endangering its goals and objectives, decisions must be made as to the forms of response to counteract the threat. If one accepts that a military response should be a last resort, for any number of reasons, the other elements of power may be more appropriate, at least initially. Winning by not fighting underlies the lessons taught by military strategists in many cultures (especially China).

DIPLOMATIC POWER

Diplomacy has been described as the art of saying "nice doggie" to a ferocious canine until you can grasp and use a large stick. In execution, diplomacy is the polite art of warning, influencing, and tactfully dissuading an enemy from pursuing a course of action that is deemed detrimental to a nation's interests. It may be of the "cookie pushing" gracious social nature or more like the gunboat diplomacy that is more military in nature. Diplomacy is seldom practiced in isolation between two nations. If a nation desires to avert a war, diplomatic signals to the enemy and to the rest of the world must involve messages to enemies, allies, other nations and international groups, and the general domestic public. Expressions of deep concern, warnings of dire actions, and allusions to taking all measures mask the real intent of diplomatic messages—often misunderstood or ignored by a less "polite" nation.

ECONOMIC POWER

A wealthy nation may impose constraints on commerce, restrain international trade, impose import taxes, or take other commercial measures to influence or punish the actions of another nation (e.g., the initial Presidential Executive Order prior to the Gulf War was to freeze Iraqi accounts in U.S. banks). Or economic power may be used as the "carrot" in encouraging cooperation and restraint (e.g., the continued findings of "most favored nation" status for nations that really don't deserve that status). With increased commercial interdependency, multinational corporations, and global economic alliances, economic warfare may become the dominant form of international conflict. Economic power in the form of spendable resources for war is discussed in the section of this book devoted to Elements of War.

POLITICAL POWER

Where diplomacy is the polite exercise of suasion, political power may be more direct and decisive. For example, alliances may be formed to avert or respond to a building crisis, or international organizations may be manipulated to create a broader constituency supporting an offended nation's positions. The political persuasion of nations is not a modern invention, although there are more avenues in the increasingly complex world to apply such power. For example, Alexander attracted the loyalty and support of Persian-dominated cities whose leaders or ruling classes were Greek (the Persians had conquered most of the Greek-held eastern Mediterranean); this was often accomplished by emissaries (ambassadors) whose message was of expanded Greek civilization and empire, returning captured territory to Greek hegemony. The fact that Alexander's vast Army was rapidly approaching did not need to be stated.

CULTURAL POWER

Culturally aligned nations "think alike." Even when they might not be "allies" in the formal sense, nations that share a common or at least compatible set of values, goals, and

objectives. The frequent alignment of nations with a common language (if moderate differences are ignored), common customs, and common ethnic ancestry is probably best illustrated by the alliances of English speaking nations during the 20th Century. Perhaps a better parallel is the frequent alignment of the United States and France, where the language is wildly different, but the republican and democratic ideals are strongly shared. Similarly, Arab nations have aligned themselves—sometimes for war (e.g., the Gulf Coalition) and more often economically. As empire building nations colonized far-flung lands, they instilled their own culture into the captive populace, creating future allies even after the colony had gained independence (e.g., England and Canada, the United States and the Philippine Islands).

However, conquest has not always led to future alignments—after the Mongols conquered northern China and were assimilated into that dynasty and absorbed into the more ancient Chinese culture, they became more Chinese than Mongol and, in later years, had to defend against renewed attacks from their former homeland. Culture became thicker than bloodlines.

A more unusual example involved later day events following the Viking conquests of most of England and of Normandy, culminating in two major battles pitting Viking descendants against each other in 1066. King Harold Hard-ruler of Norway (Harald III Hardraade, the Ruthless) was killed in the Battle of Stamford Bridge and his army roundly defeated by the forces of King Harold Godwinsson (or Godwine's son) on September 25. Harold Godwinsson was himself killed and his army conquered by William (the Conqueror) and the Norman army at the Battle of Hastings on October 14. The ties of blood and common ancestry were not as strong as territorial imperatives. William's ascendancy to the English throne on December 25, 1066, triggered rebellion of Viking descendants, aided by the Danes, in the north of England until 1071.

RELIGIOUS POWER

As a special case of commonality of culture, religion creates a bond between nations. Just as some cultures are more "peace loving" or more warlike, religious fervor and beliefs lead to conflict, violence, and wars. One can argue that, as religions mature and evolve, their beliefs in violence may also change—when Christianity was young, it was based on peaceful co-existence; as it became strong and even dominant, it became more violent (e.g., Crusades, Spanish Inquisition, military backed religious conversion of the Americas).

Christian nations banded together during the Crusades, sharing in the common policy of recapturing the Holy Land, especially Jerusalem, through military strategies of mounted knights, armed with lances and swords, making mobile attacks against the Saracens (themselves aligned by a common religion) and fortifying and defending captured cities, some of which stand almost undamaged to this day. The Thirty Years' War (1618-1648) was a massive, multinational series of campaigns that began as a Protestant-Catholic religious conflict in central Europe and ultimately involved almost every country in Europe (e.g., Germany, Austria, Spain, Italy, France, Bohemia, Poland, Holland, Denmark, Sweden).

As the Muslim religion spread across much of the world, it carried with it the concept and teaching of Jihad—holy war. The religious interpretation of Mohammed's teachings about the

one true faith, the one true God, and the rewards of death earned in combat has instilled a willingness of Muslims to serve in armed forces and to die for the political/religious policies on which the military strategies are based.

Religions that have emphasized peace or cooperation (e.g., Buddhism, Confucianism, Quakers) often carry over into the political and military policies of nations or groups. Perhaps the best example is that of an enduring China, for more than two millennia an internalized, defensive, and consolidated culture and nation. Only in the last half century has the Confucian culture been interrupted, although China remains generally non-expansionist.

A sacrilegious wag has commented that religious wars allow two peoples to fight to see whose imaginary friend is the most powerful.

PSYCHOLOGICAL POWER

A nation, ruler, or government has the ability, perhaps the duty, to influence the actions of its enemies, its allies, and its own people through management of information. These include the early creation and convincing the public and the world of the "just cause" of a nation's policies, perceived threats to those policies and vital interests, and righteousness of possible responses. Many battles have been won without fighting because of the psychological recognition of the strength and ferocity of the military forces arrayed against a relatively unprepared population. Alexander, Tamerlane (Timur-e-lenk or Timur the Lame), Genghis Khan, and Attila developed and took great advantage of the reputation of their armies for destruction, pillage, and annihilation to conquer major cities without violence.

Psychological power must also be applied with one's friends, allies, and citizens. Even dictators and kings need to gain the support of others to successfully wage war. Political spin, media manipulation, propaganda, and "speechifying" are important ingredients in building hatreds, creating emotional commitment, justifying the horrors of war, and convincing oneself of the logic that concludes in armed conflict and war.

MILITARY ELEMENT OF POWER

The military means of accomplishing the political and military policies of a nation and its government have existed for many centuries. The thoughtful description of military power, its utility, and the orchestration of military means with the civil elements of power and the policies of the nation bear the trademarks of the diverse cultures that waxed and waned in overall global or regional dominance for millennia. The descriptions below omit discussion of "the Western way of war," since most readers will be more familiar with Euro-centric thoughts about military power—what is intriguing is that many of the "foreign" thoughts have carried over into Western culture and military strategic thoughts. The reader should examine the summaries below with Western teachings at least in the subconscious to recognize the commonality of military thought.

ARMED FORCES – MEANS OF MILITARY POWER

From ancient times through the present, and undoubtedly well into the future, nations have had relatively few options in their national strategy for building military forces to carry out political and military strategies. The creation of forces has historically involved national commitment to the following kinds of armed forces:

- Standing armies and navies
- Militias and citizen defense forces
- Seasonal or occasional forces

consisting of:

- Full time, career military personnel
- Cadres
- Conscripts
- Slaves
- Allies
- Mercenaries
- Volunteers and responsible-citizens

Or some mix of these options to enable military strategies to support political goals. It should be noted that some nations eschew military forces, strategies, and means of achieving national goals and policies. Some rely on impregnable geography, economic strength (or the complete lack of resources, which tends to put off attacks by other nations), recognition of neutrality, and regional allies. Some examples are:

- Switzerland, although neutral, relatively well protected from ground invasion, and wealthy, has well-trained and equipped citizen soldiers on-call if required to defend the nation.
- Andorra, Monaco, and San Marino rely on "surrounding" nations for defense.
- Sweden maintains armed neutrality, with considerable ground, air, and sea forces.
- Belize, Costa Rica, and Tibet have relied on neutrality and alliances for defense.

That is not to say that any isolated nation should not have an army or navy, nor is it true that neutral or seemingly unassailable nations do not need or warrant armed forces.

Standing Forces

Small kingdoms, states, and nations with an adequate "wealth" of resources could afford the economic, social, agricultural, and commercial "costs" inherent in the creation and sustainment of standing military forces. Perhaps the best early example is that of Assyria, where imperial expansion and military conquest increased the wealth of the empire, enabling the commitment to a large standing army—a clear case of self-perpetuation of an Army based on economic and territorial conquests. The increase in captured goods, external trade, levies of goods and services, and efficiencies in domestic agriculture and manufacturing (e.g., weapons, chariots, means of war) provided the necessary expendable or surplus resources to support the standing military force.

Many nations followed a similar pattern of empire, exercising military strategies of conquest using large standing ground and sea forces to conquer and exploit neighboring territories and to

simultaneously defend the increasingly long boundaries of the nation. Persia, Greece, Egypt, Rome, Spain, Portugal, the Dutch, England, Russia, and, for a time, the United States relied in large part on large standing forces to extend their realms and to implement political policies through military strategies. It should be noted that this strategy does not necessarily imply that those forces are citizens or even residents of the nation involved; however, most of the large standing force nations actively and directly led the assembled indigenous, allied, and conscripted organizations forming the ground and sea forces of the nation.

Militia and Civil Mobilization Forces

Many great nations and empires adopted military strategies that relied on well trained and equipped, but "part time" armed forces, primarily of citizens who had the duty and responsibility to serve in a military status when so called on by political leaders. Rome required its free citizens to arm themselves and, when ordered, to become part of the active, standing force. Even Rome's generals were ordered to their posts as Counsels, usually serving for only one year—whether one or more Counsels were appointed by the Senate for that year.[41] The imposition of political direction on its citizens to serve has sometimes been matched by the fervor of the citizens to do so when the just nature of service impassions them to defend their nation, to attack enemies of the state, or to seek honor through military achievements.

Whether attracting volunteers, allowing substitutes (e.g., paying another to serve in one's stead, forcing a slave to serve), or submitting to conscription, the nation's population base used over a temporary period is fundamentally different than relying on a long term standing force of professional soldiers and sailors. But the mix of a professional cadre and the influx of citizen soldiers and sailors has been a foundation military strategy of many nations—as has been the often temporary augmentation of a nation's military forces with allied armed forces.

Seasonal or Occasional Forces

A less formal military strategy relies on the formation of armed forces that are subject to military duties primarily on a seasonal basis. Some agricultural kingdoms needed to ensure the planting, weeding, and harvesting of crops to sustain the populace throughout the fallow winter season. The advantage in warfare accrued to the kingdom that planted early, planned for an early harvest, and carried at least a part of that harvest as food for attacking naval or ground forces and, for ground forces, fodder for transport animals. The attacking forces sought to arrive in the objective area while the defenders were still engaged in the harvest, to capture products of the interrupted harvest, and to force the defenders to surrender due to their disunity and the increased probability of facing a starvation situation over the long winter.

In other cases, generally later in history, the cycle was bimodal. For example, the Vikings had a military strategy that allowed the farmer-soldiers to plant their crops and depart by ship for the spring season raids on other nations. During their absence, older men, women, and children tended the crops and flocks, with the military forces returning and de-mobilizing in time for the men folk to harvest the crops, after which they might mount a late fall offensive, generally to warmer climes.

[41] Which brought about a major violation of the Principle of War, "Unity of Command," when two Counsels commanded the assembled two Legions on alternate days, often creating an attack/pursue then stand fast cycle of orders and confusion.

TRAINING OF MILITARY FORCES – GUIDING MILITARY POWER

The earliest forms of war and combat were quite similar to those strategies and tactics associated with hunting—except that the quarry was human, often armed and dangerous, and generally more intelligent than the animals hunted for their meat and by-products. Military training took on a more formal setting as armed forces became the uniformly armed, dedicated warriors of early empires. Training then and now has focused on basics (e.g., order, discipline, good conduct, skill with weapons, doctrine, standard tactics for the group, rote procedures, obedience). As weaponry became more sophisticated and forces became larger, military training by organizational leaders (from immediate supervisors to commanders and generals) assumed more technologically oriented flavor and the operational integration and coordination of diverse formations dominated.

Napoleon

Arguably the greatest Western general of armies and practitioner of military strategy of the last few centuries, Napoleon wrote no great single literary work. However, he was a prolific writer of directives from which his philosophy of war and maxims on the conduct of war have been synthesized.[42] Many of his directives and the derived maxims provide an understanding of the training required to field and successfully employ an Army. Jay Luvaas's landmark work, a result of exhaustive research and scholarly summarization of "the book that Napoleon didn't write" is a "must read" for military trainers and practitioners of armed conflict. Some extracts follow:

- "Simply gathering men together does not produce soldiers: drill, instruction, and skill are what make real soldiers.
- The passage from the defensive to the offensive is one of the most delicate operations of war.
- The success of an army and its well-being depend essentially on order and discipline, which will make us loved by the people who come to greet us and with whom we share enemies.
- Unity of command is of the first necessity in war.
- Great operations…require speed in movements and as much quickness in conception as in execution…We require therefore unity of thought—military, diplomatic, and financial.
- Success in war depends on the prudence, good conduct, and experience of the general. You do not require spirit in war, but exactitude, character, and simplicity.
- Great battles are won with artillery.

Strategic Training—Education of Leaders

Until the advent of European war colleges (e.g., France, Prussia), strategic thinking and senior leadership training were self-directed processes. Often, senior political and military leaders acquired promising assistants and potential future leaders and taught them by example. Education varied for those who were historically remembered as great Admirals and Generals, but often included non-military subjects and general subjects that had only peripheral relevance

[42] For greater detail, see *Napoleon on the Art of War*, Edited and translated by Jay Luvaas, The Free Press, 1999.

to military strategy or governance. For example, Alexander learned from his teacher, Aristotle, the practical aspects of politics, accommodation and tolerance of different cultures, and lessons of philosophy that he later merged with the military skills that he learned by accompanying his father Phillip into battle—the mix of diverse subjects evolved into a complex military strategy that conquered most of the known world of the time. Greek and Roman leaders similarly acquired a "liberal arts" education that contributed to a well-rounded military education.

On occasion throughout history, brilliant military leaders arose through some galactic spark of genius and natural abilities to succeed in waging war. Although there is a void in historical records of the Warriors of the Steppes, external accounts and suppositions about their war-winning strategies suggest that there was only a "learn by doing" training environment plus the culture of skilled horsemanship, incredible endurance, and remarkable archery—the innate ability of an Attila or a Genghis Khan to invoke discipline on a relatively wild set of individuals speaks more of great personal power than of training.

However, as navies and armies became more orderly, bureaucratic, and organized, the passing of military skills to future leaders became a key function of longer tenured professional soldiers and sailors. As one examines the history and accomplishments of the Roman Legions, it is clear that the professional core—Centurions—accepted and excelled in the training of both Legionnaires and junior officers destined for greater command. This mentoring continued, with later Roman Counsels relying on old soldiers to provide candid professional guidance, even though they were junior in rank.

Such has been the same in many armies and navies, where perceptive and respectful leaders have sought and accepted advice from experienced and skilled warriors. History abounds with examples of defeat when commanders ignored the cautions of battle hardened staff officers and subordinates. If learning from past mistakes is a valid means of education, training of military leaders in strategy should likewise proceed from examining and adopting the lessons of history.

EQUIPPING MILITARY FORCES –WAR POTENTIAL FOR TRANSFORMATION INTO POWER

In a later part of this book, the broader dimensions of Resources and Materiel provide a greater depth of the means and measures to equip military forces. This short discourse deals with the strategies of equipage.

Individual Provisioning

The earliest warriors were self-equipped with weapons initially designed for hunting and later adapted or used for waging war. As some nations became wealthy enough to afford a standing force (e.g., Assyrian army, Athenian navy, Roman Legions), the provision of weapons, armor, shields, helmets, and other artifacts of war became both desirable from a need for standardization and affordable from a public finance capability.

Government Furnished Equipment

The emergence of an early arms industry brought economies of scale to the production of increasingly better weapons; it also brought forth centers of excellence in metallurgy and

manufacturing that spilled over into enhanced techniques for commercial purposes. As skilled smiths came to better understand the failings of metals, they undertook to improve both materials and processes—in effect introducing research and development into the weapons acquisition process. Great navies and great armies required masses of weaponry and equipment, forcing the development of increasingly large and capable factories and industries.

Procurement Choices

Throughout history, governments have had the same set of options for obtaining equipment for their armed forces. Whatever the source of manufacture, a government and its armed forces could require individuals to provide arms, produce them in government facilities, purchase military equipment, capture weapons, or borrow military equipment and weapons, or the money to purchase them, to support the political and military strategies of a nation. Most often, a mix of acquisition strategies has been chosen to support the military strategies and political preferences of a nation. Rome relied on self-equipping and central production; the United States built a comprehensive arsenal and military depot system; England initially relied heavily on Lend Lease from the United States in the early stages of World War II; the Viet Cong tended to capture weapons early in the Indo-China conflict.

PLANNING

A high-level strategy (defining the broadest objectives that you want to get accomplished) supported by a coherent military strategy (defining military goals and objectives, the preferred means of implementing the strategy, and the constraints imposed by political leaders) must be followed by more detailed military planning. It is assumed that the military strategy has been coordinated with other strategies (e.g., diplomatic, economic) to satisfy high-level policies, but often there are external factors that affect military planning.

STRATEGIC PLANNING

War planning is not a distinctly or uniquely military process. At the highest (strategic) level, it involves the coordinated thoughts and determinations of all facets of power—economic, diplomatic, political, religious, cultural, military, and others. Leaders and governments should continuously review the past, present, and desired future conditions that would be most favorable to them and, if they are part of a participatory system of government, the population. Planning becomes the general road map that permits all relevant elements of the society to move toward the high level political goals of the clan, tribe, state, or nation within or exclusive of external polities (e.g., allies, trading partners). The political goals and high level policies are inputs to the strategic planning process; the output should be the development and execution of military strategies and executable war plans.

Strategic Goals and Objectives

At the governmental level (e.g., chief, dictator), strategic goals and objectives describe the desired future situation from many facets. Strategic goals might be to raise the standard of living of the population, to increase the treasury by 50 percent in five years, to extend trade and commerce, to promote democracy abroad…these support and describe in greater detail the highest level policies. Some strategic goals and objectives clearly require developing military goals, objectives, and plans; few strategic goals and objectives are simply military.

Relating Goals to Means

As any political entity enters the process of determining the strategic political, economic, population, and military goals, affordability and capability must be considered. Goals must be achievable to be realistic—witness the series of Soviet Five Year Plans that set unreasonably high goals but yielded practical lower expectations. The iteration of goal setting and analyses of supporting resources should be a continuing, usually periodic process. Changes in political leadership, numbers of military-age population, economic means, reserves of food and other sustaining materiel, public willingness to go to war, readiness of military forces, alliances, and external factors require a review of strategic goals and objectives, followed by re-planning to accommodate the "new truths" of the situation.

Kinds of Strategic Plans

This complex intertwining of political goals-strategic goals and objectives-military planning can be seen as a national security "three ring circus."

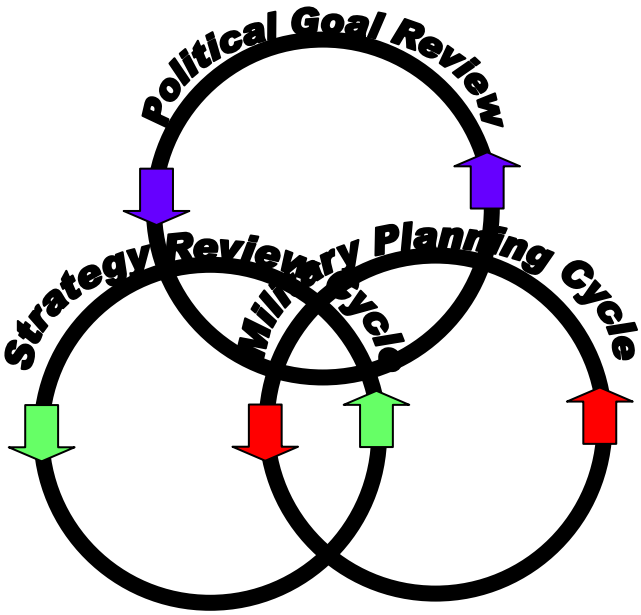

Figure 10. Strategy and Planning Cycles

These interrelated planning cycles might have the same periodicity—annually, driven by when crops are harvested (resources and reserves defined), by religious events (summer solstice), or by the seasons (after planting crops, spring is a good time to go to war) or some other time frame, driven by artificial schedules (fiscal year, elections). The point is that, as the economic, military, political, and other inputs to the political goals review cycle are considered, integrated, and change the goals, the revised goals must intersect with and cause the review of strategic goals. Similarly, the revised strategic goals must have some time for development and review, but then must intersect with and drive the planning cycle. Note that the "rotating" cycles have two intersections: once when they provide information to the other two cycles and next when the other two cycles cause a review in that level. This simplified diagram omits the economic, cultural, religious, and other cycles or "line inputs" that cause political goals to change.

Each of the three visible cycles plus the unseen elements of power generate plans—some richly fulsome, some simple, some incomplete. There could be population control plans (e.g., as in China), economic plans (e.g., Soviet Five Year Plans, Alan Greenspan's view of the future), political plans (e.g., election campaigns, Medicare), and others that, in the aggregate, seek to serve the ever-changing political goals.

Modern societies resort to bulky, formal, written plans—earlier societies relied on mutual understanding of each individual's role toward the greater good of the band, clan, tribe, or state. Increasing complexities (e.g., strong or shaky alliances, multinational mega-business, state-sponsored terrorism, shifting external political and military alignments) add additional dimensions to the setting, review, and revision of political goals, triggering review and revision of strategic and military goals and objectives that themselves cause review and revision of military war plans.

FUNDAMENTALS OF PLANNING

Planning can be conceptual, verbal or written, lengthy, or *ad hoc*. The elements and processes are similar and can be as simple or complex as time and scope allow. The earliest military planning was probably [remember, it was in pre-history, so we don't have a historian's written biases available to cloud our judgments] on the order of:

- What does the clan need that we don't have? (strategic level)
- How do we get it?
- If by force, who and with what weapons?
- OK, Og—you take these three guys and attack their cave. I'll take these two and steal their food and any women that we can capture.

Planning became more complex (and organized) as clans joined to create tribes and tribes combined to create more "civilized" political entities.

The Planning Process

There are several types of plans, but they might be categorized into those that can and should be prepared long prior to the need to implement them—deliberate plans, and those that must be prepared to respond to an emergency—hasty plans. Obviously, the deliberate planning process permits more extensive considerations and thought, while hasty planning may leap from the mind of a commander. But both should follow a disciplined and logical process.

Deliberate planning needs to consider the strategic objectives established by leaders translated into purely military terms, available military resources (e.g., condition of forces, equipment, location), opposition, environment, risks, and costs. This includes these general processes:

- Concept Development
    1. Mission analysis—What are we supposed to do?
    2. Planning guidance—How do our leaders want it done?
    3. Estimates and options—How do we think that it might work? How does the warlord think it might work?
    4. Concept—Here's how it should probably be done.

- Detailed Plan Development
    1. Mission and tasks—This is what should be accomplished
    2. Forces—Whom do we use?
    3. Support—Who helps?
    4. Movement—How do we get them there?
    5. Review—Did we miss anything?

Hasty planning should follow the same sequence, although parallel planning may be required to develop a workable military plan in the limited time available to respond to political direction and derived military strategy.

Elements of a Plan

The following structured approach accommodates critical planning elements; however, the administrative "format" of formal planning could differ greatly in different cultures. Ancient cultures undoubtedly thought about and discussed the elements necessary to implement a strategy that accomplishes political objectives through military means, but verbal statements were sufficient to develop and implement a military plan—even at the highest level. Since writing didn't exist for many centuries of war and was used initially for economic purposes, it is certain that archeologists would expect that the earliest written war plans might be in Greek…or maybe Latin…or Chinese. The fundamental elements are discussed below.

Situation. Those who prepare military plans need to understand the context and underlying rationale that military forces will face. More importantly, those who will execute the military plan in military operations in war must understand the general picture. Why are we doing this? What external influences (e.g., weather, terrain) could affect military operations? What opposition do we face? What shape are our military forces in?

Mission. Any useful military plan should provide a clear, concise statement of what is to be done—the mission. At the "war-level," the mission may be broad, but as specific as possible. Two examples:

> "The Pacific Fleet, including four carrier groups, will…have as its continuing task the destruction of enemy naval and air forces which threaten interference with the [combined] operation. Fast carrier task forces will effect…strikes on the Empire, Okinawa, Formosa, and northern Luzon…"
>
> Philippine Campaign in World War II: CANF SWPA #16-44, Nov 18, 1944

> "Enter the continent of Europe and defeat the Axis Powers…"
>
> Operation Overlord

The mission may include the task, sub-tasks, the overall purpose, the desired outcome—but it should provide the overall war or campaign leader with a full statement of what he and his military forces are to accomplish.

Execution or Operations. This is the "how to" portion of a plan. It includes the overall course of action to be taken, with specific tasks for each major military unit involved. Formal deliberate

plans will include the concept of the operation, detailed instructions and task orders for conducting operations, coordination required, support operations, and refer to supporting plans.

Support. This portion of a plan describes the (usually) non-violent arrangements that will enable combat leaders to carry out their assigned missions and tasks. High-level plans may simply refer to myriad support plans, with short summaries attached to the main war plan.

Communications. Command and control of military operations in war rely on secure, reliable, and accurate transmission and receipt of information—orders and queries to subordinates, status and requests upward, and coordination laterally. This is frequently delegated to the "support" planning; however, most large military operations recognize the essentiality of information critical to the accomplishment of the overall war mission. Early verbal communications evolved to written and electronic media as technology enabled faster sending of increasingly large volumes of information in more modern warfare involving enormous forces.

Uses of Planning and Plans

Planning provides a rational, structured way of getting ready for war. But war is chaotic and unstructured, leading to the oft-repeated axiom:

"No military plan survives the first shot fired." Anonymous

However, plans do provide the basis for requesting resources (to support the plan, military strategy, and political goals), for acquiring and training military forces (to meet and defeat the identified threat), for forming political and military alliances, and for reinforcing diplomatic and other plans in a cooperative and coordinated effort to fulfill political goals and objectives. Plans require military (and other) forces to prepare for war and, in so doing, permit the application of trained, ready, deployable, sustainable, and dedicated military forces to meet other, unforeseen threats or situations. Planning also forces political and military leaders to understand and master the disciplined, logical processes of preparing for armed military responses to non-traditional situations (e.g., non-combatant evacuation, disaster relief). And sometimes plans are actually executed! Particularly in the midst of war, sequential campaign plans provide political and military leaders with opportunities to set missions, provide forces, and prepare for combat operations against a hostile armed force—converting combat potential to combat power.

Improvisation and Adaptation

Military forces often face unforeseen threats—those outside of the expected enemy situation sub-paragraph of the operations plan. Some cultures encourage innovation, imagination, initiative, and courage in the face of danger—those commanders, war leaders, and military forces built in such an environment most often succeed in improvising, adapting plans, and effectively responding to those threats. Sometimes called "hasty planning," this is really a form of trained response to the unknown threat.

"***If men make war in slavish obedience to rules, they will fail.***"
General Ulysses S Grant

SUMMARY

National goals and political objectives beget national policies—broad statements of political and military intent. When vital national interests—those that are imbedded in a nation's goals and objectives—are threatened, national security policies define the political ends that must be achieved by an effective military strategy in concert with the application and coordination of military means with economic, political, diplomatic, psychological, religious, and cultural elements of societal potential and power. Policy begets strategy—coordinated, integrated, policy-supporting strategies in each area of the application of power. And strategy has military content—military strategy that translates strategic goals and objectives into military terms that cause military plans to be prepared—either at leisure (deliberate planning) or on-the-spot (hasty planning).

The correlation of consistent political and military strategy, leading to military planning allows for a meaningful and rationalized capability to wage war, the subject of the next several chapters.

Chapter 6. Initiation—Thresholds

Elsewhere in this book we describe the ***reasons why*** nations go to war. This section deals with the mechanics—***the hows***—of wars beginnings.

SEQUENTIAL STEPS

Wars have often begun with deliberate announcements (declarations) of war, often under conditions of ultimatums or demands by one nation of another. This may be called the "traditional" initiation of war.

SURPRISE

Wars have also been initiated under a condition called strategic surprise. In the late 1930s, an otherwise discredited book titled *When War Comes*, Ernest Dupuy and George Fielding Eliot, two combat veterans of The Great War, comment on the undeclared war initiated by Imperial Japan against Russia in the early part of the 20th century. The comment, paraphrased, was that the world will come to regret not taking issue with Japan over the inappropriate opening of the war without a formal declaration to the Russian leadership and people. [Note that the morality of war, discussed elsewhere in the present book, requires proper notification of the intent to go to war be made by an authorized authority if a war is to be considered a moral event.]

The event that brought the US into World War II, the attack on Pearl Harbor and the Philippines on 7 December 1941 was seen as a surprise attack without the formal declaration of war preceding it. Closer examination provides an explanation; the long-winded and highly classified message from the Japanese government to the US government announcing a state of war between the two took an unprecedented amount of time to decode at the Japanese Embassy in Washington, DC, thus delaying its delivery to the US Secretary of State. Of course, one can also note that announcing a declaration of war immediately before (literally an hour or so) the first military attack takes place, particularly an attack that was months in preparation and weeks at sea to get into position for launching the attack, is a very narrow conformation to the legality of war declaration.

MISUNDERSTANDING

In other cases, wars have started as a result of mistakes or misunderstandings. The opening stages of The Great War (World War I) are representative of war's initiation by misjudgment and mistake. Given the ultimatum from Imperial Austro-Hungary to Serbia (almost impossible to accept) and the complex mobilization plans of the European nations involved in a variety of interlocking agreements, the war's initiation was almost pre-ordained. The attempts to take advantage of the widespread development of national military drafts (involving most able-bodied males), large numbers of trained reserves resulting, the use of railroads for transport of military units, and prepositioning of military unit equipment all combined to make mobilizations

efficient but complex and so rigidly structured to be essentially automated processes—apparently unstoppable once begun.

The mobilizations were probably stoppable, but the various leaders believed that interruptions of the processes would lead to chaos and an inability to re-start for an extended period of time, thus leading to perceived dangerous vulnerabilities. The whole sequence was also colored by the intense emotions resulting from the triggering event, the assassination of the Grand Duke Ferdinand and his wife apparently by Serbian revolutionaries.

PREEMPTION

Preemptive attack comes about when a state that desires peace believes the enemy is going to attack and believes that it probably cannot survive and win after a first strike by the enemy. Debates over preemption were particularly acute when the US and Soviet Union were fearful that they could not ride out a surprise nuclear attack by intercontinental ballistic missiles. In time both states deployed submarines with nuclear ICBMs and IRBMs that relied on concealment to survive any surprise attack and assured great damage on the enemy if he conducted a surprise attack. The result was a stable situation that took away the option of a decisive first strike. In modern conventional warfare, however, a first air and land strike can be crippling and the temptation to attack without prior declaration—in fact with the intention of covert preparations and surprise—has become commonplace, and can be destabilizing. Hitler's attack on the Soviet Union in 1942 achieved enormous surprise and came close to being decisive. The Arab-Israeli Wars are very instructive in the study of the pros and cons of preemption. Navies in modern times have also been much concerned with surprise attacks. These can impose grievous casualties but in most cases will not decide a war's outcome.

PREVENTION.

Preventive wars begin in much the same way as preemptive wars. The differences are in context, not substance. Prevention (sometimes referred to as ***anticipatory self-defense***) foresees a potential future attack by an opponent and takes offensive action well in advance of the presumed threat to ensure that the likelihood of that future attack is seriously diminished or eliminated. Especially when the opponent's preparations for war appear to include possible catastrophic capabilities (e.g., development of nuclear weapons or delivery systems capable of attacking by a nation or group with few restraints).

In earlier times, more formal communications were used to announce intentions to go to war, orchestrated between belligerents. Envoys were often dispatched to present ultimatums or demands of one sort or another to the potential opponent. Because of existing forms of transport, at best horseback or horse-drawn vehicles, and the distances involved, considerable time elapsed between steps in the process. A potential aggressor would await the return of the envoys before acting. Often, protracted interchanges might occur before the final announcement of the existence of a state of war. From the late 19th century on, increased speed of transport and the introduction of instantaneous electric and electronic communications have cut down the time lapses. At the same time, less and less conformation to the formality of ultimatums, demands, and declarations of war has become the norm. A cursory assessment of wars of the 20th and now the 21st century shows that wars break out often without warning by an aggressor nation to a

victim nation. The roles the United Nations plays in conflict and attempts at conflict resolution do lend a modicum of formality by requiring nations to comply with UN directives or face consequences. As seen in the run-ups to the first Gulf War (Operations Desert Shield and Desert Storm, as designated by the US) and the second Gulf War (Operation Iraqi Freedom), there was considerable communication back and forth prior to the release of combat forces against Iraq.

On the other hand, many of the internecine wars within African and Far and Middle Eastern nations seem to erupt with little or no advanced communications between resulting belligerent groups (examples include Darfur, Somalia, Korea, and Vietnam). Sometimes, wars of this type occur as a result of misinterpretations of the positions of other, over-watching nations. An example of misinterpretations possible influencing a decision to go to war is the Iraq invasion of Kuwait on the assumption that the US, specifically, would not interfere as a result of a misunderstood conversation between Saddam Hussein and a US diplomat. Another is the case of a statement from a US Secretary of State as to the importance of Korea in the grand scheme of things post-World War II; North Korean leadership apparently misinterpreted that position in the summer of 1950.

Associated "triggers" for go-to-war decisions are treaties and pacts among nations. An agreement by the United Kingdom to defend Poland from aggression in the late 1930s formally required England to declare war on Germany on that country's attack on Poland. The obligation of France to Poland resulted in a similar response. A similar explanation covers Germany's declaration of war against the US in December 1941, following the US declaration of war against Japan, requested by the US president and voted out of the Congress on 8 December.

This brief summation of the ways wars begin is intended only to be suggestive, not exhaustive. Wars can begin with deliberate declarations, including pre-conflict negotiations, without notice (strategic surprise), by mistake and miscalculation, or as a result of an agreement or pact between nations.

Chapter 7. Warfare

This chapter describes military operations.[43] Since each operation during a war is unique in a time-space-context, there are many ways to organize topics for discussion. The first is to organize military operations according to the medium in which they occur: ground, sea, air, or space. The second way is to define and discuss separately several forms of military operations that are different enough from the norm to be awarded the title of "special operations." The third way is to address military operations that are in some way integrated—by overlap in the medium of performance, combining special forms of operations, or involving the services of several different polities.

WARFARE HASN"T CHANGED - IT'S WORLD WAR IV

First, it must be emphasized that warfare (military operations) has evolved throughout history in technological and social sensitivity terms. Weapons lethality has increased to the extent that casualty avoidance, concerns for collateral damage, and conflict avoidance now seek to mitigate that lethality—war is too horrible to conduct in a brutally effective sense. More importantly, warfare has remained the same in the operational sense.

Notwithstanding the headlines trumpeting the "new way" of war, irregular war, non-state war, asymmetric war, use of terror (and counter-terror) in combat operations have strong historical precedence. From earliest recorded history of wars, opponents have taken advantage of enemy weaknesses, conducted innovative and stealthy operations, and used their own strengths in "unbalanced" ways in the search for victory. And wars of the past have at times been more brutally lethal that recent wars have been.

There is a natural urge to label unrecognized situations with new terms, even though the situation is not really new. Recent events have attracted descriptions of War on Terror, Global War on Terror, 4th Generation Warfare, and the Long War, exploiting the unfamiliarities of asymmetry, irregular forces, innovative tactics, and crude weapons (e.g., improvised explosive devices, explosively formed projectiles) which are not revolutionary.

More correctly, the commonalities of the current war with past wars clearly show that the United States and its allies (and enemies) are engaged in World War IV[44]. WW IV is an ideological, religious war waged by zealots against established groups; the political nature, strategy, and objectives are consistent with any rational definition of war. Is it like every other war? Only in terms of the causes, strategic coordination, violence, and goals. To repeat a theme,

[43] The term "military operations" is often used to mean land operations, but in this book it is used only as a generic term for all forms of combat and non-combat operations involving armed forces.

[44] World War I was the "Great War"; World War II was the major mid-20th Century global conflict; and World War III was commonly called the "Cold War." World War IV is the name adopted for the US campaign in Iraq, the NATO campaign in Afghanistan, and the several campaigns involving other nations and Islamic extremists around the world.

all wars are alike in the same ways and each war is unique in individual ways. Fundamentally, warfare hasn't changed.

OPERATIONS OTHER THAN WAR

Operations Other Than War is a widely used phrase covering the actions of military forces other than training and fighting wars. Other phrases generally referring to the same phenomena are military operations other than war, stability operations, peace support operations (including peacekeeping, peacemaking, and intervention), humanitarian assistance, disaster relief, and non-combatant evacuation operations. The last three types of activity are more specific and are less often applied as generic designations.

Throughout the world, military forces have been and are being used in a variety of roles other than waging lethal warfare. Some nations regularly use military units to maintain domestic peace and stability; others use military elements as immigration and customs officials. The underlying principle associated with operations other than war is that employment of lethal weapons is not expected, although there may be casual or incidental use of lethal force during an operation other than war.

Past and recent experiences have indicated the importance of considering the role of military forces particularly in operations following war, in the geographic area of military operations. Sometimes known as rehabilitation or reconstruction, such operations also include post-war occupation. On the one hand, occupation forces are used to maintain order and insure compliance with the agreements for ending lethal conflicts. On the other hand, given the wartime destruction of facilities and services necessary for the lives and well-being of the citizens of the damaged nation, assistance in re-building and rehabilitation is often provided most expeditiously by military forces, from both sides of the belligerency (victor and defeated). The post-war action is also known as nation-building, a particularly apt phrase in the case of war resulting in a regime change; a pertinent modern example is the post-war situation following the second war against Iraq.

In addition, responses to natural disasters (hurricanes, typhoons, tsunamis, floods, volcanic eruptions, and the like) in the form of humanitarian assistance and disaster relief are often best handled by military forces. The efficacy of organization, transportation, and management skills under stressful circumstances are dominant factors in justifying the use of military forces in response to natural disasters.

There are modern examples of how deadly situations can evolve from and during military responses to natural disasters. One of the more graphic examples is the case of the firefight in Mogadishu, Somalia, October 1993 (known as Black Hawk Down), resulting in 18 US soldiers killed and 75 wounded. The event is considered the bloodiest battle of any UN peacekeeping operation. The initial assignment of the military forces sent to Somalia was to engage in and protect the provision of foodstuffs to a starving populace.

CHEMICAL AND BIOLOGICAL WARFARE

Chemical Warfare and Biological Weapons have important similarities and differences and should be discussed and treated differently. They also are not weapons of mass destruction, although modern usage by many defense establishments throughout the world includes CW and BW under that amorphous, not-well-defined category. CW and BW might more usefully be considered as weapons of mass casualties (in reality, weapons of **potential** mass casualties) but the likelihood of that designation coming into widespread usage is slim. It also may be truer to see CW and BW not as major casualty producers but rather as suppression weapons or weapons of annoying but not necessarily significant impediments to military operations.

Chemical and biological weapons used against non-combatant or civilian targets may be another matter. There are logistical difficulties and constraints against massive employment of CW and BW against civilian targets that suggest, again, minor effects on a nation at war, albeit potentially highly emotional, administrative and political impacts.

Generally, chemical weapons include lethal and incapacitating gases (sometimes called war gases), flame weapons (including napalm bombs and flame throwers), white phosphorus artillery rounds, and screening smoke (delivered by artillery and generators). A good dictionary definition is: warfare using chemicals other than explosives, especially irritants, asphyxiants, contaminants, poisons, and incendiaries, as direct weapons.

Biological warfare includes bacteria and toxins; a dictionary tells us that it is warfare in which disease-producing organisms or organic biocides are used to destroy livestock, crops, or human life. Biocides are substances that are capable of destroying living organisms. The requirement for destruction of life by a biological weapon is too restrictive; many candidates for biological weapons do not kill but rather introduce severe illness, resulting in exposed people becoming ineffective. Such affected people are designated, in military parlance, as casualties, casualties including both those who die and those who are incapacitated or are ineffective in carrying out military duties or other functions.

The idea of chemical and biological weapons and offensive systems is ubiquitous; consideration of the use of such weapons and concerns for defense against such weapons pervade most armies of the world. In addition, there is widespread concern and fear about the possible use of chemical and biological weapons among civilian populations throughout the world. The actual employment of chemical weapons is rare in the history of warfare; that of biological weapons is even rarer.

There is historical evidence of the use of flame weapons in antiquity (Greek Fire) as well as the alleged use of decaying corpses flung over fortress walls, during sieges, in the hope that some diseases would be spread among the besieged. There is also the alleged distribution of smallpox infested blankets and clothing to American Indians during the early days of the Indian Wars (late 18th and early 19th centuries). It is perhaps more likely that smallpox was spread to the biologically unprepared Indians by direct contact with whites who had contracted smallpox earlier and still carried the ‘pox, much as syphilis was introduced to the natives of the western hemisphere.

In modern times, there were a number of instances of employment of chemical weapons, most significantly during The Great War, known as the First World War. Between The Great War and World War II, there was use of chemical weapons particularly by the Italians during the war with Ethiopia. It has been alleged that the Japanese Army used chemical (and possibly biological) agents in the war with China. There was no apparent use of toxic chemicals during World War II but there was extensive use of smoke and flame weapons in the European and Pacific wars, particularly by US forces. Since World War II the only validated use of toxic chemicals was during the Iran-Iraq war and, after the First Gulf War, by the Iraq Army against rebelling Kurdish and other elements.

A minor application of chemical weapons was the use of riot-control agents (tear gas) against Korean prisoners-of-war under control of US Army units at the end of the Korean War. The use of defoliants by the US during the Vietnam War fits within the dictionary definition of chemical weapons, even though the intent was not to directly harm humans or animals. The destruction of natural coverage to reveal logistics trails was the intent. Unintended consequences include subsequent damage to humans, military and civilian, as a result of exposure to the chemical defoliants (Agent Orange, to use the popular name).

Also during the Vietnam War there was the unconfirmed challenge of the appearance of a substance called Yellow Rain, which was seen by some as a chemical or biological agent. As yet not fully confirmed, a situation referred to as the Gulf War Syndrome may be related to the complex use of sera, as prophylaxis against the possible use of biological weapons by the Iraq army, and environmental hazards to which the US and coalition forces may have been exposed. There is also the possibility that the environmental exposures and other related events, including command emphasis on the possible use of chemical or biological weapons by the Iraq forces, may have damaging psychological effects on US troops.

There are no confirmed instances of the employment of biological weapons during the 20th century. During the Korean War, about 1953, the government of the People's Republic of China charged the US with the use of bacteriological weapons. The weapon claimed to have been used was a World War II-era leaflet bomb, a light-cased munition designed to distribute propaganda sheets from the air. The US denial of the charge was supportable by the characteristics of the bomb (plausible deniability). However, the leaflet bomb was used in 1951, as an experimental device (prototype) during trials at Dugway Proving Ground, Utah, the US Army's primary location for open air chemical and biological tests. Two possible explanations can be put forth: the US in fact did attempt the covert use of a biological weapon during the Korean War or a spy in the service of China penetrated the US Army's testing site.

There are four roles toxic chemicals can play in warfare:

- produce casualties (both incapacitation and death),
- act as a barrier (deny an area to an enemy force),
- contaminate matériel (similar to the barrier use), and
- channel (also similar to the barrier use).

The role as matériel contaminator includes contaminating entire facilities such as airfields, industrial plants, and military encampments. To produce casualties, chemical agents

can be used in a surprise mode to catch people unprepared and before protection can be achieved, thus attacking through the respiratory tract.

Chemical agents can also be used to attack through or on the skin, requiring full body protection to negate such agents. The most potentially effective agents attacking through the skin are nerve agents, which kill or incapacitate as a result of hyperactivity of the nerves (by interrupting the normal dampening of nerve impulses). Agents attacking on the skin are generally vesicants or blister gases causing considerable blistering of the skin, especially in the moist unprotected parts of the body, resulting in incapacitation for some number of days.

To act as a barrier, chemical agents must have the property to remain effective on the ground for extended periods of time from hours to days; the agents must be able to contaminate or attack personnel when stirred up by the passage of vehicles or foot soldiers. The agents considered most useful in this role were the vesicants but certain nerve gases now may have sufficient persistency as to be used in a barrier role. The same gases or agents would be used to contaminate matériel and force channeling.

Generally, it is relatively easy to protect against the direct use of toxic chemical agents on troops. The gas masks (respirators) available to most armies of the world are adequate protection against airborne nerve agents and other gases intended to attack through the respiratory tract. Protective clothing is also readily available to reduce the effectiveness of agents attempting to attack through or on the skin. The principal consequence of the use of protective masks and clothing is that pace of military operations is decreased; accuracy of use of aiming devices and optical systems may also be negatively affected.

The operational effect of combat degradation is not well defined; it may be minor or it may be severe enough to outweigh the use of protection and require a military unit to bear the burden of chemical or biological casualties and maintain the efficacy of the military operation. The matter of protecting civilian populaces against chemical agents is more problematic. There is evidence that attempts to protect entire national populations may result in more casualties from incorrect use of respiratory protection than might occur from an attack with chemical weapons.

The residual effects from the heavy hand of anti-chemical warfare propaganda during the Great War and the emphasis of ensuing international arms control conferences have elevated the anxiety of military forces and civilian communities respecting chemical and biological weapons to a very, and perhaps unnecessarily, high level. Inclusion of chemical and biological weapons in the class of weapons of mass destruction has heightened that anxiety and concern. Holding chemical weapons, particularly, and biological weapons perhaps to a lesser degree, to such high regard is probably misleading. That is to say, chemical weapons are not any more fearful than fragmenting weapons and direct fire projectiles, even though present policy and doctrinal directives imply high concern.

At one level, chemical weapons are less dangerous overall than the so-called conventional weapons on the battlefield. Since, under ordinary circumstances of good training and adequate individual protection (i.e., respiratory protectors and, as needed, protective garments to defend against cutaneously penetrating agents), military personnel exposed to

chemical agents on the battlefield will receive, at most, mildly impacting doses of agents. For example, minor respiratory discomfort and miosis will probably be the general impact of soldiers who may delay gaining protection or who may be exposed to residual amounts of agent re-vaporizing from clothing after passing through contaminated areas. In any event, less than lethal doses will be soon detoxified without therapy and will leave the casualties, if disabled sufficiently to be designated casualties, with no residual damage.

A similar comment cannot be made about a wound from a bursting weapon or penetration by a direct fire projectile. In our opinion, it is time to recognize that chemicals in warfare are no more to be feared than any other weapon used on the battlefield. Committing to combat means committing to a high level of risk of death or serious incapacitation. Chemical weapons can then be seen as one of the many hazards of the battlefield and decisions (risks) about exposures, traversing contaminated areas, etc should be made in the same way that decisions are generally made on the battlefield: consideration of the importance of the mission measured against the best estimate of potential casualties.

The potential for biological weapons is somewhat different in that biological agents rarely induce immediate casualties. Pathogenic agents considered as potentially effective warfare weapons cause their casualties hours and days following exposure (incubation periods). Thus, the use of biological agents on the battlefield would be limited to operational and strategic levels of effects; potentially introducing casualties in conjunction with a long-term planned assault or by reducing the effectiveness of rear area operations such as logistics, supply, and maintenance functions. By the same token, such potential targets can be effectively alerted by detection systems, many of which are already in operation.

Technical improvements in the near future will probably be able to provide almost instantaneous alarm of an attack and also provide identification of the biological agents employed. Some protection will be provided by sera previously injected into military personnel. At most, one might expect some level of casualties to result. Most biological agents considered for warfare result in a predominant fraction of exposed personnel being casualties who will recover, some without benefit of therapy, others following traditional therapeutic measures. Some highly pathogenic agents will cause death but again in probably small numbers, given prophylactic and therapeutic procedures available to military forces.

The use of biological agents against civilian targets, as noted earlier as possibly difficult to carry out for truly mass effects, may be somewhat more effective than CW in producing casualties. Again, except for a proportionately small number of deaths that will occur from most candidate biological agents (particularly among the elderly and infant members of the population), most exposed persons will survive.

Chemical and biological weapons on the battlefield are similar to traditional weapons, no more dangerous (and perhaps less damaging) than bursting and direct fire weapons.

DESCRIPTION OF WARFARE

The first four sections in this chapter cover respectively the four major media in which operations occur. War undoubtedly began on land, and military operations on the surface of the

land were the norm until humans embarked on the rivers, lakes, seas, and oceans. Initially, sea operations were conducted to transport and deploy ground forces or to provide resupply.[45] Then, sea or naval operations became military operations conducted by soldiers aboard ships. Gradually, the differences between operations on land and operations on water grew, and a distinct form of warfare on the water developed. Thereafter, for many centuries, there were the two distinct major forms of warfare. Sometimes the land forces and the naval forces worked together; sometimes they did not. In the 19th Century, the possibility of human flight in aerial machines led to early attempts to utilize the atmosphere as an adjunct and then a medium of military operations. In the 20th Century, the advance of aviation technology brought about the emergence of the third major medium of military operations—air operations. In last half of the 20th Century, it became possible first to envision military operations in space well above the surface of the earth and beyond the atmosphere, and then to engage in such operations.[46]

In addition to military operations characterized by the medium in which they occur, there are several forms of special military operations characterized by the *manner* in which they are conducted—meaning that they are not conducted in accordance with the traditional methods used and preferred by mainstream military and political leaders. In some ways, special operations mimic earlier tactics and techniques of combat operations.

Most war-makers recognized the need to coordinate military operations of diverse types, to better take advantage of the contributions of each type of forces as part of an overall war effort. In the 20th Century, westerners adhered to "joint operations" as the term for integrating land-sea-air combat forces and "combined operations" as the term for coalition warfare. Some nations have reorganized as joint forces (e.g., Canada) to eliminate service parochialism and competition for resources and recognition during wars.

There are also some forms of military operations characterized by the unusual nature of the lethal agent used to wage war. The definition of "unusual" changes as some weapons and munitions formerly considered illegal or barbarous became part of the mainstream of war as accepted conventional munitions. For example, the cross-bow was for many years considered an illegal and barbarous weapon, and for this reason it was not used widely against "civilized" opponents.

Currently, the "unusual" munitions include nuclear weapons, electromagnetic pulse, radiation, chemical agents, biological agents, and electronic warfare. Some of these have a record of centuries of use. Others are newly invented. However, each of the unusual munitions listed above has become important in recent years because of advances in technology making them more lethal than before. Each of them is different, and each deserves separate consideration.

MILITARY OPERATIONS ON LAND

The term "military operations on land" as used in this document is defined as operations on or over land in which the aim is to affect the military situation on the ground. It includes the

[45] Alexander the Great used ships to bring supplies and replacement troops along the eastern littoral of the Mediterranean and later in the Persian Gulf; in turn, his ground forces brought the ships' crews fresh water.
[46] In this book, operations in the air and operations in space will be treated respectively as air and space operations.

use of land, air, naval, and space forces insofar as they *directly* support land operations and the objectives of land operations. Military operations include all levels in the spectrum of military conflict from war strategy and campaigns down to engagements.

Basis—Concise Theory of Combat

Virtually all aspects of combat as described in *The Concise Theory of Combat* apply to military operations on land, but with shifts of emphasis. For example, the *functions* of combat apply to military operations but the importance of pre-combat support is more crucial in the broader realm of military operations. Likewise the *primary processes* of combat remain valid, but the emphasis shifts more toward the internal processes, especially the process of sustainment. The dynamics of combat also remain valid, but here again is a change in emphasis: combat *potential* assumes a higher importance in military operations relative to combat *power*.

History

Archeological excavations of prehistoric sites show a high prevalence for warfare against neighboring tribes, perhaps even more prevalent than aggressive societies in historical times. Anthropological research provides evidence of habitations on hills protected by ditches and palisades, and an extensive menu of tactics, including raids, ambushes, blocking, surprise attacks, deception, infiltration, and frontal and flank attacks. Primary warring objectives of primitive societies were economic (hunting and fishing grounds, water holes, and the like) and revenge for homicides. Weapons included the equivalent of current-day stand-off fire support means (javelins, bows and arrows, blow-guns, slings with stones, boomerangs, etc.) and close-combat with sword, dagger, club, axe, and lance. Shields and body armor were common.

4. Military Operations in Early Civilizations. The earliest steps toward structured military operations can be traced to legendary accounts of tribal battle formations in China about 6,000 to 7,000 years ago. About the same time, civilizations in the fertile valleys of the Middle East and the Nile began to develop armies and fighting doctrine. One of the earliest was the Sumer civilization, which developed the phalanx, chariots, and siege tactics. Succeeding cultures, particularly the militaristic Assyrians, improved weapons, tactical formations, and siege weaponry.

Much later, the Greeks and Persians were each developing tactics along differing lines. The Greeks initially operated in a tight, multi-rank phalanx of hoplites armed with a 21-foot pike, a sword, and a round shield. In this early period, combat was a straightforward contest of brute force with the phalanx moving forward or backward, until the Spartans developed an articulated phalanx that could shift to execute a flank attack. Later Epaminondas of Thebes combined an oblique advance with a flanking movement. Meanwhile, in the Middle East, elaborate siege warfare and extensive use of cavalry (as yet without stirrups) and chariots in combination with archers and javelin throwers became the practice. The two doctrines were tested in the decisive Battle of Marathon in 490 BCE, an overwhelming victory for the Greeks against greater Persian strength. Marathon was a classic case of encirclement from the flanks.

Greek military operations thereafter remained static until Philip II of Macedonia and Alexander mixed the good features of the Persians and Greeks to perfect a major advance in operational art, what can be called the first combined arms doctrine. Philip combined flexible phalanxes of light and heavy infantry backed by javelin throwers and archers (his artillery) with

heavy, shock-action cavalry (the forerunner of today's armor). Alexander inherited this formidable army and led it to a remarkable series of successful campaigns using a variety of tactics. That this was accomplished over a vast area was due to innovations in logistics introduced by Philip and honed by Alexander.

Operations of the Roman Army. At a time coincident with Alexander, the city-state of Rome was moving toward a different force structure and tactics that eventually led to an army as dominant as Alexander's. Initially, Rome's forces were arrayed in three successive lines, each six ranks deep. Each line was subdivided into maniples, and these were further divided into centuries. Gaps between the maniples facilitated maneuvering. In each successive line, the maniples were positioned behind the gaps in the forward line, resulting in a checker-board pattern. As the force advanced, maniples or centuries would move forward to fill holes left in the front line, thus presenting an unbroken line to the enemy. Thirty maniples, plus a small contingent of cavalry and support elements comprised a legion of about 4,000 men.
About 100 BCE the maniple organization was abandoned in favor of a legion of ten cohorts, each with six centuries and a small cavalry unit, for a total strength of 5,240. This change was to reduce the span of control of legion commanders and to improve operational flexibility. The legionaries were professionals who remained with their particular legion until they retired as veterans, but early on, Rome also depended on auxiliary forces recruited from subjugated populations. In later years of the empire, auxiliaries became highly skilled and probably outnumbered the legionaries.

Roman legions emphasized the momentum of an aggressive offensive, even when outnumbered, relying primarily on the shock effect of well-disciplined heavy infantry (and occasionally of heavy cavalry). Battle tactics drew on a diversified menu, often departing from norms. The usual line of battle posted heavy infantry legions in the center, auxiliaries on the flanks, cavalry further out, and reserves in the rear. In addition to linear battle formations, Roman legions sometimes deployed in a wedge to split the enemy, and sometimes they advanced in an interlocked square or a dense "tortoise" formation. Battle organization facilitated flexibility of maneuver.

Weaponry relied on the sturdy, short *gladdus* sword, daggers, and javelins, all of these carried by heavy infantrymen in addition to a large convex shield and body armor. The basic tactic was to throw the javelins then rush forward to engage with the sword and dagger. Artillery included one light catapulta per century and one heavy ballista in each cohort.

From the time of Caesar, most of Rome's campaign objectives were to conquer the territory of inferior forces and then to pacify the tribes. As the empire entered its last days, objectives were reduced to defending against invaders and holding on to territory.

While the western elements of the Roman Empire were being fractionated by Goths, Vandals, and others, the eastern part of the empire, Byzantium, was successfully following a strategy of persistent defense using a chain of fortifications in depth. The fortifications protected inhabitants, harassed invaders, and triggered a counter response by armored horse archers and lancers. These combined mobility with shock action. The heavy cavalry was supplemented by light infantry in equal numbers armed primarily with bows and over-sized quivers of forty

arrows. Tactics emphasized strong blows and double envelopment. What made this force so effective was one of the most significant advances in the history of warfare: the introduction of the stirrup (which had been used for centuries by tribesman in central Asia). Among the four weapon system categories—heavy and light infantry, heavy and light cavalry—the advent of the stirrup led to dominance by heavy cavalry, a role it held until the introduction of effective firearms.

Hardy Arab forces of Islam, initially frustrated in attacking the Byzantine Empire, turned west. Using surprise, maneuver, ambush, and harassment, they at first simply wore down opponents, but over time they learned from their enemies to engage in large battles and sieges. The Arabs were masters at operations with minimal dependence on logistic support.

Later, in the 13th century, Genghis Khan and his nomadic Mongol tribesman subjugated China, then turned westward and conquered other kingdoms before defeating the Persian Empire. The conquest of Persia—to avenge an insult—was punitive in the extreme, as were later attacks into what are now Pakistan, Afghanistan, the city of Samarkand, and others. Sons and grandsons of Genghis subjugated the territory of Russia, Poland, the Ukraine, and Hungary. The Mongol strategic weapon was unmitigated terror and its tactical weapon was the skilled, leather-armored horseman armed with composite bow, hooked lance, saber, dagger, and round horse-hide shield. Skill in horsemanship and accuracy of its archers were enough to best knights in metal armor. The Mongol force was articulated on the decimal system: units of 10 men, 100, 1,000, and a division of 10,000. On the march the Mongol army was a self-sufficient logistical marvel, in effect an entire city, including women and children.

Farther to the east, the Japanese by the 12th century had developed a hereditary military clan known as "samurai" who followed a military code called "bushido." The primary combat weapon was the bow and arrow, and secondarily, the sword. The latter weapon, crafted to perfection, gained symbolic and honored importance.

After two or three centuries of malaise since the fall of Rome, Western Europe followed the trend begun in the east and converted to heavy cavalry (now equipped with stirrups) as the preeminent element of operations. It was well-armored knights on horseback—the *noblesse deep* (nobility of the sword)—that formed the cutting edge of combat. Along with the knights came a staff structure, supply organization, and, for attack of castles, a siege train. Since earliest recorded history, siege operations have been a staple of warfare, using towers, catapults, battering rams, fire as a weapon, and other devices. But sieges usually took months or years, and starvation of the defenders, rather than breached walls, was often the ultimate way to success.

8. A Turning Point in Military Operations. The year 1453 marked a major turning point in military operations, for in that year the Ottoman Turks carried out the most destructive cannon bombardment up to that time against Constantinople, succeeding where many other sieges had failed. One monster cannon used by the Turks was 26 feet long and fired a ball weighing over 1300 pounds. It was a notable event because the three concentric walls of Constantinople were indeed formidable. Yet the cannons of the Turks were crude; it was sheer brute strength that carried the siege.

Just forty-one years later, this was dramatically changed. In 1494, French King Charles VIII of France invaded Italy with the intention of subsequently launching a crusade against the Ottomans. What made Charles' army awesome were its mobile and highly efficient cannons. Against fortification after fortification, Charles breached defenses in hours that earlier would have taken days or months. It was an early example of what much later was called "blitzkrieg," and it heralded the importance of artillery and a major revolution in military operations.

The Hundred Years War and Its Aftermath. By the end of the15th Century, the Hundred Years War had brought to fruition weapons and tactical concepts that were germinating for some time. New weapon systems—the crossbow, the halberd, and more significantly, the long bow with its high rate of fire and 250 yard lethal range—decimated packed formations and penetrated body armor, thereby overriding the shock action of heavy cavalry. Of even greater and more lasting importance was the development of firearms. Cannonry had made great strides since the first recorded use at Metz in 1324 and King Charles' march through Italy. Small arms likewise were improved, though more slowly. The harquebus was the first major advance, followed by flintlock weapons (notably the musket), including the famous English Brown Bess. The socket bayonet replaced the plug-and-ring one, enabling either firing or stabbing as the situation demanded.

Significant changes in campaigns and battle tactics evolved subsequent to the Hundred Years War. The slaughter at Magdeburg in 1631 and other assaults against civilians, led governments to prefer limited warfare. Three notable generals produced what can be called the beginnings of modern warfare. Gustavus Adolphus, the "Lion of the North," focused on improved small arms and artillery firepower. He improved the rapid action of small-unit linear tactical formations, integrated artillery fire and maneuver (including close support), made drastic organizational changes, and on and on, altering doctrine across the board. Another innovative general, the Duke of Marlborough, instituted his own transformations. For example, he used two-wheeled horse drawn munition carts to speed his troops, and instituted other means to increase mobility. Frederick II (the "Great") honed these advances in weaponry and more significantly in tactics. He developed intricate maneuvers that outpaced his opponents, such as the oblique attack (the same tactic used by Epaminondas at Leucta, but with greater speed).

Elsewhere, other doctrinal changes were put in place. Marching to battle in columns allowed rapid deployment into battle formation and facilitated turning and envelopment tactics. Permanent division-size force structures appeared. As the 18th century was drawing to a close, commanders could envision flexibilities never before available, and at the same time, national infrastructures invited maneuvering on a grand scale.

In North America, military operations through the year 1763 were for the most part reflections of warfare in Europe during that period. There was, however, one innovation of note: the "skulking" manner of combat used by Indians and copied at times by the French and the English, notably by Rogers' Rangers.

The decisive event in the French and Indian War, the capture of Quebec in 1759, had a profound political result, for not only was all of Canada ceded to the British, but, by removing dependence on the mother country to guard the border, the British colonies could entertain

notions that led to the American Revolution. At the beginning of the Revolution, battles were between asymmetrical forces: the disciplined, well equipped British regulars and mercenaries against ill-trained men, who compensated with the ardor of their cause. In weaponry, one improvement foreshadowed later advances in rifles: the use by the colonials of the "Kentucky rifle" (actually originated by Pennsylvanians), whose accuracy tipped a few battle outcomes. Guerilla and "skulking" operations were used at times by the colonials. More significant was the creation among the colonials of a truly "people's army." Not long after, the French Revolution was to result in a similar development.

Military tactics and strategy practiced by Napoleon are said by many to mark a kind of grand departure from earlier times to modern warfare—a revolutionary precursor to the present. A more prevalent view is that Napoleon brilliantly organized and applied changes already begun under Adolphus, Marlborough and Frederick; it was a time of experimenting and analysis. Nonetheless it is probably fair to judge Napoleon as at least revolutionizing the art of *generalship*.

Before Napoleon, a conspicuous turn in warfare was ushered in at the Battle of Almy in 1792 between the French and the Prussians. The event is significant for two reasons. First, it was a battle in which cannon fire had a pronounced effect on the outcome ("the whole battlefield trembled"[47]), cementing the shift begun by Charles VIII in 1494. Secondly, and of greater import, was the *élan* of French troops fighting for their country and their revolution (as had the Americans more than a decade earlier). One year after Almy, the French National Convention decreed a *levee en masse* calling for full involvement in time of war of every element of the citizenry—men and women, children and the elderly. It was a call for total war, and in the words of J.F.C. Fuller, Almy was
its birth-cry.[48]

Napoleon's tactics emphasized advances in columns and extensive use of skirmishers in front of the main force; these changes led to a more dispersed battlefield. Infantry and artillery became more important at the expense of cavalry. Among organizational transformations was the fielding of a self-contained standard division with all the elements essential for conducting operations independently.

Napoleon's genius transformed the fervency for change at that time into his own powerful style of operations: swift decisions, piecemeal attack of foes, rapid force mobility, concentration against the decisive point, exploitation of interior lines, and quick execution and conclusion of campaigns. Early on, he expanded the combined arms concept to the corps level and increased the ratio of artillery to infantry. He improved force articulation at the brigade and battalion levels. With these evolutions in hand, it was his skill as an intuitive improviser in the midst of battle, together with his good sense in campaign maneuvering, that made him a military giant.

The legacy of Napoleon, his peers, and his predecessors was a more dispersed battlefield on which combined arms units from corps on down employed more artillery at the expense of

[47] A description attributed to Goethe by J.F.C. Fuller in Volume 2 of *A Military History of the Western World*, page 365.
[48] *Ibid*, page 348.

cavalry. Turning movements at both the campaign and tactical levels became easier to execute. On a broader scale, war now took the shape of nation-oriented armies conducting campaign maneuvers on a grand dimension for strategic objectives that were not limited. The era of limited, stylized warfare was over.

Except for the American Civil War, the period from Napoleon to the Great War of 1914 was one of quiet in that there were no massive, multi-nation wars. The period was also quiet insofar as there were no major advances in operational art and tactics in land warfare. But there were technological and cultural changes induced by the Industrial Revolution of such import as to set the foundation for the great revolution in military affairs that became evident in the Great War, and which, together with additional technologies, reached apogee during World War II. The foremost changes were (1) the advent of steam rail and ship transportation; (2) telegraph communications (and later, the telephone); and (3) techniques of mass production. It was in the Civil War that these technologies were applied with decisive effects on campaigns and battles, and on the war outcome itself. Yet after this war, conservatism in military circles everywhere capitalized only in modest gradations on these momentous civil changes. The impact of the changes was to be as pivotal to warfare as the introduction of gunpowder, but only feebly did military establishments pursue the opportunity.

In parallel with these advances on the strategic plane, there were consequential technological advances that profoundly impacted tactical operations. Foremost were the copper percussion cap and the cylindrical conoidal bullet, most notably the French "Minié ball." In conjunction with mass production of interchangeable weapon parts, these achievements cascaded into other advances (such as breech-loading rifles), all of which revolutionized infantry and cavalry tactics. As proved time and again in the US Civil War, improvement in infantry firepower rendered a frontal attack against a dug-in position nearly suicidal. Effective range of rifles and artillery extended the depth of the battlefield. Yet still, doctrines changed only slowly.

During the "quiet" period, several small wars cast shadows that foretold modes of combat later experienced on a large scale. The thousand or so engagements in the Indian Wars of the American West were examples of asymmetrical warfare between vastly different cultures. The Battle of Sedan in the Franco-Prussian War of 1871 placed artillery on a coequal footing with maneuver and infantry assault. In the second Boer War, guerilla warfare was broken by a system of blockhouse strong points and area sweeps. The French subjugation of Algeria and of Morocco displayed two diametrically opposed strategies, the one against Algeria employing terror as the weapon, but against Morocco, using a carrot-and-stick approach with a high ratio of force to space. The Philippine War by the United States evolved into a guerilla action that was ended by pacification measures. Finally the Russo-Japanese War in 1904-1905 was so misconstrued by observers on the world stage that the Great War in 1914 began with terribly misinformed doctrines by all parties.

The conclusions drawn from the Russo-Japanese War were that war would be violent and brief by forces in being, with clear advantage going to the side that attacked first. The simple lesson missed by both sides as the Great War commenced was the dominance of firepower in the defense. That lesson should have been clear from the Civil War on, but the military culture of offense *uber alles* blocked new thoughts; *élan* would override bullets. These misguided concepts

ended in one month at the first Battle of the Marne. Offensives bogged down, and thereafter came a stalemated linear front of trench warfare dominated by static machine guns and massed artillery. The shovel became the weapon to best the bullet and the shell.

Much of the initial German failure against France can be laid to modifications by Count von Moltke the Younger in the original Schlieffen plan of a strategic turning movement. Those modifications did, however, facilitate overwhelming victories on the eastern front at Tannenberg and the Masurian Lakes. On the western front, battles became epic slugging matches with high casualties and objectives of only a few miles. Battles at Verdun, the Somme, and Ypres, among others, became storied killing grounds with little to show except great numbers of dead and wounded on both sides. On the beginning day of the first Battle of the Somme, British casualties were more than 57,000, and after four and a half months, both sides had lost 1,265,000 men.
Elsewhere than in France and Flanders, however, warfare was fluid, with maneuver a significant element of campaigns. These actions included combat in Egypt, the Dardanelles and Gallipoli, Mesopotamia and Palestine, the Persian Gulf, Macedonia, western Africa, and the Russian front.

Desperation to overcome stalemate in the west resulted in a number of significant, if embryonic, advances in operations. Foremost was employment of the tank, which combined protection with mobility and firepower. Combat doctrine was rudimentary, but where tanks were used, even in small numbers, the impact was phenomenal. The most notable success came in the early days of the Battle of Amiens in August of 1918, where tanks were employed *en masse* with such devastating effect that German General Ludendorff acclaimed the first day of the battle "The black day of the German Army."[49]

Other weapon improvements included artillery fire based on maps without prior registration, gas and gas masks, flamethrowers, and aircraft used for reconnaissance, aerial photography, fire direction, bombardment, strafing, and air-to-air combat. The breech-loading trench mortar and rifle grenade launchers assumed important roles. Signals intelligence became an essential tool. More importantly than advances in weapons, 65 million men were mustered into uniform, virtually every civilian was mobilized, and industry and infrastructure were harnessed to the war effort. Harking back to the French revolution decree about every person becoming involved, war had become truly total.

Aside from the British and French developments in armor tactics, the Germans, beginning in 1915, evolved a combined arms doctrine of mutually supporting arms called "*stosstrupptaktik*," which emphasized elastic defense and assault. Near the end of the war, this broad concept was tailored to overcome in-depth trench defenses. Sometimes called "Hutier tactics" after the general who first used them, this doctrine called for specially trained units armed with machine guns and vehicle-mounted light artillery, using surprise and rapid movement, to infiltrate past enemy strong points, and then destroy rear elements and communications. The objective was to disrupt enemy coherence and enable a breakthrough by follow-on forces. Using these tactics in their spring offensive of 1918, the Germans came close to breaking the Allied defenses. Thereafter the entire Allied front, with fresh divisions from America, took the offensive. The Germans, exhausted, depleted, and dispirited, retreated and sued for peace.

[49] David G. Chandler, *The Art of Warfare on Land*, page 205

As usual in war, it was the losing side in the Great War that learned most.[50] The lesson that the Germans well understood, and the Russians partially did, was that future military operations would be characterized by rapid movement using forces organized with complete mobility— tanks, artillery, trucks, and aircraft.

The Germans tested that lesson in defeating Poland in 1939, and then achieved what has become popularly known as the "blitzkrieg" against French and British forces on 1940. Yet not all German generals fully believed in the lesson of shock force mobility. The initial plan for the German offensive was a conservative main attack westward against Belgium and Holland and a secondary attack in the Dinant-Sedan sector. The Allied counter plan anticipated this and called for French and British forces to move north and link with the Belgians and Dutch on the Dyle defense line, while relying on the Maginot Line east of Sedan to hold there. But Generals Guderian and Manstein persuaded Hitler to order a radical alteration. The principal effort was shifted south to a heavy concentration of panzer divisions moving through the Ardennes forest, a sector lightly held by the French. The consequences of the German attack and Allied response are well known: the rapid German march to the Channel and entrapment of Allied forces near Dunkirk.

The successful German tactics can be described as (1) concentration of armor-heavy, fully mobile, combined arms armor divisions against a weak sector; (2) use of ground-attack aircraft in lieu of slower moving artillery; (3) rapid crossing of the Meuse (the major obstacle) and continued movement without pause thereafter; and 4) superior communications, both unit-to-unit and ground-to-air. The success cannot be attributed to superior weaponry (the French and British actually had an edge) or to numerical superiority. The causes for so extreme a debacle by the Allies—aside from failing to realize armor could navigate the Ardennes—can be laid to (1) grossly poor intelligence and delayed appreciation of the situation; (2) untimely movement of reserve forces to counter the invasion (during the Great War, the Allies had time to move reserves laterally; not so in 1940); and (3) Allied uncertainty as to whether the German penetration, once achieved, would turn south and east or toward the west. The transformation of combat exemplified by this single campaign was commensurate with the transformation effected by Napoleon over several years.

The Germans immediately applied this concept against the Soviet Union in Operation Barbarossa, but with changes. They decreased the size of Panzer divisions while increasing motorized elements, thus augmenting strategic mobility at the expense of tactical shock force. With this restructuring, they executed a series of double envelopments. Yet these grandiose achievements failed to reach and take Moscow. Winter set in, and the weather, as much as Russian defenses, subdued the Germans.

In 1942, the Germans changed strategic objectives, aiming now for the oil fields between the Caspian and Black seas. Enjoying initial success, these penetrations left their flanks wide open. Moreover, Hitler insisted on continuing the bogged down attack against Stalingrad despite all good sense. The result was the turning point of the war in the east. The clinching act was the Battle of Kursk in July of 1943. It was the largest tank battle of all time, at times a mêlée. Soviet

[50] This observation is attributable to J.F.C. Fuller in Volume 3 of *A Military History of the Western World,* p. 380.

defensive measures prevailed in the battle, and thereafter, initiative belonged to the USSR. Soviet defense in depth had defeated Panzers penetration thrusts and encirclements. The Russians advanced with artillery-heavy penetrations of their own.

Meanwhile, combat of a different sort was being waged in North Africa. Here, the battlefield was one of length, not width, with the Mediterranean on one side and the desert on the other. Early British success changed when General Rommel arrived with his Panzerarmee Afrika. Thereafter back-and-forth campaigns ensued, in which Rommel's tactics offset British advantages of sea support and weaponry. Rommel's doctrine emphasized outflanking; but then, if objectives could not be attained, he resorted to the defense and prepared to counterattack. British doctrine, in contrast, called for the offensive regardless. In the end, Rommel exhausted his force at the decisive British victory in the third Battle of El Alamein.

Success in the Allied invasion over the Normandy beaches can be laid to strategic surprise gained through an elaborate and effective deception and the monumental logistical achievement of creating a harbor. Thereafter, the invasion became painful battles behind hedgerows until the breakout at St. Lo. This opened the battlefield for wide ranging maneuvers by the Allied armies and exploitation of opportunities for encirclement. Thereafter, operations turned to pursuit and supply catch-up. The final gasp of the German army was the failed counterattack through the Ardennes Forest. After this, with the Russians pushing on the eastern front, the war became a race among allies to position themselves for the most lucrative post-war political objectives.

The war in Europe had begun with German advances in tactical doctrine that overwhelmed their opponents—who then (as usually is the case) emulated the tactics. Tactical doctrine that saw experimental application during the Great War and weapons systems that had their birth in that war—the tank, trucks, and aircraft—came fully of age during World War II. New weapon systems, notably radar, jet aircraft, assorted guided missiles, and ballistic missiles appeared in World War II and matured in later wars. Nuclear weapons, after their use against Japan, have remained only as a potential.

In the Pacific military operations of an entirely different kind were waged over an area more immense than the breadth from Britain to the Volga. It was a war of repetitive amphibious assaults. It was also a war between very different cultures, a circumstance that influenced the nature of combat: the Japanese soldier was taught never to surrender, and this he believed so ardently that fighting to the death was the norm.

As with war in Europe, the Pacific began (for the United States) with a colossal loss, yet one that became decisive in that it united—in an instant—the nation's resolve. Thereafter, the best that Japan could expect was a standoff in which attrition by both sides would force a negotiated peace with at least some Japanese gains intact.

Tactically, military operations were vicious, often in dense jungle with little infrastructure, and usually isolated on islands or coastal pockets. The fate of operations on land depended directly on the fate of operations at sea, and early on, critical sea battles set the direction of events. The Battle of the Coral Sea in May 1942 aborted a large scale Japanese

amphibious invasion aimed at Port Moresby. In early June 1942, the touch-and-go United States victory in the Battle of Midway became the turning point that enabled the success of subsequent land operations.

After Allied defeats at Bataan, in southeast Asia, and on various island outposts, the Japanese soldier had gained an aura on ruthless invincibility. This was tested when, in August 1942, US Marines landed at Guadalcanal and Tulagi in the Solomons. The character of fighting there became the hallmark of battles later: intense, near-suicidal attacks by Japanese soldiers and stubborn, close quarters, infantry-dominant combat, sometimes hand-to-hand. Naval engagements gave an advantage to the Allies in the number of reinforcements. The outcome on Guadalcanal negated the reputation of the Japanese soldier's invincibility. It was a first setback to Japanese confidence.

Meanwhile, in New Guinea, the Japanese attempted an overland assault against Port Moresby along the Kokodo Track, a jungle trail. The invasion came close, but the effort ended disastrously with the Japanese back at their starting point, by then a rag-tag group, barely alive. They had been forced to retreat ignominiously after being conditioned never to retreat. As at Guadalcanal, the psychological impact was severe. New Guinea and Guadalcanal marked the zenith of Japanese expansion.

After these two campaigns, the Allies initiated Operation Cartwheel, aimed at the massive Japanese stronghold at Rabaul at the eastern tip of New Britain Island. Rather than attack Rabaul, it was encircled. One avenue of attack was up the Solomon Islands chain. The other was along the coast of Papua-New Guinea, and thence to the western part of New Britain, the Admiralty Islands, and Emirau Island. Rabaul was left to wither under repeated air attacks. At this point, Allied strategy changed to long leapfrogging past Japanese held islands and strong points, rendering them impotent. The length of the leaps were limited only by the reach of land based aircraft and sea-based support. One axis of advance was by General MacArthur's forces toward the Philippines, and the other by Admiral Nimitz through the Central Pacific. Both of these advances were classic applications of the principles of maneuver, mass, economy of force, and surprise. The two pincers constituted a stupendous version of Hannibal at the Battle of Cannae.

The tactical doctrine for these amphibious campaigns evolved through trial and error. The pattern that emerged involved these steps: (1) air and naval forces "soften up" the target island or outpost; (2) joint forces feint toward a different island to deceive the defenders; (3) the convoy of attacking forces arrives and an intense air and naval bombardment ensues; (4) the initial ship-to-shore assault forces approach in echelons, using rocket firing craft and amphibious tanks to move the assault force inland; (5) once the beachhead has been sufficiently secured, the bulk of infantry, tank, artillery, and support forces arrive in landing craft; and finally (6) supplies follow.

Japanese forces, in those places where the Allies chose to engage them, adopted extended defensive tactics to delay the Allied advance. In Luzon, the bulk of army units took to the mountainous part of northern Luzon, and fighting there continued to the end of the war. On Peleliu and later on Iwo Jima and Okinawa, Japanese defended not on the beaches but from extensive labyrinths of caves and tunnels, together with concrete blockhouses, bunkers and

trenches. Here, the Japanese military code of "bushido" was much alive. Fighting was caustic, and for the Japanese, virtually to the death. US marine and army units received tremendous air and naval gunfire support, but the final bloody victory had to be gained by foot soldiers.

The effort in the China-Burma-India theater bogged down early during the war. Hopes that the vast manpower of India and China could be harnessed never came to fruition, and attention to this axis of attack faded as success after success speeded the Pacific march toward Japan. Operations in the Aleutian Islands, with Attu the predominant battleground, were never significant to either Japanese or Allied strategy.

DOCTRINE AND TECHNOGY IN MODERN WAR

After World War II, two aspects of the world scene shaped military operations. One, primarily affecting doctrinal development, was the bipolar standoff between the West on one side and the USSR on the other. The second aspect was the flowering of technology. The crude nuclear weapons used against Japan became vastly more powerful and, at the same time, smaller and more portable. But, although they were for a time the dominant influences on strategy and doctrine, their power was viewed as too dangerous to unleash. Later, the development of computers—from monstrous-sized ones to hand held devices—and of means to communicate and process data (the "Information Age"), spawned a more useable expansion of weaponry. Experimental guided missiles from World War II—the German Fritz X and antiaircraft missiles; the US Azon and Razon—proliferated into an array of accurate missiles of all kinds for both strategic and tactical purposes. Precision of weapons was increased by an order of magnitude and they reduced collateral damage by an even greater degree. Communications systems became unbound from wires and simple radios, enabling near-instant information flow regardless of distance. Infrared development led to night vision capability. Electronic jamming and eavesdropping became an essential tool. Satellites facilitated navigation and intelligence. Helicopters added to air mobility. The list of gadgetry goes on and on.

It was the 1973 "Yom Kippur" war, where Egypt and Syria attacked Israel, that proved the value of guided weapons. That war also served as a reminder of the penalty for forgetting the importance of combined arms mutual support (an Israeli error: "armor and air can do it all"). These lessons were heeded in the West and behind the Iron Curtain. The changing versions of the US Army division structure and of the Army's Field Manual FM 100-5, *Operations*, are illustrative of the doctrinal ferment taking place in many nations after World War II.

An early drastic change from the US Army World War II triangular division was creation of the "Pentomic" Division, designed especially for the nuclear battlefield. The short-lived Pentomic Division was replaced by the Reorganized Objectives Army Division (ROAD), which emphasized flexible task organization. Airborne and mountain divisions from World War II were retained. Expanded employment of helicopters, begun in Korea, Malaya, and Algeria, led to experimental organizations that evolved into the airmobile division used in Viet Nam. Subsequently, light versions of divisions were created. Ongoing Army changes are shifting to the brigade as the basic self-sufficient combat element rather than the division.

FM 100-5 doctrinal changes moved in parallel with the organizational changes, while also seeking to keep pace with new weaponry. The 1976 version of 100-5 incorporated lessons

from the Yom Kippur War, but in responding also to the numerical superiority of the Warsaw Pact, it promulgated a doctrine called "Active Defense" which exhorted troops to "fight outnumbered and win"—specifically to win the first battle, since there might never be a second battle. The FM 100-5 of 1982 threw out Active Defense and substituted the AirLand Battle. This doctrine emphasized the importance of "operational art" (the campaign level of warfare). It envisioned Close Battle attacks, Deep Battle attacks against enemy reserves, and targeting Rear Battle elements at greater distances. Its tenets were initiative, agility, depth, and synchronization. The 1986 edition refined operational art and highlighted concepts of encirclement, annihilation, center of gravity, and the culmination point. The 1993 field manual, adjusting to missions other than war (such as peacekeeping and disaster relief), downplayed operational art. Throughout these shifting doctrines and organizations, the principle of combined arms structuring was extended to the lowest echelons, and with it flexibility of tailoring to tasks. In addition, there were great strides in doctrine and structure for joint operations.

AirLand doctrine and organization (and comparable features of Marine Corps forces) were applied with extraordinary success in Desert Storm (1991) and Operation Iraqi Freedom (2003). Desert Storm was also a stunning logistical achievement. The ground battle in Desert Storm was a classic operational level envelopment with a feint and tactical surprise. Operation Iraqi Freedom was also a text book campaign of rapid maneuver, although against light opposition. Since then, operations in Iraq and Afghanistan have turned into a bitter, complex insurgencies that Coalition forces are attempted to wage with a minimal force-to-space ratio.

INFORMATION WARFARE, FOURTH GENERATION WARFARE, AND SUCH

The ever increasing complexity of weapon systems has required full use of the tools provided in what has been called the Information Age. This is particularly so for command and control of the diverse systems and to enable a shorter cycle time than that of the enemy for gathering and processing intelligence. In the autumn of 2001, a new form of warfare using computer age tools was ushered in by two twelve-man Special Forces elements called Operational Detachments-Alpha (ODAs), riding to battle (as glamorously portrayed in news reports) on ponies and carrying laptops. Their mission, with assistance from CIA agents, was to support the Northern Alliance in their war against the Taliban, a fight that had been making little progress. Using lasers to illuminate targets and communicating with B-52 bombers far overhead, the ODAs began to take out one target after another. Quickly, they reduced Taliban capabilities, enabling the previously outgunned Northern Alliance troops to overcome the enemy. The tactic of using lasers and GPS to guide precision weapons to targets was not new, but coordinating such high-tech means with poorly equipped indigenous forces was novel.

Other "novel" forms of warfare have been bruited in recent years to address asymmetrical threats, most notably from non-state terrorist organizations. Among the labels used for these new modes of operations are information warfare, fourth generation warfare, netwar, and "swarming" operations. All are approaches generated by the information revolution, its associated technologies, and precision weaponry. Some combination of these will undoubtedly come to the fore, but the mix remains to be seen.

TRENDS, CONSTANTS AND TURNING POINTS

Since before recorded history, four fundamental features of military operations on land have remained constant. One of these is the employment of both close-in, man-to-man weapons and stand-off weapons. In earliest times these were, for example, the sword and the bow and arrow. Much later they were the rifle and artillery (cannons and air delivered weapons). The second constant is the attention to both the offense and the defense. At times, such as when castles offered safety, defense waned and offense waxed. At other times, for example when the combination of armor with aircraft led to new blitzkrieg tactics, the offense was prominent, only to be soon countered by defense in depth. But always, forces had to prepare to engage in both offense and defense. Third is the employment of both maneuver and firepower in operations. In recent times ardent debate has surfaced between advocates of maneuver or of firepower as the dominant element, and doctrine has sometimes tipped this way or that. Yet there has never been a clear winner in the dispute, and history supports both maneuver and firepower as equally essential. The fourth constant is the distilled wisdom in what is called the principles of war. Different lists of the principles have been advanced from time to time, but consistency is more prevalent than differences among them. Sun Tzu's maxims take one form. A more recent version enumerates the following: the Objective, the Offensive, Mass, Maneuver, Economy of Force, Unity of Command, Security, Surprise, and Simplicity.

In addition to the constants, we can identify persistent trends spanning the history of warfare. One is the increasing lethality of individual weapons (in contrast to the lethality of battles, which have waxed and waned, and cannot be said to be more deadly now than in the past; probably the opposite is true). One machine gun and one artillery piece are each more deadly than one sword and one javelin, and they can reach farther. A 2,000 pound bomb can kill and maim more soldiers (or civilians) than a 200 pound stone thrown by a catapult. At the extreme and off the chart is, of course, the nuclear weapon. One consequence of weapon lethality is steadily increasing battlefield dispersion. Another trend is the increasing application of technology to the equipment of war—not just to weapons, but to every element of military forces. In parallel with technological advances in the civilian sector, the trend of change in war materiel is on an exponential curve upward. Together with the technological changes, operations are becoming more and more complex. Finally, and again deriving from technology, force mobility has spurted since the days of the horse.

Regarding turning points, it is more difficult to identify ones that signify—to borrow a navy expression—sea changes in military operations on land. Most advances in land warfare have evolved gradually but steadily. The following are offered as turning points in the sense that they resulted in pronounced changes. The first goes back many millennia to the time when humans first formed in a group to face an enemy rather than as individuals. Next we can classify Philip of Macedonia's organization of a combined arms force as a major step. Subsequently, the adoption of the stirrup elevated heavy cavalry to long-standing dominance. Later the application of gunpowder to cannons (and later to small arms) displaced the castle as the focal point of operations for both defense and offense. The advent of steam powered transportation, the telegraph and telephone, and mass production techniques had an immense impact on military forces, and follow-on technological advances extended the scope of the impact, especially in mobility systems. Finally, space-based systems and the digital world of computers and related devices have transformed military operations in ways that can only be glimpsed.

NAVAL OPERATIONS

Operations in war are activities of many descriptions. In TMCI's *Concise Theory of Combat*, the tactical activities are a triad of force elements taking actions "delivered to" receiving elements.[51] The activities at the operational level of war follow the same triad, but the actions taken by elements, guided by "operational art," are not combat actions since the effects on receiving elements are not lethal.

Strategy-Operations-Tactics

Until recently the U. S. and most other navies of the world did not distinguish an operational level of war. They thought strategy contained the operations in a naval campaign. Of many possible non-American examples there is no better illustration than Italian Admiral Romeo Bernotti's two great books on tactics and strategy written in the first decade of the 20th Century. While still a lieutenant and instructor in the art of naval war at the Royal Italian Naval Academy, Bernotti first wrote his highly respected and much translated *Fundamentals of Naval Tactics*. In 1911 he followed *Tactics* with *Fundamentals of Naval Strategy.*

Both books apply quantitative analysis so effectively that his biographer, Brian Sullivan, says Bernotti foreshadowed operations analysis that we usually date from World War II. The second book on "strategy" is nearly all devoted to naval operations: campaign planning and execution in a text replete with geometric and mathematical guides for operational activities that include "strategic" reconnaissance and search procedures along with the distinction between strategic and tactical scouting methods; strategic mobility, cruising speeds and combat radius; logistical activities accompanied by a quantitative comparison between serial replenishment at sea versus support from nearby bases.

The American Navy viewed strategy the same way: the policy side of strategy determined where it was advantageous to act while the operational side of strategy determined whether the desirable action was feasible by calculating the forces we could deliver and sustain at the scene of action against the enemy's feasible responses. Prior to World War II most professional writings and studies at the Naval War College emphasized either tactics (and a little bit of technology) or operations (and a little bit of logistics). The famous war games there, all 318 of them between 1919 and 1940, were intended either to execute a presumed strategy in a campaign or teach and test the battle tactics. These games upset the incorrect presumption that the Pacific strategy would guide the campaign and its battle tactics. The games proved that the early strategy for a rapid relief of the Philippines (under Japanese attack, of course) was unexecutable. Over twenty years the changes to a more realistic national strategy took place slowly but remorselessly. There was no wishing-will-make-it-so in Naval War College strategic thinking, when practical execution was tested in every strategic (i.e., operational) game.

The U. S. Navy did not acknowledge the existence of the operational level of war until 1994. In part this grew out of pressure for a common terminology that became increasingly severe after World War II. In part it came at the urging of the Marine Corps, who saw the advantage of "operational art" that stood between strategy and tactics. The Navy and Marine

[51] E. L. DuBois, W. P Hughes, Jr., & L. J. Low, *A Concise Theory of Combat*, Monterey, CA., published jointly by The Military Conflict Institute and The Institute for Joint Warfare Analysis, NPS, Monterey, 1998.

Corps doctrinally instituted the operational level in Naval Doctrine Publication 1, *Naval Warfare*.

The three elements of war in the Navy's eyes had been strategy, tactics, and logistics. Part of the reason logistics were prominent was the geographical span of the naval operations. Distances largely unimagined by ground force commanders are involved. A map needed of a maritime theater generally covers a geographical area at least an order of magnitude larger than for a ground campaign. The *processes* to conduct a naval campaign (or operation) are probably at least 80% the activities of operational logistics. It is reasonable—and clarifying—to say that the American navy's three levels of war at sea had been strategy, operational logistics (or merely operations), and tactics.[52]

Purposes of Naval Operations

Over the centuries the foremost application of sea power has been to influence events on land by delivering ground forces at a scene of action from the oceans and (more recently) aerial combat power as well. Only secondarily do naval forces conduct operations exclusively for a maritime purpose, such as protecting fishing and off-shore oil rigs. The several purposes of the *operations on land* are described elsewhere in this treatise on Warfare.

The oceans are also manifestly a great two-dimensional highway requiring protection of shipping. Throughout history whoever controlled the seas had a great advantage which if lost led to dire consequences. There is uncontested historical evidence that naval powers usually defeat land powers. See any of A. T. Mahan's works commencing with *The Influence of Sea Power On History, 1660-1783*. His books showed the sweeping effect of command of the seas in history, from Greek and Roman times through the Napoleonic Wars. A more recent and quantitative book by John Arquilla is his landmark *Dubious Battles.*[53] It offers evidence of an even bolder assertion: in wars since 1815 not only do sea powers usually defeat land powers but the land powers more often than not initiated the wars which they then lost.

Both Mahan and Arquilla offer rich explanations of the *strategic* reasons why. For example a land power will and usually must have a substantial army and only the most prosperous of land powers can simultaneously field an army and build a navy to rival its opponent, for example France in the 18th Century confronting the British Royal Navy. Neither of these books, however, explains the *operational* advantage a sea power exploits over a land power. I will address the advantage below under **Two Great Constants: Operational Maneuver and Efficiency of Movement**.

Functions Performed by Naval Operations at Sea

A categorization broadly applicable to most states in most historical periods is that navies perform one or more of four functions. Every navy's composition will, or ought to be, constructed based on its intended contribution to the following four functions:

---

[52] One of the best concise books to make the contrast clear is J. C. Wylie, *Military Strategy,* New Brunswick NJ: Rutgers University Press, 1967; reprinted Annapolis MD: Naval Institute Press 1989 with an introduction and postscript.

[53] John Arquilla, *Dubious Battles: Aggression, Defeat, and the International System,* Washington DC, Crane Russak, 1992. Arquilla had at one time proposed the title, "Why Losers Start Wars."

On the seas
1. Ensure safety of goods and services: navies protect the *movement* of shipping and means of war on the oceans, and safeguard *stationary* forces to include SSBNs, blockading forces, and coastal patrols.

2. Deny safety of enemy goods and services: navies prevent the movement of enemy shipping and means of war.

From the seas
3. Deliver goods and services: navies put land forces ashore to seize and hold territory and deliver air and missile strikes for a variety of purposes.

4. Prevent enemy delivery of goods and services: navies protect the homeland from every threat.

Functions of the Fighting Forces

The four kinds of operations are supported by at least four categories of forces. The first three categories below are taken from Sir Julian Corbett, the best of the naval writers.

A *battle fleet* of capital ships and accompanying forces meets and destroys the enemy's battle fleet. Mahan said, correctly, the purpose of a battle fleet is to destroy the enemy's fleet in order to achieve command of the sea. But there were provisos, pointed out most famously by Corbett, who named two other categories:

C*ruisers* attack enemy commerce or defend it from attack. Capital ships of the battle fleet have been inefficient at or incapable of defending "trade," even after establishing unchallenged *command* of the seas. Raiders, pirates, and privateers were the threat historically. Since World War I surface raiders have been replaced by submarines and, since World War II, by long range shore based aircraft. A state that could not challenge a big navy for sea control could resort to a *guerre de course*, a guerrilla war at sea, threatening commerce and preventing the sea power from landing on its shores or delivering air and missile strikes. Hence a necessary navy component must be cruisers capable in numbers, speed, and radius of action to defeat cruiser-raiders. Submarines that supplanted surface raiders had to be opposed by large numbers of antisubmarine forces, which are themselves "cruisers" in Corbett's terminology.

A *flotilla* operates in littoral waters which are too dangerous to expose the battle fleet. These are numerous small combatants with a short radius of action but considerable fire power. They survive less by armor or defensive firepower than by numbers of units and stealthiness, exploiting the coastal "terrain" and attacking in coordinated operations.

The emphasis of Mahan and Corbett is on control of the oceans, functions 1 and 2, and to some extend function 4. We must add a fourth category, amphibious forces that perform function 3 by efficient delivery of ground forces from the sea. Books by P. H. Colomb and Frank Uhlig[54]

[54] P. H. Colomb, *Naval Warfare: Its Ruling Principles and Practice Historically Treated*, Annapolis, Naval Institute Press, reprinted 1990, first published 1891; and Frank Uhlig, *How Navies Fight: The U. S. Navy and Its Allies*, Annapolis, Naval Institute Press, 1994

make clear that "delivery of goods and services" from the sea, that is to say projection of power, is the operation that most superior navies have been concerned with most of the time. Throughout history it has been a function as important as safeguarding the sea lanes. But the amphibious force of a navy is a relatively new phenomenon. Mahan emphasized that sea power included merchant ships partly because he saw the merchant fleet as the means of delivering armies overseas to the scene of action in the 17th and 18th Centuries.

Interrelationships

Observe that there is no evident congruence between functions and forces, between the ends and means of operations. Moreover, it takes only a little thought to appreciate that a navy's operational functions are in turn the means of a maritime (or national) strategy's ends. To describe the three way relationships would constitute a study by itself.

Operational Constants, Trends, and Variables

The Principles of War—and from Sun Tzu until now there have been at least 22 sets of them—must by definition be applicable to operations at sea but because they are general and abstract must inherently have limited practical value. Operational Constants—things that abide—can be deduced from the history of naval operations and are more utilitarian. Trends—things that change from age to age in one direction—are usually brought about by new technology and apply as much at the operational level as the tactical level at sea.[55] The first missile attack on the Israeli destroyer Eilat in 1967 represents such a trend. It foretold a step-change with enduring tactical and operational consequences. Trends must also be deduced from naval history.

There is also a third category that might be called "variables." Variables at the operational level of war stem not from technology but from social and political change. Variables do not signify a trend in one direction but (crudely put) will oscillate. The present interest in irregular warfare and resistance to terrorist attacks such as the attack on USS Cole at Aden has brought about a great change of emphasis in the world's navies (and armies), but throughout history there have been many examples of sneak attacks in ports or restricted waters. It appears that the well-named "Long War of the 21st Century," however defined, will have durability, but any historian will say what is wrought by societies and politics will change again in a new direction. The rise of China and its well documented interest in maritime power is evidently one such change on the horizon that ought to temper any single-minded emphasis on small wars.

---

[55] A. T. Mahan believed that the trends of new technology changed tactics and nature of combat. but the base of sea power and strategy was "laid as on a rock." He was wrong, as World War I demonstrated within 30 years after he asserted this conclusion in his famous *The Influence of Sea Power On History, 1660-1783*. There were supposedly unforeseen *results* in the sea battles of World War I but there were almost no changes in *tactics*. The formations, screens, and other doctrinal particulars of the British and German battle fleets were employed as planned. The changes were strategic (or operational) and they were brought about by new technology, among them the effects of U-boats and mines, the coming effects not fully developed of aircraft, and almost invisibly and unnoticed the effects of wireless and wireless intercept.

There is no space here to catalogue the constants, trends, and variables of naval operations in the way this has been done at the tactical level[56] nor do we have such a list, but it is useful to offer examples below of constants, trends and variables of naval operations.

Two Great Constants: Operational Maneuver and Efficiency of Movement

"Operational maneuver from the sea" is a modern term coined by the U. S. Marine Corps, but the efficacy of expeditionary operations and efficient support of land forces operating across an ocean has been and remains a constant advantage of sea power. Twenty years ago Otto Bubke, an obscure German army officer, wrote a short essay describing as well as it has been done the operational reason why command of the sea is so advantageous.[57] First, sea control prevented the enemy from attacking from the sea. Second, it gives a maritime state the power to choose the scene of action anywhere on a land power's littorals.[58] The reason, he stressed, was the operational movement advantage of ships over ground transportation. At sea an amphibious force will move around 500 nautical miles a day.[59] Fast container ships will move farther still, but in the 20th Century the norm for merchant ships was more like 400 miles a day. (This is no more than double the speed of advance of sailing ships in a trade wind and so we do not hesitate to call maritime speed a great operational constant. Indeed, the steady movement of sailing ships which did not need to refuel offset the sprint speeds of engine powered ships, which have always been dependent on and hampered by the need to refuel every few days.)

On land an army moving at operational speed against weak opposition will advance about 25 statute miles a day. The famous German blitzkrieg in Poland and France moved no faster than that in 1939 and 1940. In operation Iraqi Freedom the American Army took one week to reach Baghdad—whether under weak or substantial opposition scarcely matters—which was again about 25 miles a day. The Roman road system was designed to allow a legion to move 30 miles a day.[60] In 1066 King Harold of Britain had to defeat a Norse attack at York and immediately rush south to face William the Conqueror at Hastings. Harold's army marched 25, perhaps even 30, miles a day for several days in order to confront the French landing.

Concisely, in *speed of operational movement* ships have an order of magnitude advantage over an army advancing against no or light resistance. They always have and likely always will. In numbers of logistical *personnel required* to move a force to the scene of action and sustain it, the advantage of ships over land transport has been one or two orders of magnitude. In *weight of combat potential carried* to the scene of action per unit of energy invested, the ships' advantage has usually been two to three orders of magnitude. The introduction of aircraft and aerial

---

[56] Hughes, *Fleet Tactics and Coastal Combat,* Annapolis, Naval Institute Press, 1999

[57] Otto Bubke, *Clausewitz and Naval Warfare,* Bergisch Gladbach, FRG: Federal Armed Forces Office for Studies and Exercises, August 1987

[58] There is a third, but tactical, advantage of a superior navy. Geographical effects at sea are muted or absent. There are no defensive positions as there are in land combat, so a small initial advantage in combat power is more likely to be decisive. John Arquilla noted in *Dubious Battles* that a land power's navy leaders spoke boldly of what they would do until the war started and then abruptly turned cautious.

[59] At sea an amphibious force will under most conditions move around 500 nautical miles a day. Today's

[60] Rates of advance of land forces are more complicated and variable than at sea. In 1990 R. L. Helmbold conducted a comprehensive four volume study that will likely never be exceeded in its thoroughness. For our purposes the first volume is the most relevant: *Rates of Advance in Historical Land Combat Operations*, Bethesda MD, CAA, June 1990. There is nothing comparable published on rate of movement of naval forces at sea.

logistics complicates this simplified description, but aircraft have never changed the three-fold advantage of ships over ground transportation sufficiently to offset a sea power's advantage. Intercontinental ballistic missiles with nuclear warhead potentially attenuate a sea power's advantage in preventing an attack, but to date not sufficiently to alter the paramount influence of naval operations.[61]

Bubke did not say, nor do we, that the sea power's advantage is always the power to attack a strong land power's physical center of gravity, because the land power will defend its center of gravity strongly. Nor does the sea power's advantage allow it to strike quickly and decisively. Britain found out it could not land on German soil in World War I and even an alternative operation against the Dardanelles proved to be too ambitious. In World War II the Normandy landings had to be deferred until 1944. But Bubke shows with rare clarity that because a sea power cannot be invaded it does not have to maintain a large standing army in peacetime, and often it can find and fund allies for coalition operations against the dominant land power that threatens them.

Another Constant: Land Battles are Much More Frequent than Sea Battles

Any encyclopedia of war will show there have been many fewer sea battles than land battles. We will return to the matter of frequency later to see why this is so.

A Great Trend: Changes to Scouting Effectiveness

The scouting process illustrates a trend stemming from advances in technology. Scouting is the gathering and delivery of information; it is a once-popular term that is more compact than "intelligence, surveillance, and reconnaissance (ISR)." Through most of naval history *operational* scouting was a severe challenge to fleets. When an enemy fleet under observation, for example by a fleet blockading it in port, escaped to sea, then regaining contact was often a frustrating task. When the French fleet and transports under Nelson's watchful eye escaped Toulon and other French ports in 1798, Nelson spent weeks sailing all over the Mediterranean trying to track it down until he finally found and destroyed it in the Battle of the Nile.[62] Until the turn of the 20th Century, privateers, raiders, and pirates preyed on shipping without untoward risk. A great shift then occurred between 1910 and 1920 with the introduction of aerial reconnaissance—wide area search and wireless radio reporting. Within a decade surface raiders became obsolete and successful *guerre de course* at sea had to be conducted by submarines which could to a much greater extent remain undetected by aircraft. The location of the enemy fleet and even individual surface raiders had become much less of a guessing game. Better scouting at sea has changed the nature of naval operations fundamentally.

And the trend continues, with satellites, UAVs, and other means to enhance surveillance at sea. The ability to process the information has now become the greater challenge. Thus the new trend underway is a shift of emphasis from the means of scouting—to collect

[61] Also see W. P. Hughes, Jr., "Naval Maneuver Warfare," *Naval War College Review,*

[62] An even better known example was the Trafalgar Campaign in which Napoleon intended to seduce Nelson to the West Indies with Villeneuve's fleet so that the French could dominate the English Channel long enough to get his invasion fleet on English soil. But Nelson deduced Napoleon's operational aim and moved too fast for the French, leading to the destruction of the French and Spanish fleets off Cape Trafalgar, thereby forcing Napoleon to abandon his invasion plans and start a new campaign against Austria and Prussia in the east.

comprehensive data—to the fusion and interpretation of massive amounts of information into an essence on which commanders may decide and act.

To no small extent tactical and operational scouting overlap, so much so that they can only be distinguished by the effect. A system such as a UAV may be in the air for surveillance and "strategic" warning (of an approaching threat) or it may serve the tactical purpose of guiding weapons to the target. The initial, highly efficacious campaign against the Taliban in Afghanistan is a good illustration of operational and tactical scouting with the same aircraft.

A Variable: Changed Operational Plans Due to Social and Political Changes

The current emphasis on irregular warfare is a change that is not a trend and does not stem from scientific progress. Its cause is human, not technological. Currently non-state terrorist attacks and other criminal activity such as smuggling have led the world's armed forces to act against a different threat than the ones the U. S. navy prepared to oppose in the 20th Century. The maritime aspect is represented by piracy, stolen cargoes (for example Nigerian petroleum), and terrorist threats to shipping. Maritime forces also contend with drug running and illegal immigration, including "boat people" fleeing unstable societies. At present, however, the most frequently seen role of a navy is to deliver and sustain forces contending on land in irregular warfare for stability, security, and reconstruction operations on land. Meanwhile the foremost role of the great sea power—presently the United States—presumably is still the security of all nations' shipping on the high seas.

But navies have conducted small wars many times in the past and it is fair to predict that fleet actions will reoccur again in the future.

.

Part-Trend, Part-Variable: Fewer Battles at Sea Over Time

Compared to today, maritime operations against the land and battles for naval supremacy in Greek and Roman times were much more prevalent. The same was true in the Mediterranean in the 15th and 16th Centuries when the Ottoman Turks, the Barbary states, and the leading powers of Europe, Spain, France, and the Holy Roman Empire, all contended with each other in prolonged and bitter operations. In the 17th Century the Dutch and English fought repeated wars almost completely restricted to the seas. This was a phenomenon tied to technology: at the time an entire fighting fleet could be built in a year or two. A state's defeated navy could be back in action soon after having suffered a crushing and "decisive" defeat, given the resources.

The 18th Century was a transition, in which the ships became bigger and more heavily armed. It was harder for a defeated state to replace its losses or construct a new navy. In the early 20th Century the trend of fewer battles continued all during the battleship era. This led to a curious phenomenon. From 1890 to 1910 no less than 74 pre-Dreadnought *classes* of battleships were built. Yet during the entire battleship era only seven fleet actions for command of the sea occurred.[63] Here is strong evidence that arms races do not lead to war but the prospect of war can lead to arms races.

[63] There were two decisive fleet actions in the Sino-Japanese War (1894), two in the Spanish-American War (1898), two in the Russo-Japanese War (1905), but only one, the Battle of Jutland (1915) in World War I. I am dismissing several battles like Coronel, Falklands, Dogger Bank, and Heligoland Bite as cruiser warfare or skirmishes. If one

But the *variables of statecraft* are also responsible for the fact of fewer battles and conflict on the high seas. In part the trend may be traced to the dominance of Great Britain and the policy of enlightened self-interest during the *Pax Britannica*, in which the Royal Navy protected the trade of all friendly nations. The almost battle-free period lasted from 1815 to the early the 20th Century. The absence of fleet actions explains to a large extent why capital ship designs in the battleship era were so many and sometimes so foolish. The stability of the *Pax Britannica* was destroyed before World War I by the rise of Germany and the German High Seas Fleet, and as many other states also felt compelled to compete. The prevalence of many fleets continued through World War II, and generated many naval operations and battles. After World War II American naval dominance created a new era of stability and, once again, virtually no fleet actions—although there was no lack of naval *operations*, as the ascending U. S. navy and other declining navies projected their power overseas.

Thus the infrequency of naval battles is due in part to technology which spawned bigger and more expensive warships, accompanied by expensive aircraft, satellites, and C2 systems. But in part it is the product of a non-technical, social phenomenon in which states are content to let one dominant sea power protect their sea lanes. As the societal variables wax and wane, we should anticipate a resurgence of confrontations at sea that will accompany the rise of a peer competitor against a dominant sea power, which of course currently are the PLAN of China and the U. S. Navy.

The Processes of the Operational Command Which Governs the Campaign

The strategist determines the desirable aims in theaters of operations, specifically where to act and why. As a practical matter he also normally decides the forces to commit to the campaign. The tactical commander determines how to confront and fight the enemy at the scene of action by transforming the combat potential of his forces into combat power. The operational commander *delivers* the forces and their combat potential—the forces assigned by the strategist—to the scene of action and sustains them there for the duration of the campaign. Before the campaign is initiated some combination of strategic and operational thinking will estimate the quantity of combat potential that can achieve the objective against the expected opposition, and whether that quantity of potential can be delivered and sustained. It is a responsibility of the theater commander to tell the strategist realistically how much and how fast the forces representing combat potential can be brought to the scene of action. Of course the strategist has his own staff to make these estimates, but his staff does not actually have to *perform* the acts of supply, and the operational commander's staff also frequently has better local knowledge of the temper and capacity of the opposition. The tactical commander will make his own estimates about sufficiency and has his own opinions about the enemy as he constructs his battle plan to create combat power and employ it efficaciously.

The campaign for Guadalcanal in the Solomon Islands illustrates. The Joint Chiefs of Staff, urged on by Admiral E. J. King, decided after the Battle of Midway in June 1942 that the geographical area around the Solomons in the southwest Pacific was of supreme importance and suitable location for a fighting defense, known later as the offensive-defensive phase of the

---

includes the Dreadnoughts (all big gun battleships) completed between 1905 and 1910 this adds another six classes to the 74 pre-Dreadnought classes. Before any more significant sea battles were fought the battleship era was over.

Pacific war. While the Japanese were licking their wounds and because they were constructing an airfield at Guadalcanal to dominate the surrounding air space, we wished to block their advance by a swift assault on Guadalcanal and seize the airfield before it was operational. Time was crucial, so the landing was specified for early August 1942.

CINCPACFLT, Admiral C. W. Nimitz, as theater (operational) commander had to decide whether the forces envisioned would be adequate. There were ample ground forces in the Pacific, but only the transport to deliver and sustain one Marine division as far away as the Solomons. It would be the task of the tactical commanders, notably Admirals F. J. Fletcher and R. K. Turner, and Marine General A. A. Vandegrift to land the First Marine division, establish a perimeter on Guadalcanal, and quickly activate the airfield (Henderson Field). Most of the Pacific fleet was assigned to support the landing and forestall a Japanese response.

A reaction from the Japanese navy had been predicted but not its vigor. Thus came about a six-month-long campaign, bitter in the extreme, for the Guadalcanal Island perimeter around Henderson Field. The post-mortems have covered the campaign in detail, but not enough has been said on the American side about the operational constraint: the reason why only one Marine division was assigned. The reason was not the unavailability of troops but the lack of transport. On the Japanese side the failure lay in a piecemeal response. The reason was also logistical: sending too little too late to push the Marines into the sea. It seems also to have been due to confusion at the strategic level between the importance of the end and a willingness to give the Japanese tactical commanders the means to destroy the American beachhead. This sets aside two important factors, however. First, a Japanese intelligence failure had underestimated the American forces ashore and afloat, and second, the Japanese army and navy both underestimated the resolve of the American land, air, and sea forces which, after a shaky start, fought well and exhibited a high degree of interservice cooperation.[64]

This is one of the cleanest examples of the interrelated roles of strategy, operational (or logistical) support, and tactical skill it takes to win a campaign.

Tension between Cohesive Action and Delegating Authority

The ideal is to achieve collaboration of all commanders vertically and laterally, so that cohesive action results. But prosecution of war entails some degree of decentralized authority and responsibility. The science and art of fencing is a poor analogy for military action, because a fencer is in sole control of his actions and doesn't have to cooperate with anybody else. A better sports analogy is football, because it involves a large team effort.

The goal of cohesive action is unattainable. The best, but always imperfect, compromise results from:

- Sound *doctrine* that fosters cohesion.
- Sound *training* that prepares all echelons for coherent decisions and actions. This is notably unobtainable at high echelons when government officials neither know nor care

[64] Another operational consideration tied to logistics was health of the forces on the island. Far more casualties were suffered on both sides from sickness than from combat. On the Japanese side, however, by December the troops were literally starving because we had almost severed their SLOC.

about the intricacies involved in cooperative action in a maritime campaign, or of the difficulty of retraining to a new operational doctrine.

- Sound *experience*, comes from enough of the right kind of war-making to learn what to expect of companions in positions of authority and responsibility. This is a great limitation in preparing for war when there is no war, and of previous interpersonal experience in the wrong kind of war.

AIR OPERATIONS –AIR ATTACK AND AIR DEFENSE

This section covers attacks over the horizon and beyond the immediate range of battle, whether by aircraft, long range artillery, or missiles. Involvement of air power in ground operations ("Close Air Support") is not covered here.

Elements

Any attack scenario has three elements: the attacker, the target, and the defense. The results of the attack depend of the characteristics of all three.

The attacker, whether an aircraft, missile, or other means, should approach the target (*range*), find it (*detection*), hit it (*accuracy*), and kill it (*lethality*). The defender, by a variety of means, may try to deny the attack by hitting the attacker in base (*preventive attack*); preventing the arrival by *active* defense, mainly air interceptors, ground to air missiles, or air defense artillery, either en route (*area defense*) or close to the target (*point defense*); disrupting target detection by camouflage or decoys; degrading attack accuracy by moving the target; or reducing the attacker's lethality by fortification, hardening or multiplying vital components of the target.

Each side depends on the *information* that he has about his opponent. Depending on that information, the attacker would select the appropriate weapon, choose the right tactics, and select effective ammunition. The defender would try to adapt his sheltering measures and defensive deployment to his estimate of the attacker's capabilities and intentions.

Technological changes

Much of the struggle between attackers and defenders takes place on the technological and intelligence level, whether or not war is initiated. Both attacker and defensive weapons are continuously changed by reacting to each other's weapon development. Changes have been slow throughout history, but more frequent since the beginning of World War II, stimulated by streams of information, true or false. Some weapons become obsolete even before their first operational use, or even before procurement begins. Some weapons that have not entered into procurement have been taken very seriously by the opponent, influencing his counter developments. From that point of view, modern air warfare is an intensive uninterrupted technological and economic struggle, occasionally dotted by war episodes that contribute extra pieces of information to a dynamic process that goes on anyhow.

Aircraft

Already in the First World War some heavy canons of German artillery could deliver a 100 kg projectile over range of 100 km. It did not have much effectiveness over the horizon, because of lack of information and poor accuracy. Artillery relied on eye observers for information and for correcting aiming points. (Longer range could be used to enable batteries to

cover wider range along the frontline, or to operate securely from sites farther from the frontline.) The first function of airplanes in battle was an observation service for the artillery.

Deep attacks by aircraft, far beyond the front line of the battle, were frequent in World War II, either by heavy bombers or lighter fighter-bombers. They met with effective defense of intercepting fighters and ground to air artillery. In order to reduce attrition, bombers preferred night dark hours and used high elevation; both factors brought about poor accuracy. Fighter-bombers could be more accurate by diving low towards the targets, but such sorties exposed them to effective anti-aircraft artillery. Due to the poor accuracy, in general, only large heavily-populated or industrial areas could be effectively hit by aircraft. In general, air attack was successfully detected by either radar or human observers that gave early warning to air interceptors and ground defense. The attackers could not rely on surprise. The common tactic was to use large waves of many aircraft simultaneously, in order to saturate the defense. Such waves were accompanied by fighter aircraft, intended to divert enemy interceptors from the bombers. High rate of attrition was accepted as sure unavoidable cost of such missions.

Air attack of cities did not directly help the attacking power; indirectly, however, it forced the defender to divert many resources – industrial capacity and people – from other military needs to homeland defense.

Rapid technological advances following World War II improved, step by step, the capabilities of both attack and defense systems. Jet engines provided aircraft (both attackers and interceptors) with higher combinations of speed, range and load. Modern guidance systems not only improved accuracy, but, with advanced communication and control systems, enabled them to release guided ammunition – bombs or air-to-ground missiles, autonomous or commanded from afar – farther from enemy defenses. Electro-optical technology enabled both the attack and defense to achieve high accuracy that could not be imagined two generations before. Stealth technology enables developers to build aircraft with very small radar cross sections, reducing the chance of being detected by enemy radars. Ground-to-air defense was improved as well, by radar-aimed anti-aircraft artillery, followed by ground-to-air missiles with longer range and higher accuracy. Electronic counter measures, with much sophistication in development and operation, entered the service of both sides, intended to disrupt detection, communication, coordination between systems, or enemy such countermeasures.

Modern aircraft became more effective against a wider range of targets, including small sites of strategic importance, with attrition rates lower by an order of magnitude compared with previous aircraft effectiveness. However, it became so expensive, and aircraft production and pilot training became so lengthy, that even small rates of attrition, negligible by World War II standards, became critical.

Missiles

German V-2 ballistic missiles (1944) avoided the anti-aircraft defense. However, the accuracy of the missile (typical circular error probable of 10 km and more) was even worse than the already inaccurate aircraft bombing. Obviously, ballistic missiles could only be directed against large cities (e.g., London, Antwerp). Even against such targets, most missiles missed dense population quarters. Civil defense was not effective against missiles. Early warning of

relatively slow aircraft enabled people to take cover in shelters until the wave of attack passed; high speed missiles, even if detected, left too short reaction time. On top of that, missiles can be used sporadically, spreading small threats over prolonged hours, so that people are preoccupied with having to seek shelter and unable to maintain normal civil activity. The choice is between continuous lockdown of urban activity or absorbing the losses of some uncovered population caused by randomly attacking missiles. (Against the V-2 missile attack, unlike aircraft, no alert signals were given in London. Some of the missiles killed more than 100 people each.)

During the Cold War both sides developed and produced improved ballistic missiles for shorter and longer ranges, more accurate than the V2, with a variety of warheads. However, the 1987 Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles (INF Treaty) required elimination of all Soviet and American missiles with ranges between 500 and 5,500 kilometers. The Soviet Scud missile of the 1950s survived the treaty. It was a modernized version of the German V-2 of World War II, delivering a similar 1,000 kg warhead to a similar 300 km distance. It was more accurate, thanks to the use of a better inertial guidance system, and much smaller, which enabled its mounting on a mobile transporter-erector-launcher. The original Scud-B carried a nuclear warhead (having in mind a possible great war over Europe), but the Soviets also built a conventional, high explosive version, mainly for export to their allies. Most known missiles in the Middle East and central Asia, including those that have been used in several Middle East wars, are Scud derivatives (e.g., North Korean Scud-C, Iraqi al-Hussein, North Korean No-Dong, Pakistani Gahuri, Iranian Shihab-3). Some attain longer range: 500, 600, 1000 and even 2,000 km. The accuracy of such ballistic missile is relatively poor and deteriorates with range.

Cruise missiles are single-mission unmanned aerial vehicles. Rather than high speed, the main defensive features of cruise missiles rely on low altitude flight, below radar coverage, with the further aid of having a small radar cross section, either because of small physical dimensions or the use of stealth technology. Their advantage over ballistic missiles is the use of accurate terminal homing devices. Ballistic missiles have the advantage of high velocity. In addition to that, beyond their initial motorized phase, pure ballistic missiles have no guidance or communication systems, which may be vulnerable to disruption. However, their accuracy is limited and becomes worse with longer range. In order to get an accurate hit, it is necessary to make corrections during the last phase of the trajectory, namely, to deviate from the ballistic trajectory. Adding the terminal guidance systems and other needed devices complicates the system, makes it more vulnerable to interception and add much to its cost.

Missiles are smaller than aircraft, have fewer “soft” parts, and are less vulnerable to enemy defensive weapons. Unlike complicated air attack operations that need the planning and timing of many attackers and their fighter escorts, missiles are independent of one another and could be launched at will, whether individually or in salvo, whether concentrated to a single target or scattered. Missile systems life cost is lower because they do not require the expensive and elaborate training of pilots. That has one more advantage of strategic importance; it is far easier to conceal information related to missiles (e.g., size of force, characteristics and performance) from potential enemy intelligence than information about aircraft. The latter can be acquired by following live training flights and surveillance of air bases. Occasionally, in order to

be on the safe side, missile systems were wrongly attributed with higher payloads, longer ranges, better guidance, improved versions of warhead, maneuvering trajectories, and the use of decoys.

An aircraft is a repetitive mission platform operated by a pilot. A missile – whether ballistic- or cruise-missile, is a single mission unmanned platform, destroying itself by its first operation. Modern technology enables such unmanned systems to carry out the needed functions much like aircraft, whether by autonomous systems or guided from afar. However, the only rationale for building a whole vehicle just for a single delivery of a single bomb is the high attrition rate of the multi-mission platform, whether by intercepting aircraft, ground-to-air defense, or high vulnerability of airbases to air attack. The more advanced the defense, the more expensive it becomes to build survivable aircraft, so that missiles become relatively more advantageous.

Advanced aircraft with sophisticated ammunition are beyond the reach of poor and less advanced countries. Effective defense against less advanced aircraft is not as expensive. Hence, aircraft lost much of their importance in those countries, while Scud-like missiles, inaccurate but relatively cheap and relatively invulnerable, became popular. (One of the last accords of the Iran-Iraq war of the 1980s was the ballistic missiles "war of the cities.") With limited resources, such ballistic missiles became a weapon of choice of inferior powers and as leverage against much richer and advanced powers, assuming that those powers were sensitive to even small damage potential on their rear areas, but, for some non-military considerations, are reluctant to open an all-out war and put into effect their enormous military superiority. Under such circumstances even inaccurate missiles with a limited potential of damage have a considerable weight. The inferior powers put their emphasis on demonstrating long range capability, neglecting other characteristics like accuracy or reliability. The importance of the missile threat is exaggerated because of uncertainty and risk aversion.

Anti-Ballistic Missiles (ABM)

It is more demanding to intercept an incoming ballistic missile than an attacking airplane. Missile velocity is much higher, so that the reaction time for the defense is much shorter. The cross section of the functional part of the ballistic missile (fuze and warhead) is much smaller, so that higher accuracy is needed. Even the functional parts are not as vulnerable as many "soft" parts of the airplane, so that a stronger kill mechanism is needed. Hence, ABM systems developed in the 1950s relied upon nuclear warheads. A revolution in accuracy was achieved by the introduction of electro-optic technologies that enable pin-point homing. Some Modern ABM systems (e.g., THAAD, SAM-3) do not use any explosives, but rely on the kinetic energy of the collision of a direct hit. Ballistic Missile Defense (BMD) is highly sensitive to target characteristics that may not be known for sure, or small unknown changes that the attacker may make in hardware or in tactics.

Interception of high speed long range ballistic missiles is demanding. On the other hand, shorter range ballistic missiles involve much shorter reaction time, so that the radius that can be defended by a single battery is relatively small. Defense of a large area against short range ballistic missiles requires a greater number of ABM batteries.

While anti-aircraft defense is technically much easier than ABM, hitting an aircraft is also far more valuable to the defense than hitting a missile. Just threatening the aircraft may disrupt its mission; loss of an aircraft is a loss of his potential future missions, and perhaps loss of the crew. Hitting an aircraft is a kind of active defense, degrading the attacker power; hitting a missile is a kind of passive defense, like camouflage or fortification. Even small rate of anti-aircraft hits may have a strategic importance, while ABM effectiveness depends on very high rates of success.

Anti-ballistic missiles are more expensive than their targets, the more so for countering shorter range ballistic missiles. (For unsophisticated, short range or theater ballistic missiles, the difference may be two orders of magnitude or more.) In general, the attacker can saturate the ABM defense at much lower cost. From a military point of view, ABM is justified only in exceptional cases, like ensuring partial survivability of second strike capability. Otherwise, one who can afford an ABM capability has far better and less expensive alternatives to challenge his rival.

Relying on ABM as a routine defense against ballistic missiles is a privilege only of a highly developed rich power who is sure that his poor rival is unable to multiple his missile arsenal. However, the highly developed and rich power could subdue his opponent by other, far less expensive and more effective means. Perversely, ABM goes against classical military principles, as it aims at the least vulnerable spot of the enemy, rather than taking advantage of his weaknesses. The only justification of ABM under such circumstances may be non-military considerations, political or other, that put constraints on the effective use of force. (Exogenous constraints on the effective use of force became an important factor influencing weapon development and military planning of rich developed countries; behind the high investment in accurate weapons stands not only the objective of improving hits of desired targets, but also the motivation of minimizing collateral damage. Poorer countries do not have enough resources to allow themselves such considerations.)

Nuclear capability

Large waves of World War II heavy bombers, such as fire bombing, could deliver a considerable amount of ammunition over long ranges. The rate of attrition for such raids, however, was high and tactics to avoid air defenses decreased an already low bomber accuracy. Going nuclear (against Japan in 1945) multiplied bomb lethality by more than three orders of magnitude, and compensated for those disadvantages. Similar limitations of lethality and accuracy forced the first ABM missiles (American Spartan and Sprint, Soviet Galosh), developed against intercontinental ballistic-missiles, to be equipped with nuclear warheads. Tactical nuclear warheads were developed for use against fortified targets (extremely heavy fortification is still quite effective against all non-nuclear warheads).

Nuclear warheads favor the attacker inherently. Even strong defenses cannot prevent the great damage of some successful attacks by a relatively modern military nuclear power. Still, each side can ensure the survivability of enough nuclear force for a second strike, even if attacked first. Hence the Multiple Assured Destruction (MAD) philosophy influenced US/Soviet political-military considerations. (The *Star Wars* declaration of President Reagan gave the impression of a comprehensive anti-ballistic missile defense umbrella over the United States;

military professionals realized quite soon that it would actually be just an improved version of more effective defense of the US military "second strike" capability.)

Nuclear capability allows even a militarily inferior power to inflict unbearable damage to a superior opponent. Taking a risk aversion attitude, or assuming worst case scenarios, the superior power should use its elements of national power to deny potential opponents from acquiring a nuclear capability. Actually, this was not done by the United States against the Soviet Union at the beginning of the Cold War. Unfortunately, later efforts by Asian countries to acquire nuclear capability were not deterred by potential and stronger opponents. The acquisition of just a decent nuclear capability may have influence on grand strategy considerations and lowers the role of general military superiority.

Conclusion

Referring to deep air attacks, modern technology provides both attacker and defender with a choice of highly effective systems, albeit at high cost. The role of technological potential and economic resources is predominant.

The attacker has an inherent advantage over the defender, because it is the attacker who chooses the time and place of the attack, and because some technological or operational characteristics of the attack can be hidden from the defender. The defender has to cover a much larger array of possible scenarios than the single scenario that the attacker takes. Assuming a war between two rich, modern air (including missiles) powers, each would be able to inflict much higher damage to the other than that damage achieved in World War II, with lower losses for the attackers in spite of modern defense. It would be difficult, even with modern defense means, to prevent hitting specific sites that a modern attacking power would concentrate on. Yet, each side would be able to defend and keep enough military power needed to maintain the attack. That may be true whether both use or do not use nuclear weapons, (although in the case of nuclear war the total damage, for both, would be higher by orders of magnitude).

Relatively inexpensive ballistic missiles in the hands of less developed poor countries provide a useful leverage against rich and advanced power, as far as the latter's use of force is restrained by political or other non-military considerations.

SPACE OPERATIONS

Spaceflight has evolved from the dreams of the early visionaries and pioneers to become a critical element of the global economy and the National Security interests of the United States and other nations. US National Security goals are fulfilled not only by dedicated government space systems but by major contributions from Civil, Commercial and International space operations. The significant dependence of the United States on these systems has raised concerns about their vulnerability to attack or neutralization.

The Visionaries (1865-1929)

The development of spaceflight had its origins in the early pioneers and the science fiction works which inspired them. National governments initially had minimal involvement in these pioneering space activities and there was little emphasis on the potential military applications but rather on space exploration.

Jules Verne's science fiction novels *A Journey to the Moon* (1856) and its sequel *Around the Moon* (1870) are credited by some of the space pioneers as the primary source of inspiration for their work. The French author was unsuccessful as a lawyer and stock broker. He became a playwright, and then turned to writing novels where he immediate attained fame and fortune with an immensely popular series of science fiction novels which endure to this day. *A Journey to the Moon* depicts a private expedition to the moon planned and executed by the exclusive Baltimore Gun Club, a group of millionaires with an interest in ballistics. Much of the book foreshadowed future aspects of the Apollo lunar program including a launch facility on the east coast of Florida and a three to four day transit time to the Moon.

H.G. Wells, a British physicist and author, wrote two science fiction works dealing with spaceflight. *The War of the Worlds* (1898) was the landmark alien invasion novel in which the Martians conquer Earth but die from diseases to which they have no immunity. The only role which space travel plays in the novel is in the Martian space transportation which delivers their land warfare machines and soldiers to the surface of the Earth. Wells revisited lunar exploration in *The First Men in the Moon* but using advanced anti-gravity propulsion technology based on a gravity-shielding material called Cavorite.

Less known is the work of the American novelist Philip Francis Nowlan *Armageddon 2419 AD* (1928). This novel introduced a character who was to become a cultural icon and the inspiration for many young space scientists and engineers – Buck Rogers

.

Fiction and reality converged in the classic silent science fiction film *Frau Im Mond* (*Woman in the Moon*) directed by Fritz Lang with a screenplay by his wife Thea von Harbou who had previously collaborated on the silent film masterpiece *Metropolis.* Lang wanted the film to be totally realistic and therefore hired Professor Herman Oberth of the VFR - The German Society for Spaceflight (which at the time included a young Wernher von Braun). Oberth produced a lunar mission profile, a heavy lift launch vehicle design (similar in performance to the Apollo Saturn V) and a piloted Lunar Lander (much like the Apollo Lunar Excursion Module). As part of the promotional campaign UFA, the German film company, provided Oberth with R&D funding for the development and launch of a small stratospheric rocket but the project was ultimately unsuccessful, Lang sought to make film as realistic as possible. The woman in the title was Frieda, an astronomer (possibly the first Mission Specialist). The expedition was privately financed and led by Helios (a Paul Allen –like billionaire). The theme of private spaceflight with no government participation for peaceful purposes recurred through the visionary fiction of the era but in Germany this was soon to change.

Konstantin Tsiolkovsky (1857-1935), a Russian high school mathematics teacher, is considered the father of theoretical astronautics. Inspired by the science fiction works he initially explored the flight equations of heavier-than-air flying machines then turned to rocketry. His most important work was *The Exploration of Cosmic Space by Means of Reaction Devices* published in 1903 was the first academic paper on rocketry. Among his many accomplishments he created the first conceptual design for a multi-stage liquid oxygen/liquid hydrogen launch vehicle. Tsolkovsky/s work was little known in the Soviet Union until it was discovered in 1924

by the Russian rocket pioneer Frederich Zander founder of the Society for Studies of Interplanetary Travel.

Robert Hutchings Goddard (1892-1945), a Professor of Physics at Worcester Polytechnic, was the pioneer of spaceflight in the United States and creator of the first successful liquid propellant rocket. Goddard's landmark work *A Method of Reaching Extreme Altitudes* was published by the Smithsonian Institution in 1919. On March 16, 1926 Goddard conducted the first successful launch of a liquid propellant rocket. Goddard proposed a Lunar probe which would impact the Moon's surface igniting a magnesium flash which could be observed from Earth. Although Goddard's work was known and appreciated in Germany and the Soviet Union it was greeted with skepticism and derision by the American press and public. Seeking privacy Goddard moved his launch operations to Roswell New Mexico where he continued his work in seclusion. Goddard's principal ally and funding advocate during the 1930's was Charles Lindbergh.

Hermann Oberth (1894-1989) was a German physicist/engineer of Rumanian birth who is considered by many to be the father of modern spaceflight. Inspired by the science fiction works of Jules Verne Oberth began his interest in rocketry as a youth and as a German soldier in World War I. His pioneering work was *Die Rakete zu den Planetenrlumen* (*The Rocket into Interplanetary Space*) published in 1923. In this work Oberth laid the foundation for space vehicle design and operation. In 1927 he joined the VFR – the German Society for Spaceflight which included a young Wernher von Braun. In 1929 he published a greatly expanded version of his earlier work entitled *Wege zur Raumschiffart* (*Ways to Spaceflight*) which provided the first comprehensive presentation of space mission applications. His work proposed some radical concepts including the launch and operation of large deployable mirrors which could be used to reflect the Sun's rays for night illumination and climate modification. This idea was revisited by the Nazis during World War II and by the United States during the Cold War

.

Germany's Rocket Development Programs (1929-1945)

The German Army Ordnance ballistic missile development program provided the technology foundation and point of departure for the Cold War space competition between the United States and the Soviet Union. It also provided outstanding technical talent which was later to play a critical role in the competing ballistic missile and space programs of the great powers. What became the first large black program of the twentieth century sprang from modest beginnings in the later years of the Weimar Republic.

In 1929 Lt. Col. Dr. Ing Karl Becker Commander of Section 1 (Ballistics and Munitions) of German Army Ordnance established a special program to revive and advance rocketry, a technology that was not constrained by the Treaty of Versailles. Becker's initial interest was in advanced solid propellant rockets for the delivery of chemical warfare agents but his emphasis soon turned to the more promising area of liquid rocket propulsion technology. Becker became aware of the pioneering work of the German Society for Spaceflight and the other amateur rocketry organizations and sought to acquire this expertise under development at the *Raketenflugplatz* facility near Berlin. One of Becker's challenges was identifying the real talent in these organizations and screening out the crackpots, self-promoters and hangers-on which typified these amateur groups. In 1932 Becker made his most critical talent acquisition when he

hired the young Wernher von Braun who was completing his doctoral dissertation and assigned him to Section 1 under Major Walter Dornberger of Becker's protégés. It was this technical team which led to the ultimate success of the ballistic missile program. Ultimately all German Rocket Development was absorbed by Section 1 and test activities were moved from the *Raketenflugplatz* to the new Army Ordnance test range at Kummensdorf.

Shortly after Hitler came to power in 1933 there was an immediate suppression and dissolution of the German amateur rocket societies and all technical information was impounded and classified at a special security level creating in modern terms a compartmented black program. Becker had convinced the new Nazi leadership of his long time belief that advanced rocket development could be the basis for technological and strategic surprise. Although there were a series of advances and setbacks in the priority afforded the German ballistic missile program (do in no small part to Hitler's meddling and his bizarre decision process) it ultimately received high national priority and substantial funding.

German Army Ordnance formed a strategic alliance with the Luftwaffe for the establishment of a joint development and test facility. The alliance was forged by Major Wolfram Freiherr von Richtofen a cousin of the Red Baron, a fighter pilot in the same squadron and an ace himself. He was an aggressive and imaginative leader who sold the idea to the Nazi leadership. Wernher von Braun went in search of a location. He found it by accident. While home for the Christmas holidays he mentioned his search to his mother who recommended Peenemunde, a remote site at northern tip of Usedom Island on the Baltic. It was relatively inaccessible which helped security but only about 250 km north of Berlin. He visited the site, immediately recommended it to the leadership and the development of the site proceeded after some bickering between Section 1 and the Luftwaffe.

One critical aspect of the program was that virtually every technology (aerodynamics, propulsion, structures guidance and control) had to be developed from scratch. This was feasible because of Germany's strong industrial base and the team's effective use of rapid prototyping. The details of the German ballistic missile development program which led to the successful launch of the first A4 (V-2) in 1942 will not be repeated here. For those readers who wish to explore the subject in greater depth Michael J. Neufeld's excellent book *The Rocket and the Reich: Peenemunde and the Coming of the Ballistic Missile Era* (1995) is highly recommended.

The ultimate objective of Nazi Germany's ballistic missile program was the development of an Intercontinental Ballistic Missile (ICBM) which could attack high value targets on the east coast of the United States such as New York City, Preliminary design work on the concept was begun on a two stage ICBM the A9/A10 in 1940 two years before the first successful launch of the A4 (V-2). The A9 was a single stage optionally-piloted boost glide vehicle designed to attack targets in the European Theater of Operations beyond the range of the V-2. The A10 was a large first stage which when combined with the A9 second stage formed the ICBM. The A9 was to have been equipped with cartographic radar and a map-matching capability by the pilot who would perform a final accuracy maneuver and then eject to be rescued by a submarine. The baseline warhead for both the A4 and A9 was 1000kg of Amatol but there is some evidence that a radiological warhead (liquid radioisotope in sand) was under development for an A4d version of the V-2. Wernher von Braun had always envisioned that a space launch capability would be a

natural evolutionary path from the ICBM and therefore the A11, A12 and A13 were orbital launch vehicle designs which never evolved beyond the concept stage. The A9/A10's original operational date was 1946 but some sources indicate that work on the project was terminated in 1942.

Dr. Eugen Sanger and his wife Dr. Irene Bredt undertook development of the *Silbervogel* (Silverbird) global range skip glide vehicle as their entry in the *Luftwaffe Amerika Bomber* competition. The Silverbird was the culmination of many years of hypersonic aerodynamics, structures and propulsion research by the Sanger-Bredt team. The Silverbird was a piloted rocket-powered sled-launched hypersonic vehicle which would attain global range by skipping across the upper atmosphere. Its mission was weapon delivery to the continental United States with New York city as the primary target. The Silverbird's primary payload was a 2500kg silicate case radioisotope radiation spreading device designed to detonate at 1000 meters altitude over downtown Manhattan. The *Silbervogel* never progressed beyond the technology development phase but the concept influenced a number of postwar boost-glide vehicle designs. After the war Stalin became obsessed with the Silverbird and sent a team lead by his son Vasilli to Paris to recruit (abduct) Sanger but the mission failed.

The Cold War In Space (1946-1990)

With the end of World War II and the looming rivalry between the United States and the Soviet Union both of the superpowers sought to acquire and exploit the advanced technology developed by Nazi Germany. This ultimately led to the development of ballistic missiles by both sides and the Cold War Space Race.

The potential spectrum of conflict in space during the Cold War and beyond is effectively defined in *The Politics of Space Security* (2008) an excellent work by Professor James Clay Moltz of the Naval Postgraduate School. This paper will adopt his approach as a framework for analysis. Moltz defines the spectrum to range from the most confrontational to the most cooperative as follows: *space nationalism, technological determinism, social interactionism* and *global institutionalism.* The two extremes in simple terms "space defense" versus "space sanctuary." The *space nationalism* view prevailed from 1958 through 1965 at which point the United States and the Soviet Union began to take some small steps toward greater cooperation which culminated in today's International Space Station collaboration.

Walter Dornberger, Wernher von Braun and other German engineers and scientists were brought to the United States to develop future ballistic missile and space systems under a controversial program called Operation Paperclip. Most of von Braun's team followed him to the US Army missile development activity at Fort Bliss at El Paso, Texas and eventually to the Army Ballistic Missile Agency at Redstone Arsenal in Huntsville, Alabama After Sputnik von Braun and his team were transferred to the newly formed National Aeronautics and Space Administration in the Marshall Space Flight Center in Huntsville. Walter Dornberger joined the Bell Aircraft Company in Buffalo, New York and worked on a number of hypersonic vehicle projects The Soviets also initially employed a number of German rocket engineers to support their missile design bureaus but eventually repatriated them to East Germany

Principal emphasis in the United States in the 1950's was initially on suborbital and orbital boost glide vehicles for strategic nuclear weapon delivery and strike reconnaissance The BOMI (Bomber Missile), Brass Bell and ROBO (Rocket Bomber) were intercontinental boost glide systems advocated by the United States Air Force Air Research and Development Command (ARDC) and pursed by Bell, Boeing and other major aerospace companies This progression ultimately lead to the development of the Boeing X-20 Dyna-Soar orbital boost glide vehicle which was ultimately cancelled In 1946 the Soviet Union established the NH-1 NKAP research institute under Mstislav Keldysh who sought to develop an advanced version of the Sanger Silverbird. The Keldysh Bomber design added air-breathing ramjet engines to the wing tips to reduce oxidizer consumption and other improvements but the vehicle was overshadowed by the massive Soviet ballistic missile program and was ultimately cancelled

Building on the foundation of the German ballistic missile program and captured V-2 (A4) the Soviet Union undertook an extensive ballistic missile development program
Ballistic missile development started with the R-1 which was a Soviet built V-2 evolving through a series of short, intermediate and long range ballistic missiles culminating the testing the R-7 (SS-6) ICBM in May 1957

The International Geophysical Year 1957 included the planned launch of the first artificial earth satellite by the United States the Navy's Vanguard launch vehicle which was selected over the Army's Project Orbiter because it was not based on a military rocket
In October 1957 the Soviets Launched the small Sputnik satellite which surprised and shocked the United States. The US attempted to respond with an accelerated test launch of Vanguard which failed spectacularly on the pad. In January 1958 the von Braun team was allowed to proceed and successfully launched the JPL Explorer 1 spacecraft using the Jupiter C test vehicle

Corona was a highly classified film return reconnaissance satellite program designed to replace the largely unsuccessful WS-119L and WS-164L reconnaissance balloon overflight systems and the piloted U-2 The program was run by the newly established National Reconnaissance Office (NRO) which operated under a veil of extreme secrecy A cover program, Discoverer, was established which masqueraded as space biological research program which used reentry vehicles to return samples (which in reality were film return systems)After a long failure-plagued test program Corona conducted its first successful test mission in 1964 Since overflight by reconnaissance spacecraft was tacitly accepted by all parties as not violating sovereign airspace the diplomatic problems presented by atmospheric overflight systems were avoided

The Soviet Salyut 1 was the first manned space station Salyut 1's mission was photo reconnaissance and the crew's primary function was to maintain and repair the low reliability subsystems and short mission life which plagued early Soviet space systems The space transportation system which supported Salyut was the Soyuz three seat manned spacecraft which was a byproduct of the abandoned Soviet manned lunar exploration program Early operations of the Soyuz resulted in the death of a Soviet test pilot and the asphyxiation of three cosmonauts when a valve stuck in the vehicle's life support system after separation from the Salyut
Soyuz evolved into a highly reliable manned spacecraft and advanced variants provide the primary Russian space transportation system currently supporting the International Space Station

Space Operations in a Multipolar World (1991 and Beyond)

US Joint operations have become increasingly dependent on military, civil and commercial space systems These Space Force Enhancement systems perform the following missions:

- Intelligence, Surveillance and Reconnaissance (ISR)
- Missile Warning
- Environmental Monitoring
- Satellite Communications
- Space-based Positioning, Navigation and Timing
- Other

This increasing US dependence on space systems has raised issues relative to their vulnerability to anti-satellite (ASAT) and other threats such as cyber warfare systems. In addition to the global war on terror there are increasing concerns over the expanding capabilities and intent of the Chinese military space program.

Joint Publication 3-14 provides joint doctrine for planning, executing and assessing joint space operations and defines the following Space Mission Areas:

- Space Force Enhancement
- Space Support
- Space Control
- Space Force Application

Pub 3-14 also describes Command and Control of Space Forces, defines Organizational Roles and Responsibilities and describes the Planning Process

The Future

The greatest uncertainty in the future of space operations is where in the spectrum between space as a traditional military conflict arena to space as a sanctuary with total international cooperation will the future Although China is a major source of uncertainty, India and other emerging players in space will also be part of the equation Except for information systems the advance of space technology has been slow and largely evolutionary especially with regard to space transportation where there have been no breakthroughs in propulsion technology in over fifty years. Four alternate futures for Space Operations can be envisioned as bounding conditions

- High Conflict Level / Evolutionary Technology
- High Conflict Level /Discontinuous (Breakthrough) Technology
- Low Conflict Level/ Evolutionary Technology
- Low Conflict Level/Discontinuous (Breakthrough) Technology

Summary

Concepts of space operations, space systems and critical technologies originated with the visionaries of the late 19th and early 20th century. The Nazi ballistic missile development program produced the V-2 (A4) and provided the foundation for the Cold War space competition between the United States and the Soviet Union. Space operations are critical to National Security and are now a complex combination of not only traditional National and Military

operations but Civil, Commercial and International operations as well. Significant future uncertainties exist relative to space conflict levels and the technologies available to conduct operations.

UNCONVENTIONAL WARFARE AND SPECIAL OPERATIONS

Unconventional warfare is a broad spectrum of military and paramilitary operations, normally of long duration, predominantly conducted by indigenous or surrogate forces that are organized, trained, equipped, supported, and directed in varying degrees by an external source. It includes guerrilla warfare and other direct offensive, low visibility, covert, or clandestine operations, as well as the indirect activities of subversion, sabotage, intelligence activities, and evasion and escape.[65] Among the roles of special operations forces is the conduct or facilitation such unconventional warfare. Because of the close association between unconventional warfare and special operations/forces, other special operations are also discussed here, for example, direct action and special reconnaissance.

Unconventional warfare

Unconventional warfare includes *guerrilla warfare* and other low visibility, covert, or clandestine operations, as well as subversion, sabotage, intelligence collection, and evasion and escape. Guerrilla warfare consists of military and paramilitary operations conducted by irregular, predominantly indigenous forces in enemy-held or hostile territory. It is the overt military aspect of an insurgency or other armed resistance movement. Guerrilla forces primarily employ raid and ambush tactics against enemy vulnerabilities. In the latter stages of a successful insurgency, guerrilla forces may directly oppose selected, vulnerable enemy forces while avoiding enemy concentrations of strength.

Subversion is an activity designed to undermine the military, economic, psychological, or political strength or morale of a regime, nation, or non-state actor. All elements of the resistance organization contribute to the subversive effort, but the clandestine nature of subversion dictates that the underground elements perform the bulk of the activity.

Sabotage is conducted from within and against the enemy's infrastructure in areas presumed to be safe from attack. It is designed to degrade or obstruct the war-making capability of a country by damaging, destroying, or diverting war material, facilities, utilities, and resources. Sabotage may be the most effective or only means of attacking specific targets that lie beyond the capabilities of conventional weapon systems. Sabotage selectively disrupts, destroys, or neutralizes hostile capabilities with a minimum expenditure of manpower and materiel. Once accomplished, these acts can further result in the enemy spending excessive resources to guard against future attack. During World War II in the Soviet Union, Soviet *Partizans* disrupted rail traffic in the German rear areas, resulting in the commitment of large formations to rear area security.

In unconventional warfare, the intelligence function must collect, develop, and report information concerning the capabilities, intentions, and activities of the established government, occupying power, or non-state actor and its external sponsors. In this context, intelligence

---

[65] Based on Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms, 12 April 2001 (as amended through 5 September 2003).

activities have both offensive and defensive purposes and range well beyond military issues, including social, economic, and political information that may be used to identify threats, operational objectives, and necessary supporting operations.

Escape and evasion is an activity that assists military personnel and other selected persons to move from an enemy-held, hostile, or sensitive area to areas under friendly control; avoid capture if unable to return to an area of friendly control; and if captured, escape.

Unconventional warfare is the military and paramilitary aspect of an insurgency or other armed resistance movement and may often become a protracted politico-military activity. From a government perspective, unconventional warfare may be the conduct of indirect or proxy warfare against a hostile power for the purpose of achieving national interests in peacetime; it may be employed when conventional military involvement is impractical or undesirable; or it may be a complement to conventional operations in war. The focus of unconventional warfare is primarily on existing or potential insurgent, secessionist, or other resistance movements. Special operations forces may provide advice, training, and assistance to existing indigenous resistance organizations, for example, the *Jedburgh* teams that were parachuted into Nazi occupied France during World War II to help organize and aid the French Resistance.

When unconventional warfare is conducted independently during war or military operations other than war, its primary focus may be on political and psychological objectives although outright banditry cannot be ruled out. A successful effort to organize and mobilize a segment of the civil population may culminate in military action.

Strategic unconventional warfare objectives may include the following:

- Undermining the domestic and international legitimacy of the target authority.
- Neutralizing the target authority's power and shifting that power to the resistance organization.
- Destroying the confidence and will of the target authority's leadership.
- Isolating the target authority from international diplomatic and material support while obtaining such support for the resistance organization.
- Obtaining the support or neutrality of the various segments of the society.

When unconventional warfare operations support conventional military operations, the focus shifts to primarily military objectives, for example, the disruption of rail traffic by the French *Marquis* during the D-Day invasion in 1944. However, the political and psychological implications remain. Unconventional warfare operations delay and disrupt hostile military activities, interdict lines of communications, deny the hostile power unrestricted use of key areas, divert the hostile power's attention and resources from the main battle area, and interdict hostile warfighting capabilities. Properly integrated and synchronized unconventional warfare operations can extend the depth of air, sea, or ground battles, complement conventional military operations, and provide the JFC with the windows of opportunity needed to seize the initiative through offensive action.

During war, special operations forces may directly support a resistance movement by infiltrating operational elements into denied or politically sensitive areas. They organize, train,

equip, and advise or direct the indigenous resistance organization. In situations short of war, when direct governmental involvement is inappropriate or infeasible or must be deniable, special operations forces may instead provide indirect support from an external location.

Guerrilla and resistance forces and their special operations forces must be prepared for a brutal response buy their targets especially against the innocent population. The Nazi killing of ten hostages for every Nazi soldier killed comes to mind.

Special operations are usually conducted by specially organized, trained, and equipped military and paramilitary forces to achieve military, political, economic, or psychological objectives by unconventional military means in hostile, denied, or politically sensitive areas. These operations are conducted during peacetime competition, conflict, and war, independently or in coordination with operations of conventional, non-special operations forces. Political-military considerations frequently shape special operations, requiring clandestine, covert, or low visibility techniques and may involve oversight at the highest policy making levels. Special operations differ from conventional operations in the degree of physical (small teams) and political (deniability) risk, operational techniques, mode of employment, independence from friendly support, and dependence on detailed operational intelligence and indigenous assets. Special operations are a form of warfare characterized by a unique set of objectives, weapons, and forces. Virtually all nations and non-state actors have a special operations capability or the need for such.

Employment of conventional forces, if they exist, usually involves movement of large operational units and requires extensive support structures. Such force movement and employment are generally observable and traceable to a government, which may not want such involvement traced (producing deniability). However, the capabilities of special operations forces primarily are a function of individual and small unit proficiency in a multitude of specialized, often unconventional, combat skills applied with adaptability, improvisation, innovation, and self-reliance. The small size, unique capabilities, and often self-sufficient (for short periods) nature of the operational units of special operations forces provide a government with feasible and appropriate military responses that do not entail the degree of political liability or risk of escalation normally associated with employment of necessarily larger, or more visible, conventional forces. One of the risks of deniable operations is that wounded and captured operators may not be retrievable by overt means, if at all.

Special operations forces are not a substitute for strong conventional forces for nation states but a necessary adjunct to existing conventional capabilities. However, when confronting a larger more militarily capable nation or polity, special operations and/or guerrilla forces may be the only way to carry the fight to the enemy.

Depending on requirements, special operations forces can operate independently or in conjunction with conventional forces. Special operations forces can complement and reinforce conventional forces so that they can achieve an objective that might not otherwise be attainable. The special skills and low visibility capabilities inherent in special operations forces also provide an adaptable military response in situations or crises requiring tailored, precisely focused use of force. Special operations forces can be quickly task-organized and rapidly deployed to provide a

government a selective, flexible crisis response capability. Often, special operations forces may be the force of choice for the leadership to provide a capability that falls between diplomatic initiatives and the overt commitment of conventional force. Special operations forces can be designed for specific principal missions. An imprecise understanding of special operations forces capabilities or the improper employment or support of special operations forces at any level of command can result in mission failure, attendant political costs, and possible loss of the entire force.

Special operations are marked by certain characteristics that cumulatively distinguish them from conventional operations:

- Principally offensive, usually of high physical and political risk, and directed at high-value, critical, and often perishable targets. They offer the potential for high returns, but rarely a second chance should a first mission fail.
- Often principally politico-military in nature and subject to oversight at the national level. They frequently demand operator-level detailed planning and rapid coordination with other more conventional military and governmental agencies.
- May frequently be covert or clandestine.
- Frequently prosecuted when the use of conventional forces is either inappropriate or infeasible for either military or political reasons.
- Rely on surprise, security, and audacity and frequently employ deception to achieve success.
- Often conducted at great distances from established support bases, which requires sophisticated communications and means of infiltration, exfiltration, and support to penetrate and recover from hostile, denied, or politically sensitive areas.
- May require patient, long-term commitment in a given operational area to achieve national goals extended unconventional warfare operations. Often, the training and organization of indigenous forces are required to attain these objectives.
- Frequently require discriminate and precise use of force; a mix of high and low technology weapons and equipment; and often rapid development, acquisition, and employment of weapons and equipment not standard for conventional forces.
- Most successful when conducted by specially recruited, selected, and trained personnel, organized into small units tailored for specific missions or environments. Missions often require detailed knowledge of the culture(s) and language(s) of the country where employed.
- Most successful when accompanied by detailed intelligence, thorough planning, decentralized execution, and rigorous detailed rehearsal.

Special operations forces

Most authoritative sources provide definitions of special operations and special forces that are either restrictive or ambiguous. The restrictive definitions do not satisfy our requirement that they be applicable across time and cultural boundaries. The broad definitions lack philosophical substance.

For example, one source says that special operations are “secondary or supporting operations that may be adjuncts to other operations and for which no one service is assigned primary responsibility.” And, a special force is “any military force trained for unusual or

unconventional operations." The US Army's Special Forces consist of personnel with cross training in basic and specialized military skills. They are organized into small, multipurpose detachments with the mission to train, organize, supply, direct, and control indigenous forces in guerrilla warfare and counterinsurgency operations, and to conduct their own unconventional warfare operations."

While these definitions are helpful, they meet neither the test of time nor square with contemporary experience. Xerxes' Immortals – the specially selected Persian warriors who scaled a secret mountain path at Thermopylae in order to strike the Greeks in the rear—were a special force that conducted a special operation. The Immortals were not a small force and they conducted an operation that was of primary importance to the Persian army.

More recently, British Commando and US Ranger forces conducted raids along the German occupied coast of France, Norway and other continental areas during World War II. While these tended to feature small forces, some of the raids involved several thousand soldiers, sailors and airmen. In many instances, the commando raids (which the British termed "combined operations") were the only combat activity in the theater at the time. In relation to the fighting that took place after the Normandy Invasion, the commando raids seemed secondary and supportive, but at the time most of them were conducted they were a primary means (along with the strategic air and sea campaigns) of striking back at the Germans.

In contemporary times we have witnessed special operations by elite units of different countries. Special operations forces have been used to strike back at terrorist groups and rogue regimes – Israeli operations against different Arab-based terrorist groups are one example; the bungled US Operation Desert One to free hostages from Iran is another. Although special operations were a feature of the Vietnam War, special operations do not necessarily have to be designed to "control indigenous forces in guerrilla warfare."

Special operations forces are those forces specifically organized, trained, and equipped to conduct and support special operations.[66] In addition to unconventional warfare tasks, special operations forces may also perform direct action tasks and special reconnaissance (described below).

Under certain circumstances, conventional forces may provide the capabilities required to conduct a specific special operation. However, designated special operations forces are normally the ones principally structured to be the force of choice under most circumstances. The special operations forces may include, for example:

- *Ground.* UK Special Air Service, Polish GROM [spell out], US Ranger, and the Iranian Quods Force. But not psychological operations and civil affairs units, which are associations of convenience for US organizations.
- *Water.* US Marine Corps force reconnaissance units, from-the-sea delivery vehicles, and the UK Special Boat Service.

[66] Based on Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms, 12 April 2001 (as amended through 5 September 2003).

- *Air.* Fixed-wing and vertical-lift aircraft and aircrews to conduct infiltration, exfiltration, and resupply; aerial fire support; and aerial refueling; special tactics teams composed of air combat control and pararescue forces, weather, and communications.

The demands of unconventional warfare require forces with attributes that distinguish them from conventional forces. Personnel may undergo lengthy selection processes or extensive mission-specific training programs above basic military skill training to achieve basic special operations skills. Units are small and necessarily maintain high personal and professional levels of maturity and experience, usually in more than one principal field. The complex special operations selection and long lead-time objective and subjective maturation process make any rapid replacement of personnel or capabilities very difficult.

Geographic area orientation is often required and includes the capability to execute all foreseeable operations in the full range of the area's environmental conditions. Detailed area orientation, including mastery of language and culture, requires long-term, dedicated training and may be applicable to air, ground, and maritime special operations forces units, depending on mission assignment. To develop and maintain skills, special operations forces should train and exercise under conditions resembling the operational environment in which they intend to operate.

Direct Action

Direct actions are short-duration strikes and other small-scale offensive actions by special operations forces to seize, destroy, capture, recover, or inflict damage on designated personnel or materiel. In the conduct of these operations, special operations forces may employ raid, ambush, or direct assault tactics; emplace mines and other munitions; conduct standoff attacks by fire from air, ground, or maritime platforms; provide terminal guidance for precision-guided munitions; and conduct independent sabotage.[67]

In the conduct of direct action operations, special operations forces may employ raid, ambush, or direct assault tactics; emplace munitions and other devices; conduct standoff attacks by fire from air, ground, or maritime platforms; provide terminal guidance for precision guided munitions; and conduct independent sabotage.

Direct action operations are normally limited in scope and duration and usually incorporate a planned withdrawal from the immediate objective area. Special operation forces may conduct these missions unilaterally or in support of conventional operations. Direct action operations are designed to achieve specific, well-defined, and often time-sensitive results of strategic, operational, or critical tactical significance. They frequently occur beyond the reach of tactical weapon systems and the selective strike capabilities of conventional forces. Operations typically involve attack on critical targets (materiel or personnel); interdiction of critical lines of communications or other target systems; location, capture, or recovery of designated personnel or materiel; and seizure, destruction, or neutralization of critical facilities in support of conventional forces or in advance of their arrival.

---

[67] Based on Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms, 12 April 2001 (as amended through 5 September 2003).

Individuals and small units from team to multi-battalion size conduct direct action. Although normally thought of in terms of ground or maritime close-combat type operations, they also include standoff attacks by weapon systems either delivered or directed by special operations forces. Close combat tactics and techniques are employed when the target and mission require precise or discriminate application of force beyond the capability of other forces and weapon systems or when the mission requires recovery or capture of personnel or equipment. Standoff attacks are conducted in support of close combat actions or independently when the target can be sufficiently damaged or destroyed without the commitment of close-combat type forces.

As usual, deliberately planned missions are best. They capitalize on detailed intelligence, thorough planning, and meticulous rehearsal to enhance the probability of success. In response to crises, time-sensitive missions are conducted against perishable or fleeting target or to capitalize on narrow windows of enemy vulnerability. Because of limited planning and rehearsal time and usually incomplete intelligence due to significant time constraints, the probability of success is generally less than that for deliberate operations.

Direct action missions to locate, recover, and restore to friendly control persons held captive, isolated, or threatened in sensitive, denied, or contested areas (e.g., hostage rescue) may be conducted when the priority of the operation is sufficiently high to warrant planning and conducting a special operation.

Special reconnaissance

Special reconnaissance is reconnaissance, surveillance, and target acquisition conducted by special operations forces to obtain or verify by visual observation, aural, electronic, photographic or other detection and collection methods, information concerning the capabilities, intentions, and activities of an actual or potential enemy or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. It includes the systematic observation of surface areas, places, persons, or things and the detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons; area assessment; and post-strike reconnaissance. Special reconnaissance mission areas are essentially the same for the strategic, operational, and tactical levels of operations and interest. Mission areas include indications and warning, planning and employment, and assessment.

Indications and Warning. Strategic- and operational-level special reconnaissance operations provide information necessary to assess forces and installations that threaten the nation and its allies. It may be used to enhance a nation's ability to conduct military operations on a global, theater, or regional basis. Reconnaissance missions may require both continuous surveillance and on an as-required basis to provide timely indications and warning of a threat or impending attack. Special operations force assets can assist in monitoring or verifying compliance with international agreements, e.g., arms control agreements. Tactical special reconnaissance operations provide information and intelligence similar to the strategic and operational level necessary to assess force strength and deployment, defensive and offensive capabilities, and other factors that may affect conventional force military plans and operations. Special reconnaissance missions may require both continuous surveillance and as-required

reconnaissance. They can assist in providing indications and warning of a threat or impending attack in sufficient time for an appropriate response.

Assessment. Special reconnaissance operations provide assessment support to all levels of command before, during, and after the conduct of military operations. They can provide an important means for assessing friendly deception efforts. Assessments like battle damage assessment can provide information on the success of military operations and the need for follow-up or new operations. They can assist in determining where and when to employ scarce resources and concentrate efforts. Such assessments will affect the formulation of policy and military plans at all levels of conflict.

Operations Security. Operations security must be used when generating special reconnaissance resources, while sustaining and protecting the forces, and in planning and conducting reconnaissance and surveillance operations. The purpose is to enhance combat effectiveness by gaining and maintaining essential secrecy about friendly military capabilities, intentions, and operations. Special reconnaissance operations and planning must be closely coordinated with conventional force mission strategies and objectives to ensure activities and communications do not reveal indications of the primary mission that may be exploited by adversaries. Essential secrecy is required about the specific characteristics of sensors and data links, wartime reserve mode designs, deployment intentions, areas under surveillance, when and where reconnaissance will take place, patterns of operations that may imply operational objectives, and processing capabilities.

Military Deception. Special reconnaissance operations may be used in four ways to support military deception. The first way tasks special operations forces assets to identify and locate appropriate targets for military deception within the enemy command and control structure. The second way involves special reconnaissance operations to monitor enemy actions or inactions relative to deception plans being implemented by the conventional forces. Enemy actions may include troop movement in reaction to perceived friendly movement or increased surveillance activity by the enemy in attempts to monitor friendly activities. Third, increased special operations forces activity in a specific area away from the main thrust of a conventional operation may deceive the enemy into thinking that conventional forces may be preparing an operation into a specific area. Such special reconnaissance activities, along with other military deception inputs, confuse enemy commanders, allowing conventional force commanders to exploit the situation. And fourth, special operations forces assets may be used to support detection of enemy military deception.

The Battle of Debecka Pass

On 6 April 2003, at the Debecka Pass in northern Iraq, two Special Forces special reconnaissance teams stopped the advance of, and destroyed, an artillery-supported armored infantry task force of about battalion size.

At the beginning of major combat operations in Operation Iraq Freedom, 2003, Turkey denied Coalition forces access by ground to northern Iraq. US Special Forces, including indigenous support and special reconnaissance teams were staged through Romania into northern Iraq, primarily the Kurdish areas, by air. The primary mission of these teams was to tie down Iraqi

forces that might have turned south to attack the main Coalition effort. The reconnaissance team actions included:

- Screening the arrival of the 173rd Airborne Brigade by parachute drop and its reinforcement
- Providing indications and warning of the advance of Iraqi units to attack the airborne landing
- Determining the composition and location of enemy units and obstacles to Coalition advance
- Deceiving the Iraqis as to the lack of strength of the Coalition forces by aggressive small unit action
- Disrupting an enemy advance by using hit and withdraw tactics as well as the calling in of air strikes.

Conclusion. Special operations by illegitimate or revolutionary polities are judged by different standards. Failure in peacetime does not carry the same high price as it does for major powers. In wartime, such entities are either aligned with one or the other belligerent power or are seeking advantage while their region is in turmoil. In either case, the special operations they may conduct are relatively insignificant in the overall scheme of things, unless they fail; in which case local catastrophe is the expected result.

INTEGRATED OPERATIONS

The three best known forms of integrated operations are:

- *Combined Arms Operation* that is carried out by military elements integrated within a Service. An army form is cooperative action by the branches such as infantry, artillery, armor, and signal corps. A navy form is a task force composed to accomplish a specific task or mission. A standing task force is a carrier battle group, comprising aircraft, an aircraft carrier, surface combatants, and sometimes a submarine and surveillance elements. An Air Force form is a strike formation comprising bombers, escorting fighters, and aircraft for electronic suppression of enemy defenses.
- *Joint Operation* that combines the elements of two or more Services to achieve mutually supporting operations.
- *Combined Operation* that involves two or more nations that join forces to fight a common foe.

Characterizing Integrated Operations

Integrated operations are crucially important because they can enhance fighting power when well led. Many objectives literally cannot be achieved without a joint operation. Amphibious landings have been joint operations since antiquity.

There are always tensions when integrated operations are undertaken. The leader's anticipated performance may be suspect, first, because his experience may not be sufficiently broad, and second, because he may be suspected of parochialism and mistrusted. The U. S. Navy's Composite Warfare Command doctrine, issued in the early 1980s, came about because the professionalism of task force commanders and their staffs was not sufficiently broad for strike, air and missile defense, antisubmarine warfare, and so forth. To illustrate with an example many years earlier, at the siege and naval battle of Actium of 31 B. C. E. strong mistrust existed

between the land and sea forces of the Eastern coalition. In this instance it was justified, because Antony and Cleopatra fled the scene of battle at the critical juncture.

Training for the intended operation is necessary. Training for integrated operations takes time away from the development of skills that the components bring to the operation. Service-specific combined arms training is usually in balance because Service leaders ensure it, but individual unit skills nevertheless can suffer from the time taken up by combined arms training. In the Navy, ship and unit skills are built in what is called "type training" which is an essential foundation for effective teamwork in integrated operations. If the training is for joint operations then a joint commander has a right to expect each Service component to arrive well trained. However, in the American armed forces the joint commander must live with Title X law, which requires each Service to organize, train, and equip its fighting elements, but empowers the U. S. Combatant Commanders to employ them.

The absence of training for Combined operations by the forces in a coalition is a notorious weakness.

Irregular Warfare

Terrorists and guerrillas do not conduct integrated operations. Guerrilla attacks require coordination no greater than that of an army company or integration on (at the most) the scale of a special operations force behind enemy lines. This kind of intra-Service integration typical of terrorist groups is not what we have in mind as an integrated operation. When a guerrilla force reaches the level of activity to undertake regular combat, as in the Tet offensive; or the Communists' final defeat of the Nationalists in China; or the semi-combined operations of the British Army with the Spanish guerrillas in the Peninsular campaign against the French army of occupation, then the tenets of integrated operations will hold, but not before.

On the other hand, civil-military collaboration is a form of integrated operations that is essential to resist terrorists, yet is difficult to bound and organize. Current American efforts to collaborate for enhanced homeland defense and disaster response are on a scale beyond anything before attempted in "peacetime." The wartime attempts to suppress sabotage and espionage are comparable in scope, but today America and most democracies resist the potential infringement of individual rights to privacy in "peacetime." Civil rights were also waived in World War I, the American Civil War, and even more ruthlessly in the Revolutionary/Napoleonic Wars.

Insofar as integrated operations are concerned, there is no sharper example of asymmetric warfare than the distinction between attacker and defender in the war against Islamic Extremists. The defender suffers all the handicaps of integrated operations that the attacker avoids. Observing the use of improvised explosive devices and other forms of guerrilla attacks in Iraq are a good opportunity to observe the asymmetry. Different commentators will probably hold differing views on the extent to which the various factions have, or are capable of, integrated operations. There is no question, however, that on the defender side there are many lessons to be learned in the difficulties of joint, combined (US, coalition partners, and the Iraq government), and civil-military integration.

Aggregated Operations

Outside the boundaries of what are usually thought of as integrated operations are forces built up within a service, from divisions (or brigades) to corps, armies, and army groups. To coin an identifying term these might be called aggregated operations, in full recognition that the command structure and geographic distribution has much to do with whether the operation is aggregated, independent, or something in between. Even within a single service, it is a truism that the sum of the elements (in units of soldiers or tanks, for example) is greater than their aggregated combat potential. Thus the combat potential of two divisions is less than twice the combat potential of one division. This is not an argument against aggregation. If we take the aggregate potential (somewhat pessimistically) to be one-and-a-half times the potential of a single division we would still choose to concentrate the two divisions' operation against a single division.

There should be no surprise in this. Friction grows as forces become larger. The ideal of perfect collaboration, or unity of command, is only an ideal, because competent component commanders tend to be willful, with their own perspective on how to accomplish the mission. The genius of General Dwight Eisenhower was to neutralize the widely differing perspectives of Bernard Montgomery and George Patton and sometimes even of Omar Bradley. When we add the air and sea commanders reporting to Ike into the mix, we can respect all the more his blend of firmness and grace. Here we have transitioned from single-service aggregation to the integrated joint and combined operations, but the point remains. Collective action is difficult. It involves friction in the best of circumstances, with the consequence that, when measured in units of fighting potential and combat power, the whole is less than the sum of the parts.

The Combined Arms Advantage

A distinction must be made between the aggregation of like force elements and the combination of elements of differing types, for example combining infantry, artillery, armor, reconnaissance and engineering units form a "combined arms" unit. In this case combat potential of the combined arms unit is *greater* than the potential of the separate units because of mutual support between the elements. There is an important proviso, however. The combined arms team is constructed with some particular mission or task in mind for maximum combat power. If the mission changes, e.g., from offense to defense, from deserts, to mountains, to forests the combined arms force should be redesigned or adapt to the new environment. The advantages of combined arms are discussed more completely in the TMCI document, *A Concise Theory of Combat.*

In summary, the notion of military synergy must be treated cautiously. Synergy exists in, and is the reason for, integrated operations when units bring complementary capabilities to the battle or operation. But it is achieved only with a penalty to be paid in friction. Integrated operations are most effective when wartime activities are anticipated, and integrated units are created astutely and trained energetically.

Integrated Policy and Strategy

Although operations are our subject it is impossible to completely divorce campaigns from the policies and strategies that foster them. It is well known and a subject of much historical criticism, that integration of policy and strategy are essential in the conduct of war and especially

coalition warfare. Coalition strategy is difficult to formulate and execute because different states have different motives and objectives. As has been said elsewhere in this work, in an alliance a powerful state with many resources may wish to persist in the war while a weak state whose resources are nearly exhausted may wish to seek a way out. One can also envision circumstances in which the opposite is true.

It is easy to think of many examples and many degrees of difficulty. World Wars I and II are replete with examples. The relationships between France, Great Britain, and the United States are perhaps the most closely studied, but the relationships of these nations with Russia and the Soviet Union may be even more instructive. On the Axis side in World War II, the study of integrated operations and the absence of them between Germany, Italy, and Japan is also informative. Napoleon was famous for driving wedges between the coalitions opposing him in his many successful campaigns. The Greek city-states united to defend against the Persian invasions, but then fell out and destroyed each other.

Chinese history is about war lords, coalitions, confederacies, conquests, and weak or powerful central governments. India and Japan have their own history of disunity and reunification.

Wars do not have to be large to be motivationally intricate. We see partnerships in which national survival is involved for one partner but not for another. Recently the difficulties with alliances, coalitions, and partnerships of mutual self-interest are exhibited by the Vietnam War, the First Gulf War, and Operation Iraqi Freedom. The complexities of motives between and inside the countries are multifaceted.

Networking for Integration

Networks are commonly seen as systems of communication links that connect nodes of command. Properly considered, a network includes the commanders as participants. From this point of view, a network is dominated by people conducting integrated operations that are organizationally and technologically linked for a collaborative enterprise.

Integration as Impediment

Integrated operations are usually a drag on innovative tactics, logistics, and operations, unless and until the combined arms or joint forces are bonded and trusting enough to take advantage of cross-cultural knowledge. The stasis is surely even more true for interstate combined operations. The collaboration problem was so difficult in NATO that logistics was left to each member state, not an activity of the combined forces in action. We don't know what the penalty for this might have been but it was potentially crippling.

Conclusion

On one hand, it is always advantageous to avoid integrated operations whenever possible. But on the other hand, for many centuries integrated operations have usually been desirable and often unavoidable to conduct a campaign. The overlooked aspect of these eternal verities is the need for foresight and intelligent organization and training of the integrated forces for the *expected environments, objectives, partners, and enemies*. As this work says later under Contexts, in a complicated international environment such as we see today. mere exhortation to

employ combined arms, conduct operations jointly, and form alliances for combined operations does not achieve what has been and will remain a challenge of command structure and execution.

Chapter 8. Termination and Post-War Considerations

Just as a man begins to die on the day that he is born, the end of a war should be an integral part of the determinations to initiate and to wage a war. There ought to be (and frequently isn't) a continuous process of assessing risks to a society's vital interests, setting and revising goals to protect those interests, evaluating one's own and enemy capabilities, and taking the proper steps to reach the desired end point. Even in the midst of heated patriotism and violent rhetoric about opponents, there should be (and frequently isn't) some sort of dialogue between adversaries seeking common interests and goals, if there are any, and discussing ways to achieve those at some point in the future.

"…the timing of a war's end is determined more by the loser than by the winner; that is, it is probably more sensible to think of wars being lost than won."
John Mueller, 1989

People prefer order and precision, often celebrating a date commemorating the end of a conflict. However, many wars are terminated over a time period rather than on a specific date. That's the way wars start as well—frequently, there is no specific event that marks the commencement of a war resulting from an escalating conflict, failed attempts at negotiation (or demands), and increasingly belligerent actions by opponents. The apparent cessation of hostilities is sometimes a pause rather than a conclusion—particularly when fundamental issues remain unresolved.

"Do not exact conditions which will compel your former adversary to await his time for revenge."
Count Otto von Bismarck

UNDERLYING FACTORS

First, we must understand that most wars fail to resolve the political issues that caused the hostile armed conflict in the first place. Several factors enter into each failure, including military defeat or military victory. The point is that war termination often falls short of resolving cultural, political, territorial, or economic issues. One only has to reflect on the centuries of war between European nations that do not easily compromise their basic values and goals even when "beaten" in a particular war. Values and goals do change over time, but fundamental beliefs and memories of past victories and defeats form a basis for continued conflicts—not always violent.

Second, it is important to note the non-military activities associated with military conflict, especially diplomatic maneuvering and negotiations. Most evolving conflicts are marked by earnest dialogue between the opponents well prior to armed conflict. These generally seek to communicate each side's issues, goals, and desired end-state in an attempt to avoid war. And diplomacy, direct negotiations, and dealings through neutral or allied parties usually continue

throughout the armed conflict phase of a war. Obvious examples include the strategic arms control negotiations conducted throughout most of World War III, the Cold War.

Third, the nature of opponents shifts. Those traditionalists who view history from the Western perspective of nation-versus-nation conflicts, particularly after the Peace (Treaty) of Westphalia at the conclusion of the Thirty Years' War, are often surprised by the non-state versus state wars, including civil wars, Crusades, jihads, insurrections, and, most recently, World War IV—the global conflict between Islamic extremists and their enemies. Additionally, there have been complications in multi-faceted armed combat where the enemy of one's enemy may not be a friend—only a confusing aspect that confounds the primary opponents.

Fourth, political leaders and war planners (not just military planners) focus on implementing policies and strategies rather than looking beyond the "victory" end-state that they optimistically presume will result from the major war effort. In some cases, they don't even consider the secondary effects of a war, such as population control, local security of non-combatants, interim governance, reconstruction, and restoration of economic stability. The most notable post-war success resulted from the post-World War II policies (e.g., the Truman Doctrine) and massive economic plans (e.g., the Marshall Plan, General of the Army Douglas McArthur's role in guiding Japan) that restored Allied enemy nations to some semblance of stability and viability.

Fifth, wars that actually resolve fundamental issues are the most costly in terms of casualties, social disruption, economic collapse, and political disorder. They are also the most prolonged in duration and intensity. Civil wars fall into this category.

Sixth, alliances tend to clutter the theoretical processes. Strong allies with vital interests may argue for continuing a war well past the time when weaker allies have determined that "enough is enough." There is a need to consider the "Conservation of Allies" factor throughout any conflict—their goals, expectations, demands on friendly forces, and commitment complicate the analysis and planning of primary opponents.

Last, deciding to go to war (the military aspect being primary in this discussion), prosecuting the war, and considering termination requires a continuing assessment of purpose, estimated value of the outcome (projected and later actual), appropriate missions, and results, especially costs, compared with the value of the projected outcome.

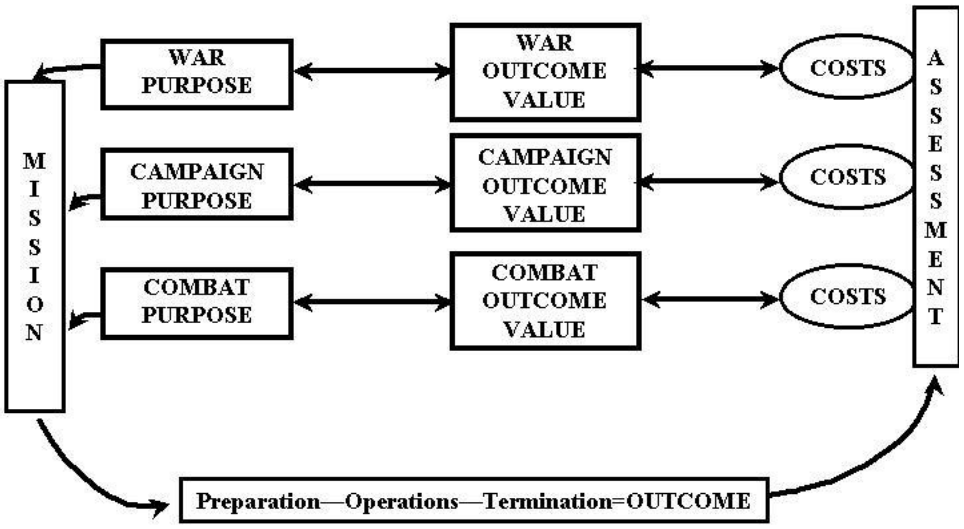

Figure 11. Purpose, Cost, and Value of War

CAUSES OF ENDING A WAR

Wars are won through military success. It's not really that simple, but this chapter primarily relates to the military aspects of war termination, summarized below.

MILITARY VICTORY OR DEFEAT

The most obvious reason that a war is terminated is overwhelming military victory…or the reverse of that coin…military defeat. But "victory" is not always "success." For example, King Pyrrhus of Epirus defeated Roman armies at Heraclea, but at great cost to his army; hence the expression Pyrrhic victory. He again defeated the Romans at excessive cost, at the Battle of Asculum. About one more such victory would have completely destroyed his army.

After the Vietnam War, a discussion between a US Army officer and an officer of the Socialist Republic of Vietnam began with the statement that the US and its allies had won almost every battle, to which the North Vietnamese officer replied, "yes, but that didn't matter."

"The quickest way of ending a war is to lose it."
George Orwell

Victory normally is a reflection of military skill—brilliant senior military strategists, competent tacticians, professional commanders, and dedicated, loyal troops. Most readers understand the appropriate qualities inherent in "skill" and proficiency in arms through which the military execution of missions successfully achieves the political purposes set by leaders.

Defeat results from insufficiency. Military leaders and troops may lack skills, materiel, ammunition, commitment, communications, or endurance—sometimes engaged forces just get worn down and lose whatever capabilities (realized combat potential) that they had.

STANDOFF OR STALEMATE

Military stalemate is that situation short of winning or losing when political leaders compare their original (or revised) purposes and the value of the desired outcome versus the actual outcome and costs thereof. Is it worth it to continue the military phase of the war? At some point, political leaders may decide that their early optimism and confidence has proven short of the actual results. At that time, diplomatic and military-to-military negotiations intensify (if the anger and frustration have not destroyed those possibilities) seeking a way to reach termination acceptable to both parties.

SOCIETAL FAILURE

In some cases, wars end simply because one opponent suffers catastrophic societal or economic failure—whether or not the armed forces are still capable of continuing a war or not. One can argue that World War III became primarily a socio-economic war, where the Union of Soviet Socialist Republics and Warsaw Pact allies could not support a massive military buildup, arms race, and sustaining effort as well as the United States, NATO, and other friendly nations. In a sense, this could be seen as a war between the policy of a command-economy and the capitalist system.

NO COMBAT

In some cases, engaged forces may get tired of the combat situation in which there is no perceived opportunity for "winning" and not much danger of "losing." In that case, combat dwindles in intensity as commitment falters. Anecdotal stories of daytime enemies trading with nighttime "friends" on the other side suggest a less than total commitment of combat troops. Obviously, public support, military morale, and external influences (e.g., media, international organizations) contribute to modification or abandonment of purposes, goals, and military strategies.

In other cases, allied political leaders may slide toward decreased military involvement or even neutrality. They may remain officially aligned and involved to some extent, but may withdraw military forces or otherwise fail to meet military commitments.

REASONS FOR ENDING A WAR

The reasons for ending a war differ somewhat from the causes. James F. Dunnigan and William Martel analyzed more than 400 of the most recent wars, looking at the various types of war, stages of war from start to finish, causative factors, and war avoidance in their 1987 book, *How to Stop a War: The Lessons on Two Hundred Years of War and Peace*. They list five major reasons that cause political leaders to end a war, including military prowess, negotiation, stalemate, exhaustion, surrender, and unresolved situations.

MILITARY PROWESS

Those qualities that contribute to military skills and proficiency through the assignment of meaningful missions, strategic planning, tactical execution of those plans, and practicing the proven techniques of successful combat result in military prowess.

NEGOTIATIONS

Sometimes military in nature, but usually diplomatic in function. The art of setting goals and desired outcomes, communicating those with allies and opponents (often hiding the "real" goals), understanding their goals, and convincing them to concede to your goals.

Simply defined as reaching an agreement—as a product of compromise. Crudely stated as the practice of saying "Nice doggie" while reaching for a big stick. Two elements must be present: common interests and issues of conflict.

Without common interests there is nothing to negotiate for;
without conflict there is nothing to negotiate about.
Fred C. Ikle

STALEMATE

If a military conclusion cannot be reached, opponents must somehow de-escalate an armed conflict into something resembling peace. This frequently involves negotiations between or among opponents, such as the prolonged talks that led to the establishment of a demilitarized zone between the Koreas, followed by decades of almost-confrontation with few actual shots fired.

EXHAUSTION

In the military sense, the degradation of combat capabilities to the point of inefficiency could lead to total collapse of a military force. A society can also reach exhaustion in the sense that public opinion makes further war impossible or at least infeasible, or that the economic burdens (people, funds, things) become so large as to be intolerable.

SURRENDER

Short of recognizing or experiencing a condition of exhaustion, astute political leaders may determine that continued warfare is simply impossible. It may become clear, or at least be perceived, that continued armed hostilities would cost more than the results warrant.

ANALYTIC SUMMARY

Dunnigan's and Marley's analysis (summarized from page 270) shows why those wars ended as they did:

Military Victory	Military Defeat	Stalemate	Societal Collapse	No Combat
46%	41%	11%	1%	1%

In another perspective, they conclude that the reasons for ending a war were distributed as follows:

Military Prowess	Negotiation	Stalemate	Exhaustion	Surrender	Unresolved
73%	11%	11%	3%	1%	1%
Issues resolved in 62% of these cases	Issues resolved in 32% of these	Issues resolved in 36% of these	No issues resolved	Issues resolved in 3% of these	Issues resolved in 32% of these

POST-WAR CONSIDERATIONS

There are several schools of thought concerning the responsibilities of victors following a war. The "less civilized" view involves rape, pillage, and plunder. The "morally proud" view acknowledges the need to restore cultural, societal, political, and economic infrastructure to the extent that the causes for initiating the war allow. For example, a victor would not reestablish a dictatorship if regime change had been a reason for going to war.

The end of a war may harbor the seeds for another war. The conditions for fueling future war include:

- Instability in governance of the conquered territory. The post-war government might not be composed of the same political leadership or those with beliefs that were dominant during the war. Inexperience, incompetence, and inability to deal with a chaotic situation after losing a war contribute to governmental instability. Naturally, the counter to such instability is for the victor to impose a government of occupation…which is likely to have the same unfortunate inabilities and is ignorant of cultural traditions and norms.
- Civil disorder. The destruction of the economic viability of a conquered society leads to insecurity of the population and, frequently, to insurrection as the people try to take hold of their lives in a disrupted situation. Civil unrest may not be restricted to "losers" after a war; victorious societies may have exhausted economic means, wealth, and perhaps a generation of military-age soldiers, leading to popular pressures for reform and restoration of pre-war conditions. Population control (a euphemism for forceful measures to prevent or deal with civil disorder) becomes a mission of victorious military forces in the conquered territories and, preferably, police to deal with the victor's people at home.
- Unresolved issues. Wars don't always conclude in favorable or even acceptable conditions. Dunnigan and Marley concluded that issues were not resolved in about 45 percent of the 200 years' wars in their analysis. Using the categories in the preceding table, issues that caused the 409 wars in the data base were not resolved in the number of wars under each heading:

Military Prowess	Negotiation	Stalemate	Exhaustion	Surrender	Unresolved
108	30	29	12	3	3

  Unresolved issues clearly provide incentives to "get it right the next time." One only has to look at the centuries of inter-European wars, when losers initiated the next war against the previous winners.
- Revenge. Regardless of issues resolved or unresolved, there is a natural "get even" emotional influence on societies, especially those that lost. But the same feeling may arise in a winning society's population if the post-conflict terms are seen as inadequate in any way—"They lost, and we only got xxx? Let's kick 'em while they're down and get everything that we're owed!"

FUNDAMENTAL RIGHTS

Many war-making societies hold strong views about human rights, economic freedom, limits and duties of governments, tolerance of differing views, and religious norms. Frequently, a victor will seek to impose its beliefs to replace "objectionable" traditions in a conquered society.

However, those beliefs may be so alien to the conquered society that they are unacceptable. In those cases, the defeated society cannot be expected to adopt wildly untraditional beliefs.

Romans imposed Roman law and customs throughout Europe. Genghis Khan put controlling satraps in place, but allowed traditions to continue—although he imposed the "Great Law" and an extensive postal service in his conquest of most of the known world.

STABILITY

Whether it can be called a "right" or not, post-conflict stability is critical to the somewhat durable absence of war—which we usually call "peace." A society in chaos, whether victorious or defeated, creates conditions for further conflict, either internal disruption and a breakdown in societal norms or external violence of a renewed war or interference by vulture-societies seeking to pick the bones of a defeated or depleted society.

Adherence to laws or rules (traditional or imposed), population control to slow migration, and early post-war attention to needs contribute to societal stability.

RECONSTRUCTION

Some wars lead to such catastrophic destruction that the survivors of the defeated society are incapable of restoring security measures, local governments, basic services (e.g., water, sewer, electricity), or means of living (e.g., agriculture, commerce, trade). If one of the victor's goals was to "bomb them back into the stone age," there may be no incentive or rationale for aiding the defeated population in reconstructing their society. In most cases, victors feel compelled to assist survivors in reestablishing a viable society in the cultural, economic, and governmental senses.

REGULATION

Victors have the authority to regulate any defeated society—the spoils of war. The manner of regulating may range from dictatorship to cooperative governance to eventual "freedom" of the conquered society.

Part III. Elements of War

This part of ***A Philosophy of War*** deals with the supporting elements of war—the firm foundation that enables, sustains, and assists in the planning of strategy and successful conduct of wartime military operations as well as the non-violent operations of military forces, including peacetime support. Simplifying and describing "war" is no simple task. However, there are some elements of war that are arguably analogous to the earth, air, fire, and water set of primitive elements.

War Leaders reflect the fiery nature of tribal, clan, national, and international societies and cultural hierarchies. If "fire" is understood to include heat, brightness or brilliance, and smoke, it is indeed a good parallel with those human factors that apply to leadership in war. Sun Tzu identifies the characteristics of wisdom, integrity, humanity, courage, and discipline as characteristics of command.[68]

Resources are similar to "water," in that monetary, natural, political, and human resources flow in a hydrodynamic manner. Resources, like water, can dwindle to a trickle or freeze to a stop as they are consumed or withheld from war.

Weapons and Materiel can be compared to "earth." Materiel, in military terminology, includes those materials, tools, and support services necessary to any work or enterprise, particularly weapons, equipment, and supplies for armed forces.

Logistics is the end-to-end process of developing, producing, storing, distributing, maintaining, and providing materiel and services to military forces—the transformation of resources, weapons, and materiel into combat potential. Logistics provides the wherewithal to provide combat potential to a military force; converting that to combat power is a function of strategy, campaign planning, and tactics.

Information and Intelligence is an element of war that is analogous to "air," in that it is ephemeral and drifting, sometimes distorted, and of variable speed and dependability. Information has always been critical to war efforts, and knowledge is indeed power.

Communications involves the transmitting, giving, or exchanging of information, signals, or messages and is analogous to "wind"—the movement of "air" (information). Communications is associated with the preparation, transmission, receipt, processing, and presentation of data to derive information (interpreted or analyzed raw data) and knowledge.

War requires leadership, funds, equipage, and knowledge—the elements of war.

[68] Sun Tzu in Chapter 1 (On Assessments) in ***The Art of War***

Chapter 9. War Leaders

Early family groups, huddled together for sustenance and survival, had "leaders" in much the same way that recently discovered primitive clans have had—either a patriarchal or matriarchal society, but often led by the strongest, ablest mature male. As clans and tribes evolved for increased strength, food gathering, and defense, each smaller group gave up some of its freedom and rights to anoint a common leader. When food production created more efficient means of sustaining and growing of small societies, those [excess] members who were not needed as farmers and herders were free to adopt more specialized roles as leaders with more time-consuming responsibilities and duties, priests, scribes, tradesmen, craftsmen, and soldiers. Leaders have often been war chiefs as well, with notable examples from Og in pre-history through ancient civilizations, Alexander, the Caesars, Genghis Khan, and Napoleon—a few examples of that tradition. In occasional outbreaks of peace, leaders had the duty of governance of their populations. The three general groupings of leadership roles and responsibilities—Head of State, Chief Executive, and Commander-in-Chief (or war chief)—are summarized below.

HEAD OF STATE

This primarily ceremonial, diplomatic, and political role pertains to the leader who is recognized by his or her own people and by citizens of other polities as "the ruler" of a clan, tribe, or nation. The Head of State often makes the rules, dictates actions of the people, and directs the external relations with other groups. Whether chief, Emperor, President, or Queen, the Head of State retains exceptional authorities over the lives of the population, their well-being, commerce, and the military potential and ability to make war. In many societies, the decision to go to war ultimately rested with the Head of State.

CHIEF EXECUTIVE

The role of a Chief Executive relates to the responsibilities for running the government. Chief Executives set the rules for other governmental entities, ensure the effective performance of governmental duties by others, and administer the operations of bureaucracies. His or her role in governmental affairs is internal to the political entity and its citizens, slaves, and inhabitants—this is the person who runs the government.

COMMANDER-IN-CHIEF

This is the military role of a leader—the war chief of the clan or tribe, the general of the armed forces, the director of military power toward achievement of political goals. Earlier, smaller, simpler political structures usually looked to the political-administrative leader as the war leader as well—kings and emperors led their armed forces into wars, leaving the direction of political-administrative operations at home in the hands of regents or bureaucrats for the duration of the war. This greatly simplified translation of political objectives (policies) into military strategy and operations in war, since the Head of State was also the Commander-in-Chief. As political structures and populations expanded (and wars of conquest were longer in duration), most cultures retained separation of the responsibilities and roles at the highest level. The

commander in the field simply could not "govern" at home, raise the resources necessary to support the war, or sustain and reinforce the military forces at war.

THE BUREAUCRACY

In a clan, one leader (the "Big Guy" theory of governance) could easily plan, direct, and control all of the members of the clan. As food production permitted the growth and storage of surplus food and as efficiencies in farming and herding permitted people to take on duties other than sustaining the population, some people sought other responsibilities to support the Big Guy and the tribal members. Sickness and injuries created a need for medical practioners who, with more time on their hands from freedom from farming, sought herbs, cures, and medical techniques to save lives and improve the health of the clan or tribe. The wonders of nature and search for a higher meaning created priests and religions. The need to count stored food (levied from the 10-20 percent of the population engaged in food production) led to writing, scribes, and records.

Others became the governmental pool of assistants, deputies, specialists, and multi-layered bureaucrats. These became the hands that carried out, or caused to be carried out, the directions of the political and military leaders. But the populations sought some balance—a means to have some influence on the Chief, the Emperor, the Queen. Thus the interpreters of justice and rules begat judges (and lawyers) and the people's representatives who wrote the rules begat parliaments (and lobbyists) whose roles were to take some of the "burdens" of governance off the shoulders of the ruler and to more fairly write and administer the laws.

GENERALS AND ADMIRALS

Huang Shih-kung advises that "generals" should have wide comprehension, decisiveness, and extensive abilities to master problems. A general should act with swiftness, secrecy, unity, and uprightness. A leader's anger should be righteous and result in the punishment of offenders. Ancient Chinese strategists emphasize that orders must be well thought out in advance, issued by delegating responsibility and authority, and never rescinded, although subsequent modification can be made to compensate for evolving situations. Loyalty and discipline, usually seen in the West as flowing upward from troops to leaders, are better understood as bi-directional—responsibilities and characteristics of both national and military leaders and followers. Founded on Confucian belief systems that stress calm, adaptive, tolerant characteristics, he described favorable human factors:

> ***"The general should be able to be pure; able to be quiet; able to be tranquil; able to be controlled; able to accept criticism; able to judge disputes; able to attract and employ men; able to select and accept advice; able to know the customs of states; able to map mountains and rivers; able to discern defiles and difficulty; and able to control military authority. The general can be pleased but cannot be troubled."***

So those human factors that pertain to war involve those collective leadership qualities that have been recognized in war leaders throughout the ages—those qualities of great war leaders, who may also have been warrior-commanders, that incite, inspire, and sustain public

support of a war. Many warrior traits apply to war leaders, with extensions that recognize the broader context.

CHARACTERISTICS OF LEADERS

War is a collective human effort that stems from (and brings out) leadership characteristics to provide direction to military forces and the band, clan, tribe, or nation as a whole. Unlike combat, which requires individual bravery and unit cohesion and commitment in the face of personal danger, war requires a different, collective form of courage and dedication to commit others to combat. National leaders must publicly demonstrate the need for war, dedication of the entire nation to prosecute a war, and sorrow for the results of combat that resulted from their orders. Governance, the leadership and administration of a population by a few for the good of many, involves the decisiveness, sagacity, and determination to set political goals and to achieve those goals by, *inter alia*, war, demanding the violent sacrifice of a part of the population.

Table 4. Characteristics

of Leaders[69]	of Fighters
[Mutual] Trust is Vital	Personal Bravery; Courage
Good Teacher and Communicator	Peer Commitment; Esprit
Facilitate Problem Solving, But Don't Solve	Dedication
Stamina	Discipline
Manage Time & Use Time Effectively	Trust Superiors; Commitment
Technical Competence	Loyalty
Must Not Condone Incompetence	Sense of Duty
Take Care of People	Concern
Provide Vision (Planning)	Anticipate Enemy
Subordinate Ego to Organizational Goals	Take care of the troops before the troops take care of you.
Know How to Run Meetings	Unilateral Approach
Must Be a Motivator [Delegate & Mentor]	Decisive Orders
Must Be Visible and Approachable	Lead from the Front
Have a Sense of Humor	
Must Be Patiently Decisive [40-70 Rule]	Quick Reaction
Introspective	
Reliable	Determined
Open Minded	Listen to the Sergeants
Maintain High Standards of Dignity	Lead by Example
Exude Integrity	
Compliment People	

[69] Paraphrased from: Smith, Major General Perry M., ***Taking Charge***, Avery Publishing Group, Garden City Park, NY, 1988.

POLITICAL LEADERS AS COMMANDERS

For many centuries, Chiefs, Khans, Kings, and Emperors served frequently as both Head of State and Military Commander. From the earliest times, when every able-bodied citizen had to be involved in military activities, it was expected that the leader in peace would also be the leader in war. Even in empires that came to rely on mobilized citizen-soldiers, militias, and mercenaries, socio-political leaders retained command. Those Chiefs who led their forces in battles that were part of larger campaigns and wars therefore had to demonstrate the personal characteristics associated with life-threatening combat as fighters as well as those leadership traits needed to direct others into danger.

"A leader is a man who has the ability to get other people to do what they don't want to do, and like it."

Harry S Truman

"The badge of rank which an officer wears on his coat is really a symbol of servitude—servitude to his men."

General Maxwell D. Taylor

"… great leaders gain authority by giving it away."

VADM James Bond Stockdale

Table 5. Leadership Traits

Trait	Description
Bearing	How you are seen, perceived by those a leader seeks to influence; regal, recognizable stature, commanding presence, self-confidence, self-worth
Courage	Collective physical and moral will to risk wealth, populace, government in service to the "right;" commitment and adherence to inviolable principles
Decisiveness	Clear concise direction in the face of risk, uncertainty, adversity; adaptability and flexibility to change direction on the basis of developments
Dependability	Constancy, stability of purpose, reliability; genuine concern for those who are subject to orders; role model
Endurance	Patience, physical stamina, ability to sustain mental and physical hardships; steadfastness of purpose to the greater good
Enthusiasm	Energy, determination, contagious optimism
Initiative	Vision, action, innovation
Integrity	Moral courage, absolute honesty, truthfulness
Judgment	Rational, analytical, logical, thoughtful, conclusive; willingness to act on facts; proven inspiration
Justice	Fairness to forces, population, enemy, allies; unbiased; set and enforce standards
Knowledge	Experience, expertise, commitment to learning, building of skills, open minded
Loyalty	Two way confidence in character, dependability, proven reputation, sincerity in caring
Tact	Caring, persuasion, polite, diplomatic
Unselfishness	Seeks the larger good, accepts personal privation, accessible

General Krulak's List [70]

[70] Adapted from *14 Traits of Effective Leadership*, General Charles C. Krulak, Commandant of the Marine Corps, in the ***Record*** of Sigma Alpha Epsilon, Winter 1999.

One need not be an oriental strategist or a four star general to create a list of desirable characteristics of a military leader. Wess Roberts "created" a conceptual commentary that should have been written by a Hunnish historian, *Leadership Secrets of Attila the Hun*, that puts forth essential qualities for chieftains:

- **Accountability**
- **Anticipation**
- **Competitiveness**
- **Courage**
- **Credibility**
- **Decisiveness**
- **Dependability**
- **Desire to Lead**
- **Emotional Stamina**
- **Empathy (for Other Cultures)**
- **Loyalty**
- **Physical Stamina**
- **Responsibility**
- **Self Confidence**
- **Stewardship (Loyalty Downward)**
- **Tenacity**
- **Timing**

"Just because you are not paranoid doesn't mean that people aren't out to get you."

Robert Pfaltzgraff

"Where there is no vision, the people perish."

Proverbs XXIX, 18

"When the army's wells have not yet been completed, the general does not mention thirst. When the encampment has not yet been secured, the general does not speak about fatigue. When the army's cook stoves not yet been lit, the general does not speak about hunger. In the winter he does not wear a fur robe; in the summer he does not use a fan; and in the rain he does not set up an umbrella."[71]

The Three Strategies of Huang Shih-kung

"Courage then, as has been stated, is the usual condition with regard to things that cause confidence or fear in the circumstances described. A man chooses

[71] This is the first formal declaration that Army Officers may not carry or use umbrellas.

action, or endures pain, because it is honorable to do so, or because the opposite course is disgraceful."

Aristotle, Nichomachean Ethics

"Mistrust a subordinate who never finds fault with his superior."

John C. Collins

"Under a good general, there are no bad soldiers."

Chinese proverb

"It is now to this natural proclivity of men, to hurt each other, which they derive from their passions, but chiefly from a vain esteem of themselves, you add, the right of all to all, wherewith one by right invades, the other by right resists, and whence arise perpetual jealousies and suspicions on all hands, and how hard a thing it is to provide against an enemy invading us with an intention to oppress and ruin, though he come with a small number, and no great provision; it cannot be denied but that the natural state of men, before they entered into society, was a mere war, and that not simply, but a war of all men against all men [Emphasis added]."

Thomas Hobbes, Leviathan

"Warriors, after all, fight battles; politicians wage war."

Howard Blum, The Gold of Exodus, 1998

Chapter 10. Resources

The population, leadership, culture, wealth, will and determination, forces, natural resources, industry, means of production, materiel, and other militarily useful assets or capabilities provided, apportioned, or allocated to a commander to accomplish operational military missions.

Economic and commercial wealth are only a part, although perhaps the most important part, of the resources required to go to war. Any clan, tribe, or nation must have dedicated political leadership, a perceived need to go to war, surplus (disposable) people and other resources that can be diverted from peacetime occupations and used to train and fight, sufficient remaining population to sustain a war effort, surplus fungible economic strength and flexibility, supporting technology and industry to produce weapons (or funds to purchase things, bribe enemies to create traitors, and pay external mercenaries), and a national will to apply resources to war.

HOW DO SOCIETIES GENERATE RESOURCES?

Early mankind formed family groups, bands, tribes, and clans to scavenge, hunt, and gather food to sustain themselves. Approximately 13,000 years ago, some tribes recognized that there were significant advantages to cultivating some crops and to domesticating some animals—especially large, relatively rapid reproducing herbivores—as adjuncts to supplement basic hunting, fishing, and gathering[72]. Farming and herding did not then, nor do they more recently, replace hunting and scavenging; however, the inherent efficiencies in the more centralized production of food have distinct advantages. In general, hunter-gatherers are nomadic, moving frequently to better hunting grounds and to richer crop areas, while farmer-herders are more sedentary, staying in place to cultivate and harvest grain and to corral their domesticated animals.

HOW DOES FOOD PRODUCTION RELATE TO WAR?

The primary advantage is the greater efficiency in producing or procuring food. Farming can yield 10 to 100 times as much grain suitable for human consumption per hectare as the yield of wild grains in a comparable area. Similarly, hunting involves a higher risk of failure to kill a big animal than the more assured occasional slaughter of domesticated (or fenced-in wild) animals.

More food, assured sustenance, greater efficiency, and exploding populations gave the farmer-herders significant advantages over their nomadic competitors. The members of the clan who were not needed for food production became the non-food producing "professionals" in the clan: the chiefs, medicine men, war leaders, scholars, soldiers (often the former hunters), sailors

[72] For a more complete discussion, see ***Guns, Germs, and Steel: The Fates of Human Societies***, and ***The Third Chimpanzee***, both by Jared Diamond.

(former fishermen), and tradesmen. The continuing upward and increasing spiral of efficiencies in food production, increased population, and more "civilized" availability of non-food producers created both incentives for war and capabilities for war to conquer more land (for increased food production), to capture people (as exogamous wives, slaves, scholars), and to capture additional resources (raw materials, trade routes, metals), thus increasing the relative wealth of the conquering clan.

WEALTH ENABLES AND SUPPORTS WAR

A growing, thriving clan, tribe, chiefdom, state, or empire generates wealth—surplus resources that can be diverted to commerce, to increased standards of living for its leaders and citizens, and, when political objectives warrant, to support and sustain war. Population wealth, the generation of "surplus" people who are not needed to produce food to sustain the clan, contributes to the ability to make and support war. Wealth enables war.

LACK OF WEALTH ALSO INSPIRES WAR

The "have-nots" may be inspired to concentrate their limited resources in an effort to acquire additional resources for means of survival or growth. The "jealous" or desperate clans or tribes generally had to make raids and escape with what booty they could. Malthus recognized that growing populations within a relatively fixed and constrained level of aggregate natural resources became a primary cause of war.

EXCEPTIONS

Many examples show that some nomadic clans, tribes, and empires traditionally chose war and conquest, even protracted conflict, despite their relative disadvantages related to food production and resources. Perhaps the best example is that of the two-millennium long series of raids, conquests, and wars waged by the warriors of the Steppes across most of the civilized world. The Mongols chose conquest and capture over cultivation. Hannibal invaded the Italian peninsula with a small military force and some loose alliances; for several years, he raided, threatened, and survived despite the fielding by Rome of up to 23 Legions, with 15 Legions and two Consuls retained in Italy to thwart Hannibal. More recent examples include the highly successful guerilla forces in Vietnam, Afghanistan, Iraq, and other under-resourced nations.

INFLUENCES ON RESOURCES

Some places, some cultures, and some conditions give rise to the more rapid creation of resources. Where the conditions are unfavorable, the societal group evolves more slowly and stands at a disadvantage vis-à-vis its neighbors and competitors.

GEOGRAPHIC LOCATION

Where you live can be a positive resource, if the land and sea produce large quantities of food and natural resources, or if the geography supports trade and commerce, or if the land and rivers provide terrain and trade routes favorable to military forces (or coast lines and ports that invite trade, raids, and invasion). For example, the geography of the eastern Mediterranean has

been host to invaders, conquerors, and armies "just passing through" since recorded history—and before[73].

NATURAL RESOURCES

The presence or absence of domesticable animals and crops that can be cultivated to support a growing population is a fundamental influence on the creation of resources by a society. This may be the dominant fundamental factor underlying the emergence and development of societies several thousand years ago.

GEOGRAPHIC LOCATION

Some areas had significant advantages over others in terms of natural resources favorable to the creation and development of technology and societies. The presence of raw materials (e.g., metals, timber, tool-making stone, precious metals, jewel stones) favors the society that has chosen to occupy that area and exploit those natural resources. These raw materials, combined with the crafts and technology to convert them into manufactured implements, gave one group wealth relative to other groups not as favored with natural resources.

CLIMATE AND GEOGRAPHY - ENVIRONMENT

Natural resources can also include navigable rivers, natural cross-country trade routes, waterfalls (for mills and power generation), and terrain features favorable to military defenses.

PEOPLE

Population growth favors one clan or tribe over another neighboring clan or tribe by "outweighing" the potential adversary. As a clan grows and seeks additional land, labor, or resources, it can destroy or push the incumbent clan out of the way to satisfy its political and military goals and objectives. The principle of Mass in war has been true since the earliest raids and conquests.

CULTURE

Additionally, there are certain cultures that seem to enjoy war more than others and, when those cultures generate sufficient warriors who can leave their peacetime work for a short-term raid or a protracted war, tend to sally forth to wage war on neighbors and distant lands more frequently. For example, as noted above, the nomadic people of the Steppes have surged forth in hordes over many centuries in every direction, being assimilated into the parts of China they conquered, spreading their rule south into India and Pakistan, roving northward to war with the Rus (the Slavic tribe initially ruled by Vikings), and threatening most of Europe.

COMMERCE AND TRADE

Societies that acquired wealth and developed crafts began to trade with others societies. The peaceful commercial caravans and sailing vessels created the means of trade to further increase their wealth and power…but they also created incentives for attack by others. Relative to resources for war, commerce and trade frequently allowed a growing clan or tribe to acquire

[73] The biblical story/history of the Battle of Jericho has proven archeologically accurate, and remains of other, older walls beneath those that fell to Joshua suggest defensive fortifications dating to about 10,500 B.C.

better weapons and trade-advantaged additional wealth. Put another way, isolated societies generally lacked the increased military capabilities enjoyed by trading societies.

RESOURCE WARS

The phenomena of resource wars could be foreseen in the rise and fall of Greek city-states, Rome, the colonizing and internal-war powers of Europe, and elsewhere (e.g., Chinese dynasties, Persia). But the most vivid examples are those in the 20th Century—the three World Wars. Both WW I and WW II pitted wealthy nations and alliances against each other for long periods of time, in intense combat consumption rates (e.g., gassing and disease in WW I, submarine sinking of cargo vessels in WW II), using more expensive equipment and weapons with increased rates of fire, and over broader areas than the world had experienced as the "same war" in the past.

World War III, the "cold war," is the best example of a resource war, with massive expenditures for huge stockpiles of nuclear weapons, their technological means of delivery, and extensive defenses against such a war. There was a similar huge buildup in and maintenance of conventional forces, as NATO and the Warsaw Pact prepared for a large-scale conventional (and later, tactical nuclear) land, sea, and air war throughout Europe and contiguous waters. One can argue that this was a war of competing economic-political systems, rather than a military confrontation. And that is probably a good description of the most costly resource war in history—won by the wealthiest power.

MAKING THE RIGHT CHOICES

In an autocratic society, decisions are not easier—but they are usually quicker. Participatory governments tend to be more deliberative, with open, public debate of the issues associated with putting resources against requirements. All governments must create some sort of budget to assess their future resource situation—will military costs exhaust the coffers? Will social costs bankrupt the state? Is borrowing an option? Choices involve the identification and analysis of postulated military and civil requirements, assessment of their relative validity or irrelevance to goals of the group, judgment of their relative priority in context of the society's cultural norms and security strategy, and apportionment of resources to meet the highest priority requirements.

THE STRATEGIC PARADOX

Military strategy creates the environment and framework that defines military resource requirements, so a broad and grandiose strategy tends to generate and inflate military requirements. At the same time, the availability of resources to support a strategy can actually constrain that military strategy—if a military force does not have the equipment or sustainment or transport or other resources to accomplish a mission, there are limits to the actions that it can take to accomplish the strategy.

Strategy defines resource requirements, and resources limit strategy.

This paradox yields two management controls: one to balance strategy with resources and the other to manage resources efficiently.

CYCLIC PLANNING

Periodic resource assessments and planning occur in parallel with planning military strategy. And the results of each process should be fed back into the other realm so that a realistic and achievable military strategy results—the society can pay for the military capability to support the strategy. There are competing societal planning considerations, assessment of allies and enemies, predictions of commercial successes, and accommodation of social and cultural changes.

UNCONSTRAINED MILITARY STRATEGY

History is replete with examples of war-making nations that went bankrupt supporting military conquests—Assyria, Rome, and the Soviet Union have been members of the "rise and fall" club, along with other expansionist states, empires, and nations. Those societies that perceive and support military (or overall) needs in excess of available resources eventually face the problems of rebellion, failure in commerce, default on loans, and shrinking capabilities that enemies are only too eager to take advantage of through retaliation of the weakened military forces.

MANAGING WAR RESOURCES

In the 20th Century, the shift to increasingly machine-dominated military forces had three major resource implications. It costs more to:

- Produce the technological engines of war.
- Create the necessary explosive power and means of delivery to defeat the enemy.
- Transport and support the forces (since they were heavier and more complex).

Even for the well-recognized and expensive cold war demands for strategic nuclear forces, there were pressures to control costs, to efficiently build and maintain modern forces, and to pay for the military capabilities to support deterrent and war-winning strategies of the super powers. At the same time, building civil-social pressures, even in the command economy Communist nations, demanded more effective controls over military requirements and resource expenditures.

> ***The art of war is of vital importance to the state. It is a matter of life and death, a road either to safety or to ruin. Hence it is a subject of inquiry that can on no account be neglected.***
>
> ***Sun Tzu***

SUMMARY

Resources enable a society to wage war to support political decisions, and the society with more resources generally prevails over a less-wealthy society. Political reasons to go to war are often based on the need (desire) to acquire additional land, to capture additional people (slave labor), and to obtain additional resources to strengthen the attacking political power—be it clan, tribe, nation, empire, or international alliance. Having surplus resources eases the hard political decision to go to war and, in some cases, can be euphemistically translated into imperatives for

war. Resources and strategy constitute a paradox, in that an independent, unconstrained military strategy may be unaffordable and therefore unachievable; interrelationships must be accommodated in planning both resources and military strategy (and other matters that affect either). Controlling or managing resources becomes increasingly critical as technology, global economies, and information revolution changes the face of war and its supporting resources into the 21st Century.

Chapter 11. Weapons and Materiel

"Fists might be OK in a personal fight, but for a real war, you got to be well equipped to kill."
Anonymous

SINEWS OF WAR

Early man needed hunting tools to sustain himself, his family, and his clan; those who "invented" or adapted natural tools survived better than those who had no "research and development" tendencies. Stone knives were replaced with shards of flint; fire-hardened spears replaced sticks; metal tools and weapons came into vogue. Adaptation, innovation, and development of improved weapons designed to be used solely against people "militarized" weaponry and technology.

WEAPONRY

Since this book is about war, the initial focus of attention is on the adaptation and use of tools for hunting and fishing—and the cognition that such hunting instruments could also be useful to defend one's peoples and to attack "enemies." From the earliest use of weapons, man demonstrated an ability to reason, to innovate, and to apply technology to improve the performance of weaponry.

ACQUSITION OF WEAPONS AND MATERIEL

Early a tool was needed, searching for the right stone or stick, and using it. As mankind developed more precise needs and became more technically proficient, the process became more logical and "analytic."

EVOLUTION OF WEAPONS AND MATERIEL

Greek mythology attributes the origin of weapons to the labors of Hephaestus.[74] Swords, knives, axes, shields, armor, chariots, and other tools of war had been developed and improved on for many centuries. Weapons were principally used in ground operations, with some application to naval warfare up to the Greek period of history.

METALURGY AND WEAPONS

The Stele of the Vultures commemorates the 2550 B.C. victory of the warriors of King Eannatum of Ur wearing helmets, square shields, and swords much like those carried by the Greek Phalanx or the Roman Legions. Metal workers later discovered that a metal usually becomes harder when it is beaten, and they learned that it was best to beat the bronze metal of a

[74] Hephaestus was the god of fire and metalwork, As the artisan among the gods, Hephaestus made their armor, weapons, and jewelry. His workshop was believed to lie under Mount Etna, a volcano in Sicily. Hephaestus is often identified with the Roman god of fire, Vulcan.

sword while it was cold and to temper it afterward to decrease the brittleness. The secret of making wrought iron was discovered by 2500 B.C., but it wasn't until about 1400 B.C. that the Chalybes in the Armenian Mountains discovered how to heat wrought iron in a charcoal fire and give it a steel facing by hammering on it. That breakthrough was followed by technological discoveries to slag the iron ore (adding limestone to liquefy iron ore in a furnace), quenching, annealing, and more modern processes.

The generally slow advances in weaponry in the previous millennia "jumped" as talented Greeks (and Persians, Chinese, and others) applied their scientific and engineering knowledge to the problems of conceiving and producing weapons and materiel for warfare. The lengthy conflicts between the Persians and Greeks provided many opportunities for applying basic science and engineering for warlike purposes.

The Greeks used "chemical" weapons, particularly incendiaries and liquid fire in the same century and later.[75] In 424 B.C., the Greeks created a gas attack with burning sulfur fumes at the Siege of Delium. Flame weapons were not invented by the Greeks; liquid fire is represented on the bas-reliefs of the Assyrians.

Greek and Roman engineers understood the fundamentals and use of the screw, wedge, gear, and lever, building huge siege towers, battering rams, and several types of catapults. The latter provided a standoff capability, as well as a means of bombarding walled city inhabitants to defeat strong defensive positions.

Over the next several centuries, there were few changes in heavier weaponry until the advent of gunpowder and the internal combustion engine. During those many centuries, the spears, swords, bows and arrows, chariots, and armor got better, but it didn't get "different." Alexander's soldiers in the 4th Century B.C. would have immediately recognized and been able to use the materiel provisioned to Charlemagne's warriors. Some "minor" inventions were true force multipliers. The development of the saddle and stirrups by far-ranging Mongols permitted efficient use of swords and short bows. Progress in technology advanced more rapidly, leading to the industrial revolution that provided newer and better means of war—including aviation, electronics, and war machines that used petroleum or electricity.

The increasing expense of production forced governments to finance purchase or manufacture of weapons and war materiel for military forces. This in turn provided the political objectives of conquest. Advancing or conquering forces imposed tributes from those who wanted to avoid being destroyed and "contributions" from reluctant allies. As costs increased and treasuries were threatened, kings and nations became financially sophisticated and made use of government-backed loans, thus incurring post-war debts, issuance of bonds, and other borrowing to provide the wealth of resources required to acquire war materiel.

[75] Note that "Greek Fire" was invented by Kallinokos, an Egyptian architect who had fled Syria when the Muslims were exporting the faith. He provided the self-igniting, unquenchable weapon to Emperor Constantine Pogonatus when Constantinople was being besieged by Saracens in 673 A.D. Greek fire was later used by the Muslims against the Christians during the Siege of Acre in 1190. The secret formula was subsequently lost.

BANG!

Gunpowder changed the lethality equation of war in a major way. The Chinese invented gunpowder in the 12th Century and had used primitive rockets early against the Tartars in 1232. The knowledge of gunpowder-powered rockets had been reported back to rulers in the West in the 13th Century. The Italians are reported to have experimented with rockets as early as 1281 at Forli (now Emilia), and there are reports of rockets at Ghent in 1314, at Metz in 1324, and in England in 1327. But rockets are inherently inaccurate, uncontrollable, dangerous, and prone to misfire when damp.

The Arabs developed the *madfaa*, a deep wooden bowl holding gunpowder, with a cannon ball perched atop the muzzle. The French came up with the pot-de-fer, the first drawing of which appeared in a 1326 manuscript; Edward III is said to have used one in Scotland in 1327. The pot-de-fer was an iron bottle crammed with saltpeter, sulfur, and other chemicals with an iron arrow jammed into the neck; a red-hot wire was thrust through a touchhole at the bottom to launch the arrow. Small-bore cannon gave way to larger caliber, longer-barreled weapons.

The Chinese had also developed small-bore cannon after finding rockets unsuitable as effective weapons and adapted them for naval warfare. Late in the 14th Century, Zheng He, a senior naval commander appointed by Ming Emperor Zhu Did (known as Dongle/Yong Le/Yong Lu or "*Perpetual Happiness*," the Son of Heaven), dispatched many armadas of several hundred ships each, carrying as many as 37,000 men, on voyages throughout the Pacific and well beyond. The "treasure ships" at the core of each voyage were 400 feet long (five times as long as the Santa Maria, Columbus's flagship), with beams of 150 feet, each armed with cannon, albeit short range and not particularly accurate.

Cannons threatened the failure of castles in Europe. Mohammed II, who became Sultan of the Ottoman Empire in 1451, decided to capture the last Christian stronghold of Constantinople. His Hungarian ordnance engineer, Urban, was tasked to design and build 56 cannon and 12 great bombards (generally short barreled, larger caliber weapons—mortars). One "super-bombard" called Basilica measured 36 inches at the bore, requiring 200 men and 60 oxen to move it. Its ball weighed almost a ton and flew more than a mile; its rate of fire was seven rounds per day, but it blew up after firing only a few rounds. Mohammed succeeded in breaching the walls, massacred 2000 inhabitants, and sold 60,000 of the population of 100,000 as slaves. Some of these same guns were used against a British squadron in 1807—a 700-pound stone shot cut the mainmast of Admiral J.T. Duckworth's flagship, and a second shot killed or wounded 60 sailors.

The French mounted naval cannon on galleons in 1494, proving the cannon's effectiveness against the British in 1512. Their effectiveness was shown even more emphatically at the Battle of Lecanto[76] in 1571. British King Henry VIII and later Queen Elizabeth took great

[76] Lepanto was the last great naval battle dominated by oar-propelled vessels. Christian naval forces had 208 galleys and 8 cannon-bearing galleasses; the Turkish naval force had 250 galleys. Results: 25,000 Turks killed; 8,000 Christians killed; and huge numbers of wounded on both sides.

pride in the navy and committed significant resources toward developing a highly capable navy; Henry built the first "warships," beginning with *The Mary Rose*.

17th CENTURY SCIENCE AND TECHNOLOGY

In Europe, this was a century of warfare. Philosophers pondered the justness of war, scientists ignored war, and military engineers concentrated on improving the efficiency of killing. Standardization became the byword of technologists of the times. Metallurgists developed better steel, denser projectiles, lighter weight but stronger carriages, and more efficient gunpowder.

THE 18th CENTURY

A modest improvement in ground force weaponry occurred, with the development and widespread use of lighter cannons and rifles, such as the "Kentucky" rifle made in Pennsylvania, which was lighter and longer than the German rifles of the time. It wasn't until the American Revolutionary War that the British discovered that the only counter to the American rifle[77] was a British rifle. The better-trained Brits had the advantage until General George Washington taught his troops to use aimed fire rather that the traditional unaimed volley.

One breakthrough was the development and use of Mercier's "shell gun" at the end of the century; the new projectile was a 5.5-inch explosive shell[78] with a short fuze fired from a 24-pounder mortar. It wasn't until the last quarter of the 18th Century that a well-designed, steerable, useful submarine was developed.[79] Scientific and engineering advances in steam engines for propulsion and wrought iron, and later steel, for hulls brought a change in naval warship design.

THE 19th CENTURY

The conversion of European navies from sail on wood ships to steam-powered steel hulls and the expansion of railroads set the stage for the violent last half of the century. Breechloaders replaced muzzleloaders. Henry Joseph Paixhans developed the shell gun to defeat the British navy, but Napoleon realized that it might be reverse engineered and used against the French. Henry Bessemer found that blowing air into a crucible containing molten pig iron caused it to burn, eliminating most of the carbon and creating "harder" ferrous metals. Most of the modern explosives[80] were discovered, although their properties were not well tested until the 20th Century.

Handheld weapons were improved by the development and fielding of the percussion cap, which avoided the "wet powder" unreliability of previous long barreled weapons and handguns. The introduction of the cylindro-conoidal bullet was invented in 1823 by Captain Norton of the British 34th Regiment, but the Brits didn't pick up on that idea that greatly

[77] Actually, the rebels fought mostly with muskets, most of which came from France and Spain. Most of the imports were Charleville .69 caliber guns costing about $5 each.

[78] Renaud Ville had invented an efficient shell in 1602, but no one fully developed a weaponized version. Henry Shrapnel designed the fragmenting shell that bears his name.

[79] Cornelis Drebbel had built a type of submarine in 1620, and David Bushnell constructed the first successful submarine, *The Turtle*, in 1773-1775. Robert Fulton designed, tested, and proved his submarine, the *Nautilus*, for Napoleon, who rejected the idea of that invention—so did the British. Submarines were developed to deliver torpedoes, which was the term for explosive charges attached to the submarine.

[80] PETN, TNT, tetryl, cyclonite, and picric acid.

improved the range and accuracy of small arms weapons. French Captain C.E. Minié did, and gave his name to it—the Minié ball, which was not his invention, nor was it a ball.

Artillerists benefited from the interrupted screw breechblock, rifled cannon, improvements in interior ballistics[81], and the development of better recoil mechanisms. Friedrich and Alfred Krupp manufactured lightweight cast steel muzzleloaders. American Robert Parrott designed a cast iron rifled gun with wrought iron bands wrapped around the breech for extra strength. Gun carriages remained problematic until the design of a slide or trough that allowed the gun to recoil without moving the supporting carriage; the recoil force compressing springs that ran the gun back into battery (firing position), allowing a much higher rate of fire.

Smokeless powder came into the military inventory after Vieille (in 1844) and Alfred Nobel (1890) produced ballistite, a form of nitroglycerin-based propellant. Cordite was in use in Britain by 1890. The disguised advantage of "smokeless" powder was that it burned slower, more controllable. The large caliber cannon could then be redesigned with longer, slender barrels to increase range or projectile weight, since the maximum internal pressures were lower.

Samuel Colt devised a short cylinder holding cartridges that revolved within a fixed hammer-barrel frame. Repeating rifles appeared in the 1850s. The French *mitrailleuse*, developed by Faschamp and Montigny in the 1851-1869 timeframe, was the first practical machine gun…but the 37-barreled gun weighed more than a ton, was mounted on a cannon carriage, and had to be pulled by a team of four horses. The first real machine gun was designed by Dr. Richard Gatling in 1862. "Real" because cartridges were fed into the chambers, fired, and casings extracted all by the operation of the machinery. Sir Hiram Stevens Maxim, the British inventor, redesigned this by devising a gun that used its own recoil energy to load, fire, and eject cartridges from a 250 round canvas belt—the first automatic machine gun. John M. Browning teamed with Colt to build an air-cooled, gas pressure operated single barrel gun mounted on a tripod.

The introduction of steam propulsion for ships was strongly resisted. Early paddle wheelers were vulnerable to gunfire, especially since their engines were normally placed above the water line and the paddle wheels were exposed. The *Demologos* was designed by Robert Fulton in 1814 as a defensive steam warship; it had 5-feet thick walls and thirty 32-pounder guns, with a single paddlewheel mounted in a centerline channel well and the engines below the water line. The major advantage of steam-powered warships was that they were not restricted in the direction of sailing by the wind. A major disadvantage of steam-powered warships was that they were reliant on coaling stations or resupply ships that, on their own, also needed refueling. But, by having to remain in the vicinity of ports for coaling, the crews could be guaranteed fresh rations on a more regular basis. When the French built the steam-powered, screw-driven line-of-battle warship *Napoleon* in 1850, the British recognized that their fleet of about 240 ships (only

[81] This science was in its infancy. Wrought iron guns had the nasty habit of exploding, the worst of which was the catastrophic 1844 demonstration of the "Peacemaker," Captain Robert F. Stockton's 12-inch smoothbore, aboard the Princeton—that detonation killed several prominent dignitaries, including the Secretaries of the Navy and State. A. Thiery, Chief of Squadron in the French Army, experimented with shrinking a wrought iron envelope over a cast iron barrel as early as 1829; Professor Daniel Treadwell (Harvard) built some hoped guns in 1843.

1/8 of which, non-combatants all, were steam-powered) had to be junked and replaced by modern warships.

Then came the ironclads. Iron permitted larger, stronger, lighter vessels and allowed greater flexibility in design, less vulnerability in storms, more immunity to fire and lightning, cellular construction or compartmentation, and a more stable gun platform. Disadvantages included the propensity of early ironclads and iron ships to spray splinters when hit by heavy projectiles and the need to clean the iron hulls, which attracted rapid marine growth as compared to copper-sheathed wood hulled warships. The famous *Virginia* (popularly known as the *Merrimack*)-*Monitor* duel was the first real battle between two steam-powered ironclads; it had great dramatic impact in Europe.

Both Union and Confederate forces used mines and spar torpedoes to good effect. The Confederate *Hunley* sank the Federal corvette *Housatonic* (and itself) with a spar torpedo. A federal warship sank the Confederate *Albemarle* with a spar torpedo. Floating Confederate torpedoes (mines) were sent down rivers, and it was these that Admiral David Farragut damned at Mobile Bay.

THE 20th CENTURY

Materiel needs and development of weapons leapt in the 20th Century. Massive production of increasingly complex machines of war led to the creation of peacetime providers of war materiel—the industrial base. The ability to equip and employ larger mechanized forces also created political rationale to declare wars, leading to even greater pressures to expand the industrial base. This was particularly so in the period following World War I, when major powers supported peacetime research and development of the weapons of war that would fuel World War II.

Most nations participated in programs of air warfare training and experimentation in the pre-World War I time frame. Airplanes were first used in war during the Italian Tripoli campaign of 1911-1912. The Bulgarian Army hired mercenary aviators to perform reconnaissance during the Balkan War of 1912-1913. The Germans were impressed; they built an air fleet of about 200 first-line planes by the start of World War I, twice the number available to the French or British. World War I saw the effective use of gasoline engine-powered aircraft in reconnaissance, torpedo delivery, observation, high priority delivery of very sensitive messages, bombing, and combat roles. The adaptation of machine guns to highly maneuverable aircraft introduced air-to-air combat above the traditional "slug it out in the mud" form of combat. There were "aircraft carriers" that carried and launched aircraft for submarine surveillance, but the flat tops were too short to land the same aircraft—"One-way Charlie" became the bywords of naval aviators.

The Krupps had proved the efficacy of diving boats with real fighting value about 1905. Gyroscopes, diesel engines, and a range of weapons entered the German arsenal prior to the Great War. The overconfident Royal Navy knew about the 1200 nautical mile range of the U 18 submarine, but didn't know that the U 19 had a cruising/attack range of 5000 nautical miles.

Torpedoes had been perfected. The Royal Navy had a 21-inch torpedo with a range of 7000 yards at 41 knots. The German Navy attacked the Battleship *Monarch* with a torpedo

within a "secure" harbor, forcing an emergency program to construct submarine defensive barriers. Merchant vessels were armed with small caliber cannon (sufficient to sink or badly damage the thin-skinned U-boats with a low freeboard), forcing them to refrain from surface gunnery attacks and to rely on dwindling stocks of torpedoes. Additionally, anti-submarine mining provided another active measure defense, with approximately 172,000 mines laid by the allies. Allied submarines and depth charges from surface combatant vessels also played a key role in conjunction with aerial surveillance in attacking the U-boats.

Ground combat became a stalemate, with continuous bombardment by artillery and trench warfare. Some advances in weaponry appeared, including larger caliber artillery, especially the German 420 mm "Big Bertha" mortar and the "Paris Gun," which was constructed by putting three large caliber naval guns end-to-end and inserting a tubular core, reducing the bore to about eight inches, firing a 250-pound projectile 75 miles into the French capital.

Chlorine, phosgene, and mustard gas were used in the Great War with varying results; the first German attack on the Western Front occurred on April 22, 1915, breaking the strength of two Allied divisions. Overall, approximately ¼ of the 258,000 American casualties from the war were caused by gas; only two percent died from poison gas, while, among those scores of thousands who were wounded in action by conventional weapons, the death rate was about 25 percent.

In World War I, the British shipped more tons of fodder for horses and mules than ammunition. Horse towed artillery, ambulances, and supply wagons were much more common than gasoline powered trucks in all fronts of WW1!

In October of 1914, British Army Colonel Ernest Swinson watched some American Holt caterpillar (tracked[82]) vehicles tow artillery pieces and conceived of the idea of armoring the tractor, mounting it with guns[83], and using it to counter the enemy machine guns. The first British "tank" was a 31-ton machine mounting two 6-pounders and four machine guns[84]; next came a 30-ton machine with six machine guns. The first serious use came in the Battle of Cambrai on November 20, 1917, when the British fielded 381 tanks employing 1000 guns. By the time they had breached the enemy's main defense system and made a four-mile penetration, 179 tanks were out of action and the attacking British soldiers were exhausted. Bigger, better tanks[85] were produced, culminating in a British 450-tank surprise attack in front of Amiens on August 8, 1918, that created an eight mile penetration, killing or capturing 28,000 German troops and capturing 400 German guns—the Germans learned the utility of tanks for the future.

THE INTERWAR PERIOD

Despite the aura of "peace in our time," the League of Nations, and U.S. neo-isolationism (followed by the Great Depression), there were some significant advances in weaponry research, development, and testing following the Great War. Many of the lessons learned spurred development of armored vehicles, especially tanks with larger caliber cannon, greater speed, and

[82] Not a new idea. Thomas German invented the jointed track, so useful for traversing soft ground, in 1801.
[83] Not a new idea. F.R. Simms successfully mounted a Maxim machine gun on a motorcycle in 1898.
[84] "Little Willie" was the first experimental tank—an armored box set atop the tracked chassis.
[85] "Big Willie" was the first "rhomboidal" tank—an integrated design with two side turret cannon.

more reliable components; military aircraft, weaponry, and tactics; larger, better armored battleships; lighter fragmentation grenades; improved small arms (e.g., .30 and .50 caliber machine guns); and faster, deeper running submarines armed with longer range, more lethal torpedoes. Tight budgets and economic constraints were balanced against foreseeable military needs for modern weapons and supporting equipment, such as radios, truck transport, and pre-packaged, longer shelf life rations.

WORLD WAR II

The mobilization of Japan, Britain, Germany, and the United States during the mid to late 1930s foretold a longer, more violent war. U.S. production of materiel for allies supported their earlier introduction into the war. All of the more complicated machines of war demanded expansion of the parts-producing community of manufacturers. Almost every major weapon used by the U.S. and its Allies during World War II had been designed, tested, and ordered into production prior to the attack on Pearl Harbor; most of the weapons ordered after December 7, 1941 were repeat orders of pre-war designs or modified major weapons and other materiel. Overall, the United States produced 176,000 aircraft (50,000 were in the program by Fiscal Year 1941).

The more exotic weapons and materiel, such as radar, long-range bombers, the atomic bomb, radar-deceiving chaff, and computers for communications intelligence, were perfected early in the war or in advanced, full-scale development by the end of 1942. Research and development accelerated during the war leading to production of truly advanced weapons and weapons carriers by the end of the war—the German Luftwaffe fielded the ME-262 jet-powered interceptor aircraft at the end of the war, the long-range B-29 bomber entered service for major attacks in the Pacific theater, the late-arriving B-36 heavy bomber saw service at the end of the war, the Midway class came into action, and the atomic bomb became a tested, ultimate weapon of war, the final technology of World War II.

WORLD WAR III (THE COLD WAR)

Following World War II, "disarmament" was untraditional, retaining sizable conventional forces and growing arsenals of strategic forces. Weapons and materiel requirements created enormous defense industrial complexes, justified by the needs to prevent a nuclear holocaust, to restrain the Soviet/Warsaw Pact expansion into Western Europe and other areas of the world, to preserve and protect democracy from communism, and to contain potential enemies.

This was the advent of guided missiles, nuclear weapons, and electronics adapted or designed for military use. The emphasis on both conventional and strategic forces and materiel created danger and opportunity—the mere existence of nuclear armed forces was considered to threaten an accidental war that could have ended civilization, while the protection offered by those forces permitted and encouraged rapid economic recovery and growth. In turn, that economic strength allowed even more research, development, and production of weapons and materiel.

Materiel requirements mounted. Strategic nuclear forces and large standing conventional military forces increased the economic burdens on the super powers and their allies. Equipping

and supporting unprecedented high levels of highly sophisticated military forces turned the nuclear Cold War into a primarily economic war—a long-term battle of affordability that was eventually won by the United States.

OTHER 20th CENTURY WARS

During and after World War III, "smaller wars" required a steady production and provision of war materiel around the world. More major campaigns of longer lasting wars (e.g., Soviets in Afghanistan, Kosovo, Bosnia, U.S. and Gulf Allies in Kuwait) maintained the impetus for military-industrial production complexes. The results of shifting political goals (e.g., use of military forces to support humanitarian objectives, emphasis on internal social needs at the expense of military budgets) promised great changes in the 21st Century.

INTO THE FUTURE - 21st CENTURY MATERIEL IMPLICATIONS

With the increased and prolonged use of military forces in non-traditional roles such as stability operations and reconstruction, those new missions impose new materiel and other requirements (e.g., force structure, training, cultural awareness). As we get deeper into the Information Revolution, the trends emphasize the increased reliance on acquiring and acting on information, imposing economic constraints and materiel efficiencies, exploiting adequacy and timeliness, and ensuring flexibility. These in turn place increased reliance on casualty reduction, training in civil-military-political affairs, information-related capabilities, use of standoff weapons, and emphasis on interoperable coalition forces. Perhaps the larger question is how to support the forces and deliver the required supplies for force sustainment and humanitarian purposes—causing us to look at the arcane science of logistics throughout the ages of conflict and war.

TECHNOLOGY AND ITS EFFECTS

Technology is the application of science and engineering to meet military requirements for hardware (e.g., weapons, equipage) and processes (e.g., medical techniques, communications, intelligence analysis). Technology may be viewed in its simplest form as the inspirational or thoughtful adaptation of day-to-day things or capabilities by a warrior to improve his abilities to injure others or protect himself or his comrades. In its broader context, technology is a nation's devotion of scientific and engineering resources and capabilities to improve its latent military might, contributing to deterrence, formation of alliances, and the wide range of military means and materiel most commonly associated with technology. There is a dichotomy that military requirements drive research and development and that novel inventions spark acquisition—the latter case being that invention is the mother of necessity as senior officers are intrigued with the potential use of innovative equipment, especially weapons.

It is this melding of many factors that creates military technological advances and changes. Technology alone, although often touted as the "solution to military problems," is simply a means to permits creative minds to foresee how scientific phenomena might be adapted and applied to increase combat potential and to offset emerging or existing enemy capabilities.

> *"Historically, an RMA* [revolution in military affairs] *occurs when the incorporation of new technologies into military systems combines with innovative*

operational concepts and organizational adaptations to fundamentally alter the character and conduct of military operations."

Report of the Secretary of Defense, March 1996

ADAPTATION

Reactive adaptation of science and the industrial arts is a more usual form of applying technology. The military requirements are to create an effective response to an existing enemy offensive capability (e.g., armor to counter swords, radar to detect attacking aircraft) or to build an offensive capability to overwhelm an enemy's military force (e.g., gunpowder adapted to weapons, penetration aids with ballistic missile warheads). Technological advances have continued to inflict surprises in combat and war as innovative weapons, equipment, and processes have been infused into military forces—technology is the enemy of tradition, particularly in the military application of science and industry.

COST OF TECHNOLOGY

Technology is seldom the highest cost in the development of a weapon system or piece of military equipment, although one can cite examples of extended developments that died prior to full-scale production and fielding (e.g., US Navy A-12, US Army DIVAD, USAF Vanguard). There are also examples of very expensive explorations at the "cutting edge of technology" such as the Manhattan Project. But these are not the norm; weapons normally cost much less to develop and produce than the costs of using and maintaining them.

"Over 60 percent of a typical weapon system's life cycle costs are accounted for by Operating and Support costs. Over 90 percent of these costs are shaped by acquisition decisions made before Milestone III [production decision point]."

Department of Defense
Logistics Strategic Plan, 1995

TECHNOLOGY CREATES SURPRISE AS WELL AS CAPABILITY

From the earliest infusion of new technology into combat operations, its effects and value have been increased lethality, enhanced defensive security, and the shock and surprise of the combatants, sometimes on both sides. Historically, the advent of inventions adapted to combat have given one side an advantage in battle—perhaps momentary, but often decisive. One can only imagine the astonishment of one clan, accustomed to clubs and knives as weapons, as an enemy tribe employed throwing spears

"Holy fire from the sky, Og, that Neanderthal threw his long fighting knife at me!" [Simplified translation]

Similar technological surprises in combat grew from more deliberate and complicated pre-war developments, but the value of enhanced technology in combat has usually been enhanced by secrecy to increase the element of surprise in addition to increasing relative combat power of the technological opponent. This is true whether the technology contributed to infliction of casualties; increased defenses; or improvements in speed or ease of movement, means of communications, support techniques, gathering of intelligence (and

counterintelligence), medical treatment, and other processes necessarily coupled to combat. The shock value of secretly developed and deployed weapons has been seen in the effective employment of long bows against armored knights in Medieval warfare, the introduction of armored and tracked vehicles (misidentified as "tanks" to confuse intelligence collectors) during World War I, the use of unguided V-1 missiles and V-2 guided missiles in attacks on England during World War II, and the dropping of atomic bombs at the end of World War II.

Another point of clarification, or perhaps emphasis, is that there are many "offensive" weapons with intrinsic "defensive" capabilities. Armor, for example, is vital to a modern weapon system because it is a defensive attribute of an offensive fighting capability. Aircraft are easily understood to be "dual capable" as attacking weapons platforms and as intelligence collectors and defenders of airspace. Chemical weapons may be as dangerous to the user as the unprotected target force, depending on winds, persistency (vis-à-vis duration and effectiveness of protective gear). Most of the technological "processes" favor whichever side uses them—they are not inherently favorable or useful to attack or defense.

MEDICAL TECHNOLOGY

The often-understated contribution of the health sciences to military success should be redressed. Many medical developments, such as vaccines, treatment of trauma patients, triage, emergency medical treatment, and surgical advances, have grown from the pre-war technological studies and lifesaving treatment techniques pioneered by the military. Historically, the casualties from disease, infection, and untreatable wounds often were greater than immediate kills on the battlefield. Combat casualties have increasingly included civilians, and procedures invented for treatment following bombings, missile attacks, or mass fires limited the damage and extended a nation's ability to support a lengthy war.

INFORMATION TECHNOLOGY

As the world moves further into the information age of the 21st Century, the unimpeded movement of large volumes of high speed, accurate, and usable data becomes increasingly important. Collection of larger amounts of data about the enemy, environment, friendly forces; rapid sifting and computer aided analysis of huge volumes of data; near real-time dissemination of time sensitive intelligence to combatant commanders; and resultant transmission of operational orders to act promptly as a result create an increasingly complex web of technological challenges. The successful mastery of myriad challenges substantiates the old adage, "Knowledge is Power"—especially knowledge about the situation, vulnerability, and strengths of enemy and friendly forces engaged in combat.

Equally impressive technological advances in offensive combat weapons and defensive means portend greater lethality per aircraft, fighting ship, or warrior; improved stealth and protective measures; and shorter, preemptive military combat through technology. The introduction of technology into combat potential and combat power over recent years and in the foreseeable future brings with it an increase in associated support requirements.

THE FUTURE

Wealthy nations can be expected to invest heavily in increasingly expensive potential more lethal weaponry (e.g., combat aircraft, major naval combatant vessels, laser weapons), and less

wealthy political groups seeking military capabilities are more likely to take advantage of simpler, yet effective weapons (e.g., improvised explosive devices).

Chapter 12. Logistics

Logistics is the third fundamental element of war (together with **Strategy** and **Tactics**). Unlike combat, with its immediacy and concentration on violence, war provides more "non-shooting" time to accommodate the complete cycle of providing war materiel. This includes defining and validating military operational requirements, planning to satisfy those needs, development, acquisition, storage, movement, distribution, maintenance and repair, evacuation, and disposition of military materiel; planning and provision of personnel support services; and acquisition and management of required facilities—the fulsome and robust range of logistics.

Logistics includes materiel development, acquisition, and production; storage, movement, and distribution of supplies and equipment; maintenance, evacuation, and disposition of damaged materiel; medical and other support services; and acquisition and maintenance of facilities.

Logistics is complex and enduring in its military sense; definitions and principles are later postulated and discussed as they relate to war through the ages and in different areas of the world. Logistics is poorly understood because it encompasses all of the arcane and less glamorous facets of equipping and supporting military forces from their formation until their demobilization.

> ***"I have no reason to believe that logistics will ever have much military sex-appeal, except to serious soldiers..."***
>
> ***Major General Julian Thompson (Royal Marines, Retired)***

> ***"...[because] only serious soldiers can understand and master logistics."***
>
> ***General Richard H. Thompson (U.S. Army, Retired)***

> ***"...there is nothing more common than to find consideration of supply affecting the strategic lines of a campaign and a war."***
>
> ***Carl von Clausewitz***

There is a rich history of ground force operations and support. It is a complex and demanding science, and winning wars depends on sustaining military forces that are holding territory, something that neither naval nor air forces do quite as well.

> ***"[Although logistics] is a practical art that must be mastered by navies and air forces as well, there is something distinctive about logistics in land warfare in that it requires territory to be held once taken, over an extended period."***
>
> ***Professor Lawrence Freedman, Kings College***

Until **naval** combatants became somewhat self-sufficient (early, relatively faster narrow beam fighting ships had no space for more than 1-2 days of sustainment) in about the 16th Century, naval logistics usually entailed return to home or friendly ports. Today's primarily nuclear navies and attached replenishment ships provide a much longer leash on combatants. Navies consume fewer pounds per person per day in the aggregate, since the frequency and duration of engagements differs from that of ground forces.

Air forces are essentially base dependent (including aircraft carriers), with their considerable logistics support requirements planned and executed similarly to ground force support of garrison forces. Air logistics is more complex, deals with relatively heavier volumes of transported supplies, and constitutes a much larger proportion of the force than either ground or naval forces.

LOGISTICS

Several definitions of logistics and principles of logistics are summarized below to establish a base of understanding. This broad overview is followed by some commentary about the role of logistics in other times and locales. The purpose is to examine the principles and resultant practices of logistics support to ensure that some set of general principles applies in all conflicts, wars, and combat. The examination is not meant to be exhaustive, but a general assessment of basic, long-standing, and fundamental logistics guidelines to foster a better understanding of the complex, yet simple role of logistics in warfare.

> ***Logistics: the stuff that if you don't have enough of, the war will not be won as soon as.*** ***G.C. Thorpe, Pure Logistics***

> ***The bodies of men, munitions, and money may justly be called the sinews of war.*** ***Sir Walter Raleigh***

> ***...logistics is the art of moving armies. It comprises the order and details of marches and camps, and of quartering and supplying troops; in a word, it is the execution of strategical and tactical enterprises.***
> ***General Henri Jomini, The Art of War***

Logistics is more a military "science" rather than an "art." It is a more precise process unlike strategy and tactics, particularly mathematics in a practical sense—akin to engineering. Although strategy and tactics include analytic considerations (e.g., relative combat potential, combat power, force ratios, weapons effectiveness), logistics is more dependent on the calculation of requirements, availability of supplies and materiel, money, time, distance, productivity of men and machines, and (for the prudent logistician) some fractional hedges against uncertainty.

CONVERTING RESOURCES INTO COMBAT POWER

One succinct explanation of logistics comes from RADM Henry Eccles, who saw logistics as a process, a major transforming function of warfare.

> ***"Logistics is the bridge between the national economy and the combat forces, and logistics thus operates as 'military economics' in the fullest sense of the word. Therefore, logistics must be seen from two viewpoints. Logistics has its roots in the national economy...it is dominated by civilian influences and civilian authority. In this area, the major criterion of logistics is production efficiency. On the other hand, the end product of logistics lies in the operations of combat forces. There logistics is dominated by military influence and military authority. In this area the major criterion of logistics is its effectiveness in creating and sustaining combat forces in action against an enemy."***
>
> **RADM Henry E. Eccles**
> ***Logistics in the National Defense***

PRINCIPLES OF LOGISTICS

Principles are both fundamental truths and essential qualities that describe and define. They form the basis for functional procedures supporting military operations. To be considered valid, principles should approach immutability—enduring through time.

Principles of Administration (British Army Pamphlet, ca. 1850)

- Foresight
- Economy
- Flexibility
- Simplicity
- Co-operation

Principles of Logistics (JCS Pub 4-0, *Doctrine for Logistic Support of Joint Operations*, January 27, 1995) [**NOTE**: several other principles are collected and addressed under the heading of joint logistic planning.]

- Responsiveness
- Simplicity
- Flexibility
- Economy
- Attainability
- Sustainability
- Survivability

LOGISTICS PLANNING

Planning for logistics support of combat operations descends from the statement of strategic goals and objectives, definition of the military mission and commander's guidance, and the understanding of the tactical plan for executing operations. Logistics planning begins with analysis of the feasibility of supporting proposed combat operations in terms of resources and transportation. Any logistics plan must be sufficiently flexible to accommodate changes to meet the situation at the time it is executed—the purpose of logistics is to support military operations.

> ***"Logistics ... can be described as the bridge connecting a nation's economy to a nation's warfighting forces."*** **JCS Pub 4.0**

IMPLEMENTATION

As supplies, replacement equipment, and repair parts are made available, their orderly movement from production and storage facilities to the forces relies on the transportation systems and logistics plans prepared for the operation, as well as standard logistics communications and information systems. A mix of support options is normally planned to provide sustainment well forward in the theater of operations. These include supplies accompanying forces, prewar positioning of supplies and procurement in or near the theater of operations, and transfers of resources from other areas or Allies (e.g., Wartime Host Nation Support services). Simply put—take it with you, get it there, or get it shipped from someplace else; use transportation efficiently by communicating appropriate requirements and situational information to provide timely support of military operations.

COMMUNICATIONS AND INFORMATION

Providing needed support at the right place and at the right time requires communicating urgent military support requirements to suppliers and informing operational commanders of the status of support. The growing complexity of equipment and related logistics functions and the need for near real time tracking and accountability for supplies demand collection of great amounts of raw data, conversion of "clean" data to information, and presentation in summarized form for decisionmakers. This requires automated and standardized systems, simple formats, accessible databases, rapid data rates, and improved communications that are used by supporting units, sustaining base organizations, and headquarters (e.g., with summarized information at higher levels). Knowing and understanding the support priorities, requirements, and logistics status, additional support can be generated and provided quickly enough to influence the outcome of military operations.

EFFICIENCY AND ECONOMY

Although logistics support has often sought to flood the theater of operations with all available sustaining resources, operational support priorities are best met by responding in a more timely manner to commanders' statements of immediate and near future requirements (the PULL system) or more accurately forecasting their needs (the PUSH system) in a more accurate and economical manner, using simulations and near-real time connectivity to best advantage. Efficiency includes providing support of the right kind, at the right time, in the right condition and amount, at the right place. Economy includes awareness that fiscal, production, distribution, and other constraints require setting priorities to limit waste and setting reasonable time lines.

TIMELINESS

Support training, planning, production, movement, distribution, and provision can neither be too late nor too early. Premature execution of logistics planning is wasteful. The sin of tardiness is more easily recognized—for want of a nail, etc. Promptness in logistics planning and operations is key to military victory.

RESPOSIBILITY

Management, leadership, and supervision of operations and planning are best completed by identifying who is responsible for what. Generally, logistics planners have the broader experience in coordinating disparate functional support, while more narrowly functional experts provide details of the commodities of supplies or services with which they are more

knowledgeable. Preparation of an overall logistics plan to support a major military operation (war or campaign) relies on understanding the mission and ultimate objectives. Based on that understanding, planners proceed with the preparation of functional annexes, integration of diverse planning elements, and revision of overall plans to ensure cohesiveness. Provision of services and supplies is frequently assigned to technical, functional units. But each role, including the authority required, is assigned to an individual to fix responsibility.

UNITY OF COMMAND

Associated with responsibility is the principle of unity of command. Logistics is inextricably a function of the operational commander. History is replete with examples of great leaders who saw to their own logistics, but there are virtually no examples of successful war leaders who ignored logistics. At the national level, responsibility and authority are generally delegated to "share the load." However, any leader or commander who delegates logistics authority and responsibility hazards the success of the operational mission.

SIMPLICITY

Despite technological advances and complexities of modern military operations and the exploding information age, the role of support organizations is to provide support in the simplest manner possible. Operating forces should demand and receive the right support, at the right time and place, and in the right configuration. Supporters should seek the simplest means of providing support, eliminating bureaucratic procedures and forms, creating more efficient support forces and systems, and aiding the operating forces in accomplishing their missions.

APPLICABILITY OF LOGISTICS PRINCIPLES

The premise is that the principles represent a reasonable metric against which logistics considerations were successfully or unsuccessfully executed without significant differences across the experience of recorded history of combat operations. In general, the principles provide an analytic basis against which logistics support can be evaluated for a battle, campaign, or war. The most important conclusion is that the under-studied role of logistics in war is not the result of lack of information—the opposite is more the case; the systematic study of military logistics has grown over the last half century, with monumental (although frequently debatable) thoughts brought to the military-professional table for digestion.

CHANGES OR CONTINUITY?

There is another conclusion implicit in the analysis of logistics in war that exposes the often-emotional debates concerning the controversy of interpreting logistics as it proceeds in time and space. Some, the orthodox (revolutionary) view, hold that logistics ***changes*** over time. Others, notably Martin van Creveld who wrote *Supplying War: Logistics from Wallenstein to Patton*, cite the ***continuity*** inherent in logistics (the immutability view). *Supplying War*, published in 1977 and limited to land combat logistics in a European environment over a relatively short period, is perhaps the baseline for (a) escalating the logistics debate to more scholarly levels and (b) escalating the acknowledgment of the importance of logistics and its relation to strategy, tactics, and war. The change-continuity debate includes an evolutionary view that basic principles apply over long periods, that their importance waxes or wanes over time as the environment matures, and that the changes in logistics are related to discovery and application of new means—incremental changes do not violate the enduring fundamentals that

one can derive from studying logistics in combat and war. But the changes are in method, size, and process, not in theory.

BASIC PROCESSES ARE EVOLUTIONARY; INVENTION IS REVOLUTIONARY

Particularly in the case of the logistics functions, the basic processes of transporting, feeding, equipping, fixing, and medically treating retain their fundamental purposes while the improving technological capabilities to perform those functions changes over time. Some changes are more dramatic (e.g., first use of ships to supply armies), some are faster paced (e.g., communications, information flow), and some have greater effects (e.g., medical treatment coupled with faster evacuation of wounded). So the logistics debate should persist, but with recognition that logistics evolves by incrementally improving (changing) processes while retaining fundamental purposes (continuity).

CONCLUSION

Rather than a lengthy summation of the material, let's list some fundamental lessons, perspectives, and characteristics.

- Logistics is the third element of combat, conflict, and war, together with Strategy and Tactics.
- Logistics supports combat tactics and campaign and war strategy.
- Logistics may define or create combat tactics and campaign strategy.
- Logistics is complex because people don't take the time to understand it and it isn't glamorous.
- Logistics is simple because it is only the movement and maintenance of people and things.
- Logistics can be defined broadly (as in 15) or extensively; narrow definitions are inadequate.
- Logistics is provided by taking it with you, getting it on the way, or having it at the objective.
- Logistics contributes to victory when their fundamental principles are faithfully followed.
- Logistics is evolving to keep pace with changes in international relations and technology.
- Logistics is at the frontier of military study and public understanding; more needs to be done.

Chapter 13. Intelligence and Information

The basic elements of intelligence have not changed over the centuries. For example, Roman commanders wanted to know the topography of the areas in which they were fighting, as well the security of various routes.[86] These officers needed to know where enemy units were located and the morale of these troops. Prior to their invasion of Great Britain, Roman leaders demanded to know the geography of this territory, the condition of Britain's harbors, and the nature of its inhabitants, both psychological and physical.[87] To obtain this information and to prevent surprise, scouts and reconnaissance units were utilized, along with interrogation of POWs. Enemy deserters and refugees were questioned, the former being especially anxious to pass on enough information to secure a good reception. Caesar used skirmishes with the enemy to find out how good these troops were and to uncover weaknesses in his own forces.[88]

Chingis Khan (ca. 1162-1227) sent messengers into cities that he planned to plunder to alert the spies he had already settled into these areas. Some of his intelligence agents disguised themselves as merchants to spread panic in his target areas, though they sometimes sought to persuade people that the invaders were not to be feared. To avoid surprise, Chingis Khan sent scouts in front of his reconnaissance patrols that preceded the bulk of his armies.[89] In the Crimean War (1854-56), the British military were thoroughly unprepared in terms of intelligence assets, so a civilian, Charles Cattley, an expelled British consul from the Crimean port of Kertch, organized a military intelligence organization. He sent cavalry and spies into the Crimean area, and interrogated deserters and POWs, in order to track various Russian units. Cattley analyzed the resulting information, citing sources and evaluating the credibility of these sources, and then presented his conclusions in his intelligence reports to the British military. He also attempted to predict future moves by the Russian military.[90]

Perhaps the first fully organized military intelligence organization was that set up by Col. George H. Sharpe of the Union Army in the American Civil War (1861-65). Sharpe established an all-source intelligence system. Sharpe used scouts, cavalry reconnaissance, spies deep into the Confederacy, balloons, Signal Corps observation stations, flag signal interceptions, examination of Southern newspapers, and telegraph reports—whose information he collated and combined to produce this all-source intelligence.[91] This advance in intelligence disappeared in the United States until 1947, when Congress passed the National Security Act in the attempt to create an all-source intelligence system and avoid another intelligence fiasco as happened at Pearl Harbor in 1941.

---

[86] N. J.E. Austin and N.B. Rankin, Exploratio, (New York: Routledge, 1995), p. 43.
[87] Ibid. p. 13.
[88] Ibid. p. 48.
[89] James Chambers, The Devil's Horsemen, (New York: Atheneum, 1979), pp. 53-95.
[90] Stephen M. Harris, British Military Intelligence in the Crimean War, 1854-56, (London: Frank Cass, 1999), pp. 92-131.
[91] Edwin C. Fishel, The Secret War for the Union, (New York: Houghton Mifflin, 1996), pp. 275-98.

China today seeks to learn the order of battle of potential enemies, the military geography of neighboring countries, the intentions of current and potential enemies, military economics—the industrial potential and agricultural strength of other nations, biographical intelligence on foreign military and political leaders, the location of possible nuclear targets, vulnerabilities of other countries, basic information, and current intelligence. To gather intelligence about India before the 1962 offensive against this South Asia nation, the Chinese utilized agents planted among road gangs, porters, and muleteers. They also captured Indian patrols. Chinese intelligence leaders may be utilizing the comparatively large population of ethnic Chinese in America to collect information on American research. In general, Chinese intelligence recruits international arms dealers to hide their own role in the acquisition of weapons systems from other countries, and in training guerrillas, they recruit some of these people to collect information for their own use.[92]

Soviet intelligence was able to infiltrate the senior levels of the American government in the 1930s through such men as Harry Dexter White, an Assistant Secretary of the Treasury, Henry Wallace, once Vice President of the United States, Harry Hopkins, Assistant to President Franklin D. Roosevelt, and Alger Hiss, a high-ranking state department official.[93] In May 1940 German military intelligence, under the leadership of Col. Ulrich Liss, read French military doctrine and military journals very thoroughly. These men advised German operational officers that a feint in the northern sector towards Holland and Belgium could lure Allied forces into this sector and that when the main German attack proceeded through the Ardennes, the French military would not have the flexibility and resilience to move south to counter this main thrust.[94] The Wehrmacht was thus able to divide Allied forces and conquer northern France in approximately six weeks.

INTELLIGENCE INFORMATION

With the explosion of computers and the internet, there are now many types of information available to intelligence operatives simply by clicking a mouse that would have involved working with covert operatives or clandestine sources in the past. For example, a force on force comparison of North and South Korean armed forces can be accomplished within a matter of seconds by simply going to the Republic of Korea Ministry of National Defense web page. Once there, an analyst can do an immediate order of battle comparison.

This has led many individuals within the United States Department of Defense, Congress, NATO, the European Union, the academic communities, and others in the public around the world to question if there is even a need for covert operatives and clandestine sources. Such sources are constantly in danger of being discovered and punished, are often expensive to maintain and their reliability often in question because of the motives they may have for sharing information with the enemy (us).[95]

---

[92] Nicholas Eftimiades, Chinese Military Operations, (Annapolis: The Naval Institute Press, 1994) 25-57.
[93] For more information in this area, see Herbert Romerstein and Eric Breindel, The Verona Secrets, (Washington DC: Regnery Publishing, 2000).
[94] Ernest R. May, Strange Victory, (New York: Hill and Wang, 2000).
[95] Daniel Patrick Moynihan, Secrecy (New Haven Conn: Yale University Press, 1998), 8-10.

The fact remains that collection by covert operatives is very important. Information obtained from clandestine sources is also very important. Covert collection is often confused with clandestine sources. Because of the confusion (particularly in the policy community) that exists about the difference between these two aspects of intelligence, it is important to briefly discuss how they differ. *Covert collection* can be defined as that which is collected "under cover." For example, an intelligence operative under cover as an American businessman in Beijing may in reality be using radio intercept gear to collect Signals Intelligence on the Chinese military.

Another example could be an individual assigned to duties at the embassy who secretly takes pictures of military equipment. These individuals are covert operatives, operating "under cover" in a potentially unfriendly country to provide intelligence data to those who need it. On the other hand, a *clandestine source* is normally an individual(s) who is providing information on his or her government or military to a second party that will potentially use that information against his or her government. More often than not, these are purely HUMINT sources. The differences between *covert operations* and *clandestine sources* are thus fairly clear cut. A covert operation can be many types of intelligence collection, conducted by agents of one's own country. A clandestine source is a member of a potential enemy's forces. A source that if discovered risks punishment or even death.

Back to the legitimate question asked by many policy makers, "Do we still need covert collection and clandestine sources?" The answer is yes. While there is a growing volume of sources available on the internet and other open sources, key sensitive information – particularly about intentions, can be obtained by using covert operations or clandestine sources.

That brings us back to open sources. How valuable are they? Open sources have become a vital part of intelligence collection. They have become so important in the past 10 years that intelligence agencies and other staffs that provide support for warfighters worldwide now often have their own web browsers for analysts to use on a daily basis. In fact, intelligence agencies, as well as contractors and academics worldwide now have courses for analysts (both new analysts and experienced ones, for whom this is still a relatively new source), teaching them all of the aspects of open source intelligence collection and how vital it is in being able to paint a complete picture for military commanders and national level policy makers.

Open source collection is not limited to simply surfing the internet. For example, debriefings given to members of Non-Governmental Organizations such as World Vision, after returning from places such as North Korea or Serbia, can provide invaluable information for intelligence personnel on things normal collection simply cannot detect. These sessions are of course unclassified, but in this "new world order" the role of such organizations as a potential tool for intelligence collection has become very important. Information obtained at conferences, symposiums and even book signings by academics and foreign policy makers can also often prove to be very valuable. The bottom line is that open source information has become a very important aspect of intelligence within the past 10 years.

PUTTING INFORMATION GATHERING INTO FOCUS

Because we now live in the information age, putting information gathering and dissemination into focus has now become more of a challenge to commanders than ever before in the history of warfare. The biggest danger that commanders and those who provide them with information face is trying to focus on *too much information*. This can (and has) actually lead to slowdown in the planning and operations process. In fact, a key concern of many military staffs is now the advent of "information overload." This can consume the time of line officers and staff members alike.

All military commands, from individual battalions that various nations may field, all the way up to combined forces in the international arena fighting or conducting other operations for NATO and the United Nations, deal with *essential elements of information.* This is information important to the commander in accomplishing his or her mission. In the intelligence process, the best way to focus on this is through *intelligence requirements (IRs).* These requirements are based on information known about enemy forces that is known to the intelligence staff of a combatant commander. The information is evaluated into intelligence, and matched with planning requirements from the commander's staff. The information is then turned into IRs. Critical intelligence requirements are known as *priority intelligence requirements, or PIRs.*[96] PIR's can often change or go away completely depending on the flow of the combat threat or the political situation.

Once these PIR's and IRs are put into print, they drive collection for the assets available to the commander – or sometimes the national level intelligence community. This information also often influences war plans. For example, the US-Republic of Korea OPLAN 5027 has changed many times since 1953 (the last time in 1998). Often these changes are made because of changes in the North Korean threat as reflected by the Chief intelligence officer for United States Forces Korea and/or United Nations Command. It can truly be stated that information drives intelligence and intelligence drives planning. Analysis is also driven by IRs and PIRs. All-source intelligence analysts focus on analyzing the information that is contained in IRs and PIR's. Production and presentation of intelligence is really dependent on the consumer – the commander.

Most combatant commanders for US, European, NATO and United Nations commands now have formal intelligence briefings on a daily or weekly basis, presented to them by their chief intelligence officer and put together by the intelligence analysts of the various intelligence staffs. In this modern age of computers and high-speed information sharing, many of the combatant CINCs can now read each other's briefings, point papers and other intelligence products online, daily. In addition, the coordination and synthesizing of these products before they come out is now an easy process because analysts from the various commands and national level intelligence agencies now can share these products via secure email. Often at the battalion, regiment and even division (or wing) level briefings are much more informal, normally consisting of some hand written notes presented in front of a map that may have important units or threats marked.

[96] Field Manual (FM) 34-8-2, Intelligence (Washington, DC: Dept of the Army, July 1998), D1-D2.

One of the biggest and most important changes to intelligence sharing in recent years has been its dissemination among allies. This varies from ally to ally and often becomes an ad hoc affair dependent on the situation. For example, while the United States is well known for routinely sharing intelligence information with close allies such as the United Kingdom and Canada, it often shares very little with countries considered allies but who have radically different language and culture. This was exactly the case in the Gulf War, where US intelligence sharing effort with the Saudis changed dramatically because commanders and staffs were working side by side.[97] Often in situations like the war in the Gulf, issues of compartmentation, sensitive collection sources such as signals intelligence and imagery, and classification markings are thrown aside as the commanders and the intelligence officers who work for them adjust standards in order to get the intelligence out to the people who need it.

The situation above is just one example out of many in recent years. Other key examples would include the air campaign in Kosovo, the Non-Combatant Evacuation operations in Africa, and the operation in Haiti. It should be mentioned that the sharing of intelligence information with allies can often be a dangerous game. This applies to any country. The priorities of one country may not be those of another. Thus, when one country shares intelligence with another there is always the risk of information being released which though not harmful to the country releasing it, could be extremely damaging to the government or military of the originating country.

In this brief section I have addressed how intelligence staffs provide focus for information gathering, analysis, production of intelligence and dissemination. All aspects of the process must work properly in order to keep commanders properly informed of key intelligence. When referencing intelligence specifically, it should be stated that analysis drives collection, collection drives production and production requirements drive dissemination.

INTELLIGENCE ABOUT FRIENDLY FORCES

This is a function that often does not sit with the intelligence section of a commander's staff, though the intelligence section is often called in to provide support functions that deal with this kind of problem. Intelligence on the capabilities and readiness of friendly forces often sits with the operations officer at the joint level as well as lower levels.

Information about friendly forces such as readiness and capabilities, disposition and supportability is very important when determining when to go to war, how to go to war, and how high the price will be. When it comes to intelligence, the main role played here is providing a threat assessment of the potential enemy and how that enemy stands up against friendly forces. This is normally done by first laying out a comparative order of battle. For example, when briefing on the North Korean threat, a comparative spread (of North Korean and South Korean forces) sheet showing numbers of tanks, artillery, trucks, planes, ships etc. will always be provided. The next step is not so easy. When determining readiness and capabilities, one must first take a look at friendly forces and then the enemy. Field training levels, maintenance of equipment, force structure and command and control all determine the readiness of a military.

[97] US Congress, Senate, Select Committee on Intelligence, Final Report to Congress: Conduct of the Persian Gulf War, Appendix C, 1st Session, April 1992, S. Rept. 339-340.

Looking again at the Korean example, North Korea has many more tanks than South Korea. But South Korea has more modern, capable tanks. Further (getting back to supportability), North Korea is dangerously low on all fuels. South Korea has an abundance of fuels. Sheer numbers of friendly forces vice potential enemy forces is just the beginning of determining our capability to fight and maintain the advantage against an enemy.

Information about friendly forces is a key component of preparing an intelligence estimate for joint and combined war planners. The role intelligence plays in the process has been outlined above. It is vital that we understand the capability of our enemy compared to our readiness, capabilities and intent, before sending young men and women into harm's way.

INTELLIGENCE ABOUT THE ENVIRONMENT

Despite the emphasis on politics, leadership and "sexy" weapons that intelligence analysts seem intent to concentrate on, the key intelligence concern as often as not for the tactical commander is knowing the environment that he is going into. In the late 1980s, a new methodology for being able to analyze and brief intelligence was devised by the United States military. This method was named *Intelligence Preparation of the Battlefield (IPB).* It was first used in the Persian Gulf War. Later, when Marine forces landed in Somalia in 1992 as the advance force for the joint task force deployed there, IPB was used to lay out the urban environment for the Marine Expeditionary Unit commander prior to entering Mogadishu and other key areas of the country. IPB is now used not only by the United States but also by NATO, the United Nations peacekeeping forces, and other individual countries. IPB is used by all joint and service intelligence elements prior to entering any potential combat situation. It is the definitive methodology for analysis and dissemination of information about the potential combat environment to commanders who need it.

What is IPB? It is the analysis of the potential battlefield using various kinds of overlays, templates, and matrices used during the intelligence preparation process that enhance the battlefield visualization of the commander and staff. These products are integrated into one large briefing or a series of briefings that make the often-confusing intelligence picture easy for the commander to understand. What makes IPB so useful is that it can be used for all services and joint task forces. The type of product developed simply depends on what type of commander is going into the operation and what type of environment he is going into (urban, desert, jungle etc.)

Examples of the types of things that would go into terrain analysis include obstacles, key terrain, restricted terrain, severely restricted terrain, soils and weather analysis. Concealment and cover overlays are often included, as are combined obstacles overlays, population status overlays (very useful in Low Intensity Conflict), key facilities and target overlays, and lines of communications overlays. For naval commanders, this can also include overlays on avenues and sea-lanes. Doctrinal templates can be used to depict enemy deployment of forces. Situation templates can be used to depict deployed enemy forces adjusted for obstacles and terrain. Matrices can be used for such things as an event matrix (depicting courses of action and indicators that would help confirm them), and for defining the air battlefield for the air

commander matching such things as type of aircraft with minimum velocity, wind speed, direction, precipitation, temperature and illumination.[98]

Overlays, templates and matrices can of course be augmented by scale models and other visual aids. The key here is taking a potentially complicated information environment and presenting it at the most simple level possible, making the intelligence easily understood by a combat commander. With a thorough knowledge of the environment he will be sending his forces into, the commander now is capable of deploying forces with confidence.

It is should be stressed that while IPB is a vital tool for tactical and operational level intelligence missions, these missions must be supported by strategic level intelligence staffs that provide them with information on enemy strategy, doctrine and tactics. This intelligence can and should be included into the briefings provided for the tactical and operational commanders and if possible integrated into the IPB process.

THE "INTS": WHAT THEY ARE AND HOW TO USE THEM

Battlefield commanders have intelligence available to them on a real-time basis as no one before them has in the history of warfare. Because of this, it is important that the CinC, joint task force commander or the service commander understand clearly what the intelligence fields are and how he can use them. Even more importantly, it is important that the staff intelligence officer understand what the different intelligence disciplines are, how to use them, and how he can gain support from national, strategic and tactical intelligence assets.

The four intelligence disciplines are SIGINT, MASINT, HUMIT, and IMINT.[99] Any other so-called "types of intelligence" are merely sub-disciplines of the four mentioned above. Because of this, it is important to first define each of these intelligence disciplines and then go into more detail, outlining how they serve the combatant commander.

SIGINT

Intelligence information comprising either individually or in combination all communications intelligence, electronics intelligence, and foreign instrumentation signals intelligence, however translated.[100]

MASINT

Scientific and technical intelligence information obtained by quantitative and qualitative analysis of data (metric, angle, spatial, wavelength, time dependence, modulation, plasma, and hydromagnetic) derived from specific technical sensors for the purpose of identifying any distinctive features associated with the sources, emitter, or sender and to facilitate subsequent identification and/or measurement of the same.[101]

---

[98] Field Manual (FM) 34-8-2, B1-B13.
[99] Department of Defense, Joint PUB 2-0, Joint Doctrine For Intelligence Support to Operations. (Washington DC: GPO, 1993), V3-V7.
[100] Department of Defense, Defense Intelligence College, Estimative Intelligence: Glossary of Intelligence Terms. (Washington DC: GPO, 1992), 14.
[101] Department of Defense, Defense Intelligence College, 10.

HUMINT

A category of intelligence information derived from human sources.[102]

IMINT

Representations of objects reproduced electronically or by optical means on film, electronic display devices, or other media. The collected products of imagery interpretation are processed for intelligence use.[103]

SIGINT has been a major contributor to all levels of combatant command since WII. If an enemy force is talking on a radio, telephone, computer or satellite link, it is likely to be intercepted by SIGINT collectors. If the enemy turns on his radar – same situation. While national level systems are very important in presenting a clear picture to military leaders, every operational commander (and often tactical commanders as well) has organic SIGINT elements attached. These individuals are capable of intercepting and processing communications and emanations using both airborne and ground based systems.

MASINT is the newest of the four intelligence disciplines. As seen in the definition, MASINT is essentially the analysis of an enemy's movement and other activity to glean information on intentions and capabilities. This is primarily done using sensors of all kinds and doing in-depth analysis over varying periods of time. MASINT specialists are frequently attached to the combatant CINCs, giving them organic collection and timely analysis.

HUMINT is the oldest and best known of all the intelligence disciplines. Going back to ancient times, and noteworthy in American history as far back as the War of Independence and particularly the Civil War, HUMINT has played a major role in the intelligence community. It is perhaps the most highly protected discipline because often if a source is discovered it can mean his or her life. The Defense Intelligence Agency coordinates and controls all Department of Defense related HUMINT activities by the United States military, including the valuable services provided by the military attaches around the world.[104] All combatant CINCs and joint task force commanders also normally have organic HUMINT personnel attached. HUMINT remains a key element today of the intelligence that is presented to the commander. National level agencies of major powers worldwide such as MI5 and MI6 in the United Kingdom and the Defense Intelligence Organization in Australia also control strategic HUMINT for military commanders.

IMINT is valuable at both the national and theater levels. While national level IMINT is derived from expensive well known satellite systems, IMINT is also derived at the operational level using aircraft as collection platforms. National level IMINT information is now often available to operational commanders and tactical commanders in combat situations such as the recent Kosovo operation. Since the mid-1990s, unclassified IMINT has been available on the National Imagery and Mapping Agency web site on the internet as well as other areas for commercial use.

---

[102] Department of Defense, Defense Intelligence College, 7.
[103] Department of Defense, Defense Intelligence College, 8.
[104] Barbara A. Duckworth, "The Defense HUMINT Service: Preparing for the 21st Century," Defense Intelligence Journal Volume 40 no. 1 (Spring 1997): 7-9.

Intelligence officers at all levels need to have an understanding of how the systems, agencies, and individuals attached to their commands conduct intelligence operations in all of the intelligence disciplines. The more modern a military becomes, the more complicated the systems will get that support these intelligence disciplines. The real challenge to the intelligence officers at all levels is coordinating and synthesizing these disciplines in support of a combat operation. The all-source intelligence professional now no longer deals just with his own interrogators, photo-interpreters, and "secret listeners," but also with national level agencies and combatant CinC intelligence elements. What this means for today's military is that all intelligence officers must have a strong background in both strategic and tactical intelligence and how the two integrate.

INFORMATION SECURITY

Security of classified information is no longer a simple matter. In fact, as the chart below demonstrates, there are many types of security in intelligence. All of them are very important.[105]

Automated Data Processing Security
Communication Security
Computer Security
Cryptographic Security
Electronic Emission Security
Emanation Security
Emission Security
Information Security
Transmission Security
National Security
Operations Security
Physical Security
Signals Security

Security is now a big part of intelligence. Now that the United States military is not only the biggest in the world, but the most modern, it has become a high priority of not just our enemies but our friends to obtain all the classified information they can on every aspect of our information systems available – whether through open sources or by infiltrating our modern information systems.

CONCLUSIONS

The reason intelligence has become so much more important to our military leaders in recent years is in reality because information has become so much more important. The fact that

[105] Department of Defense, Defense Intelligence College, 14.

information is now so much more readily available in so many different forms is what makes intelligence more of a focal point for military planning than ever before. The challenge is ensuring that commanders do not get overwhelmed with intelligence information.[106] That is the key element of an intelligence officer's job – telling the commander what he needs to know, and not overloading him with worthless and/or confusing intelligence information. Before the battle of Gettysburg Robert E. Lee could never have imagined having such an array of intelligence sources available to him as our commanders do today.

[106] Melvin A. Goodman, "Starting Over at the CIA," Intellectual Capital.Com, Available online at: www.us.net/cip/startovr.htm, 17 June 1998, 1.

Chapter 14. Communications and Information in War

The figure below illustrates how the processes of war rely on communications—in the forms of data, pictures, speech, documents, information, and knowledge. There are processes that influence one's own "side" (command-control, motivation, sustainment, movement, protection, information acquisition, communication) and those that influence the enemy (demoralization, destruction, suppression, neutralization, disruption, deception)—but they are all dependent on communications to be effective in supporting war aims. Additionally, there are communications and information flowing into the war environment from global sources (e.g., friends, allies, trading partners, neutrals) that impinge on a war leader's decision processes.

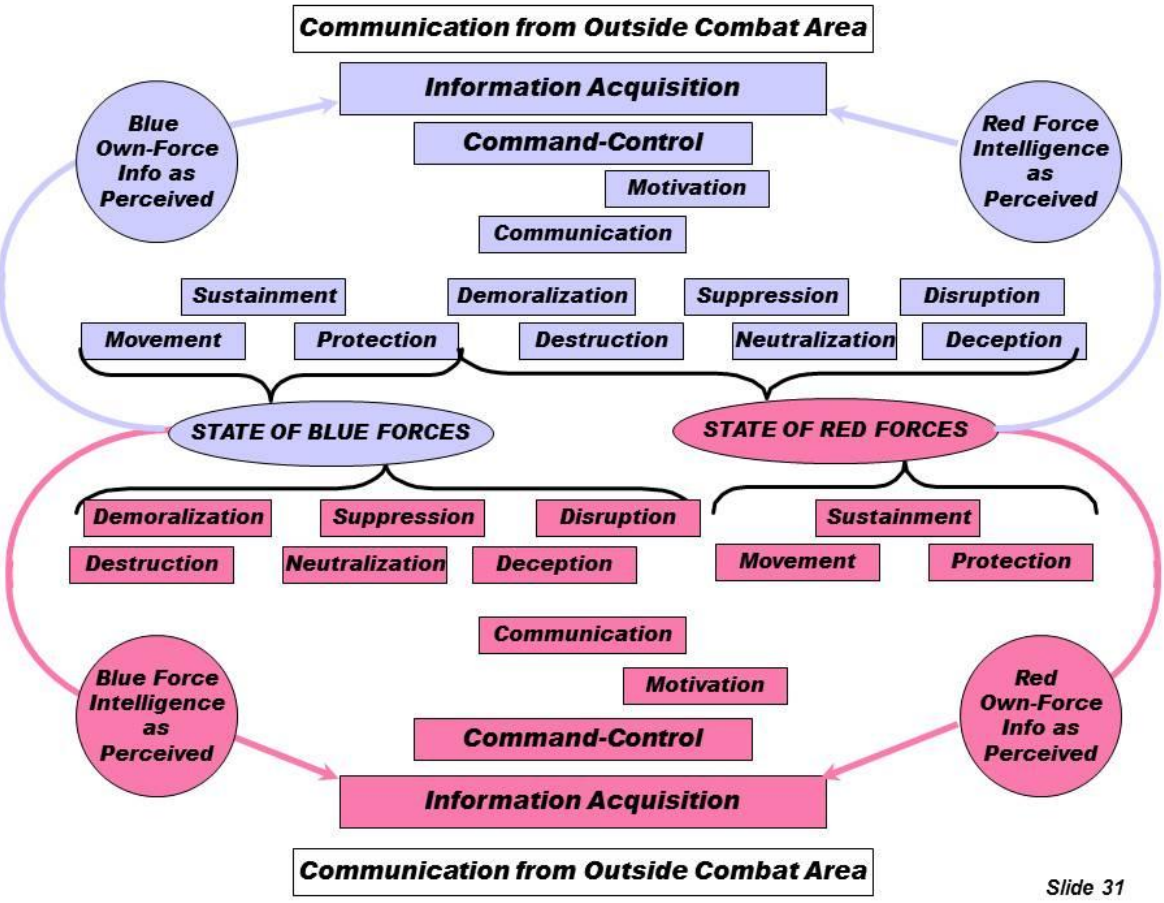

Figure 12. Force Interactions

People observe activities and gather data. The process of transforming data, heavily colored by perceptions, into information involves communicating[107] the data, analyzing the related data set, and passing the results (information) in an understandable and useful form—communicating knowledge. War leaders, commanders, and decisionmakers involved in planning or conducting war or other national security management operations must absorb the overabundance of information, however good it is, and apply their judgment and experience to convert the information and knowledge into relevant understanding on which to base decisions, discarding the unreliable, inaccurate, and irrelevant ragged edges of the information and knowledge through their judgmental processes.

ELECTRICITY MODERNIZES COMMUNICATIONS

The practical application of electricity to emerging technologies significantly speeded the communication of information in a broad sense. The progress made possible through invention and application of electric phenomena advanced over the last two centuries.

TELEGRAPH

The development of the telegraph revolutionized the communications of war information—not just military information, but broader political messages, economic arrangements, and information intended to sway public opinion. Speedy dissemination of information (versus horsemen traveling at a lope or trains carrying information at relatively slow speeds) and communications with multiple recipients enabled war leaders to interact with subordinates more quickly.[108] The widespread use of the telegraph in the mid-1800s conditioned people to expect speedy, albeit short message traffic—easily transitioning from routine business dealings to a war footing when required.

VERBAL TELEGRAPH--THE TELEPHONE

The invention of the microphone (and the use of the same device as a mini-speaker in reverse) led to the inexorable expansion of the telephone industry to business, government, and military systems, permitting the communication of more information per unit of time than the telegraph could ever achieve…and the tone of voice, volume, inflection, and emotions inherent in voice communications provided information that the telegraph could only imagine. But the limitations of the use of wires (e.g., signal attenuation, restricted to fixed sites, vulnerability to outages due to nature or enemy action, time to emplace and install) persist to this day and at least into the near future. And Navies couldn't use either telegraph or telephone wire-bound communications.

SO LET'S GO WIRELESS

In 1890, Guglielmo Marconi became interested in wireless telegraphy, and by 1895 he had developed an apparatus that successfully sent "signals" a few kilometers distant by means of a directional antenna. By 1907, trans-Atlantic wireless telegraph service was a public-use reality. The British, Italian, and other Navies quickly adopted his system. There was one technological difference with going wireless: there was a very broad frequency spectrum on which to base transmission and reception. Originally operating in the high frequency band (generally longer

[107] Recall that this is a combination of sending and receiving data, not just transmitting.

[108] Perhaps this is a technological parallel to time advantages that the "speech-enabled" early cultures had over their "speech-impaired enemies.

distances were possible due to the "bounce" of the signal), Marconi extended his search into the short wave band as a means of secret communications (no one else could receive those signals) for the Italian forces during World War I.

It was but a small jump from wireless telegraph to radio. Microphones and speakers adapted to landline use were easily applied to the wireless systems, and long-distance governmental and public voice communications flooded the airways.

Both wireless telegraph and radio communications allowed commanders at sea and in the field to send information to each other, to subordinates, and to higher echelons from mobile sites. No longer were fixed stations and wire or cable connections required. As other platforms of war emerged (the airplane), technological advances permitted the construction and use of lighter, smaller radios by military aviators and eventually space platforms (e.g., spy satellites, radio relay communications satellites, manned space vehicles). "Radio," as a generic means of communications, remains the predominant means of sending and receiving information to and from military forces and war leaders.

Television entered the scene early in the 20th Century, experiencing rapid growth in the last half of that century. TV[109] is not restricted to public use, with military applications in the fields of sensors, video teleconferences, and collaborative interactive video providing the pictures to enhance the spoken words. How much more useful is a pictorial download from a video camera aboard an Unmanned Aerial Vehicle to a military command center than a spot report from an exhausted observer with shaking binoculars? Satellite photos using optical, infrared, and ultraviolet receptors further dispel the fog of war.

PROGRESS HAPPENS

As wires became outmoded, innovation and technological progress provided manual switchboards, amplifier relays, fiber optic cables, microwave relays, automated switches, touch tone dialing, and digital signal conversion for the telegraph and telephone. More recently, the formation and expansion of the Internet has created a public global grid, while similar military applications and networks work in parallel. Military radio and TV faced the challenges of interference, reception quality, and open access (anyone who had an HF receiver could "listen in" on military communications).

TECHNOLOGY MEETS THE CHALLENGES

Just as Marconi used short wave frequencies to hide Italian military communications, military organizations have adopted many technologies to protect the privacy and secrecy of their landline and broadcast communications. Encryption, codes, enciphering, burst transmission, frequency hopping, complex modulated laser beams, and myriad other schemes[110] have been developed to prevent interception and use of military information in wars. But there is a never-

[109] Let's use the term TV to include the multitude of optical means of detection, formatting, and presentation, but the actual transmission is essentially radio.

[110] An unusual practice was the use of Navajo "code talkers" during US Pacific campaigns in World War II. In addition to speaking a native language unknown to the rest of the world, the Navajo code talkers used substitute words (e.g., eagle for airplane) and shorthand phrases to "double encrypt" their communications.

ending battle between those seeking to protect information and those on the other side who are determined to intercept and understand it.

ESSENTIAL COMMUNICATIONS

The history of military (and civilian) communications provides a background to the primary theme of this chapter—the use of communications to exchange war information. Let's go back to an earlier graphic to describe the processes of war and their dependence on communications.

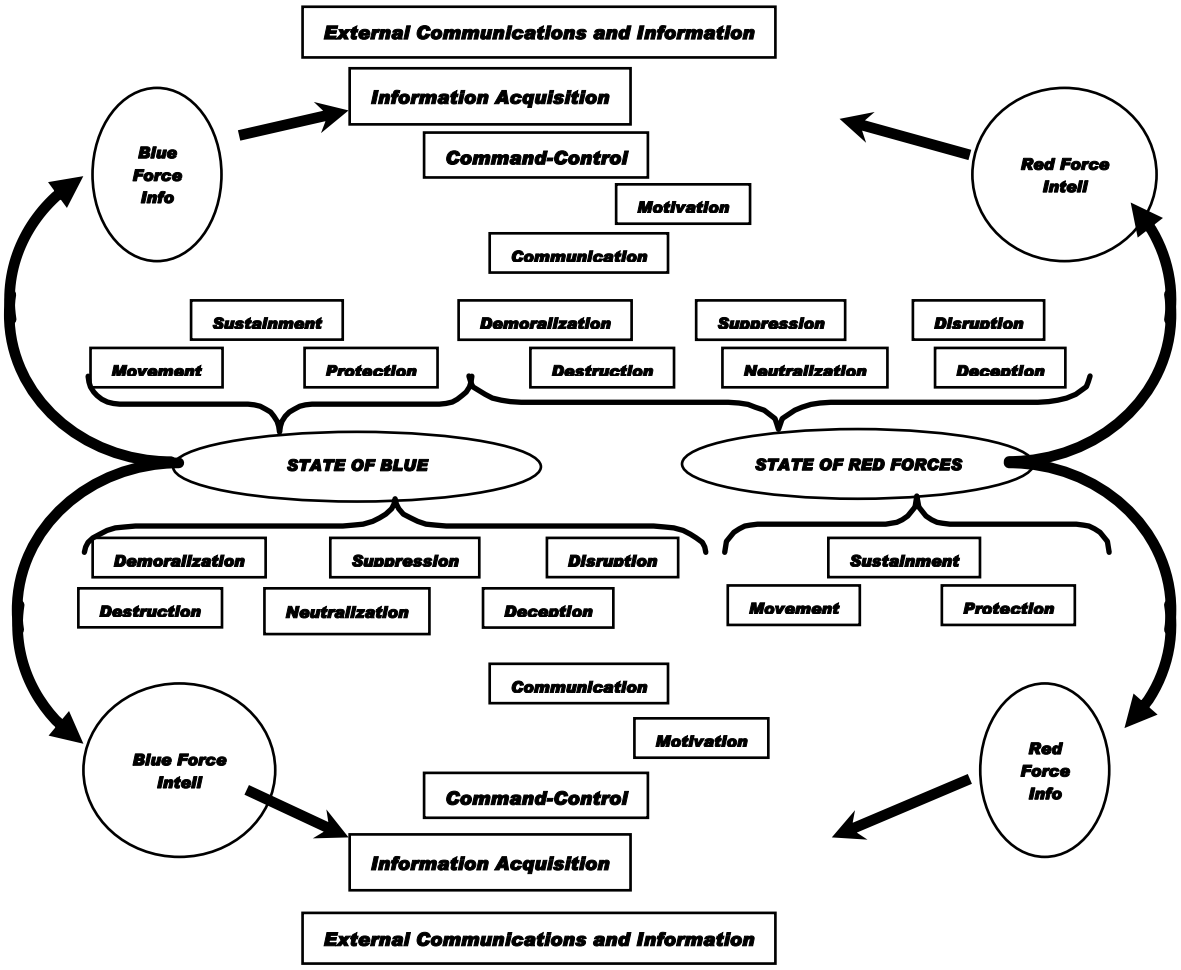

Figure 13: Internal and External Functions

INTERNAL FUNCTIONS

War leaders must influence their own societal forces (military, but also economic, political, religious, cultural, diplomatic, etc.—the elements of power). The processes that pertain to one's own elements of war power, the internal processes, are:

- **Command and control**. The exercise of authority by war leaders that coordinates all of the other processes.
- **Motivation**. The infusing of patriotism and support of the war effort by the citizenry and wielders of the elements of power (increasingly, not just military forces).
- **Sustainment**. The resources and materiel to support the war effort over protracted periods of time, including national will, natural resources, industrial or manufacturing might, and wealth.
- **Movement**. The transportation, physical repositioning, and electronic transfers of people, things, and intangibles in support of the war effort.
- **Protection**. In anticipation of an enemy's reaction, preemption, or natural catastrophe, war leaders must provide security and preserve the means of conducting a war.
- **Information Acquisition**. Without understandable data, information, and knowledge, a society is virtually helpless in deciding to go to war, preparing for war, and conducting wartime operations.
- **Communication**. The ubiquitous process that enables success in all of the rest of the processes; the lifeline of the flow of information supporting every process of war.

EXTERNAL FUNCTIONS OF WAR

There are things that a society and its leaders want to do to their opponents that also rely on communications. These include (again from the diagram):

- **Demoralization**. Destroying the motivation and will of an enemy society and its people, especially those who exercise their elements of power.
- **Suppression**. Primarily a military process, suppression keeps an opponent from using his military forces, economic might, diplomatic skills, and other war-supporting resources.
- **Disruption**. The process of interfering with, interrupting, distracting, or disrupting an opponent's activities to decrease effectiveness.
- **Destruction**. The (usually) violent obliteration, annihilation, or devastation of an enemy's resource base, facilities, military forces, economic structure, or people.
- **Neutralization**. Activities undertaken to eliminate, eradicate, or significantly diminish an opponent's resources, forces, or effective elements of power; to render critical capabilities useless.
- **Deception**. Misleading, tricking, or otherwise tricking or hiding one's own capabilities and intentions from an opponent.

OUTSIDE CONSIDERATIONS

The third realm that a society embarked on the path to war must consider and accommodate includes those other societies that are not directly or fully involved in the war. Some of these societies (clans, tribes, nations) may tend to support the war maker society; some may tend to support the opponent; and some may be mere kibitzers—for several reasons. A neighboring tribe may have family ties to the war maker society; an industrial nation may have weapons for sale and economic gain; another society may have religious or cultural ties to one of

the combatant societies. And there are complex sets of conflicting motivations that shift during a war, realigning those external societies.

But a war maker must listen to and watch the external influences, the information that they provide, the means by which they communicate, and the information that must be sent to the outside world in an attempt to generate external support…and reduce support of one's opponent.

DYNAMICS

Communications are essential in all three realms—internal, external, and "extraneous" (the societies outside the immediate war activities. The two most important needs for information have to do with communicating the results of all of the processes of war and their processes:

1. The change of state of a society's forces (again, military, economic, cultural, political, etc.) caused by an opponent.
2. The change of state of an opponent's forces.

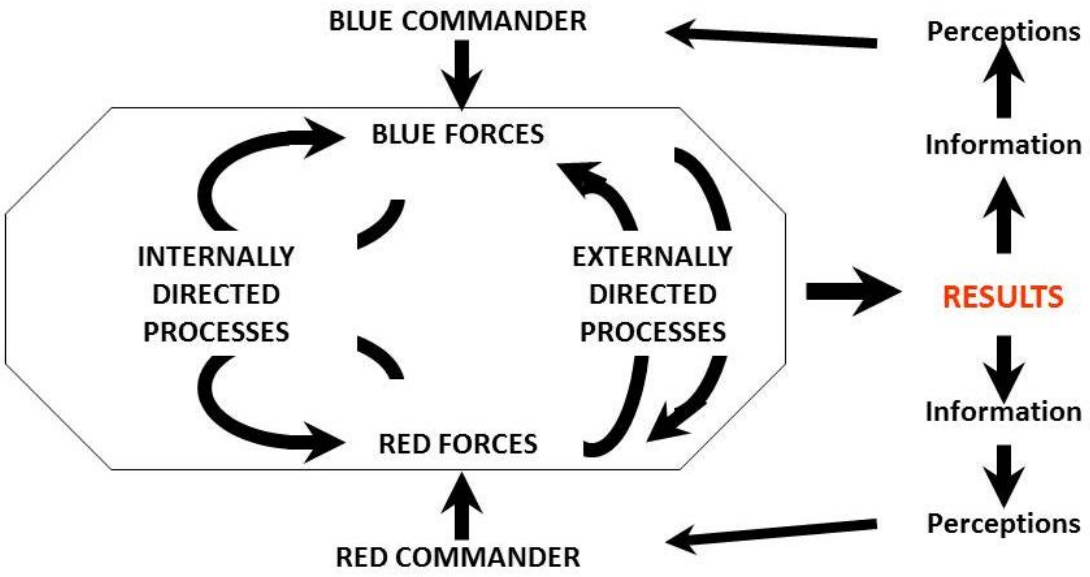

Figure 14: Internal and External Processes

But communications can only relay perceptions, observations, interpretations, and analysis of the changes in state. True, there are some perfect data and incontrovertible facts gathered, and these form the foundation for processing all of the input into information, knowledge, and understanding. There will probably never be "complete" information or intelligence concerning the current state of blue and red forces respectively, nor will the perceptions and interpretations be completely accurate. But communications must preserve whatever degree of reliability and accuracy exists in the information passed among the several processes of war. In the dynamic wartime situation, war leaders must decide when to act, what to do, and how to act (or react) in the absence of complete information, knowing that the situation will change even as decisions are reached, orders issued, and communications are sent—the "facts" are perishable over time. The figure below shows the Probability of Success (vertical axis) versus time; nominal decision and execution points are also illustrated. Decision under

uncertainty is both necessary and wise; we need to decide and execute decisions before the situation (and information) changes completely—and before the opponent decides on his actions.

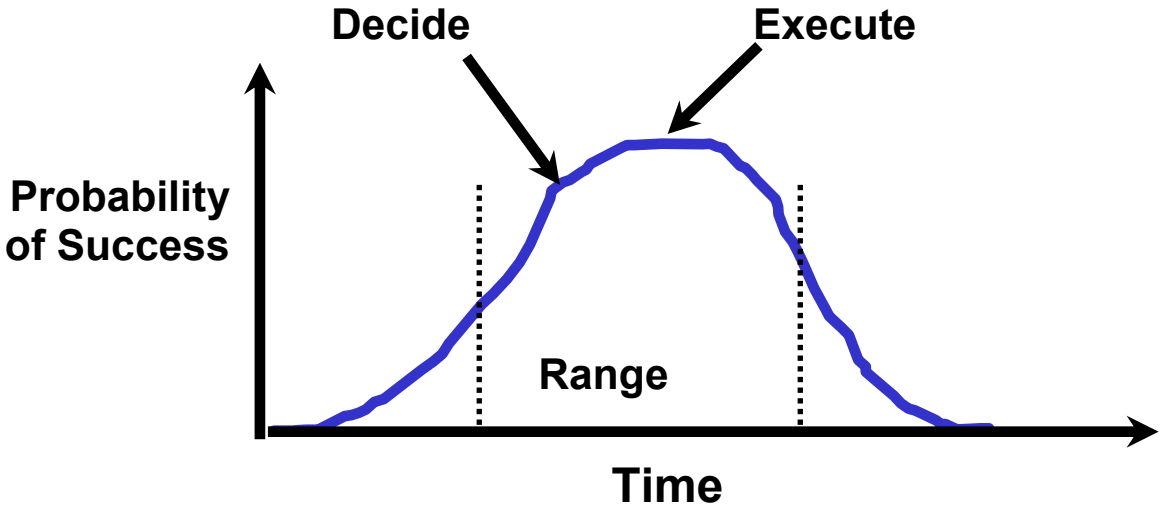

Figure 15: Decision Timing

In a two-sided activity such as war, the unilateral illustration above only describes one side's process in acquiring information, making a decision based on understanding (or misunderstanding) that information, and executing the decision. Communications can shorten the times involved in that process, and generally the society's war leader who can get understandable information and act on that information quickest, relative to his opponent, has a distinct advantage, as illustrated below. The speed of updating information concerning the dynamic situation—seeing the results of decisions based on earlier information is dependent on speedy, accurate, reliable, and dependable communications.

Figure 16. Decision Process

CONCLUSIONS

Communications is a process of sending and receiving data, information, and understandable knowledge. Those involved in war, particularly those who direct the actions of military forces involved in war, rely on communicated information to perform the processes of war in order to change the state of opponents—not just affecting the military forces, but influencing the opponent's political, economic, cultural, social, and religious elements of power. But the information on which war leaders rely is colored by the perceptions, biases, experience, and faulty reporting of the observer—so perceptions of actual results of war activities distort the facts and data. The same thing happens to communications, wherein the media (e.g., electronic, visual) distorts fidelity of the information.

The several processes of war, both internal (those that influence the state of one's own forces) and external (those that influence the state of the opponent's forces), depend on the timely, accurate, and reliable communications of data, information, and knowledge. Additionally, societies directly involved in a war must communicate with uninvolved societies, who also communicate relevant, although perhaps incidental, information to the parties conducting the war. The timeliness of receiving "enough" information on which to make a decision, then influencing one's own forces and the opponent's forces, receiving the perceived results (how the state of the opponent changed; the changed state of one's own forces) of that activity, and again acting on that information is essential in promoting the success of a society's war efforts—the determinant of victory.

Whoever said that "knowledge is power" recognized that communication of war information can be decisive in bolstering one's own military, economic, social, diplomatic, and cultural forces while decreasing the power of an opponent's forces.

Part IV. The Future of War

Predictions. Soldiers and analysts have repeatedly tried to predict coming crises and wars to better prepare, but few have succeeded beyond simple straight-line projections. With the advances of technology and globalization, this is even more difficult today than ever before. These predictions have usually been based on experiences of the past and then projected into the future. Trend analysis is a major military industry and entire organizations are built around "studies and analyses" or "strategic studies." The unfortunate fact is that armies and navies are routinely prepared for the last war, the last known major data point, and the analyses are generally biased toward the existing organization and military culture, not the threat nor the potential for technology breakthroughs nor for new applications of tactics, operational art, or strategies. History is replete with examples of guerrilla wars, for example, but few nation-states know how to deal with them successfully. Some projections of the future have been singularly correct and insightful; others have been far less helpful. Whatever the case, people will not stop trying to project the future in that we have to prepare for what may come, and this is particularly true in the current era of globalization where communications are virtually instantaneous and travel is counted in hours or less.

Businessmen survive on successful projections of the future. They fail by waiting "one more year" to change. They must adapt and change in order to compete with less immediately obvious pressure. Societies and large organizations, however, are very slow to change, and often it takes major events to effect even a small vector change. As the events after 9/11 demonstrated, that change in the United States was not very many degrees from the norm.

STRATEGIES

Strategies flow from the accepted projections of the future. In many cases governments and non-state entities look at alternative futures along with their goals and interests in order to prepare for uncertainty, but usually there is not enough money in the budget to prepare for all and priorities are assigned. Choices must be made, and risks taken.

Military strategies, doctrine, and tactics are very much dependent on the environment as it develops and changes, both the man-made environment (diplomacy, economics, information, technology) and the natural environment (terrain [including human terrain], climate, weather, and natural resources). Many of the world's militaries are heavily dependent on oil, for example, and that will tend to drive many future scenarios.

Strategies are also dependent on the military culture. The current military culture of the United States is that of a dependence on technology. This is now recognized as both a great strength and a great weakness. Still the American military culture thrives on technological answers to most every problem.

WAR PLANS

War Plans are essentially predictions of what a military force has to do in various threat scenarios. That is, these plans are based on predictions (projections if one likes) of the future. There are many levels and types of war plans, but the ones referred to here are those high level plans to prepare for eventualities that have not yet occurred. Prior to World War II, the United States had a war plan called the War Plan Orange, which was designed for a War with Japan. The plan was remarkable for its accurate predictions, but the needs were not at all met in the pre-war years. War plans give estimates of what it will take to win, and depending on the priority of the war plan (the perceived threat), long lead items that are needed to develop weaponry are based on these predictions. Troop strengths and compositions are based on these war plans. Geographic locations of forces are based on war plans – such as the American Forces in Europe in the post-World War II period - to counter the perceived Soviet threat to Europe.

Many aggressive war plans have created unintended consequences because the enemy has a vote. The 1941 Japanese attack on Pearl Harbor was one such war plan, and a major issue involved in that plan was obtaining sufficient oil, and protecting the oil supply lines, for oil-starved Japan to conduct their grand strategy of a "Greater Far East Co-Prosperity Sphere." The initiation of Operation Iraqi Freedom in 2003 may prove to have been another such example.

FRAGILE ASSUMPTIONS

As in the example above, predictions, projections, and presumptions usually fail the sniff test, but usually only in hindsight. How do we know the directions we are taking to the future are the right ones? Essentially there are two cognitive approaches to projecting the future: one is logical (determinism) and the other is esoteric. Of those thinkers in history that we know who were able to pry into the future, the most successful were the logical thinkers. Examples include Michelangelo, J.F.C. Fuller, and Bill Gates. On the esoteric side, there are notables as well such as Nostradamus, Isaac Asimov, and Martin van Creveld.

Very logical systems analysts will tell us to use risk analysis to determine how much is enough. Others will suggest following historical trends or pattern analysis that lead to the future. Logic is presented in the more and more popular computer modeling and analysis of the future. Still the fatal flaws are in the assumptions that are made and carried out in the analyses.

On the other hand, the esoterics are hard to believe and assumptions are made on the validity of their projections based on notions of their reliability. This in turn brings up the question of the validity of projections by anyone. Very few studies have looked at "futures studies" that were made 20 years ago or more to see how close they were to reality. It is doubtful that the results of such studies would show many that were accurate or consistent. So there are few yardsticks that measure the results.

PROJECTING THE FUTURE AND A PHILOSOPHY OF WAR

A Philosophy of War is an attempt to identify enduring truths about war. Looking ahead is quite different from trying to establish enduring truths based on warfare of the past. Predictions are fraught with peril. Yet we must do both: search for enduring truths and try to project the future as best we can in order to prepare military forces for what might come.

Chapter 15. The Changing Context of War

Wars have been used to resolve disputes for all of recorded history; they are among the earliest events recorded by historians. Indeed, the major work of Herodotus, "the father of history," was on the Persian wars, and Thucydides' narrative of the Peloponnesian War continues to be essential reading for aspiring military historians. War has been, and continues to be, a major feature of how the nations of the world interact. There are few things which present a greater challenge to a nation's survival than war, and by the same token there are few things other than a war that can unite conflicting political factions. Conversely, an unpopular war can have a polarizing effect. Although the conduct of war is generally considered to be the province of the military, war's effects will eventually touch the entire nation. It cannot be isolated from the context of other national undertakings.

John Keegan, an astute student, observed some years ago that "There is no such thing as 'war', there are only specific wars." While the concept of war can be simply defined as a conflict carried on by force of arms between nations or other war-makers, defining a specific war depends on the political and social context in which it is fought. In recent years, however, there has been an increased use of political slogans such as the "war on poverty" and the "war against drugs" to draw attention to problems outside the realm of armed conflict. At the same time, these slogans tend to trivialize the concept of war as a deadly endeavor in which competing entities use violence to attain their goals or objectives. While the recently declared "war on terrorism" has involved armed conflict, it too has been largely a rhetorical device without clear objectives.

War is a paradox; it is both simple and complex. It is simple when a nation uses war to attain clear objectives with only a small loss of life and treasure. But in reality war will always be complex because it is inherently unpredictable and its basic characteristic is chaos. Also paradoxically, the historical record of warfare generally presents an orderly picture of war since, to make any sense at all of what happened in past wars, historians record war's chaos in an orderly fashion. This orderly record of wars tends to mask the chaos and confusion of warfare. Relying solely on an historical record which portrays battles and campaigns as a series of neat red and blue lines and boxes on a map which in many cases may not have even existed at the time of the conflict is not enough to understand a war. The context, or set of circumstances, that surround a specific war are what sets it apart from other wars.

With the relative simplicity of the 20th century's Cold War with its two super-power adversaries facing each other long gone, the political context of war has become rather more complex. Rather than two easily identifiable political camps dominating the globe, the constellation of potential war-makers now appears almost endless. There are more countries in the international community than at any time in recorded history and their number is still growing. Not only are there more countries in the world, there are an increasing number of non-state players that have the capability and the will to plan and execute war-like events to advance their causes. With the world-wide communications systems that blanket the globe countries and

entities that may be widely separated geographically but share a common ideology can interact on a global basis frequently and rapidly.

Although there is a great deal of truth in the cliché that war is too important to be left to the generals and admirals, they, as the senior members of the profession of arms, do have a responsibility to understand the political context of a war and be able to clearly explain its implications to their political leaders. The political leadership, in turn, should be willing to heed the advice of their generals and admirals and put the potential consequences of war—good and bad—into context. But the civilian leadership, no matter how peace-loving its intent, certainly ought not to leave the study of war solely to its military professionals. It is imperative to the future of a country that maintains any sort of standing armed force that both its civilian and military leadership understand the context of any war in which they choose to engage.

There are many aspects to the changing context of war. There are the entities that have the capability and will to wage war, each of which will have a one or more elements of power they can use to attain their desired goals. Determining what a war might accomplish depends on the setting objectives which might vary depending on the perspective of the participants. Information has always been a critical part of waging war, but in the 21st century it has assumed a greater role. Finally, change itself is happening faster and continues to accelerate.

WARMAKERS

The number of potential war-makers in the world is increasing. Nations, alliances of nations, ethnic groups, political factions, and tribes are examples of entities that may be capable of waging war. In the 20th century nations or groups of nations (alliances) were the primary players in waging war, but today there are a number of other groups capable of conducting violent operations. States are losing their monopoly on organized violence. The concept of states began in the 16th century in Europe and gradually spread across the world. As they became more powerful, they took control of managing the violence of war. As armies became the province of the state, they forced other potential war making groups out of business. States retained control of war until the advent of nuclear weapons in the 20th century, when the two Cold War adversaries, the United States and the Soviet Union, backed by their respective alliances, deterred each other from engaging in a large war. As states became less inclined to use war as a means of gaining their desired ends, groups outside the international state system became increasingly capable of using violence to further their goals and therefore waging war in one form or another.

Entities—both states and non-state—will have their own concept of what constitutes war. And there may be elements within an entity that hold a differing view. War can be considered the use or threat of use of military force and it could include using other elements of power such as economic , political, diplomatic, or information to accomplish the a group's goals. Entities that have attained the capability of using violence as a means to an end will usually have developed some sort of philosophy that puts war in context for the group. It may not be a written document, but it will constitute a common understanding within the group of when it is appropriate to use violence, how it may be used, and against what targets. Such things as the values, historical experience, geographical location, technological capabilities, economics, and sociological factors will influence an entities philosophy of war. Where the art and science of war may be universal,

a philosophy of war is peculiar to a particular group with its unique perception of what constitutes war and its own reasons for waging a war.

Conflicts between entities that have differing or even competing philosophies of war may not even be recognized as a war by one side or outside observers. A political or ethnic group acting outside a recognized national structure, for example, may see itself conducting a war to acquire territory for a homeland, but what it considers appropriate activities in war may not be regarded the same way by nations or alliances that hold the disputed lands. A nation or state whose philosophy of war differs from a group challenging or posing a potential threat in some way, may not recognize its activities as the correct method of fighting a war. In the modern world, for example, terrorism may or may not be regarded as an acceptable activity of war, depending on what philosophy of war a group espouses.

There can be many reasons for conducting a war, including: beliefs—religious, political, ideological; acquisition of territory—needing more, resolving a disputed area; defense—protecting territory or vital interests; fulfilling treaty agreements with other entities or alliances of entities; distracting a population from a domestic crisis; internal disputes such as civil war; improving an economic situation; or taking advantage of an opponent's weakness. War may unite different entities toward a common goal. A combination of states and non-state entities may pool their efforts to conduct a war against a common opponent. In these situations, the members of the alliance will have to develop a common philosophy for conducting that war. In some cases, an entity may decide to modify its values or other element of its own philosophy of war to put its actions in context with the rest of the alliance.

Many nations of the world have formed alliances and international organizations that share laws of warfare that govern specific methods of how operations in war may or may not be conducted. But those laws do not translate into a universal philosophy of war. Every sovereign nation can reserve the option to use or not use its armed forces to conduct operations as it sees fit and in accordance with its own philosophy of war. There are also entities other than nations that have a motive and the capability to conduct activities in a war that may not be in consonance with what may be deemed to be the established international laws of war. For example, ethnic groups seeking to carve out a homeland from what they consider a repressive regime might not feel obligated to observe the laws of war established by nation-states with whom they have little in common.

Philosophies of war are not in and of themselves inherently good or bad. Recognizing that there are other philosophies of war does not mean that they all have to be acceptable, but it helps put in context how a particular entity might conduct itself in what it considers war. The philosophies of war of the various participants will affect the conduct of a specific war in two ways. First, it will establish the capabilities of military forces by shaping their organization and doctrine during the preparation for war and that, in turn, will determine the kinds of operations a military force can conduct—its capabilities. For example, if an entity does not consider the use of weapons of mass destruction appropriate in war, then it will not provide for them in its military establishment. Second, a philosophy of war can determine when and how specific operations may be conducted. Again, using weapons of mass destruction as an example, an entity

that does include them in its arsenal will have to consider the context in which their use would be acceptable.

When two entities have philosophies that have common elements, then they will likely be preparing to fight the same kind of war, as was the case in World War II where the military forces of both sides were in large part mirror images of each other. On the other hand, when entities have substantially different philosophies of war, one or the other side might not fully understand that they are actually engaging in a war. And it may be the case that the more powerful, conventionally armed entity in a conflict might be at a disadvantage against a smaller, more imaginative opponent who is using a different approach to the war.

ELEMENTS OF POWER

The world is, and will continue to be for the foreseeable future, in a state of anarchy. The states of the world are autonomous and sovereign. They rely on power to maintain their independence and freedom of action. There are also a number of non-state entities with enough power to influence the activities of established nation-states. They, like states, might also have a number of elements of power. Each sovereign nation will seek to attain its own national goals. States will use whatever power they have to pursue their national goals. The measure of power is intangible, but in general the more a state can bend the wills of others to its desires, the more powerful it is.

War-makers, states and non-states alike, derive their power from different sources and apply it in a variety of ways. Typical elements of power include military, diplomatic, economic, and technological. Things such as history, culture, education, geographical location, and climate all have an influence on the acquisition and use of power. Potential war-makers are not all created equal in their capability to develop and exercise power. An entity might be deficient in one or more of the more common elements of power, but it may also possess an element of power unique to its situation. Religion, for example, may not be thought of as an element of national power, but there are nations and non-state entities which can exploit religious fervor in waging war. It is an element of national power a secular, democratic state may find difficult to counter.

Military power is the traditional and most obvious element of power for a state to use during a war. The model of 20th century machine warfare makes military power the centerpiece of waging war, but that may not always be the case when entities other than nation states are opposing each other. Military operations are directed toward the attainment of specific goals or objectives that must be clearly designated and realistically attainable by the forces available.

The economics of warfare, paying the bills, has always been a factor in waging war. The stronger an entity's economic power, the more capable it is of sustaining a war. In some cases military power can be used against a nation's economy. Bombing a county's transportation infrastructure, for example, is a way to destroy its economic power. In combating a non-state entity, however, finding and eliminating the financial backing of entities may be as important as employing military power.

Coalition warfare requires diplomatic power. The greater the diplomatic power of a state, the more capability it has to build an effective coalition for waging war. But a non-state entity can also have political or diplomatic power. It might be able persuade states or other entities with whom it shares a common religious belief to provide support to its activities. It can also be able to dissuade other entities from opposing it in a particular conflict.

Technological power has become increasingly important as machine warfare gained dominance on the battlefield. Ironically, however, over reliance on technology can provide opportunities for an imaginative and daring opponent. Reliance on technological methods of gathering information, for example, can produce gaps in intelligence against potential foes who are not so advanced or choose not to rely on the latest communications systems. Placing a high reliance on technology in warfare can reduce losses on the battlefield, but can come at a high cost. Killing an individual tank using sophisticated smart weaponry, for example, can cost many times the value of the tank. Even the most advanced and wealthiest nation in the world has to account for the cost of war at some point.

SETTING OBJECTIVES

To be effective, whatever elements of power war-making entities might possess should be directed toward some sort of objective that supports its ultimate goals, whatever they may be. Setting objectives defines the mission for the armed forces and the other elements of power. Use of military force is guided by a strategy that sets the conditions for military operations. For the United States, its national strategy establishes global priorities for the political, economic, psychological, technological, and diplomatic means it uses to attain its purposes or to frustrate those of an adversary. Strategy also determines how and when to use the elements of power to secure desired objectives.

A specific, militarily achievable goal provides the strategic leadership the opportunity to explain what they hope to achieve by the use of force and declare victory or success when it has been attained. The risk of specifying a specific military objective is that it might not be attained, thereby leaving the leadership with a failure in the use of military power. Understanding the risk of failure should be part of the analysis of the situation; it is not a reason for going to war with vague military objectives. Initiating the chaos of war without a clear idea of what the desired order should look like makes war more unpredictable. Setting objectives depends on the context of the war. In World War II the ultimate goal of the Allies was unconditional surrender of Germany and Japan. Strategic military objectives were things such as cities, islands, or specific geographical areas. As each strategic objective was attained it contributed to the ultimate goal of the war and made it easy to identify success on the battlefield that encouraged support for the war at home. When military objectives are established in a political context with intangible goals such as regime change or nation-building, success is more difficult to assess, making it difficult to explain the expenditure of treasure and lives to the population that must pay those bills.

Directing operations toward specific objectives provides unambiguous standards by which to measure success or failure, and it provides a solid basis for planning and allocating forces and resources. Successful military operations are defined by the attainment of designated objectives, unsuccessful ones fail in that regard. It may appear that determining the success or failure of military operations in terms of whether or not they attained the designated objective is

simple, but in reality it is not. Operations are generally conducted against an opponent who has a different objective in mind. An attacking force, for example, usually wants to destroy the forces opposing it or gain control of something the opponent is protecting, while the defenders want to prevent that outcome. Battles are almost always chaotic and frequently result in something other than complete success or utter failure. Lack of success in an operation may be the result of having no clearly defined objective on which to base the planning and execution in the first place, or it may have failed for a variety of reasons, including inadequate forces, poor preparation, or stronger than anticipated enemy resistance. But even a failed operation can contribute to future success by wearing down an opponent.

Attaining strategic military objectives will make a specific and positive contribution toward a national policy goal. Examples of strategic objectives are occupation of disputed territory, defeat of an opposing military force, or destruction of industrial capabilities. A wide-spread or long war may entail the attainment of a succession of strategic military objectives, whereas a small or short war may have a single strategic objective. Objectives should be clearly and concisely definable, and can be especially important in a democracy where the government is responsible to its people. Non-democratic states and non-state entities may have less need for specific objectives because the leadership is largely autonomous and not directly responsible to their people or subordinates. In a democratic state the civilian population generally has access to wide variety of information and will want to know what progress during a long war. Vietnam, with no clear objectives, resorted to the unfortunate system of counting bodies as a measure of success. World War II, on the other hand, could be measured by the geographical progress of Allied military forces across Europe and the Pacific.

Civilian populations that could be destroyed or influenced have always been possible objectives in war. In the 20th century, air power provided a means of attacking civilian populations, although bombing civilians in World War II tended to galvanize their support rather than intimidate them. In the context of 21st century wars, civilians have in many respects, become the battlefield. The attacks on New York City and Washington, D.C. on 11 September 2001 clearly targeted the civilian population, thereby making it part of the battlefield. Whether or not that civilians are a proper target depends on the philosophy of war an entity espouses.

The machine warfare that characterized the 20th century requires extensive support which can impose limitations on its use and effectiveness. However, the imaginative use of weapons requires minimal support. The 11 September attacks, using hijacked civilian airliners cost the non-state entity that planned and executed the operation 11 lives and an estimated one million dollars, but it gained a world-wide reputation as a foe to be reckoned with. The United States' response was largely conventional warfare against a state that may or may not have been involved with the attacks has entailed the expenditure of billions or perhaps trillions of dollars and thousands of lives on the battlefield with little to show for it.

When the leadership of a war-making entity makes the decision to pursue strategic goals by the use of military force it means, or at least it should mean, that the desired order will be worth the expenditure of lives and treasure. No matter how the war goes, at some point the chaos will end or at least subside and give way to a new order of some sort which may or may not be what expected at the outset. Wars rarely end exactly how either side expected. Indeed, for some

non-state entities, the goal may simply be an ongoing level of chaos in which they can pursue their own objectives.

PERSPECTIVES OF WAR

From the earliest history of war man has tried to reduce its chaos to manageable proportions. Efforts to reduce the chaos have usually involved an organizational or technological change or a combination of the two. Even when armies consisted simply of dismounted warriors armed with only one or two types of weapon it was necessary to impose some sort of organization on the conduct of war. Centuries of experience in war and advances in technology have combined to produce modern armed forces with their innumerable organizations of people and equipment designed to cope with the chaos of war. While changes in organization and advances in technology have reduced the chaos to some degree, they have also made war more complex. As experience and technology made war more complex, the perspectives of war of both warriors and leaders began to change; leaders had to take a wider view. The perspective of the warrior was simply to fight, while the perspective of the leader included such things as where to fight, when to fight, and even how to fight.

Eventually, professional warriors and leaders appeared. These professionals concentrated on how best to use military force to attain specific objectives. As war continued to grow more complex so did the entities that used war to attain their goals, and the leaders of these groups took a wider perspective than the professional soldiers. For the first few thousand years of organized warfare there were two general perspectives of war, the tactical perspective of the professional warrior and the strategic view of the leaders of the entities that evolved into states. The tactical and strategic perspectives of war evolved slowly and it is not always clear where one left off and the other began, especially when the leaders of the military and leaders of society were the same. While it is certainly an oversimplification of history to cover centuries of evolution of warfare in one or two sentences, it is also true that until recently the study and conduct of war had but two categories, tactics and strategy.

Centuries of changes in organization and technology eventually made war too complex for its chaos to be managed by only two perspectives, and a third, the operational appeared in the 20th century. Each of the three perspectives, tactical, operational, and strategic, view a war in a different context. From the tactical perspective the warriors focus on the actual fighting or activities at the lower levels of command. Leaders that have an operational perspective ensure that their subordinate units are oriented toward the proper tactical objectives and have what they need to attain them. The strategic perspective encompasses all elements of power, coordinating them toward attaining strategic goals.

With the large, hierarchical military organizations that typified large wars waged by states against other states and alliances in the 20th century, the different perspectives of war were easily discerned. As non-state entities began to engage in various types of low-level warfare that garnered global attention, the three perspectives have become compressed. As the three perspectives become closer and real time information becomes more widely available across the battlefield and up the chain of command, actions at the tactical level can have a significant impact on strategy, and strategic decision makers have the capability to have an immediate influence on tactics.

The different perspectives occur in both conventional and non-conventional warfare. Terrorists, for example, may not look like conventional military forces, but since force or the threat of force is how they attempt to impose their will then they must be considered a form of military force. From the strategic perspective, terrorism is particularly effective when the senior leaders can publicize what they consider a successful operation even if blowing up trains in Spain may not be considered a proper activity of war by states or entities with a different philosophy of war. Part of the strategic perspective of terrorism includes appropriate publicity from the international news media. Like other forms of warfare, terrorists' acts are much more successful when they can be coordinated with other elements of power. Although it may sometimes be difficult to understand how an act of seemingly random violence can support the goals of any entity, from the point of view of the entity executing the attack the resultant publicity is an opportunity to demonstrate its power.

From the operational perspective terrorism is not essentially different from other forms of war. The focus of the operational perspective is selection of a strategic objective which, when attained, will contribute to the overall political goals of the state or national group. Some considerations for terrorists viewing war from the operational perspective might include the specific nation against which an act of terrorist violence would make the biggest news impact, the location in the world where there would be widespread, even sympathetic, press coverage, or the best time of year to make an impact on the world. Terrorism may vary from more conventional forms of warfare in that the strategic objective of a specific terrorist act may also constitute the tactical objective. Since terrorists will generally make even minor decisions from the strategic perspective of war, selection of the objective and the method of attack leaves little room for variation by the individuals or teams who view the activities from the operational or tactical perspectives.

The execution of a terrorist act itself is viewed from the tactical perspective. The terrorist who actually hijacks a ship or airplane, assassinates a national or world figure, or blows up a building has a tactical perspective, although it may have a tremendous impact in a strategic context. These activities constitute the use of military force in the sense that they are focused entirely on the terrorist act. At the moment of detonation of the bomb, kidnapping of the hostage, or hijacking the vessel, terrorists concentrate on force and the threat of force, as do conventional military forces when they attack and secure a tactical objective.

INFORMATION

Global communications systems make it possible for potential war-making entities scattered around the world to quickly and easily share develop and share a philosophy of war. Understanding the context of a war begins with an examination of the situation. The key to understanding the situation is accurate, unbiased information. In the past hundred years, the methods of gathering and analyzing large quantities of information have increasingly dominated the decision-making process. The computer model with its seductive visual images on a full-color screen does not reflect reality, and its apparent predictive powers must be used always with caution. While quantitative analysis and mathematical models can provide tremendous insight into what might happen in a specific situation, war’s inherent chaos makes accurate predictions impossible.

The computer and its capability to process information has become a fixture on the battlefield giving commanders vast amounts of data about specific things. But more information is not necessarily better information, and too much detailed information may actually slow decision making and reaction time from all perspectives of war. To complement the detailed data available in real time, commanders and leaders need to have a better understanding of the intangibles of war—things such as knowledge of local languages, cultures, religious beliefs, and history, all of which are essential to understanding the context of a war. They must be studied as part of the preparation for war and incorporated into decisions made on the battlefield.

Digital technology enables participants in a war to have near real time situational awareness of what is happening on the battlefield and beyond. The highest strategic levels of command can follow the operations of the smallest tactical elements. Whether or not that will prove to be an advantage remains to be seen. In any case, information technology has caused the perspectives of war to become more compressed.

Modern warfare is based on a complex system of communications systems. Military forces must be able to rapidly and accurately exchange information even as they seek to keep their operational intentions secret. War-making entities of all types need to communicate their goals and report progress toward those goals to a global audience. At the same time, mass media demands information on a regular basis to provide program content regardless of the context. The plethora of worldwide communications systems, including live television from virtually anywhere in the world, can make it difficult to keep a war in context. Seeing small, violent encounters on television every night might provide good content for programming, but the tactical perspective it presents might not be accurately reflect the operational or strategic context of the war.

CHANGE

A thousand years ago changes in warfare occurred so slowly as to be virtually imperceptible to the participants, and conventional military wisdom could remain unchanged for generations. By the 19th century, however, the Industrial Revolution had wrought great changes in warfare. Although the changes that took place on 19th century battlefields should have been evident to military and political leaders, the bloody slaughter of World War I still managed to catch them all by surprise. Ironically, the War to End All Wars actually introduced the world to a century of destructive machine warfare. The world's military forces reversed their earlier skepticism about the use of science and technology on the battlefield, Revolutionary weapons such as tanks, airplanes, aircraft carriers, and submarines introduced in the World War I, became familiar to military and civilian participants in the World War II. By the time the Allies finally battered the Axis Powers into accepting an unconditional surrender in 1945, science had become a full partner in waging war, and the victors warmly embraced the complex weapons and equipment that had given them an advantage on the battlefield.

Although significant changes in waging war have been fomenting since 1945, they were largely masked by the American and Soviet domination of world military power in the latter half of the 20th century. There is nothing like success to confirm military concepts of how to wage war. World War II made a great impression on both the United States and the Soviet Union.

They built their post-war military establishments based on that successful experience. As the leaders of the two most powerful military coalitions in the world during the Cold War, the North Atlantic Treaty Organization and the Warsaw Pact, they dispensed doctrine, weapons, and training to allies and surrogates in accordance with principles of machine warfare perfected on the battlefields of Europe. In so doing they were really preparing to fight each other in a grander version of World War II and largely ignoring what other war-making entities were doing.

One result of the concentrated fascination with the World War II was that the United States and the Soviet Union both interpreted failures by their high technology military forces (Vietnam for the Americans and Afghanistan for the Soviets) as anomalies to their concept of so-called conventional machine warfare, rather than accepting them as different forms of war. As the capabilities of information technology have become more widespread and available, war-making organizations are able communicate quickly around the world to coordinate their support systems and plan future attacks. The familiar hierarchical structure of warfare with its strategic, operational, and tactical perspectives has given way to a flatter pattern in which the actions of very small groups can have global implications. And the rate of change in the world continues to accelerate.

One consequence of the ongoing chaos and change is that surprise will continue to be a staple of warfare. The world-wide surveillance capabilities and communications systems now in use actually make achieving surprise much more desirable. Imaginative methods of attaining even a little bit of surprise will pay high dividends. Even a small amount of violence focused on a market place filled with shoppers can be as powerful a tool in war as the thousand-plane bombing raids of World War II.

In the past, the military forces traditionally prepared for the chaos of war in peacetime, during periods of relative calm and order. In the 21st century military forces will have to develop the capability to operate effectively within the inherent chaos of war rather than attempting to superimpose the traditional facade of orderliness. The preparation period will itself be chaotic. As military forces prepare for the future, they will have to deal with the chaos of constant change. The rapid advances in technology and constant changes in international relations have made the relative order of peace into a time of chaos. The military mind, a traditionally conservative and orderly place, will have to change its way of dealing with the world and accept chaos and change as the norm in both peace and war.

The success of new, flexible organizations will depend on an innovative officer corps that understands the context of each new war and is comfortable with preparing for and conducting war in an environment of constant change. The prevailing attitude will have to become one of actively seeking new information and ideas rather than charting the same old course. This will create a dynamic tension between change and status quo. Tension between new and old has always been part of warfare, but whereas in the past the goal was to resolve the tension and seek a solution of consensus, the future path may be to encourage the tension and pursue a variety of solutions.

LOOKING TO THE FUTURE

Making any prophesy of future war a risky business. One way of looking to the future is to see how well prognosticators of the past have done. In his analysis of the literature of future wars, *Voices Prophesying War*, I.F. Clarke, a British English professor and World War II intelligence officer concluded that "fiction has an almost unbroken record of failing to forecast the true course of future wars." At the end of his 1979 book, *Third World War, August 1985. a Future History*, Sir John Hackett, a former NATO command and astute student of warfare who turned to fiction to gain a wider audience for his concerns about the Cold War in Europe, emphasized the challenge of prediction: "We who have put this book together know very well that the only forecast that can be made with any confidence of the course and outcome of another world war, should there be one, is that nothing will happen exactly as we have shown here."

With a wider variety of potential war-makers, each of which may have a different philosophy of war, trying to put 21st century wars into context has become more chaotic and complex than the relatively simple 20th century wars fought between states and alliance with largely mirror-image military forces. It comes back to the challenge of looking into the future with any hope of getting it right. Trying to get it exactly right at the beginning is less important than being prepared to adapt to the changes that will inevitably occur during the conduct of any war. Because predictions about future war are rarely accurate, success depends largely on adapting to change faster and more effectively than the opposition.

Chapter 16. The Future of Warfare

What might have been written in these pages ten years ago is only partially applicable today, and given the rate of change experienced in the past 20 years, can we project tomorrow's battlespace? What might have been thought of as a "bounded" future or even a limited number of "alternative futures" becomes more circumspect. Not only is technology changing the potential battlespace, but also surprising new elements cloud the future for which there are few "trends" to analyze. It is entirely possible that what is written here will no longer be relevant to a Philosophy of War ten years from now. Recent conflicts have also made us more humble in attempting to project the future. Can we afford not to project tomorrow's battlespace to allow for preparing and readiness of military forces to support a government's policies? Clearly nation states have to provide security to their citizens, and to do so they must provide a best guess at what the future might bring. Weapon systems take many years to design, develop, test, and produce for an army, but in tomorrow's world many of these systems might be either obsolete or irrelevant?

In many cases, what used to be easily identified as a particular function, such as telecommunications, is now being integrated into other functions at a rapid rate, and it is difficult to pigeon hole the piece parts. Not all of this integration is technology. It includes people, ideas, and things into a much more complex world that allows Taliban tribesmen to sell fundamentalist Islam to other Muslims using internet web sites as well as propagandize their enemies. Military forces have to now be much more integrated with societies than in the past, including the introduction of cultural specialists and civilian-military centers to adapt to this need. This is not to say that future wars will not be fought in remote areas by armies facing off against each other, but what we are looking at today could foretell a future quite different from what might have been projected in the past – meaning that armies and navies and air forces will have difficulty clinging to military tradition and military cultures of the past.

This chapter identifies the many shifts that could affect war in the future but does not attempt to project what the future might be. The conclusions represent a very general statement of the direction which all military entities must be prepared: they must be prepared for change.

SOCIETIES

Factors making up societies include values, religion, allegiances, and demographics. Here cultures clash, and the more we are forced together by global communications, the more one might expect clashes that were not as evident in the past. Some have described a future world as one of constant conflict. This may have been the case in the past, but without global communications we simply did not know about it.

Populations are moving toward urban areas for jobs, welfare, and a better way of life. Similar to the migrations from Europe to America in the 18th and 19th centuries, people are moving from the farms to the cities. The population of Tokyo, the world's largest city, is over

32 million people. Seoul, Mexico City, and New York City number over 20 million. The 100th largest city is Napoli, Italy with over 3 million people. Some of the migrations are policy issues such as fleeing contested territories or laws that restrict rights or freedoms. Some immigrants cross international boundaries but others do not. The fact is clear, however, cities are where people want to go and stay. This puts enormous pressures on cities in terms of infrastructure, policing, and providing basic services. Cities can readily become crime-ridden if not adequately policed. The favelas in Rio de Janeiro are avoided by police due to the extreme violence. Subcultures can easily develop within such areas leading to insurrection or anarchy.

Gender and age demographics vary throughout the world with the youngest populations growing in less developed states. Migration such as the Central American illegal migration into the United States and the Turkish guest worker migration into Germany brings with it the complex issues of a rapid change in the ethnic percent of the population from that of just a few decades ago. Policies such as those of China restricting the number of children has led to a vast overpopulation of men over the past 20 years as a result of a cultural preference for boys. Demographics provide the closest thing to what might be called an established trend. It is entirely possible, however, that in the future, some situations, like dangerous polluting smog over cities or detonation of a weapons of mass destruction in a city, might reverse this trend.

Education is another aspect of demographics. Some lands have limited education, such as Africa and many parts of the Middle East where the definition of education is limited to religious education of males only, but this in no way implies that less educated people are not innately intelligent. This limitation of education, however, leads to a preference for technologies such as cell phones as opposed to the internet. In Afghanistan, NATO forces have had difficulty training Afghani Army recruits because most cannot read. Conversely, the many languages of less developed countries are little understood by military forces of other countries without interpreters who may or may not be vetted. Future technology may have a partial solution with two-way automated translators for both written and spoken languages.

POLITICS

International politics have been dominated in the recent past by superpowers, but that too is changing. Disenfranchised states such as Iran and North Korea have become intransigent and bellicose. Non-state entities such as the Palestinians have allied with powerful States and armed groups to obtain or retake lost territory and statehood. They are opposed by the newer state of Israel whose efforts to secure their borders and security often clashes openly with the needs and desires of the Palestinians which could lead to much bigger conflicts not only in the region, but worldwide. The conflicts in the Middle East which began as a result of the attack on the Twin Towers 9 September 2001 continue to enflame not only the Middle East but also many other areas of the globe with worldwide terrorism.

The once recognized legitimate authority of the nation state has eroded, and continues to be threatened by non-state entities both from within and from regional and global organizations. Even casual observers recognize the "reach" of Al Qaeda, drug cartels, and even ostensible multinational business organizations. Moreover, the recognized global peace organization, the United Nations, has proved ineffective in keeping the peace and dealing with increasing militant pressures. The great Soviet Union dissolved into separate states at the end of the Cold War, and it is doubtful that it will recover. Gang violence has increased multifold in even the most

"advanced" nation states, and in some cases leading to anarchy. Tribalism appears to be one of the most rigid standards in many parts of the world defying governance. The question of the legitimacy of the nation state has been raised where it was previously accepted and enforced by European States since the Peace of Westphalia in the mid-1600s.

ENVIRONMENT

Environmental changes in progress bring new challenges almost daily. Still controversial, "Global warming", whether proved or not, creates new problems for predictions of where wars might be fought. Few can deny that global weather patterns are changing, and whether this is a natural phenomenon or man-made, may be irrelevant in the near term, The Arctic may become a new naval concern for surface fleets. New deserts may be created where once there were jungles – aided by mans' deforestation. Rising sea levels may bring economic disruption and new causes for conflict. Continued pollution of the water and the air create health hazards that may be irreversible. Regional health problems stemming from the pollution of the environment might mean that the region would be unable to field a healthy military force.

In the past most military forces have used either the enemy force or terrain as objectives. In the future, those objectives may be quite different such as a nation's infrastructure or denial of space.

ECONOMICS

Wealthy nations can command large armies and equip them with the latest fighting equipment. Today's global economy is fluid and may be unpredictable. A nation state that was a Superpower ten years ago may not be one today. Affordability will affect how much and what type of a force can be assembled, equipped, and trained to protect a nation.

The type of economy of a nation or a non-state entity may be a future determinant of war outcomes. Can an agrarian nation fight longer than an industrial society, a services society, a drug-dependent society? Can highly technological societies dictate durations of war? How does that affect the force structures and equipping and sustaining of forces?

Global economies: Thomas Friedman identified the rush to globalization in his book The World is Flat, published in 2005, as bringing the world closer together. Recent events have torn at the fabric of globalization as described by Friedman, but increasingly there are interdependencies among recognized states, multinational corporations, and regional economic alignments. One can only surmise the future which pits emotions as envy, greed, and beliefs against economic elites.

Today's media (meaning mostly digital media) is not only global, but it is also big business. In many states, the media is either competitive which means it relies on support from either advertising or funding from commercial business, or it is state controlled and funded such as the British Broadcasting Corporation (BBC). People around the world watch television (with some few exceptions) for news and information. There is a competition for "market share"; thus, there is a rush to get news on the airwaves often with disregard of the facts. Internet Blog sites are becoming more popular and have no control on the content. Some blogs may even deliberately publish erroneous information and/or propaganda, as some Al Qaeda blog sites are known to do. Social networking is a relatively new phenomenon which dispenses with the middle man to allow people to communicate freely, albeit without security. Media such as Face

Book, Twitter, Linked-In, and others have global reach. This may change how we communicate. Other free services such as Skype which allows both audio and video of the persons on the net, that it may one day be the video-teleconference of choice. iPods and Droids are rapidly integrating cell phones as well as hundreds of applications, both military and civilian. Commercial systems are rapidly replacing expensive military communications systems at much lower cost but at higher risk.

Economics have been one of the major causes of war in the past. What will the economic dependencies of the future bring?

TECHNOLOGY

Perhaps the most dramatic agent of change is technology. The computer age has brought with it new weapons, new battlefield dimensions such as space and cyberspace, and a leveling of the playing field in many cases. That is, less developed nations and people worldwide can now access the internet, use cell phones for communications, and travel much more rapidly than in the recent past. The new access to knowledge provides insights to conflict and leverage that did not have to be acquired through expensive research and development programs or the sustainment of legacy systems. Less developed nations did not have to deal with checks for banking transactions requiring a considerable infrastructure. They now deal with credit and debit cards provided at little cost by multinational companies with a fee for service. Cell phone towers are easy to erect and provide wireless communications compared to the stringing of telephone wires to every town and village and home. Commercial availability of high end technology allows individuals, groups, and nations to simply buy the technology desired without investing in other less appropriate and more expensive technologies. Man-portable Air Defense Systems (MANPADS) allow less developed armies and even non-state entities to buy relatively cheap shoulder fired missiles to deny airspace rather than invest in fleets of aircraft. Guerrilla groups may now commercially or illegally acquire near-equivalents to sensors used by soldiers of more advanced armies, such as night vision goggles. The poor man's Inter-Continental Missile System (ICBM) is a Weapon of Mass Destruction in a CONEX container.

The computer revolution has brought with it the ability to virtually replace man. Pilots may no longer be necessary through the advance of robotics, sensors, automatic programming, and global positioning systems. In space, it may be more functional to allow robots to perform missions than man. On the ground, disabling mines is much safer than sending in sappers.

Mainly responsible for many of the changes now taking place in the world, technology has empowered man to do things until now thought to be impossible. In warfare, technology is changing the way we have to think about future wars. If Moore's Law states there will be a new computer generation every 18 months, what does that mean for how we look at the future?

Technology has already provided entities such as drug cartels the ability to provide worldwide networks and access to money, drugs, and weaponry to partners in crime and war against the state.

SPACE AND CYBERSPACE

Space and cyberspace have become the new battlespace enabled by technology. In the past, there have been three dimensions of war: air, land and sea. In this world and in the future,

we have to add the .dimensions of space and cyberspace. The Soviet Union was the first state to launch an earth orbiter. The U.S. put a man on the moon and landed robots on Mars. Several countries now have their own Global Positioning Satellites as well as various types of high resolution sensors and communications relay stations in space. Private companies have launched orbiters with both known and unknown packages. The United Nations has a treaty banning space weapons, but clearly missiles with weapons of mass destruction are owned and operated by a growing number of states. Space enables global networking and what is called cyberspace. For wont of a better definition, cyberspace is the electronic medium of computer networks, in which online communication takes place.

Current technology integrates a number of capabilities (sensors, signals, connections, transmissions, processors, and controllers) sufficient to generate an interactive experience accessible regardless of a geographic location. Most advanced technology nations have rapidly moved into the cyber world and adopted these conventions, but it is in no way restricted to nation-states. It is used widely by international banking, commerce, and communications systems as well as private companies, but it too has vulnerabilities.

A hacker in the Philippines can launch a damaging computer virus into cyberspace and affect computers worldwide. Moreover, because there are no international laws, the hacker may not be prosecuted. Because of the anonymity of the internet, most hackers are never identified. Hackers may be individuals, non-state entities, or even state-sponsored. Two Chinese colonels wrote a serious monograph in 1999 entitled Unrestricted Warfare which describes in depth how to take advantage of the vulnerabilities within the U.S. use of the internet. A more recent example suggests nation-states actually using a virulent worm, Stuxnet, to disrupt the network infrastructure of Iran. Iran accused Israel and the U.S. of having implanted the worm into their network, but the source remains unknown.

TIME

Not only are these changes happening at a rapid pace, they appear to be exponentially increasing leading to almost constant change. Technology appears to be changing the fastest of all, but it is interesting to see that in two recent American wars, technology has been checkmated by rudimentary weapons and fanaticism. The growing number of states with Weapons of Mass Destruction (WMD) grimly warns of the potential for nuclear conflict. Further the desire of non-state entities to acquire WMDs and their relative availability creates more problems for defense. There is an axiom that time is on the side of the insurgent. Moreover, advanced societies will not support long wars of attrition. Can the armies of advanced states afford long wars? Osama Bin Laden does not think so and considers this the Achilles' heel of advanced economic states.

VULNERABILITIES

Today, even the richest states have vulnerabilities. Dependencies on strategic minerals, oil, and cheap labor are weak links. Moral values and education provide either strong or weak armies or forces. Further, the reliance on a global economy means that parts for even the most basic computers are outsourced without knowing what chips and links might contain that could threaten the user at critical times. Technology has made it possible to disperse the battle formations over much wider fronts in what might be termed conventional wars, but in the face of hybrid or unconventional wars, such dispersion may not be wise. Technology may be able to protect men from the effects of blast and shrapnel by bundling them inside large troop carriers,

but by doing so, it separates the men from the people on the grounds who are not enemies. By doing so, it makes the soldiers in the protected vehicles appear to be remote and foreign instead of friends. This dichotomy has to be resolved by commanders on the ground.

DEVELOPMENTS

These happenings are more than just trends. Many are new developments that have not been experienced by conventional or even un-conventional forces in the past. The formation of new commands for combat in cyberspace where individual hackers can affect national defense is but one example. Large states are no longer protected by oceans or vast plains. They are threatened by disruption within from enemies large and small through their use of technology.

The question has to be asked: what role do the military forces of a nation state play in the defense of state banking and commerce? To be sure, an attack on a nation's infrastructure is an act of war, but what if there are no accepted laws to prosecute the groups or individuals who perpetrated such attacks. What if you cannot even identify the attacker? If an attacker is identified is he a criminal or enemy combatant or both? If the hacker is in another country, can he be brought to justice or counterattacked?

CONCLUSION

The future is difficult, and perhaps impossible, to predict or project. History provides examples of how wars were fought in the past, but which of these lessons are applicable to a rapidly changing future is difficult to identify. Trend analysis appears to miss much of what is happening because of the unknowns and because of the speed at which it happens. Modeling and simulation can assist, but the programs may have to be written from the point of time of the relevant change. And if change is the norm, modeling and simulation will be a sure investment for venture capitalists. The real question is how do armies, navies, and air forces prepare for an uncertain future? It appears that wars will be fought with the equipment that is on hand or that which can be acquired quickly. Training in skills related to the service will have to be conducted given the role the service plays and the equipment it has. But what has to be introduced to the training of conventional forces is adaptive training and thinking. This has to be conducted at all levels of command and in individual, collective, and schoolhouse training. It is likely that every conflict situation will be different in scope, scale, purpose, and identity. That demands not only adaptive leaders, but also adaptive soldiers, sailors, and airmen. Organizations for combat may have to adopt civilian individuals and groups such as cultural anthropologists, computer scientists, and even ad men into the standard formations to account for the problems of the future. Compromises will have to be made with regard to all-volunteer forces versus a national draft army or even a militia army. Much of the compromise has to do with affordability.

In any case, the future will be high risk for any force. Reducing this risk is an imperative but how to do that without knowing the future means reliance on not only qualified leaders, but exceptional leaders who are capable of adapting to change. The organizational construct of having a conventional force readiness in addition to special forces will not be enough for the future. In addition to the air, land, and sea dimensions that we have known in the past, military forces must prepare for the space and cyberspace dimensions of war.

Chapter 17. Future of Military Decision Making and Modeling

The future of warfare chapter highlighted the difficulties and uncertainties of forecasting and decision making. Military forecasting starts during the procurement of new weapons and support systems for future warfare by suggesting via modeling what might happen in a future war. Modeling is used for planning, operations, and even post-war assessment. Making decisions that must be communicated often requires explicit modeling; so that assumptions, processes, and conclusions can be shared. Because war is so costly, money will continue to be invested to gain experience vicariously before combat. Modeling wisely about uncertainty, forecasting, value, and cost is the goal. Techniques addressing sources of error and uncertainty include adversarial reasoning, denial and deception operations, and ways to prevent surprise.

Thesis: The purpose of quantitative analysis using models of different kinds is to help military decision makers make a continuing stream of improved forecasts in the face of great uncertainties.

Whatever the reader believes about current decision making tools, techniques and procedures; this chapter is about the future of forecasting and the criterion is improvement. Understanding the purpose of the decision and how it might be improved is foremost. It is about creating winning models that can be communicated easily and that do not have blind spots. Using novel technology to calculate possible answers must be subordinate to aiding effective decision making.

The future of decision making and modeling is explained so that current and future generations of military thinkers will examine their specific context to exploit opportunities afforded by quantifying their decision maker's goals. Planners and decision makers often benefit from generating multiple approaches; each is called a course of action (COA), to their mission and considering multiple contexts. And then striving with all due diligence to deliver the best valued solutions in an adaptive way.

The 21st century has already highlighted the expanding nature of conflict. Countries must be able to effectively conduct warfare, wars, campaigns, battles, engagements, actions, and even law enforcement activities. At every level of abstraction effective decisions are needed. While the other chapters in APOW have dealt with critical factors to be considered in decision making, this chapter will deal with engineering the decision making process itself and the activities of thinking people.

The chapter addresses:

- Deciding and acting individually
- Sources of error and uncertainty,
- Adversarial reasoning,
- Communicating models,
- Decision making in groups,

- Modeling as design (including value),
- Selecting how to improve and considering Model tradeoffs

Refined ways of forming situational assessments and reasoning on information will be developed and deployed by every nation which wants to become more effective. This chapter examines the process of turning information into actionable evidence using knowledge and computer processing. Even the predominant mathematics of decision making may change future. Currently information theory, decision analysis, and game theory are used most often.

There is a presumption in this work: humans will remain the knowledge platform during the next fifty years. Decision makers (and not robotics) will make sense of patterns, assess projected outcomes, and choose plans for implementation. But they will be aided by intelligent augmentation. There are numerous reasons supporting such findings that are covered in other papers, such as: enhancing option creation, guarding against arithmetic and logic mistakes, and supporting comparison methods. Frequently, simulation, modeling or information system output provides other perspectives to an analytical discussion. Under few circumstances, should such techniques be labeled as 'knowledge.'

DECIDING AND ACTING INDIVIDUALLY

In the last one hundred and fifty years modern militaries have succeeded in using new technologies to change how wars are fought. One of these areas is decision support. Numerous mechanisms have emerged that allow warriors to ***sense*** what is happening in the world quicker and more accurately. Warriors have been trained to use the information better by applying their knowledge of what can happen in the world to ***understand*** and invent their own alternative courses of action. The result of evaluating envisioned outcomes of courses of action helps the warrior to ***decide*** how to act.

A simple model expanding Boyd's observe-orient-decide-act (OODA) loop is presented to ease explanation of how sensing, understanding, deciding, and acting may affect war. Furthermore, the figure below is used to identify where beliefs, errors, and uncertainty exist in the decision making process.

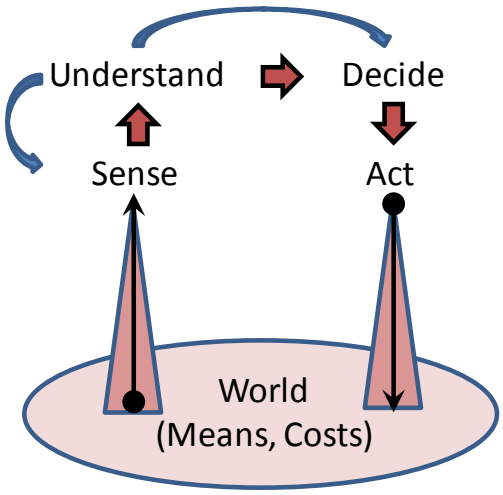

Figure 17. One sided, Sense-Understand-Decide-Act in the World (SUDA)

Psychologists have shown in many experiments how a person's understanding of situations biases what they sense. Physiologists have even identified brain, eye, and other sense operations that help or hinder novelty detection. One of the purposes of explicit modeling of the decision making process is to locate possible errors. An implied purpose is to aid in finding and fixing systemic errors.

The sensing triangle shows that many signals may come from the world from phenomena that get integrated into sensed information. There is a filtering effect that is influenced by our understanding of what might occur. Individual experience and expertise can aid sensing, speeding the process of categorization and key feature extraction. Experience can also introduce error, particularly about novel phenomena.

The curved blue arrows represent that understanding influences both sensing and deciding. Embedded in understanding is: recognizing the significance of changes in the world with respect to on-going actions, considering new courses of action (COAs), assessing the value of COAs, and planning more on highly valued COAs; so that a decision might be made. Sensing leads to understanding which affects future understanding. We call this revision process - learning. An individual (but more effectively a team of individuals) must be aware of how errors can occur during learning and challenge mistakes quickly.

Following the bold arrow to 'decide' accounts for the stage when we make a choice among our anticipated options. Selecting plans in adversarial situations has a rich literature and will be considered in the next section of this chapter. Generally, the best choice considers the degree of flexibility of changing future plans and advancing towards strategic objectives while minimizing costs; similar to our modeling explanation later in the chapter. However in war, deception that surprises foes is greatly valued; so committing to a successful plan is a revered step. Selecting a plan is not based solely on using the highest valued plan based on current information, but also on evaluating the robustness landscape.

The acting triangle shows that what we do may interact with the world in foreseen and unforeseen ways. As others act, even more interactions may occur and even more outcomes may become unanticipated. To a large extent, expectations and possibilities are colliding within our planning domain to compel us to wisely limit our considerations. Thus, it becomes more economical to sense what is happening in a continuing loop than to plan farther into the future.

ERRORS AND UNCERTAINTY

Every step in our thinking process (the SUDA loop) may introduce errors. Furthermore, Uncertainty abounds when one considers comparing and contrasting models at numerous levels of abstraction and a variety of contexts.

Philosophically, humans reason subjectively. 'Objectivity' involves understanding the state of nature so well that the reasoner needs to significantly approach omniscience to assign evidence to 'truth.' Yet, even though we know that truth exists, our reasoning processes cannot assume that we know the truth accurately. For instance, even when we are sampling six-sided die rolls, we get to decide when to stop rolling and when to record the rolls, which is subjective.

If we roll 600 times and the number '2' had occurred 150 times (1/4 of the time), we would probably agree to keep rolling or to decide that the die was not 'fair.'

Thus, our understanding of the physics of rolling dice informs our expectations, which in turn shapes our experimental design. How can we seriously call this process objective?

We can adopt the term 'error' to represent misperception and inaccurate recording of information. We can use 'uncertainty' to represent the application of knowledge or models that generates many-valued forecasting. So we can use effort, sampling, and mathematics to reduce to effects of errors. But we must use reasoning and beliefs to adopt approaches to reducing uncertainty.

ADVERSARIAL REASONING THEORY, RED TEAMING, WARGAMING

Planning processes that assume that by exercising initiative that the enemy's choices are inconsequential, frequently, uncover that such planning processes are flawed.

Warfare at its most simple abstraction should be modeled as a six-process phenomenon in which each side controls only three. At the same time our side establishes our complete chain from sense to act, we try to break the enemy's chain which is, at this level of abstraction, identical. The initiator of the action has the advantages of initiative but must maintain the entire chain to effectively implement a plan. The responder has the advantage of being able to break the chain in only one place to destroy or attenuate the enemy's effectiveness. Thus, at the same time both sides are sensing, deciding, and acting they are trying to interfere with the enemy's chain.

This two-sided aspect is most evident in engagements, battles, and tactical maneuvers. But in campaigns, wars, and many other forms of conflict, an analyst employing models should be aware of enemy choices. In coalitions, insurgencies, and long-term conflicts even more sides ('**n-players**' to use the game theory label) must be considered and sometimes modeled explicitly, such as: allies' intent and capabilities, indigenous populations, nearby countries' effects, international opinion and resulting actions.

Game theory is a tool of analysis to help correct one-sided decision making explained above. Numerous versions of game theory have been invented to expand from its highly theoretical initial framework to increase its applicability. Many books can be found on game theory, but some of the most informative are those which propose to loosen the axioms, fault aspects of the methodology, and expand the limited intelligence nature of conflict. Except for nuclear war, most players find it advantageous to limit informational exchange of their possible battle plans. To calculate a Nash equilibrium mixed strategy (NEMS) from game theory's normal form; all sides' plans, counterplans and 'expected results' must be known by all players.

Several multi-game or multi-perspective approaches have been invented to extend adversarial analyses and lessen game theory's dependency on shared information: including metagame theory [Howard] and hypergame theory [Bennett, Vane]. For instance, in hypergame theory one considers some limitations on different players' information, computing/modeling capabilities, and even option generation processes. These considerations are called 'bounded rationality' to differentiate them from consistent alignment theory, a process of plan and counterplan elicitation is applied by analysts to bound the number of probable plans for both

sides. Then explicit reasoning is proposed about why one side or the other may not know or consider all of the COAs. These hypotheses are then expressed as hypergame expected utilities (HEUs). HEUs are used to inform a decision maker about how highly confident that one must be to select the corresponding COA.

Another form of adversarial reasoning is 'red teaming.' An experienced team of analysts studies the enemy and attempts to emulate their reasoning. The process is frequently started with a friendly plan, and the red team attempts to exploit vulnerabilities in the plan consistent with enemy preferences and capabilities. The goal is to mitigate surprise and inform friendly planners about what they might see during an upcoming operation. It is designed to prevent 'mirroring' which can occur when friendly planners invent enemy plans consistent with their own planning processes, but not enemy planning doctrine. This is a knowledge based approach that seldom needs more than a friendly plan, current intelligence, and an experienced red team.

Wargaming is also used in adversarial analysis to answer a question at many levels of fidelity. An example question might be, "What might happen if Country A attacks country B?" Generally, a wargames team develops a scenario that stimulates experts (who are assigned roles as players) to consider the pros and cons of various COAs. Wargames may be tabletop exercises where expert opinion is expressed and challenged in a collegial, structured way. The goal is to discover the 'landscape' of possible alternatives. Wargames may also become very structured by using the answers of players to provide information for computer simulations that calculate outcomes. These can be very expensive.

Often wargames facilitators can query the players about any indicators and warning signs that might be observed if a one side is doing an identified COA. Such information serves to help prevent the surprise of friendly forces and may alert intelligence organizations. Lastly, if a friendly planning gap or vulnerability is uncovered, players are often asked to suggest a mitigation approach. A number of enriching books on wargaming can provide more depth.

COMMUNICATION

Everything that must be done by more than one person requires communication. Minds do not communicate directly with other minds, we communicate through shared symbols. While the symbols must be transmitted through a physical medium, we can generally abstract that step away. By retaining an understanding that our communications are to transmit understanding, then we can test how the information that has been transmitted is being used by others as knowledge. We can ask questions of recipients or respond to their questions based what each person seems to focus upon.

Models can aid the communication process by being explicit. Models can help communicators to remember what is being discussed, so that we can respond consistently and appropriately to questions. So models are needed by decision makers to decide and to communicate to others who will participate in the implementation of plans.

Communication is a decision making process of how to act, so it is described by the SUDA loop. The SUDA loop itself is an attempt to communicate refinements to Boyd's OODA loop and implicit understanding processes.

DECISION MAKING WITH GROUPS

The breadth and scale of global militaries requires more than a few people to be involved in decision making. To handle these levels of commitment, militaries have invented officer staffs to plan and operate echelons of headquarters for most mission-related activities and inter-agency working groups for emerging concerns. Counteracting the trends towards larger units and large numbers of combatants, as seen in the 20th century, most militaries are shrinking size-wise while improving their effectiveness, by focusing on quality and self-selection (volunteerism).

The military has been using staffs of officers to support decision making for many years. Any project involving multiple people increases the available brainpower and potentially the planning throughput. Brooks' Mythical Man-Month is instructive about the communications overhead that might undo the expected efficiencies. Most readers will be familiar with the advantages of experienced staff with specialty areas, such as logistics or personnel. Successful militaries use extensive training of persons to inculcate shared processes and the results are demonstrably positive. The US and other well-trained militaries enjoy significant success on modern battlefields. Since computers are already being used for information storage and retrieval, as well as simulations, gradually software agents will perform more tasks as military staff in the upcoming decades.

Improvements to group decision making have incorporated some of the adversarial techniques, such as wargaming and red teaming, mentioned in the previous section. By engaging players with a set of sequential challenges of each potential COA to exploit its vulnerabilities, a large number of less radical courses of action can be characterized without having to explicitly enumerate them. For instance, plans to go around the right flank or the left flank generally require very different responses by the opponent. Attacks anywhere along the actual line of combat troops are often less valuable to the planner and may be considered by adding only a 'weighted assault' to the planning process. Therefore, these three COAs bound many of the variants of flank attacks and weighted attacks.

There are some specific strengths of adding diversity to decision making processes. The most obvious advantage is breadth of experience and expanded domain expertise. This is particularly appropriate when 'whole of government' approaches are desired. Law enforcement professionals, operations researchers, military planners, intelligence agency representatives, university professors, and specialists can effectively combine to generate brand new approaches to stalled solution domains. Sometimes, all that is needed is to empower people with assigned roles that break the rigidity of a well-rehearsed decision process. When choosing this approach, one should expect more time and effort than normally devoted.

It is very helpful to set the *mission* of a new group to solve emerging problems. An important next step is assigning them a group charter with roles and responsibilities. Often, an identifiable group name enables people to gain some sense of community for the effort. It is valuable to interview participants, when possible, before assembling them into a working group. For example, during the USAID project for the year 2000 time-related software project, the diagnostic team was constructed by interviewing 50 software engineers, selecting 12, and calling them "the Eagles."

Weaknesses that sometimes occur in group-aided decision making are: obscured responsibility for follow-on actions and impeded decision making because some participants are unskilled. Both of these weaknesses can be prevented by expert group facilitation. A seasoned facilitator will maintain the tempo of progress, prevent the hijacking of the process, and keep everyone informed about who is in charge of what. There are many non-confrontational, but firm ways, to guide group work. Decision making in war should not be an egalitarian process, but the advantages cited to avoid planning myopia or group think are often very valuable.

Articles and books for commercial businesses have added suggestions to increase creativity by forming people into groups. They may include suggestions about ways to avoid people who are very dominating or aggressive. In the past, such single-minded leadership has been called visionary. Game facilitators use other labels. Sometimes no opportunity exists to choose group members. Please be aware that some groups' memberships are pre-assigned by those requesting decision making help based on factors such as stakeholder equity.

MODELING AS DESIGN

Modeling is an engineering discipline. The goal is to deliver as much value as is practical from an effort and cost perspective.

VALUE (ACHIEVING BENEFIT)

Commanders and their staffs can quantify the qualities that lead to better decisions by defining the benefits desired for their assigned mission. These end states become a magnet for design. Once this important step is done, every plan can be harmonized with anticipated benefit. Before campaigns are started, a statement communicating what is valued should be specified to leaders of subordinate elements. When clear, this statement can help align organizational effort. Modifications to the statement should occur as needed, but the statement should be as concise as practical and mostly about end state benefit. For example, success in Afghanistan might be 99.9% likelihood that non-state extremists operating in the country are unable to conduct violent attacks on more than ten NATO citizens per year.

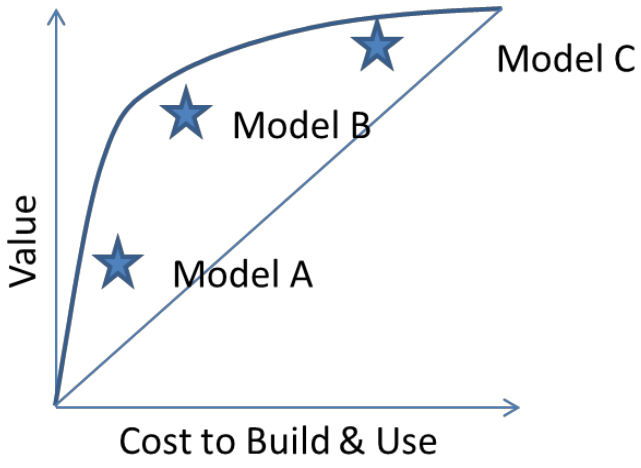

Figure 18. Modeling value versus costs

Quantified techniques have been derived independently [Hubbard and Gilb] to address ways of measuring and designing quality into projects. Representative qualities (Value) of effective military modeling used for example purposes in this chapter are:

Accuracy of Forecast,
Timeliness of Forecast,
Availability of Information needed to forecast,
Robustness of Forecast – how much variation occurs in the neighborhood of the forecast, and
Clarity – how effective one is at communicating the plan associated with a forecasted outcome.

The costs of forecasting are – to ***build*** the model and to actually ***use*** the model. A notional engineering tradeoff in two dimensions appears in the figure just above.

Even the above metrics require forecasting and assume a context. Accuracy is defined in terms of computed results versus what actually will occur. Who actually knows what will occur? Timeliness assumes an operational tempo that doesn't shatter our preconceptions of politics and decision making. Availability of information presumes a suite of data collection mechanisms. Robustness is more expansive, it relies on understanding what might occur. Clarity requires a theory of mind about the potential receivers of information; their background, commonality of experience, and facility with concepts and language. To hedge against surprise, we have to consider what we might not know. These concerns expand the fields of investigation, sometimes in very costly ways.

It should not be surprising that there is not a single list for high quality decisions and that they are highly dependent on organizations. What works well for one culture, often fails for another. Thus it is important to determine the benefits desired and the organizationally appropriate qualities which should be designed into the approach.

Adversarial reasoning often *expands* the contexts and possibilities. Decision makers must consider that opponents may not care about aspects of conflict for which we care deeply. Unwisely chosen metrics may help design a high scoring battle plan for one context that is completely inappropriate for another, for example the blunt instruments of conventional forces for civil wars.

The inference is that learning can greatly modify the effectiveness of actions, so models must be adaptable. To combat the challenge of discovering new contexts, modelers must add at least two more design qualities to modeling activities that can be tested continually during the building and delivery of military decision support tools. They are:

- *Modifiability* of the model (measured in cost and time to deliver a new aspect) and
- *Reliability* of the results (measured in terms of traceability of inputs to outputs).

Modeling projects must be managed to promote adaptation and learning. Boehm's Spiral Development and Gilb's Evolutionary Delivery are two of a number of project approaches that are addressing these concerns and are called "Agile."

SELECTING THE NEXT MODEL

Committing to improving a model is analogous to generating a new battle plan. The enemy of software projects is primarily technical and funding uncertainties, not enemy leaders. All designs to be considered are forecasted as to their potential effectiveness. And we need to consider the cost (mostly in dollars and time, not blood and equipment). So by changing models, we are doing the SUDA loop to generate plans that map onto value-cost.

For example purposes, consider "Model A" as the next projected state of our modeling project. By plotting the values, it is presumed that one has already tested our baseline model, noted a shortfall, and forecasted the impacts of models A, B and C. Thus, the Sense and Understand portions of the SUDA loop for changing the model are complete. Since "Model A" is the least valuable, least costly of the three plotted alternatives, it is a good candidate for improvement. It is similar to the costs of staying in a defensive position prior to the declaration of hostilities. "Model B" has about twice the value for about twice the cost. And "Model C" has one and a half times the value for close to five times the cost. Please note that nonlinear value-to-cost ratios are quite usual.

Once Model A has been delivered, the idea of "sunk costs" means that it costs almost nothing to build and has very little uncertainty involved with its position in the graph. So the scenario is: do we continue building A or change to B or C. If we continue building model A, its implementation commitments will adjust the costs of models B and C, usually making them more costly. An earlier commitment to changing the design often results in less total cost. Too many changes results in thrashing – achieving very little progress because of the periodicity of change.

The next step is to decide which of the three to build. If the decision is purely based on value, then C is the choice. If the decision is purely on cost, then A is the choice. Often, the perceived value of a plan fluctuates based on circumstances or contexts. Decision theorists have invented multi-attribute utility theory to account for combining sub-value components (previously called metrics). The key is to try to determine the likelihood of the various contexts and reassessing the value function. At that point a value surface exists and it may be very turbulent (low value regions next to high valued ones). Decision making is risky.

SYSTEMIC CHALLENGES WITH COMPUTATION

A representative table of modeling choices with known weaknesses and strengths are provided to highlight two aspects of modeling: (1) engineering tradeoffs are not free, and (2) one should ask for both the strengths and weaknesses of approaches to better understand the selection impacts from the previous section. The point of providing this table is to address some often used modeling techniques and to help the reader understand how this kind of thinking could be applied to any other new techniques which may be developed.

Table 6. Techniques

Technique	Weakness	Strength
Add Multiple Scenarios	Requires more time	Helps prevent surprise
Add Multiple Solutions	Requires more time	Helps sense making

(COAs)	Requires more people creativity	Helps prevent surprise
Add Indicators and Warnings	Wastes time for I&W that do not occur	Helps prevent surprise
Construct Decision Landscapes	May take much more effort Unknown benefit at outset	Forces Outcomes to be scored
Structured Records (Lots of indexed data)	Difficulty handling new or exceptional information Required pre-collection taxonomy	Speed of Use
Add more of data	Slower to retrieve	Comprehensiveness
Design more Complex models	Often less generalizable Often less explainable Increases cost Harder to validate	More accuracy in focus area (for instance: nuclear-biological-chemical)
Use Agent based models	Fewer developers are able to design and develop	Context based activity is easier to track
Use Person-in-the loop simulation	Familiar user interfaces (visualization and controls) needed for each aspect	Novel actions may occur which may be very informative
Use Tabletop wargaming	Costs too much for routine activities	Better understanding of event possibilities and solutions
Use existing models	May be hard to understand May have hidden aspects	Can decrease cost

MODEL CHANGES

One aspect of modeling that becomes evident in complicated computer models is the exponentially increased durations of time needed for computing. As many models double their data, the time needed to calculate their results increases by the square of the ratio of change. Please see the table below to see representative run time changes.

Table 7. Modeling Changes and Concerns

Aspect	Change	Runtime change
Data size	x 2	x (2)^2 = x 4
Duration	x 5	x 5 (uncertainty increases)
Monte Carlo sampling	X 100	X 100
Resolution of terrain	x 10	x 10^2 = x 100, best is x 30
Numbers of units	x 3	x (3)^2 = x 9
Modeled features	x 6	x (Complexity radix)^6
Partitioning	x 4	Overhead, but can reduce duration to 1/16

The goal of most software engineers is to contain computation duration by design. There are some linear algorithms that scale as the linear ratio of any increase. In our table, a difference of duration of five (modeling five days of combat rather than one day) is often linear. If it takes ten minutes to compute a day's worth of combat then it will take fifty minutes to compute the results of five days. There is a caveat – the longer that one projects in an iterative way the results of an interactive environment (combat simulations), then the less likely that it will be accurate.

Monte Carlo sampling is the idea of running a model that is believed to be right many times to observe a distribution of outcomes (presumed to help the decision maker 'know' how battles might result). Often many model runs are needed to develop a feel for the variability of such models. But the act of slogging through runs is computationally linear. The reams of data that must be analyzed is crushing.

As the number of data records increases, the best that modelers can do is keep the computation durations down to 'N times log(base 2) N'. This is the theoretical limit for relational data searching. It is significantly better than 'squared' but worse than linear.

However brute force approaches are often the order of the day for simulations, because the data is being generated and does not benefit by being indexed during a simulation run, as historical bank records do. The overhead of the cure is worse than the problem. The next two entries in the table are: terrain data and number of units. So going from 100m terrain data to 10 m data (tenfold resolution increase) would increase computational time tremendously (x 100). And adding another echelon of units, brigades to battalions, would increase model run duration by a factor of nine.

Even more egregious computationally is modeling (highly detailed) features of phenomena. Such modeling can be so computationally expensive that the duration of modeling increases by tens. For instance, a complexity radix of 20 (the base for exponentiation) raided to the sixth power, which is 20^6, or 64 million.

There is some possibility of doing better, by using knowledge of the problem to partition it into independent pieces. The pieces need to be combined into an outcome, so there is some overhead and art to this process. This is another example of where wisdom and art interact in the modeling process.

Not surprisingly, the conclusion must be that inspired, wise modelers are needed to produce useful models for any phase of decision making. Using a compelling approach to choosing the right level of abstraction, and performing diligent checks for modeling errors; one might build a really valuable tool. That is the reason that the seven representative qualities for providing end user benefit were included in the earlier sections. Experience has shown that end-users for models are most accurate at quantifying the minimum acceptable and maximum-limit conditions for these qualities.

Lastly, a quick review of computational architectures' probable impact on modeling is provided for graphics processing units, time warp, agent-based modeling and cloud computing. Graphics processing units (GPUs) have been lauded for their incredible parallel computational capabilities, which can only be realized by feeding them data. So GPUs need arrayed data that

behave deterministically, not likely in a Monte Carlo simulation. What makes them wonderful for math modeling, visualization, and streaming data (such as the stock market), almost prevents their effectiveness in military modeling. Time warp is a software technique to use parallel processing by continuing to compute both branches of IF-THEN-ELSE clauses using multiple processors and using a time window and executive function to combine and prune computational branches. Agent based modeling has a lot of potential, but continually disappoints because of the level of modeling or software expertise needed to control agents. Lessons learned from robotics will be beneficial to agent based modeling. Otherwise, it is another dangerous opportunity to show intuitive results that in practice are overwhelmed by largely indecipherable possibility trees. Cloud computing is a very promising computational platform (from size alone that might yield just in time results) and potentially valuable for actual decision making. When one's computations are distributed, are the models or computers worthy of trust? So the issues of computer security and informational assurance must become involved.

ROBOTICS FOR DECISION MAKING

The SUDA loop in may benefit from dynamically tasked sensor and understanding robotics to process at extremely high speeds what is actually occurring. Robotics may lessen the uncertainties associated with far out time projections by being applied just in time and tasked because of situational understanding.

Intelligent augmentation, the use of sensors and computer-user networks to affect sense-making, will profoundly affect the future of decision making before, during, and after war. Since there are so many ways to perform decision support leading up to full intelligent augmentation, decision support, modeling and communications could become the next international race for supremacy. A decision to launch extensive development in these areas certainly could waste many governments' finances. It is very important to carefully quantify the benefits for future decision making and then implement designs evolutionarily [Gilb] to control costs.

EPISTEMOLOGY

Epistemology is the study of how we humans know anything. Each person's foundational axioms for epistemology affect most aspects of modeling and decision making. The strengths and weaknesses of modernism and postmodernism guide us to important questions that highlight whether the axioms that we have adopted cohere. I suggest that we need an approach that accepts the legitimacy of each view's questions and methods while recognizing any of each view's shortfalls. Whatever post-postmodernist approach becomes called, truth exists even if we humans cannot be sure that we know truth. And beliefs can be used to blind ourselves to new information or to control others.

Instead, similar to the decision making and modeling in this chapter; teams of people can be used to mitigate errors and characterize uncertainties for more valuable and less costly forecasts. An example of advances in intelligence processes leading to situational understanding.

Warning Analysis for the Information Age: Rethinking the Intelligence_Process by John Bodnar [Bodnar] is a recommended source of new thinking on the subject of intelligent decision making. It includes dozens of innovations related to framing early warning and sense-making. The following axioms need to be explored for their impact on more effective sense-making:

The key to understanding the operation of networks is "orienting the arrows" rather than just "connecting the dots"

Plotting space, time, and energy requires maps, timelines, and organization charts.

Biological and military-political systems can be modeled as a series of nested Decision Cycles (OODA Cycles)

Organization Charts, Program Timelines, and National (geospatial) Maps must be used in an integrated manner to track the organization and operation of networks.

Some effort should be devoted to understanding the observations that: For Bottom-Up thinking—Structure determines Function; and for Top-Down thinking—Function determines Structure.

CONCLUSION

Critical thinking techniques, adversarial reasoning, and group efforts will empower better analysis. Analysis and synthesis of models for decision making can benefit from the explosion of information computational power. Machines will not replace knowledge workers for the foreseeable future, because they lack understanding of context and inspiration. Communication of decisions is very important and is aided by active listening. Lastly, decision making is an esteemed step that tests the mettle of organizations and their leaders. Actions follow from it.