REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	28.Jun.00	THESIS

4. TITLE AND SUBTITLE
TOWARD AN UNDERSTANDING OF PEOPLE'S LIBERATION ARMY INFORMATION WARFARE DOCTRINE.

5. FUNDING NUMBERS

6. AUTHOR(S)
CAPT TAVENNER CARSON L

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
UNIVERSITY OF WASHINGTON

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
THE DEPARTMENT OF THE AIR FORCE
AFIT/CIA, BLDG 125
2950 P STREET
WPAFB OH 45433

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
FY00-226

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION AVAILABILITY STATEMENT
Unlimited distribution
In Accordance With AFI 35-205/AFIT Sup 1

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

20000718 030

14. SUBJECT TERMS	15. NUMBER OF PAGES
	111
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

Toward an Understanding of People's Liberation Army Information Warfare Doctrine

by

Carson Tavenner

A thesis submitted in partial fulfillment of the
requirements for the degree of

Master of Arts in International Studies

University of Washington

2000

Program Authorized to Offer Degree:

Henry M. Jackson School of International Studies

China Program

University of Washington
Graduate School

This is to certify that I have examined this copy of a master's thesis by

Carson Tavenner

and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by the final
examining committee have been made.

Committee Members:

David Bachman

Mary Callaghan

Date: 6/5/03

Master's Thesis

In presenting this thesis in partial fulfillment of the requirements for a Master's degree at the University of Washington, I agree that the Library shall make its copies freely available for inspection. I further agree that extensive copying of this thesis is allowable only for scholarly purposes, consistent with "fair use" as prescribed in the U.S. Copyright Law. Any other reproduction for any purposes or by any means shall not be allowed without my written permission.

Signature Carsten Tavenner

Date 7 JUN 2000

University of Washington

Abstract

Toward an Understanding of People's Liberation Army Information Warfare Doctrine

by Carson Tavenner

Chairperson of the Supervisory Committee

Professor David Bachman
Henry M. Jackson School of International Studies, China Program

Chinese and American Information Warfare (IW) terminology and concepts overlap due to the Chinese incorporation of established American airpower doctrinal concepts into their own publications. Leaders and theorists within the People's Liberation Army must reexamine this incorporation of American IW thinking into the development of their own IW doctrine because the incorporation is incomplete and will cause fundamental problems for the PLA in implementing information warfare operations. This is true for two primary reasons. First, Chinese military doctrine lacks an awareness of the important role of targeting frameworks in long-range precision attack missions. Targeting frameworks are essential for providing the necessary constructs for corporate, as opposed to individual, decision-making on target selections. Second, the Chinese doctrine functions under a fundamental principle of information control, which runs contrary to the tenets of speed and flexibility. Yet the recognition and utilization of these two tenets is central and fundamental in American airpower doctrine, which the PLA has seemingly begun to adopt into the development of their own information warfare doctrine. The problematic subjects of targeting and information control are each vital enough to render Chinese IW doctrine ineffective. Together, they will prevent success on the battlefield.

TABLE OF CONTENTS

TABLE OF FIGURES

GLOSSARY

AFCC	Air Force Command College (China)
AFCI	Air Force Command Institute (China)
AMS	Academy of Military Science (China)
AWACS	Airborne Warning And Control System
BDA	Battle Damage Assessment
C^3I	Command, Control, Communications, and Intelligence
C^4I	Command, Control, Communications, Computers, and Intelligence
CMC	Central Military Commission
FBI	Federal Bureau of Investigation
GPS	Global Positioning Satellite/System
ICP	Internet Content Provider
ISP	Internet Service Provider
IW	Information Warfare
MII	Ministry of Information Industry
PGMs	Precision-Guided Munitions
PLA	People's Liberation Army
PLAAF	People's Liberation Army Air Force
PRC	People's Republic of China
SAM	Surface-to-Air Missile
SCOSTIND	State Committee On Science and Technology Industry for National Defense
SCIO	State Council Information Office

PREFACE

This thesis began with the end in mind. Ultimately, it is not likely to have discovered any tangible military developments in Mainland China which either the open source or classified worlds have not already become aware of. Therefore it has not attempted to do so. Nor does it seek to outpace the incredible strides being made (even as this is being written) by those who already work and publish professionally in the field of PLA (People's Liberation Army) analysis. What it does establish is *how and why* current observations about PLA Information Warfare (IW) thinking are valid. One of the contributions made by the set of various publications which came out in 1999 and early 2000 was the collective assessment that PLA doctrinal thinking regarding IW is framed by Western concepts.[1] A secondary, unstated observation these findings suggest is that this U.S. influence may not be able to 'stick' with the PLA for long. But is this observation accurate, and if so, how can that assessment be proven? This work picks up where the recently published assessments left off by revealing *how and why* the incorporation of U.S. IW thinking into PLA IW doctrine is indeed problematic.

Given that the field of PLA studies is largely divided between non-military China watchers, who usually lack the time to study U.S. military history, and U.S. military analysts, who usually lack the opportunity to conduct in-depth studies of Chinese IW

[1] This assessment was reflected in Michael Pillsbury's China Debates the Future Security Environment, National Defense University Press, Washington, D.C., January 2000, and James Mulvenon and Richard Yang's edited volume The PLA in the Information Age, Project AIR FORCE, RAND, Santa Monica, California, 1999.

thought, this work will seek to create a bridge for the synthesis of these two areas (Chinese military developments and American airpower history). If such a synthesis is possible and successful, it will create a new structural framework upon which both communities may further build an understanding of what the PLA faces as it grapples with the 21st century, a century filled with the promises of advanced information technology.

ACKNOWLEDGEMENTS

I wish to acknowledge first and foremost the tremendous assistance of my professor, David Bachman, as he provided me with volume after volume of information about PLA studies and national security analysis.

I also could not possibly fail to overestimate the value of translators. The work of people such as Michael Pillsbury and James Mulvenon, as well as the support of institutions such as the National Defense University and the RAND Corporation, have been absolutely critical to the findings in this work. Without translations of PLA publications regarding information technology, the revolution in military affairs, national defense issues, and other important sources of information on developments in Mainland China, the field of PLA studies, and particularly its struggle over the role of information technology's role in China's future defense, would become an extremely misdirected and ill-informed field. If communication generates greater understanding, and if understanding generates greater cooperation, then let communication thrive.

In addition, I want to acknowledge the special friendship of Qian Jun, a student and teacher of economics, who has played a very significant role in my life since 1987, when we first came to know each other. The planting and flowering of that relationship has provided me more motivation for further pursuing a career in working towards healthy U.S. – China relations than all the history and policy books together could muster. By being a trustworthy friend, he has helped me see the great benefit of coming alongside China and encouraging the increase of virtue.

DEDICATION

This work is dedicated to my wife, Wendy, who has been a never-ending source of encouragement to me during this project, just one of the many steps we will take together as we work toward our life-long pursuit of establishing peaceful relations with China.

Chapter 1 - Introduction

The impact of information technology (IT) on the world in general is without question the most significant impact of any of the worldwide technological developments that have surfaced since the end of the Cold War. Developments in the areas of communications, electronics, space systems, computers, video technology and many others have provided opportunities that the world has never seen before. Significant opportunities come from the integration of these technologies, including many in the realm of warfare.

The impact that the world felt from the growth of IT through the 1980s and 1990s has been accompanied by the rise of the People's Republic of China (PRC) on the world stage. Even before the end of the Cold War, the United States sought to develop a better understanding of China, and many Americans as well as Chinese hope this developing understanding will lead to meaningful and long-lasting relationships for peace. But at the same time, the United States has actively pursued the research and development (R&D) of new technologies for the continuous improvement of its national defense. A major portion of this effort to expand national defense capability has been focused on the application of the various information technologies. These R&D efforts have often resulted in revolutionary new concepts and ideas for the application of military force, which in turn has already started to influence all sorts of national and international affairs, not only in military affairs, but in those of politics, economics and sometimes even culture as well.

The importance of this impact on national and international affairs has not been lost on the Chinese, and as the United States-led coalition demonstrated so powerfully in the 1991 Gulf War, the development, incorporation and use of information-based weapons and concepts in warfare has become a matter of central importance to the future credibility (not to mention survivability) of any military force structure. Unfortunately for the Chinese, the desire to push their military forward into the Information Age is hampered by the reality of a military force structure which has not received much assistance in developing, encouraging, and using high technology conventional warfare methods over the past fifty years. However, the economic reforms initiated by Deng Xiaoping in the 1980s have begun to reap great rewards. With a vibrant and growing economy, the PRC is now poised to acquire the kind of technology that it feels it needs for the development and improvement of China's national security.

The Four Areas of National Security Progress

A question that remains partly unanswered, however, is "what *does* the PRC need to do in order to best maintain security?" The People's Liberation Army (PLA) is primarily responsible for answering this question, and through an examination of many writings by its leaders, western scholars have begun to see how the PLA is addressing the issue. The answer, it seems, is that the PLA desires to modernize itself in all possible aspects. That is to say, they are trying to progress in terms of equipment and doctrine as well as in terms of conventional and information warfare applications. Since both conventional warfare and Information Warfare (IW) each have their own equipment and

doctrinal aspects, the net result at the turn of the century is a military that hopes to develop itself in four different ways.

Of these four general areas (see Figure 1 – Comparative Growth Model), Information Warfare (IW) doctrine is that portion of the PLA's drive toward modernization that still has the furthest distance, conceptually, to travel. Since this work does not focus on the other three aspects of PLA modernization shown in the diagram, we must work with some assumptions about the nature of their relationships to one another. First is the assumption that the PLA's conventional warfare establishment is far more developed than that of information, in both the equipment and doctrinal aspects. The figure demonstrates this relationship through the height of the dark columns compared to the light columns.

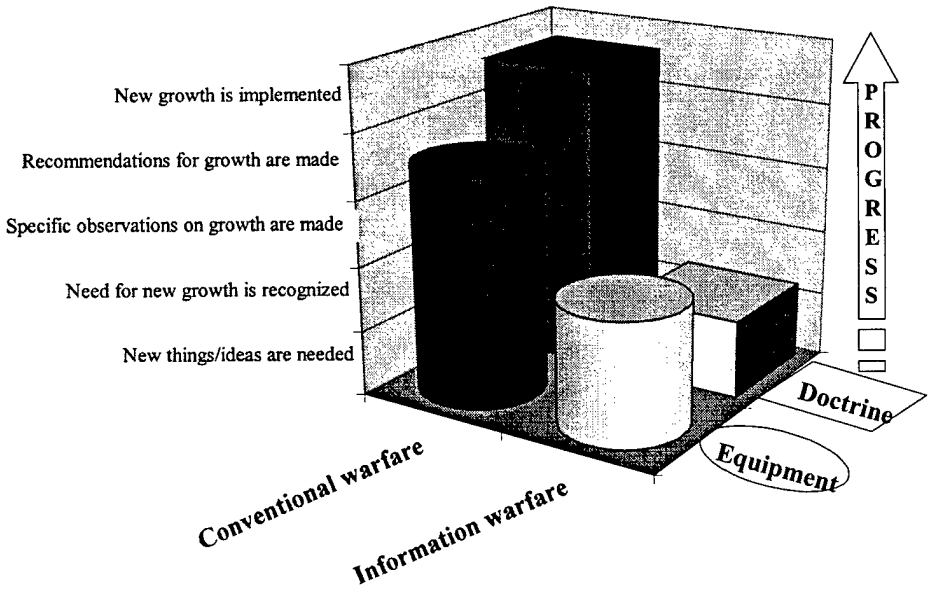

Figure 1 – Comparative Growth Model

Second is the assumption that PLA conventional warfare doctrine has largely been established, especially in relation to its high-tech equipment acquisition. This relationship is diagrammed in the difference between the two dark columns. The PLA is definitely trying to acquire advanced conventional weaponry, but during this past century Chinese soldiers have already developed the doctrine under which they intend to fight conventional battles, and have exercised that doctrine in real combat. This is not to say that all leaders within the PLA agree on doctrine. 'People's War' and 'Local War' are two schools of thought within the PLA, which are arguably at odds with one another in terms of what sort of military action the PLA must be primarily prepared to face.[1]

Since the main purpose of this work is to provide a structural framework through which one can better understand how and why PLA IW doctrine has far to go, the diagram illustrates the assumption that progress toward acquiring IW *equipment* is comparatively greater than the progress toward a developed IW *doctrine.* This last consideration is diagrammed in the relationship between the light-colored columns. This thesis does not focus on China's acquisition of IT, partly because the PRC's activities in this area have already received extensive interest and examination in both the western analytical and the U.S. political communities. The high level of professional attention is

---

[1] The make-up of these two schools of thought, and their relationship to a third information-based school of thought (the Revolution in Military Affairs school), are detailed by Michael Pillsbury in China Debates the Future Security Environment.

evidence of the fact that China's progress in IT acquisition is significant, even though it is incomplete.[2]

Regarding the height of the column, the initial stages of IW doctrinal development have occurred. But this is arguably due simply to the outright copying of U.S. doctrinal materials into their own writing. In an effort to move toward a better understanding of PLA IW doctrine, three western analysts of the PLA have just recently published books describing characteristics of the PLA's approach to IW. Beyond this, what needs to be accomplished? The field of China studies could benefit from a greater appreciation of the distance which remains to be covered, and the nature of the problems which the Chinese will face in getting there.

Chinese Information Warfare Doctrinal Development

This thesis will argue that contemporary Chinese IW doctrine is incomplete because the PLA leaders and theorists have not fully assessed the impact of incorporating U.S. IW thinking into the development of their own IW doctrine. It will also attempt to demonstrate that if the PLA attempts to implement the United States' doctrinal concepts that it has already appropriated, then it will face great difficulty or failure. Having illustrated a model for the relationship of PLA IW doctrine to other aspects of PLA modernization, this section of the introduction will now present another model for understanding the relationship between the Chinese and U.S. IW doctrine. This model

---

[2] Also note that there is no emphasis or research herein on the way in which Chinese doctrine is constructed, or by which entities, whether regarding IW or not. Factors impacting Chinese IW doctrine are dealt with as they relate to the PLA as a whole, not to an individual policy-making entity.

will then be used as the basis for fleshing out the thesis' argument for why the PLA leaders and theorists must reexamine their incorporation of U.S. IW thinking into the development of their own IW doctrine.

This work is centrally built on the understanding that there is an overlap between the Chinese and the American IW terminology, largely if not entirely due to China's adoption of United States IW publications into their own writing. However, the overlap is not total. Many U.S. terms and concepts have not appeared in Chinese IW publications. Also, the Chinese may have adopted a body of terms that escaped notice, are not yet translated, or have been deliberately hidden. In short, western scholars know the Chinese IW doctrine in part, yet also understand that what they know is not the whole picture.

The overlapped relationship between the American and Chinese IW doctrines can be clearly illustrated with the following model. Figure 2 – Doctrinal Overlap Model – is a model for representing the conceptual framework of this uncertain body of Chinese military knowledge and its overlap with the U.S. IW terminology and concepts.

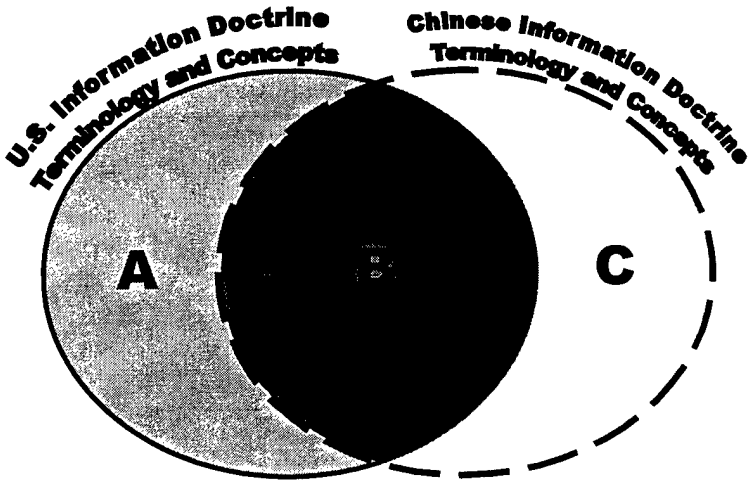

Figure 2 – Doctrinal Overlap Model

Area 'A' represents that which is uniquely from the U.S., area 'B' represents the shared terms and concepts, and area 'C' represents that which is uniquely Chinese. Again, the size and position of the entire Chinese set is unknown (dashed line). Therefore, the exact size of area B is also unknown; perhaps the most appropriate initial assessment is simply that we know B exists.

This thesis presents two main claims within the overall argument, both of which may be illustrated using this model. First, there are portions of area 'A' that must become included in area 'B' in order for the PLA to develop effective offensive IW capabilities. These unincorporated portions are the frameworks for a targeting methodology. Second, there are characteristics of area 'C' that will make the actualization of some IW concepts found in area 'B' difficult for the PLA. These characteristics are the attitudes and inclinations of the Chinese Communist Party (CCP) toward controlling, not assuring or providing, information in general. Both these claims contain some specific terminology and concepts, which will be fully explained in Chapter 2 – Structures for Understanding. The supporting evidence for the claims will be examined in detail in Chapters 5 and 6.

The Argument

Having illustrated a model of the overlap between Chinese and U.S. IW doctrine, we now turn to look at the structure of the thesis' argument that the PLA leaders and theorists must reexamine their incorporation of U.S. IW thinking into the development of their own IW doctrine.

The argument starts with the straightforward observation that the words that the Chinese use to discuss IW are the same words used in the U.S. and Western sources.[3] As explained and supported by James Mulvenon in his essay "The PLA and Information Warfare," the Chinese "draw inspiration primarily from U.S. military writings. The net result of this 'borrowing' is that many PLA authors' definitions of IW and IW concepts sound eerily familiar."[4]

This might be taken to suggest that the Chinese words also inherit the meaning that the U.S. military has given them. However, this thesis claims that Chinese IW terminology and concepts inherit the definitions, but not the full meaning, of the U.S. sources from which they were derived, specifically in the area of targeting. The key to this claim lies not within the Chinese texts, but within the U.S. military experiences of the 20th century. This is because U.S. thinking regarding IW has its intellectual roots firmly planted in the historical groundwork of airpower, specifically the history of long-range strategic bombing, a history *which the Chinese do not share.* American and Chinese wars in the 20th century, being radically different from each other (even when participating in the same overall conflict), have generated equally diverse military doctrines. Full explanations of the historical backgrounds to these doctrines can be found in Chapter 3 – The Influence of History.

---

[3] I appreciate that there are certain potentially significant differences in meaning between the Chinese characters being used and the English they translate into is important, but this fact does not change the essential purpose at this point in the argument. The Chinese intention is clearly to use the same terminology as the Americans (even if it is not always documented as such).

[4] Mulvenon and Yang, The PLA in the Information Age, p. 176.

In addition, the body of evidence in the thesis will be split into two sections, each dealing with one of the two claims. The first will take the information doctrinal aspect of control vs. assurance, and the second will cover the targeting aspect of both airpower and information technology. The claim regarding the doctrines of control vs. assurance is argued in the following fashion. The Chinese see the achievement of information dominance as a matter of establishing control over information. The Americans view the achievement of information dominance as a matter of establishing the assurance of information, meaning its viability and protection of information systems. Some of the high-tech systems, and definitely the way they have been designed to function, have this inherent "Information Assurance" doctrine affecting their operations. Complete explanations of what this work means by these doctrines can be found in Chapter 2 – Structures for Understanding. The conclusion is that the requirements of some of the adopted U.S. concepts will therefore run counter to inherent Chinese doctrinal tendencies. This will cause them problems.

The second claim makes an argument for the need to have targeting frameworks. The doctrinal idea of airpower dominance through strategic bombing, though inspired by new technology, actually preceded the appearance of the technology that could make the doctrine work. Now the situation appears to be flipped; the information technology appears to have made a number of new actions possible, yet for which no one has created any new appropriate doctrine. With no specifically derived information doctrine in place, the Americans have naturally stepped into IW using their established doctrine from the historical association between airpower and IT. But the Chinese do not share that history,

do not understand the importance of targeting, and therefore will not be able to effectively employ the technology in the same way. Yet the Chinese have begun to incorporate U.S. doctrine into their discussions of information warfare. This will also cause them problems as PLA commanders discover the need to implement speed and flexibility into their operations, neither of which is readily provided by the doctrine of control.

Counterarguments

An initial counterargument to these assertions is that one must consider the possibility that China *does* understand the full meaning of how airpower has influenced U.S. military thinking, despite the lack of experience in airpower. How is it that we can say the PLA does not understand? After all, they have thoroughly pored over the available documentation, and have adopted it clearly, even mirroring the lessons that came out of the Gulf War. What is the evidence to support this assertion? The evidence lies in the *absence of significant discussion or comments associated with the targeting problem*, in both IW and airpower Chinese writings, combined with the *appearance of a general attitude toward high-tech weaponry that the weaponry itself is the key to success in combat.*

Perhaps some targeting framework discussions *are* taking place, but only in secret. The rationale here is that targeting frameworks are likely to incorporate the kind of thinking the PLA intentionally keeps out of open source publications. What is evident, however, is that Chinese IW and airpower writings impart a general attitude toward high-tech weaponry that the weaponry itself is the key to success in combat. The authors

demonstrate that they are unaware of the importance of having a targeting framework in order to succeed in modern high-tech warfare.

What this all means is that the PLA, Central Military Commission (CMC) and State Commission On Science, Technology and Industry for National Defense (SCOSTIND) theorists, as they experiment on their own with different IW concepts and technologies, and unless there is a dramatic transformation in their fundamental national security doctrine, are likely to begin injecting more and more indigenous meaning from their own intellectual and military history background into their own IW doctrine. The meaning behind IW terminology may begin to migrate away from original U.S. meaning, sharing only the most fundamental similarities. It is important to note that by successfully disengaging themselves from the constraints of established United States frameworks, the Chinese might even end up building a superior IW national security structure. Such a situation would certainly create a whole new set of challenges for western analysts and theorists alike, as they scramble to figure out the real meaning of new Chinese IW ideas, actions and intentions.

Chapter 2 – Structures for Understanding

Perhaps the incorporation of China studies with U.S. military history and terminology has created a confusing environment for communication. Common ground must be established in order to navigate the remainder of the thesis. Here we examine several key definitions, present assumptions and limitations, and finally construct two conceptual frameworks for use in discussing decision making and targeting.

Definitions

This section will discuss doctrine and targeting in some depth, then compare and contrast conventional and information warfare, and quickly define some terms associated with the Revolution in Military Affairs before introducing the section on Assumptions.

Doctrine

The focus herein on China's IW doctrine recognizes that the word 'doctrine' represents something different in China than what it represents in America. To keep matters straight, the word 'doctrine' is used in this thesis to describe the collective set of ideas, methodologies, or tendencies to behavior that drive the manifestation of strategy into action. Therefore, the word 'doctrine' in this work does not mean a published body of official terms, definitions, or directions. Doctrine can indeed be officially published, as it often is in America. But it can be just as legitimate an influence on an organization's behavior if it is not, as is the case with China.

Doctrine is a product of analysis and experience. Analysis is necessary when new technologies, for instance, appear on the scene and governments wish to determine how

they will best be used. Experience is necessary for determining the real-world accuracy of analytical propositions. In the case of infantry combat doctrine, almost all doctrine is based on experience since the fundamentals haven't changed for several decades. In the case of nuclear warfare doctrine, almost all doctrine is based on analysis, since only two nuclear warheads have ever been detonated in war, and the value of avoiding nuclear war is much greater than the value of determining the accuracy of analytical models.

Doctrine functions in order to provide guidance, not policy, though in authoritarian regimes the difference may be indistinguishable. It can also exist at several levels. The U.S. government publishes, among many types, national security doctrine (incorporating economic, political, military and other issues), joint military doctrine (for guiding air, land, sea and space forces) and Air Force doctrine (which defines airpower characteristics, how it is best organized and implemented).

Finally, doctrine reflects an organization's fundamental beliefs about the nature of a certain medium and how behavior is best deployed. For example, the most fundamental guidance from the U.S. Air Force draws attention to the advantages of using the air itself (perspective, speed, range and maneuverability) as well as to the inherent capabilities of airpower (mobility, responsiveness, flexibility and versatility).[5] All air operations designed by the USAF must take these characteristics into account if they are to operate successfully in accordance with official doctrine.

---

[5] U.S. Air Force, Air Force Manual 1-1: Basic Aerospace Doctrine of the United States Air Force, vol. 2, March 1992, p. 79-83.

In the case of information warfare, there is little experience to guide the makers of doctrine, and often people cannot agree on the proper analytical models. Therefore whatever type of IW doctrine a country chooses to follow will be based on its fundamental beliefs about how best to interact with and use information. This work shall define three general examples of ways in which an information doctrine could be created, two of which will then continue to be used throughout the text. This list does not include all potential doctrinal directions; it serves only to illustrate the essential ideas incorporated in the thesis. These specific forms of doctrine are merely suggestions from the author, based on personal observations of groups and individuals reacting differently to information responsibilities in various situations and from exposure to U.S. Air Force Information Assurance programs.

Three different physical analogies of the information infrastructure (as a pipeline, a library, and a castle) will illustrate each of the three doctrinal forms by comparison and contrast.

Doctrine of Denial

A possible option for operating in the information sphere is to hold the denial of information to the enemy as the fundamental priority. Such a doctrine might seek to prevent the enemy's effective use of information or even the destruction of information if possible, even when it might mean the lack of effective operations for oneself.

Visualizing the information infrastructure as a pipeline, the party that operates by a denial doctrine seeks to crack others' pipes or clog them to restrict or stop flow. In the analogy of the library, the organization would lock the doors and go out seeking to burn

others' books. If the infrastructure can be likened to a castle, a doctrine of denial would heavily restrict access through the gates, and in the event of a crisis would raise the drawbridge and send out siege machines. The defensive and offensive measures this doctrine would need to have implemented before a crisis would likely restrict the effective use of its own infrastructure during times of peace, due to unnecessary mistrust, security measures and other constraints. This could be the information doctrine of a terrorist organization.

Doctrine of Assurance

On the opposite end of the scale, an organization could adopt a doctrine of assurance, which would seek to create policies that protect the critical infrastructure of a network in order to provide for the uninterrupted flow of information. This doctrine will prevent the organization from having full control over the information on the network (the content), since the emphasis on ensuring continuous operations, combined with the incredible speed at which information flows, naturally limits the organization's ability to step in, stop the flow, and selectively eliminate. Therefore, the essential principle of a doctrine of assurance is to give the viability of the network a higher priority than holding onto decision-making power regarding content. The preservation of decision-making power in general is still important even under a doctrine of assurance, but it will be subordinated in a time of crisis to the preservation of the network.

Within the analogy of the pipeline, an organization operating under a doctrine of assurance would primarily seek to keep all pipes clear of debris, continually repair cracks and maintain a supply of replacement pipe. If the information infrastructure is like a

library, an assurance doctrine keeps the doors unlocked, makes multiple copies of books available, loans them out to others, and installs smoke detectors and fire extinguishers believing that such behavior will motivate others to cooperate to keep the libraries safe from vandals. Treated as a castle, the assurance doctrine mans the towers, sends couriers with coded messages between castles, sends out local patrols, and maintains the moat and walls but otherwise has gates on every side and lets everyone come in and out of the markets to do their business unhindered. Information Assurance (IA) is an official strategy used in America for defensive IW.[6]

Doctrine of Control

A doctrine of control is one in which governing powers seek to guide their resources and assets in such a way that their behavior is centered on the preservation of decision making authority over their network content, especially the ability to determine what is allowed to happen to content which they regard as critical information (determined by the network power). Within such a doctrine, domination over decision-making has a higher priority than building and defending an effective network through which information is free to be created, move, and reside. Naturally the preservation of the network is still important even under a doctrine of control, but it will be subordinated in a time of crisis to the preservation of control.

---

[6] Joint Chiefs of Staff, Information Assurance: Legal, Regulatory, Policy and Organizational Considerations, 4th ed., August 1999. The castle analogy comes from section 4, page 2 and applied to the other two doctrinal forms. The pipeline and library analogies are the author's own. For further review of U.S. Government Critical Infrastructure Protection directives, see www.pccip.gov.

If information is like water in a pipe, a control doctrine would protect its ability to decide to what position the valves are set. In the library example, the control doctrine would allow the doors to be unlocked, but might prevent copies of materials from being made, or restrict the number of books that could be loaned at one time, not to mention the need to retain decision-making authority over what books were put onto the shelves in the first place. Finally, if the information infrastructure is likened to a castle, the doctrine of control might perform such actions as posting guards to check identities at the gates, demanding couriers return immediately to the castle upon delivering their messages, allowing merchants to come inside the walls to trade, but only under certain conditions, and ensuring no usurpers to the crown enter the central towers.

For the sake of further communication in this work, references to a doctrine of information control in China may sometimes use the phrase 'Information Control,' but in no way is this meant to imply that there is any such official or unofficial phrase being used to describe deliberate Chinese government policies. However, evidence will be presented to illustrate that this is indeed the sort of information doctrine that China has already begun to adopt in Chapter 5 – The Doctrine of Control.

Targeting

The discussion of targeting is split in two parts. The first half here defines targeting in its own context. The second half is found in the Structural Frameworks section of this chapter. There, targeting is put into the context of its relationship to doctrine.

For the purpose of this work, targeting must be seen as the full process through which humans and machines proceed in order to launch an effective attack on the enemy. Ensuring consistent decision-making throughout the process requires the use of targeting frameworks, which are mental constructs used in categorizing types of targets and assigning them priorities in order to make limited resources work as effectively as possible. For example, a useful targeting framework against an industrial nation might be to group all enemy installations by size, and make a priority of striking the largest buildings first, assuming that large buildings contain important production. A targeting framework in an IW context might start with the assumption that targeting links (communication pathways) is better than targeting nodes (where information is kept and processed). From this assumption, information analysts might categorize the links by bandwidth and then make a priority of disabling 60% of microwave relays before moving on to satellite ground stations. A completely different, but equally viable, type of IW targeting framework might be to attack nodes, categorizing them by their degree of importance to the country's overseas shipping industry, and make a priority of inserting viruses into those running a certain set of software.

The huge variety of possible frameworks and the implications on military operations if the adopted frameworks are either not effectively or consistently used, are staggering. Assuming most air commanders are not in agreement about the proper use of air assets, establishing the right targeting framework for a given conflict requires extensive discussion, debate and consideration among the leaders responsible for carrying out air attacks for the nation.

The targeting process begins with analysts putting together collections of possible targets, influenced by the appropriate targeting frameworks. The selected targets have intelligence collected on them by various means over a period of time, as determined by the collection branches of that military. Targeteers have the responsibility of putting together files on individual targets using the available intelligence. They must also maintain an accountability system for each file, since over time these files must be updated with new information, with higher priority targets being updated more frequently.[7] Planners are assigned the task of prioritizing; they determine which targets are the most important ones to strike first. This job is the one most directly connected to targeting frameworks, often has higher levels of command involved, and requires large investments of time. The commander's and targeteers' final decisions nominate individual targets for attack. Matching the right weapon with the right delivery method (a combination of release method, release altitude and angle of impact) is called weaponeering. This stage is dramatically influenced by the degree to which the military's supply operations have or have not made sufficient numbers of bombs and guidance packages available for use.

The final stage of targeting is the action of the pilot and other involved crew in bringing the weapon to the point and time of delivery. But all of the previous work is required in order to make the best attack possible. Outside observers have a very difficult

---

[7] This point in the process is critical for maintaining a military's capability to strike effectively. It is also one of the hardest steps to perform consistently well, as evidenced by the bombing of the Chinese embassy in Belgrade, 7 May 1999.

time seeing past the final stage, especially when dramatic, eye-popping pinpoint strikes have been involved. The result is the appearance of high-tech weapons possessing an inherent capability of striking exactly what they need to strike as long as the aircraft gets them there. But when an understanding of the targeting process and the importance of the accompanying frameworks is achieved, one can easily see that applying airpower effectively is much more than acquiring precision weapons. Seeing targeting as a process, and not an action, is critical to understanding the differences between Chinese and United States doctrinal views of airpower and information warfare.

Conventional Warfare compared to Information Warfare (IW)

Conventional warfare is what most societies are painfully familiar with: the use of guns, tanks, ships and planes to project force on others through the use of maneuver and fire. Good position, massive firepower, flexible maneuver and troop strength are the highest priorities in conventional warfare. Modern conventional warfare can and does incorporate extensive use of information technology, but as long as the information aspects are simply being used to supplement the fire and maneuver of the forces that determine victory, the warfare is still conventional.

By comparison, IW places highest value directly on the information itself. Conventional force positions, firepower, maneuvers and strength are secondary, and are used to influence the manipulation of information in order to establish information superiority and victory. Information warfare may still involve extensive conventional force operations, but those operations would be subordinated to supplement the collection, dissemination, protection, or destruction of information. Accuracy, timeliness

and relevance become the concepts of highest priority. In a strict or futuristic view, information warfare does not have to take place in the physical realm at all, instead using unique attack and defense concepts completely within the context of cyberspace.

Herein lies a conceptual problem for the thesis. Air assets have benefited from the influence of information technology nearly since their inception, much longer than even the use of the term 'information technology' itself. To more clearly understand this point, consider the following summary of aviation and information technological development.

The airplane, originally seen by many as little more than an interesting but militarily trivial flying machine, had relatively limited utility to ground commanders until it was given the capability to communicate enemy force locations to the commanders via radio. When aviation technology was sufficiently advanced to make long-range bombers practical, the airplane again had relatively limited defensive utility until was given the capability to intercept via radar. Finally, the limited accuracy of gravity bombs kept the airplane from achieving truly effective strategic attacks until it was able to strike targets with the aid of laser guidance and/or Global Positioning Satellite (GPS) signals.

Seeing, and in fact living out in combat, this symbiotic link between aviation and information technology makes separating conventional air warfare from airborne information warfare exceedingly difficult. This may even explain in part why some Chinese authors see air war as information war, even though a strict or futuristic definition of IW would not have to incorporate air assets at all.

The reader should take note of a possible mix-up. Do not confuse this work's use of the term 'conventional war' with the Cold War definition, which meant non-nuclear conflict between regular, not guerilla or partisan, forces. Fortunately the 21st century is a new era. Since this work does not concern itself with comments or arguments regarding nuclear war, it does not wish to cling to that terminology. Instead, the distinction in this thesis between 'conventional' and 'information' forms of conflict is made by determining on which element of victory the priority is being placed.

The Revolution in Military Affairs (RMA)

The Information Age is ushering in a new era in many aspects of global society, not the least of which is a change in the affairs of the military. Information warfare is a part of, but not synonymous with, the RMA. Advances in areas other than IT have also changed military technology. New ideas for how to use advanced technologies have changed military operations. Experiences with new operations, such as peacekeeping, have changed military roles. The requirements of new roles have changed military relationships. These four – technology, operations, roles and relationships – are the four basic categories of the RMA and are applicable to developed and developing militaries alike.

The RMA allows nations to now confront each other in the air, in space and in cyberspace without having to deploy forces on land and sea. But referencing a battlefield that has no solid surface area is difficult. Therefore a new term, battlespace, is used to describe where modern conflicts take place. In addition to location changes, the RMA provides nations with various options for guiding military development. Exercising those

options increases the likelihood that military forces will be organized, trained and equipped differently from one another. When dissimilar forces meet in the battlespace, it is called asymmetric warfare.

An example of asymmetric warfare occurred in the Vietnam War, in which the helicopter and artillery-supported U.S. soldiers fought against the indigenous, peasant army of the Vietcong. Another example is the series of 1939 German invasions using new tactics (blitzkrieg) made possible by new technology (armor and dive-bombing). The Nazis used their new advantage to quickly bypass territory, which other nations had thought would be protected by the barbed wire, artillery, and entrenched fortifications inherited from World War One.

Asymmetry is not limited to force structure comparisons. Information dominance is a term used to describe the ability to conduct operations in the information domain without effective opposition. Information dominance has its intellectual roots in the pursuit of aerospace superiority, a term applied to the operations conducted in that environment. Many authors, American and Chinese alike, have perceived the coalition victory in the Gulf War as a major transition from the conventional to the information-based concepts described above.

Elements of Airpower

The most important element of airpower in this work is the strategic, long-range, precision bombing mission, which was conceived before World War One, long before the technology was available to implement it successfully. This distinct mission has played a major role in shaping United States airpower doctrine. Proponents claim that both an

enemy's will and ability to fight can be targeted quickly and decisively using this mission. The purpose of the mission is to eliminate targets critical to the enemy's war effort, with a minimal effect on the surrounding area, from a sufficiently safe distance in order to protect your own forces. U.S. military leaders feel the benefits derived from being able to perform this mission outweigh the economic burden of developing the capability.

Other missions important to understand in relation to targeting are interdiction and close air support. Interdiction attempts to stop the flow of supplies from the enemy's rear areas to the front lines. Close air support attacks enemy ground forces in close proximity to friendly forces. Historically there has been a debate between air and ground commanders over the degree to which air assets should be designated to strategic, interdiction or close air support missions. The air commanders recognize the ultimate need to help the ground commanders fight battles, but they believe the best way to help the army out is to prevent the enemy from showing up at all by stopping the flow of material with interdiction strikes, or to prevent him from being able to prosecute the war by doing strategic bombing attacks. Ground commanders, on the other hand, do not usually see the value of using airpower for these unique missions, because they have not often turned out any productive results, while the ground troops were getting damaged on the battlefields. This fundamental disagreement highlights the importance of answering the targeting question "what should you strike?" and having a targeting framework in place before conflict erupts, not after.

Two additional terms used later in the thesis are 'force multiplying' and 'gravity bombs.' The synergistic effect of providing a traditionally non-combative element to improve by orders of magnitude the capabilities of combat forces is usually called a force multiplying effect. Two examples include the ability of real-time weather data to make one F-16 fighter jet as effective as four and the ability of GPS location equipment to help a platoon of soldiers navigate three times the normal distance.

Many people forget that lasers, radar, radio, or GPS signals do not guide many of the bombs dropped, even by the U.S. Air Force. These unguided bombs are often called gravity bombs. In addition, the distinction between bombs and missiles is the presence or absence of propulsion. A missile is an explosive charge combined with a guidance system and a form of propulsion. Bombs are explosive charges dropped from an altitude, though the modern versions have some guidance packages added to the front and/or rear of the bomb casing. Missiles without guidance systems are usually called rockets.

Assumptions

General Assumptions

This paper assumes that half the audience for this thesis is China experts without prior understanding of airpower history, and the other half is U.S. military officers without prior understanding of contemporary PLA issues and developments.

As for the military subjects discussed, higher levels of command, compared to lower levels of command, are assumed to occupy relatively few physical locations and use relatively few communications nodes.

Additionally, none of the doctrine or technology discussed in this paper stands alone. Despite advances of technology, the mere possession of technology is not sufficient for effective use. War is about people, not machines. Military leaders throughout history have stressed time and again that personnel are the most precious resource. This does not change with IW; powerful computers and incredibly capable software are impotent without personnel who have a firm, fundamental grasp of IW methods and practices. Those methods and practices include, but are not limited to, acknowledging receipt of a message, establishing credibility (for oneself as well as determining that of the sender), changing passwords regularly, providing source information when passing something on, and the like. Just as people empower their technology through the appropriate application of doctrine, they can also render it powerless.

Assumptions Regarding Information

The creation of IW doctrine must take into account the essential character of information in order to be effective. Information has certain fundamental characteristics that transcend cultural and national differences. First, the meaning of information is unavoidably changed from one person to another by the unavoidable presence of cultural and individual filters. Second, information must be received as well as passed on in order for transmission to have occurred. Third, information flourishes in a network; networks can exist in forms other than wire and cable, such as communities and libraries. Fourth, information is infinitely repeatable, though the method used to repeat it will largely determine the inheritance of accuracy.

The Internet is not the sum of the information sphere, and therefore is not the only possible battlespace for IW. However, the Internet operates on the fundamental principles that govern information; the same principles govern information operations and should therefore influence doctrine designed to work with the Internet.

Secretary of Commerce William M. Daley gave an excellent account of the differences between the U.S. and Chinese government approaches to the Internet on April 7, 2000, which highlighted the importance of understanding the nature of information and networks. In it, he articulated that only by deliberately keeping government control off of the Internet, allowing it to function under the influence of its own characteristic nature, has America been able to see such tremendous growth and success in that field.[8] The Chinese aspect to this that he portrayed was the tendency to want to control the information, which he believes will not generate nearly the same kind of results.

Limitations

There are three main topics that this thesis may have benefited from including, but did not, based on time and knowledge constraints.

First and foremost, the thesis is limited to exploring information warfare doctrine, and not the issues associated with the military use of IT equipment. This includes questions about how the PLA integrates IT into normal operations, and whether they have started to create specialized IW operations. Another aspect of being limited to IW

---

[8] Secretary of Commerce William M. Daley, speaking to the 4th China International Electronic Commerce Summit in Beijing.

doctrine is that the work does not venture far into conventional warfare matters. The exceptions to this are United States airpower history and the association by some Chinese authors between IW and air warfare.

The emphasis on military doctrine means that civilian information operations are also not considered. However, the fact that information networks are bringing military and civilian applications into close proximity to one another means that the actions and risks taken by one side will ultimately impact the other. In U.S. IT terminology, this is called shared risk. Future development of this topic would ideally include an exploration into this relationship.

This work has also not looked at all the factors that affect the development of Chinese military doctrine, and how those factors might differ from national security doctrine. For example, whether or not any aspect of Confucianism has an impact on military operations has not been considered.

Structural Frameworks

Military targeting frameworks that carried over from the industrial age to the World Wars were largely responsible for the widespread destruction of cities and killing of millions. These frameworks, which remained largely unchanged even after the world's transition to the nuclear age, served to constrain airpower from being able to display its natural dominance over the battlefield for several decades. The Gulf War was the first example of a new targeting framework being applied to the appropriate technology, which finally allowed the fundamental nature of airpower to be applied. The

application of airpower in conjunction with technology resulted in parallel attacks on the important centers of gravity and brought victory.

The possibility that the Chinese have not incorporated the idea of advanced targeting frameworks into their defense thinking means that the technological advances they are pursuing will not necessarily produce the results they expect. This applies not only to airpower technology, but information technology as well. An important part of this project's assessment of Chinese information warfare doctrinal development is therefore to take a look at the issue of targeting frameworks.

The availability of aviation technology has forced U.S. military leaders to have to make decisions about its implementation. These decisions have contributed to the creation of a body of knowledge regarding the proper and improper applications of airpower. This body of knowledge is the collective experience from which airpower doctrine is derived. In addition, there is a common association between airpower and information technology; this association has contributed to the growth of U.S. IW doctrine from the roots of airpower history. The powerful "force multiplying" effect of information technology on airpower elements created this common association by allowing aircraft advantages of speed and altitude to be directed to attack and defend at exactly the right place and at the right time. Just as airpower has been a powerful influence on United States military history through the assistance of information technology, so has the dominant nature of aviation technology over the battlefield been a powerful influence on the United States military theorists' ideas about the application and use of information warfare.

The essential and fundamental question of targeting in respect to airpower doctrine is "what should we strike?" Of special significance is the fact that the air commander and planners do not ask the question "*how* should we strike?" until after they have answered the question "*what* should we strike?" This is because, with the large number of possible targets to which a limited number of precision weapons can be delivered by a limited number of long-range aircraft, the importance of efficient use rises dramatically, making the targeting decision methodology essential for success.

U.S. IW thinking has been largely connected to, and inherits, the intellectual traditions of airpower history. This is evident in the institutions dealing with IW, the terminology used, and even the association by Chinese authors connecting airpower with IT. This is not to say that the contemporary U.S. experiment with IW is solely an airpower experiment, for it certainly is not. But the tradition from which U.S. IW terminology and methodological patterns are derived is based on airpower theory.

The Essential Role of Decision Making in Targeting Frameworks

An outside observer of a war, whether that observer is an individual or a nation, will have a great number of elements to deal with and attempt to process. The natural process of simplification makes it easy for a modern day observer to make the mistake of seeing a successful strike against the 'right' target as a natural consequence of high technology and its capabilities. This may partly be due to the lack of any requirement on the observer to consider what targets were not hit, much less to consider whether those targets should have been hit instead.

The essential reason for applying a decision-making framework within a targeting system is to manifest the essential principles of the commander into action on the battlefield. There are two complementary objectives in making a decision about the use of any resource, whether one is dealing with military munitions, energy or financial resources. The first objective is to generate the greatest chance of reaching whatever goal the action is associated with. In the case of air attack, this goal may be the elimination of all aircraft hangers at a certain airfield. In the case of a massive casualty scenario, the goal may be the saving of as many lives as possible. The complementary objective is to avoid the wasting of resources in actions that provide no progress toward the goal at all. In the case of the air attack, dropping bombs on the barracks would be a good example of wasted resources if the bombs could have actually damaged aircraft hangers, and in the massive casualty case, administering bandages to a man with terminal internal injuries would be a waste of resources if the bandages would have saved others' lives.

At some point in both of these scenarios the number of choices available to those deciding how to use the resources greatly exceeds the ability of the available resources to cover all options. In these typical situations, a decision must be made. In the case of the massive casualties, a triage is established. The triage system allows for the systematic prioritization of injuries, taking into account criticality of injury, resources needed, and resources and time available. Note that often, in a mass casualty triage system, the resources do not always end up going to those who need treatment the most, but to those for whom the treatment will be the most effective at saving their lives. The medical workers will choose not to tend to some critical injuries, in addition to most of the lesser

wounds. Those wounded who are closer to the margin of life or death will receive the first attention as a result of the doctors, nurses and technicians applying a decision-making framework to the abundant level of medical need.

What happens without a decision-making framework? Without a framework, there is no way to determine what a 'best' decision looks like. In this situation, the natural human response is to put resources on whatever need is deemed the most urgent at that particular point in time. This happens because there is no way of knowing whether there will be a better way to use the resources later; therefore, use them now.

Chapter 3 – The Influence of History

This background section is split into two broad areas, each examining the appropriate background from U.S. and Chinese military history. By focusing on nearly the same exact time periods in each, the reader will get a good sense of just how differently the two countries experienced conflict in the 20th century. In a general sense, 20th century warfare for the United States was defined by technology, but for China it was defined by ideology. This fundamental difference in experience is what will lead to China's difficulty in utilizing information technology in combat if the PLA demands on adopting selective portions of U.S. war fighting concepts.

The Development of U.S. Airpower Doctrine[9]

The Wright Flyer left a significant mark on aviation history on December 17, 1903. Almost exactly 38 years later, on December 7, 1941, steel descendants of that first

---

[9] The history presented in this section, being a very summarized version of material covered by a great number of excellent works, has been largely inspired by the doctrinally-minded summaries of airpower history included in the official Maxwell Air Force Base Squadron Officer's School study materials found in Air and Space Power, Ed. Bradford R. Barnett, Captain. Maxwell Air Force Base, Alabama, Air University Press, 1998, p. 4110-R-1 through 4120-R-4 . The focus here is to quickly introduce or refresh the reader with regard to the essential portions of airpower history which reflect the impact of the strategic bombing and targeting debates. For further study in detail, see Robert Futrell's multi-volume series, Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, Air University Press, December 1989; Mark Clodfelter, The Limits of Airpower, New York, The Free Press, 1989; Richard Reynolds, Colonel, Heart of the Storm: The Genesis of the Air Campaign Against Iraq, Air University Press, January 1995; Edward Mann III, Colonel, Thunder and Lightning: Desert Storm and the Airpower Debates, Air University Press, Alabama, April 1995; and Air Force Manual 1-1: Basic Aerospace Doctrine of the United States Air Force, vol. 2.

wood-and-cloth invention were dropping high explosives on the soon-to-be-obsolete battleships of the U.S. Pacific Fleet. The ability to strike a long-range, decisive blow on a foreign power from the air had finally been demonstrated. However, the idea of using the airplane to project power through the air and into the interior of an enemy's country had inspired the ideas of military strategists as early as the First World War. The original airpower theorists, generals such as Italian Giulio Douhet and American Billy Mitchell, sought to capitalize on the opportunities provided by the new technology. They were convinced the airplane could transform the battlefield, free the Army from having to sacrifice itself for the offensive, and take on the role of providing decisive victories through air superiority. These early theorists had no idea how many decades it was going to take for the technology to catch up with their revolutionary ideas, but eventually it did, in the skies over Iraq.

World War Two

By World War Two, the airplane had already transformed the capabilities of nations to wage war. It expanded intelligence collection. It sped up ground offensives. It provided supplies to China over the Himalayas. It changed the nature of submarine warfare. Most significantly of all, it allowed London, Berlin, and Tokyo to be bombed as the world had never before imagined.

The strategic bombing missions against Germany and Japan were able to occur primarily due to the prior influence of a new military community of airpower theorists. They had studied Douhet and Mitchell's doctrinal arguments, understood the technical difficulties which faced the World War One airframes, and had taken note of the

tremendous improvements in range and payload capabilities of a new Boeing airframe, eventually known as the B-17. These men felt sure the original First World War vision of decisive strategic bombing missions, not possible at first due to short aircraft ranges, was finally in reach due to the long range of such aircraft as the Boeing B-17 Flying Fortress and the Consolidated B-24 Liberator. They were eager to see how the airplane could by-pass enemy forces, strike at the heart of a country, and thereby end the war. Since they already understood that the key to success in the mission was precise targeting, they came up with theories about which types of targets were the best to hit first, and demanded that missions be performed during the day. This forced the B-17s to fly at higher altitudes than the British, who chose to fly at night for added safety, but sacrificed precision in the process.

However, the technology had still not caught up with the doctrine. Bombing sights were insufficient for striking the proper target without bringing about huge collateral damage and German fighters and anti-air artillery were extremely capable at defending against Allied bombers. Confidence in the ability of airpower to bring about a decisive victory through strategic bombing began to wane. After a quantum leap in weaponry, the invention of the nuclear weapon, everything changed. In the ensuing political turmoil and chaotic frenzy of Cold War preparations for nuclear war, precision bombing frameworks were virtually ignored as the new intellectuals in the defense community focused almost entirely on nuclear technology as the determiner of doctrine.

Korea

The Korean War should have been a warning to airpower theorists about the coming challenge of Vietnam, but the supremacy of strategic nuclear forces blinded them. Many refused to believe the war in Korea was anything more than an anomaly in its dependence on the tactical, as opposed to strategic, use of air forces. Strategic nuclear forces had received by far the most political and military attention since the end of World War Two. The available targeting framework for dealing with conventional ground offensives was little more than a combination of interdiction and carpet-bombing missions. The tactical air forces, which provided air support to the Army, were neither trained nor prepared for the kind of low altitude, ground-coordinated combat they faced on the Korean peninsula.

The interdiction mission became an important part of the war effort, but planners learned that it would have been more effective through consistent targeting, instead of shifting the emphasis from one target group to another when things didn't seem to be working out. Political limitations on the use of nuclear weapons and excessive strategic force also constrained the targeting framework. This was all done under the guidance of the United Nations, which sought to keep the conflict at relatively low levels of intensity in the hopes that victory could be achieved without raising the ire of the Soviets.

The Korean War offered air forces the opportunity to learn a lesson in the importance of not continually shifting interdiction target sets. Also, air commanders could have noticed and appreciated the possibility that strategic bombing would not always be allowed to go after the targets that strategists felt would bring a quick end to

war due to the political risks involved. However, both those lessons were not learned, and less than two decades later, twenty degrees further south, the U.S. Air Force would encounter them all over again.

Vietnam

This time conditions were even worse. The war was much less symmetrical, the effort lacked a defined goal, and the White House took on the decision-making authority for all targeting. Not knowing the lessons of Korea, and with no framework for deciding what to attack, President Johnson and his staff defaulted to dropping as many bombs as possible on the false belief that sheer numbers would bring victory. This is an unfortunate example of how, without a targeting framework appropriate to the environment and the available technology, few decisions were made that put the right weapon on the right target. The legacy was an air war that left many air commanders feeling frustrated and betrayed by a government that refused to let them loose on the strategic targets in Hanoi they yearned to strike against.

President Nixon's solution, to establish with the Chinese the freedom to lift strategic bombing restrictions on Hanoi, led to a settlement that allowed America to withdraw from their long and painful involvement. It was proof to airpower theorists that they really could bring about a decisive victory in war without requiring a huge ground offensive.

During the ensuing years, air commanders began to draw up plans for using airpower using these targeting frameworks; as technology changed, so too did the associated concepts and conversations. There were many reasons for ground

commanders to be skeptical, especially since the Cold War in Europe was not going away, and they wanted assurances from NATO air forces that aircraft would be flying overhead, providing close air support, and not flying off to do too many interdiction or strategic bombing missions. Significant arguments between the U.S. Army, Navy and Air Force ensued. At the same time, air campaign planners were learning their lessons from the past, studying the targeting experiences of World War Two, Korea and Vietnam. Working through the remainder of the Cold War, they developed a targeting framework that would take into account the opportunities being provided by new and powerful capabilities. The strategic precision bombing mission was about to come into its own with the incorporation of laser guidance, GPS signals, and stealth technology. Finally, the technology was catching up to the doctrine.

The 1991 Gulf War

By 1991 the world had changed a great deal; in many ways the political and military rulebooks had been completely rewritten. In this new arrangement, Saddam Hussein, leader of Iraq, invaded the neighboring kingdom of Kuwait. When coalition forces realized Saddam Hussein was not about to immediately press further south into Saudi Arabia, but was digging in and waiting for their attack, air commanders knew they had their chance to pull off an original plan based on airpower. The White House was not about to relive Vietnam and turned all operational authority over to the military commanders, working instead on developing the international support that would be needed in order for the lifting of restrictions on airpower to work appropriately.

Conscious of their historic opportunity to prove airpower, once and for all, confident they had the political freedom to strike whatever target needed neutralizing, U.S. air theorists designed an air campaign built upon fundamental doctrine, using the capabilities of stealth aircraft and precision-guided bombs to target Iraq's critical infrastructures. Air assets were able to remain relatively safe yet denied Saddam electric power, information and air defense. By seizing and maintaining air and information supremacy over the battlespace as their first and virtually only priority, air assets prevented the ground forces from having to wage a huge ground offensive against a well-defended enemy. With air and information supremacy ensured, air assets were freed to begin a ground attack campaign that prepared the enemy physically and psychologically for defeat.

The war was the first time appropriate doctrine had been combined with appropriate technology. Seen in this light, the powerful influence of high-technology weapons clearly does not stem from an inherent capability to strike powerfully and decisively. That capability is only delivered to the weapon by a doctrine that, when followed by military and political leadership alike, provides a consistent foundation from which to make targeting decisions.

Review

Understanding the background these four major conflicts provide, one can better understand the development of targeting as a key component of U.S. military doctrine. There are four key points. First, the mere presence and availability of airpower technology forced U.S. military commanders to face the question of how they were going

to use it in combat. Some generals had criticized the first airplanes as being merely interesting gadgets incapable of military significance and had no intention of supporting their incorporation. But as the benefits of aerial reconnaissance became increasingly obvious, and as weapons designed to shoot down enemy planes began to improve, the path to full aerial commitment gained feasibility and support.

Second, the inherent range and flexibility of aircraft made an entire country's territory, and therefore its population and resources, possible targets of attack. As weapon accuracy improved, previously individual elements could be broken down into several possible targets of smaller and smaller dimension, requiring greater and greater amounts of data for each target. Figure 3 illustrates this inverse relationship between the

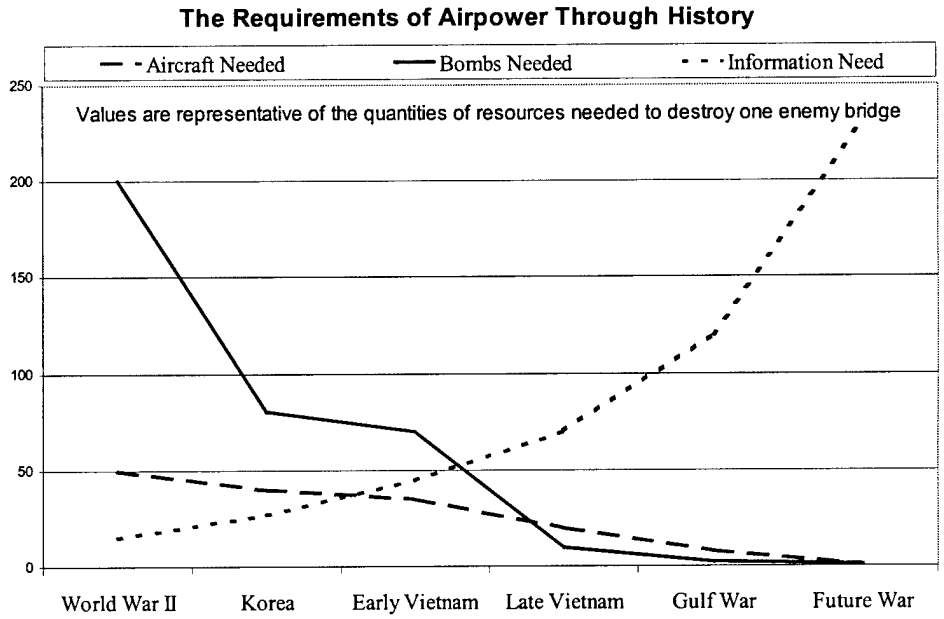

Figure 3 – Resource Requirements[10]

[10] This chart is inspired by a similar visual presentation of bomb/aircraft/information requirements created by the Air Force Information Warfare Center (AFIWC), 1996.

requirements for aircraft and bombs compared to the requirements for information. The exponential growth in target information is an unmanageable trend without the assistance of information systems and a framework with which to categorize and assess target characteristics. The trend of increasing information combined with decreasing assets places a tremendous burden on the need for proper targeting frameworks to assist war planners in dealing with their options and thereby ensure effective target nominations.

Third, aircraft seemed at first like a perfect solution to warfare through technology, but turned out to have a great number of problems to overcome, some of them doctrinal, most of them technical. The obstacles stemmed from problems of inadequate range, the vulnerability of bombers, bad target choices, inaccurate weaponry and, most unexpected of all, political restraints. The early theorists did not anticipate having to overcome these problems in order to implement effective strategic bombing. In a similar fashion, today's information warfare theorists, whether Chinese or American, are probably unable to anticipate the kind of obstacles that will have to be overcome before information warriors can truly achieve effective IW attacks and defenses.

Fourth, the increase in airpower's usefulness was usually associated with the incorporation of some new form of information technology. As a result, there has been a natural association between information and aviation technology that makes their conceptual separation more difficult. History has allowed information technology to provide force multiplier effects to America's aerospace forces more easily and naturally

than it has to its naval and ground forces, though this is not to imply that it has not created tremendous advantages for them as well.

In contrast, China's contact with aviation technology has been limited, rarely utilized in war and, as the next section will demonstrate, deliberately removed from Chinese military doctrine until recently. The same could be said of information technology. Consider the likelihood that, given this sort of history, the PLA will be able to match high-tech air and information warfare assets with proper doctrine on their first try. Though possible, there is little reason to suspect that the targeting frameworks necessary for effective use of long-range precision guided weapons are already present and accounted for in their doctrine. The first area of evidence to support this is China's own history.

The Development of Chinese Doctrine[11]

Dr. Sun Yat-sen left a significant mark on Chinese political history on October 10, 1911, as his first successful army revolt sparked the dramatic end of twenty-one centuries of Chinese imperial rule.[12] Almost exactly 38 years later, on October 1, 1949,

---

[11] Much of the history presented in this section, being a very summarized version of material covered by a great number of excellent works, has been largely inspired by the doctrinally-minded summaries of China's history included in two very recent works supported by RAND's Project AIR FORCE: James C. Mulvenon's essay, "The PLA and Information Warfare," The People's Liberation Army in the Information Age, 1999 and Chapter Three of Mark Burles and Abram N. Shulsky's book, Patterns in China's Use of Force: Evidence from History and Doctrinal Writings, 2000. The focus here is to quickly introduce or refresh the reader with regard to the essential portions of PLA history which bear on its contemporary modernization.

[12] John E. Wills, Jr., Mountain of Fame, p. 297.

his intellectual descendant, Mao Zedong, stood on the high wall of the now-obsolete imperial palace and declared "The Chinese people have stood up!"[13] The dream of being a people of their own destiny, it seemed, had finally become real to the Chinese people.

As early as the late 19th century, some Chinese scholars and thinkers had proposed the iconoclastic idea that it was the old imperial rule that was keeping China weak and unable to rise in power to rival the Western nations.[14] China's student youth, holding on to the dawning 20th century's promise of political emancipation, inherited this train of thought, and spent their best years after the fall of the emperor struggling to find a solution for China's self-rule through the ensuing chaos of the warlord era. The first success at government had chosen a decidedly Western, Republican model; many were still dissatisfied and chose to be inspired by the new, seemingly less Western, Communist model. The original Chinese Communists, men such as Mao Zedong, Zhou Enlai, and Deng Xiaoping, all sought to capitalize on the opportunities provided by the new ideology. They were convinced Communism could transform the rice field, free the masses from having to sacrifice themselves for the bourgeoisie, and take on the role of providing a promising industrial future for the people. These early Chinese Communists had no idea how many decades of fighting it was going to take for them to implement their revolutionary ideas, but eventually they succeeded.

---

[13] Ibid., p. 350.
[14] Maurice Meisner, Mao's China and After, p. 4.

People's War: Countryside vs. City, Red vs. Expert

Just as western 20th century military history is defined by technology, the most significant being airpower, so China's 20th century military history is defined by ideology, one of the most significant forms being People's War. Developed by Mao over the course of the Chinese Civil War (1927-1949), People's War was a strategy that took into account the great advantage of China's burgeoning population. By telling the population how to think and how to see the world using his principles, called Mao Zedong Thought, he literally armed them with the ability to defend the nation, even though the economy was not strong enough to support the production of advanced technology or arms. Calling on the peasants and the workers to rise to their newly proclaimed inheritance of a prosperous and vibrant China, Mao led the population to fervently believe in Mao Zedong Thought. Through his words, the power resident in their lives could be manifested into action, physical construction, and all things could be accomplished. He upheld the will and effort of the people as sufficient to secure China's future without reliance on technology. This deliberate shunning of technology therefore prevented the development of a technologically based military doctrine.

In Maoist ideology, preference for rural – over urban – centered warfare and loyal – over skilled – soldiers held weighty consequences for military doctrine. Instead of following the Soviet model and appealing to the oppressed worker as the foundation of revolutionary power, Mao recognized the importance and relevance in China of appealing to the peasant in the countryside. In this frame of mind, People's War sought to draw the better armed but smaller aggressor nation into the rural areas, where industrial urban-

based advantages could not repeatedly defend against the frequent skirmishes and low-intensity conflicts of guerilla war. After a long period, potentially years, of such conflict, People's War would move into second and third stages, in which the inferior position of the people would slowly give way to a superiority over the invader, and eventually the invader would be driven out.

People's War had two major prerequisites. First, it necessitated a fighting force that would be willing to hold out against an invader for years. To engender such deep commitment, Mao focussed on developing unwavering PLA loyalty. Thereby the PLA, by maintaining Mao's absolute authority over the Party, may have helped set a historical precedent for doctrinal control. As the Great Helmsman, Mao was able to maintain strict ideology for more than three decades.

The second prerequisite was a large production base located in the center of China, away from the industrialized but vulnerable port cities, which would certainly fall to the powerful invading armies. Since People's War doctrine anticipated an invasion of China by a large and technologically sophisticated army, the PLA needed a way to maintain a reasonable hold on the economic production of the country. Therefore, Mao called for the construction of a back-up industrial area to be produced. The effort required to create this production base manifested the rural-urban struggle.

This massive campaign was called the Third Front. It lasted from the 1960s to the mid-1970s and involved almost all industries. Many large projects were committed to, and everyone was forced to pursue high production targets. They dispersed their production areas in small villages, in the mountains, and even in caves. Consider how

very different the Cold War would have affected the United States if the government had required Boeing, Sears, Anheuiser–Busch, Ford, Chevrolet and many others to go set up operations in the Colorado and Wyoming Rocky Mountains in anticipation of a possible invasion that would never come. Yet this is exactly what the Chinese were focussed on militarily while the United States was in Vietnam practicing the use of laser-guided bombs.

The second fundamental struggle in Maoist doctrine was Mao's preference for having the common, relatively uneducated worker perform the important jobs of the state rather than a bourgeoisie-educated Chinese. This preferential emphasis was coined 'Red vs. Expert'. When implemented as policy, it resulted in an emphasis in the PLA of political righteousness being more valuable to career and advancement than the ability to expertly perform a specialized skill. Those who specialized, who sought to become experts in technical fields, were largely eliminated from the privileged areas of decision-making in the PLA and Party organization. This behavior had naturally debilitating effects on the PLA's acquisition as well as maintenance of all but the most simple machinery and equipment, making aviation technology outside of Soviet aid an almost impossible venture.

Korean War

Korea provided an opportunity to engage U.S. pilots in aerial combat, which turned out disastrously for the Chinese. Though the war gave the Chinese an opportunity to experience and learn airpower lessons, the real lesson they pulled from the conflict was that they could face the world's greatest military on the ground and walk away

undefeated. The political benefits derived from this view of their involvement in Korea greatly overshadowed the negative news about the PLAAF. Few are likely to have paid the slightest attention to the need for better air war capability, especially given Mao's growing mistrust of technology and the experts who worked with it.

Vanguards of the Cultural Revolution

Over the course of the next two decades, the PLA found itself in the midst of a maelstrom of various political campaigns fashioned by Mao to maintain China as the center of world revolution.[15] The Cultural Revolution in particular had a pronounced effect on the development of the PLA. Throughout the late 1960s, the PLA was the vanguard of the mounting revolution, playing the role of a watchful guardian, guiding the youthful Red Guards to practice proper revolutionary fervor. When events began to get out of hand, the PLA was called on to provide judgment, discipline and direction to the wayward factions of the Cultural Revolution. The ideological emphasis caused widespread loss of technical expertise and allowed the continuous neglect of airpower, but it also clinched the PLA's reputation as both the protector of the people and the rightful heir to Mao Zedong Thought.

1979 Vietnam conflict

Relatively soon after Mao died, the PLA, under Deng Xiaoping's directives, invaded Vietnam on February 17, 1979, purportedly as punishment for Vietnam's

---

[15] Meisner, p. 378.

invasion of Cambodia and subsequent removal of the Chinese-backed regime there.[16] The PLAAF, though deployed near the southern border, was not committed to combat. Without air support, the PLA suffered humiliating losses. This dramatically revealed the reality of how the previous decades had technologically and organizationally stunted the PLA.[17] After the Sino-Vietnamese war, many PLA commanders saw the need to acquire technologically advanced forces and stop emphasizing reliance on People's War doctrine.

Reforms of the 1980s

This change in emphasis from People's War to more modern forms of doctrine was made manifest in the 1980s. An important trend with implications for the 1990s was a growing interest in following Western military models, not only in weapons but in ideology and organization as well. Some factions of the PLA even began to voice interest in following the Western model of having the military controlled by the national government, not the Party. Others saw an important future trend toward information and communications systems.

Part of the overall answer to this call for change was the establishment of Local War doctrine under Deng's leadership in 1985.[18] Local War allowed the PLA to organize, train and equip in such a way as to fight high-intensity, advanced technology combat near and just beyond its borders; this was the kind of battle which many nations

---

[16] Meisner, p. 435.

[17] Kenneth Allen, Glenn Krumel, and Jonathan D. Pollack, China's Air Force Enters the 21st Century, Project AIR FORCE, RAND, Santa Monica, California, 1995, p. 92-94.
[18] Pillsbury, China Debates, p. 289.

of the world had already experienced. Deng sought to shape the future of the PLA by allowing it to begin its modernization into a technologically advanced conventional force.

Beijing Massacre

During the first half of 1989, a growing sense of unease and discontent among the Chinese population, fueled by commemoration of the May 4, 1919, student revolt, sparked a massive display of civil disobedience that ended in the slaying of hundreds, arguably thousands, of Beijing citizens at the hands of the PLA on June 4. This crisis marked a true turning point in the reputation of the PLA as guardians of the people. The PLA's internal organizational reforms, which had almost been established, were also greatly affected; the CCP began to irrevocably remove all hope of ideological reform for the PLA and returned it once again to an ideological platform of loyalty to the Party.

This created a doctrinal direction in the 1990s of still seeking technology while trying to keep the ideological baggage that normally goes with it out of the PLA. For the most part, this may have worked, but analysis shows that the PLA is still struggling with issues of organization and command and control; issues that are inextricably linked to Western information warfare concepts.

Review

PLA leaders now have difficulty grappling with what must be done in order to acquire, learn and master airpower and IW technology. Foundations of this difficulty are, as summarized in the history, a low priority given to air forces and other advanced technology, a recent return to a more ideological doctrine, and a limited Westernization that emphasizes technical over organizational issues. However, there are a number of

advantages as well. Technology is much more readily available, the Chinese economy is growing fast enough to warrant high-tech acquisitions, and airpower is seen as the key to victory in its ability to provide information warfare capabilities.

Now that the 21st century is giving the Chinese the opportunity to acquire high-technology information systems, how they choose to use those systems to promote national security will be affected by whether or not the PLA has also continued to model Western concepts. The technology of the Gulf War had a tremendous impact on PLA views of modern warfare. The dramatic displays of airpower technology being used in powerful and destructive ways must surely have been a sight that few in the PLA had imagined was possible.

Witnessing the Gulf War sparked the PLA, as well as many other militaries, to accelerated thought and debate about the symbiotic relationship between information warfare and airpower. Since China has lacked any real opportunity to share in aviation technology with the West, the PLA has few established concepts of what airpower is supposed to represent, and has even fewer concepts of how best to use it. In fact, associating air assets with information warfare concepts may be a more natural reaction to the images of the Gulf War in China than in America, precisely because the powerful images of the Gulf War were China's 'first impression' of airpower since before the Cultural Revolution.[19] This possibility seems even more likely when one remembers that

---

[19] A notable exception is the Falkland Islands conflict between Britain and Argentina, but the degree to which that event marked itself on the collective imagination of the Chinese, though not explored in this research, is unlikely to have been very significant.

the Gulf War can easily be seen by Americans as simply the latest in a long series of airpower accomplishments, despite the drawbacks in history. The establishment of the ideological situation in China today, and how the legacy continues to affect the PLA, is just as significant to them as the history of airpower is to the United States military's way of fighting.

Chapter 4 – The View from the PLA

Bringing the discussion up to the present day, the issues of technology acquisition by the PLA and the questions surrounding PLA capabilities and intentions still define much of the analytical landscape in which China watchers must work. In the past, the opaqueness of the PLA prevented outside observers from getting any good idea of what was going on in the development of Chinese military thinking; currently the relatively open atmosphere of international exchange has led to numerous articles and publications by PLA and other Chinese defense industry authors. This in turn has supported the creation of a new generation of western materials, reporting and analyzing the messages found in the primary materials. In taking a look at the overall field of PLA treatments of IW, this chapter considers the Chinese authors and the western publications separately.

The PLA: From Echoes to Voices

At the beginning of the 1990s, most sources of information about the contemporary PLA came from western authors who had to draw their own conclusions about what was being discussed, what factors were influencing military development, and so on. Their information came from official Party documents relating changes or other aspects of military decisions; Foreign Broadcast Information Service (FBIS), Joint Publications Research Service (JPRS) and other translated media; magazine articles, and perhaps the occasional interview. The western publications were the direct means by which other academics or policy makers would turn for views of the PLA whenever an understanding of some issue was required. Though not necessarily misleading, this

method of transmitting information about the PLA left the recipients in the awkward position of seeing the PLA in the eyes of another westerner using primary materials, which did not necessarily provide the best, or at least not a comprehensive, view into the heart of what was really going on in the PLA. Raw data and information relating the facts of what was happening inside the PLA was able to travel with probably little degradation of accuracy (at least from the original). But the real voice of the PLA was no more recognizable in this process of transmission than one's own voice is recognizable in a canyon echo.

Interviews were occasionally possible and very valuable. They provided in literal and figurative terms the opportunity to hear what the PLA had to say about itself; they gave the PLA a voice with which to be heard. But the relative infrequency of this kind of information, and the broad strokes with which such information was used to paint portraits of the military's internal affairs, left even the interview material inadequate for the field's needs.

By 1992, however, new sources of information had already begun to appear when PLA officers, many of them senior ranking officials with national command responsibilities and years of military and political experience, began to publish widely available articles and books from their own point of view. The traditionally closed community in the Academy of Military Science (AMS) also began to receive a much greater number of visitors and interviews.[20] The subjects of PLA open discussion

---

[20] Pillsbury, China Debates, p. 371.

broadened to include airpower, ground tactics, the impact of globalization, the RMA, the promise and impact of IT on the future battlespace, suggestions and comments about changing doctrinal issues, and more. These sources appeared not just in the Liberation Army Daily, but more significantly in the AMS journal *China Military Science*, in *Modern Weaponry*, *Contemporary Military Affairs*, and several others.[21] The information provided was able to go beyond the reporting of events and developments; now the echo was supplanted by the direct voice of the PLA leadership.

In addition, many senior officers and defense industry officials published a number of books through such institutions as the National Defense Industry Press and the Academy of Military Science Press, both in Beijing. Finally, travel and exchange opportunities between the military educational institutions of the United States and China became more frequent. Figures such as China's Minister of National Defense General Chi Haotian have given speeches to senior military audiences in the United States, further opening the level of exposure to China within the United States military community.[22]

---

[21] These examples are of those publications included in Pillsbury's Chinese Views of Future Warfare, National Defense University Press, Washington, D.C., 1996, which had published articles emphasizing matters of technological modernization, future conditions and concepts, and observations about information warfare.

[22] General Chi spoke at the National Defense University on Ft McNair, Washington D.C., December 10, 1996 during his trip to the United States following a visit to China by Secretary of Defense William Perry in October 1994.
See http://www.defenselink.mil/news/Dec1996/b120596_bt663-96.html and http://www.defenselink.mil/news/Dec1996/p120996_p341-96.html.
Text of the address at NDU is in Part Two of Pillsbury's Chinese Views of Future Warfare at http://www.ndu.edu/inss/books/chinview/chinapt2.html#1.

By far the most important work of translation which has managed to make these sources, and others, available to the non-Chinese reader is the twin set of books edited by Michael Pillsbury, "Chinese Views of Future Warfare" and "China Debates the Future Security Environment." Though prepared and translated by a U.S. author, both books work together to produce a virtual gold mine of information. Inspired by the benefits bestowed from Dr. Pillsbury's set of translations, and fueled by contemporary international concerns, more digging is bound to occur in the area of Chinese views on military issues. Taken together, his books provide the singular most comprehensive collection of contemporary Chinese thought on the wide range of military, defense and security issues facing China. The majority of the RMA and future-oriented articles in Michael Pillsbury's collection were published since 1995, revealing their tremendous applicability to current conditions.

Two Characteristics

Now that the echo has become a voice, what is there to hear? This thesis has tried to limit itself to reading the works that deal specifically with aviation technology, advanced weapons, and information technology. At least in these few pieces, some strong, consistent characteristics seem to appear.

Credibility Through Knowledge

In many, if not most, of the articles written by the PLA, there is a sense of trying to present as much factual knowledge about the material as possible, regardless of the subject matter. In some instances, this gives the impression that the standard for

establishing credibility is simply to know about the technology, understanding when and how it was used by the West, but without having to adopt a creative approach toward, or necessarily grapple with, a Chinese operational application.

As they focus on matters of enlightening, educating and inspiring the reader to understanding the implications of future Chinese military greatness, they do not attempt to motivate the reader to action, or inspire the thinking needed to generate answers to the questions which will inevitably come. This is not to say that PLA leaders themselves are not aware of the problems, simply that the discussions and levels of awareness do not appear in the literature. There is often the projection of a voice of authority, explaining the great progress of the information age. But while describing the amazing opportunities presented to a military acquiring the blessings of the information age, this voice can also sound as if it is saying that Chinese development in IW is something that, once actively pursued, will naturally be accomplished. Questions dealing with hard, practical aspects of such things as building networks, assuring technology transfer, establishing standardization, training users, and developing appropriate doctrine, not to mention the institutions, to provide and employ all of this, are virtually non-existent in the literature. Still, this does not seem to hinder the writers in telling their readers as much as they can about the wonderful promise all this technology brings to military affairs.

Specifically, the articles written on airpower or information warfare tend to be either conceptual or general treatments of the subject matter. The significant lack of high-technology applied in Chinese aviation and weapons development may be the main factor affecting why the writing tends toward the conceptual and general. The lack of

hands-on experience and limited operational history would tend to limit the number of occasions for most discussions to even occur between colleagues, much less to inspire one to put the arguments down on paper.

Ultimately, what they say they are developing and focusing on, we should at least take at face value. The authors are not spouting pointless, trivial knowledge. Every year, a greater and greater percentage of PLA officers have higher and higher levels of education. For this and other reasons, too much doubt about the accuracy of their own claims about themselves is unhealthy for the study of the PLA to develop if those in the field wish to use these sources as points of referential authority. However, later conclusions will show that what they expect to be able to do does not necessarily find support or promotion in the developments that are actually taking place. The possible significance of this particular aspect will be revisited, when examining the paper's claim that the PLA must develop targeting frameworks in order to develop effective offensive IW capabilities, in Chapter 6 – Targeting Frameworks.

"Will" vs. "Must"

Another consistent characteristic appearing often in the primary literature, especially in those articles covering the RMA or IW, is that a lot is said about what "will" happen, but very little of what "must" happen. The distinction to make between this second characteristic and the first is that this observation stems from the actual use of specific terms, not the general attitude that runs unspoken through the texts. Over one third of the authors use the word "will" (or characters which translate to that meaning) at

least thirty times more frequently than their use of the word "must". Half of them use it at least four times more often.

One article, "The [RMA]: Weapons of the 21st Century," is both extensive and deliberate in this manner. The opening lines state that the article "looks at how weapons and military units will be information intensified, focusing mostly on the years 2010-2020." That article uses the word "will" 81 times and the word "must" only once.[23] In another example, "Information Warfare" by Wang Baocun and Li Fei, the authors use the word "will" 100 times and "must" only once.[24]

Of course there are exceptions. Three of the articles use the words on a nearly equal basis. Also, when analyses of the articles add the word "should," a less emphatic version of "must", then five of the articles end up using the word "will" less often than the total number of "must" and "should." Comparison of this group of articles to the entire collection indicates an emphasis on suggesting or choosing changes for the future, such as "Reforming Defense Science, Technology, and Industry," "The Challenge of [IW]," and "China's National Defense Development Concepts."

A particularly interesting aspect of how the word "will" is used in the majority of the articles is that the descriptions of what "will" happen rarely attribute the future conditions specifically to China. Instead, the references seem to be making statements

---

[23] The singular use of "must" states "because information-intensified military units make full use of all kinds of information, the intensity concept must be introduced." Chang Mengxiong, "The Revolution in Military Affairs: Weapons of the 21st Century," as translated in Michael Pillsbury's Chinese Views of Future Warfare.

[24] Wang Baocun and Li Fei, "Information Warfare," as translated in Michael Pillsbury's Chinese Views of Future Warfare.

about the condition of things in the world in general, or the way in which technology will change, or the new advances in military operations. But they do not specifically ascribe any of this development to China's situation. There are at least two possible reasons for this generalization.

The first possibility is that they do not assume China's participation in the technological modernization, but desire it, and are therefore trying to make their voice a warning, to motivate decision-makers to modernize. Clearly there may be at least a few authors who are concerned enough about the future military condition as well as having doubts about the current situation to warrant this explanation. However, where then are their suggestions for how to do it all? The absence of suggestions and "musts" in a text designed to warn indicates the author is not prepared to answer the questions. This thesis goes even further, claiming that for those issues associated with targeting, many in the PLA are simply unaware of the need to even be asking the questions that are necessary.

The second possibility is that they assume China's participation in the technological modernization, and therefore 'speak' as if it is a natural consequence of China's forward progress. Of course, this means the authors are making assumptions that may not be an accurate reflection of China's contemporary reality. Not the least of these assumptions is the establishment of extensive and professional high-technology research and development capabilities (and funds). Also there must be an assumption of increasing high-technology defense spending in their national budget. As questionable as these first two are, even more questionable are the unnoticed assumptions (unnoticed perhaps even to the Chinese) regarding their military culture being able to easily, quickly

and correctly adopt the conceptual frameworks for guiding the new training, decision-making and operational methods.

At some points in certain authors' works this aspect of assuming China's technological development onto the military's future even seems to take on the aura of a historical birthright. For example, an officer from the Shaanxi Military Command, Yang Wei, evokes the imperative of pursuing "our glorious tradition of overcoming an enemy with superior weaponry and equipment with our inferior ones."[25] Certainly there is no question that such a depiction of the Chinese armies as being successful at finding ways to "defeat the superior with the inferior" is accurate. But that kind of behavior is not a part of Chinese history because of some innate characteristic passed down the line of military leaders on the mainland, but because of previous leaders' careful consideration of what must be done in order to achieve success on the battlefield, even in the presence of overwhelmingly bad odds. If victory comes from operation after preparation, then this truth is the preparation half. Contemporary Chinese military leadership cannot afford to assume that targeting decisions, whenever and wherever they must be made, will be made well. Yet this behavior is exactly what appears to be happening from what is found in their writing.

Chinese authors present the reader with certain (and usually, for the most part, accurate) portrayals of what "has" and "is" happening in airpower developments, the RMA or IW, but disregard the "how" or "why" it happened. Understanding the "why"

---

[25] Yang Wei, "Tactical Studies", as translated in Michael Pillsbury's Chinese Views of Future Warfare.

and the "how" of U.S. airpower history is critical to understanding the importance of properly applying doctrine to technology, yet there is little evidence in Chinese IW literature that supports the idea that the PLA leaders comprehend the historical influences on U.S. airpower doctrine. Instead, their application of doctrine is heavily influenced by the historical images of their own, decidedly non-technological, People's War experiences.

Western Assessments

None of the above observations have been presented, at least with any obvious treatment, in the few collective analyses or assessments that exist of the Chinese authors.[26] A possible exception, though dealing primarily with the single publication Unrestricted Warfare, is a collection of insightful comments by David Cowhig, which he includes at the opening of each of the four portions of his translation of the work.[27]

The field needs to have more analysts looking at consequences. The issues the PLA is writing about are going to impact the entire nation of China in one way or another. Whether the PLA is able to build a truly long-range power projection capability

---

[26] To be fair, there are only three publications that the author has found which could reasonably have assessed these characteristics. They are Pillsbury's two volumes, Chinese Views of Future Warfare and China Debates the Future Security Environment, as well as James Mulvenon and Richard Yang's edited volume, The People's Liberation Army in the Information Age. All three works spend a great deal of time looking at other aspects of what the Chinese authors are stating.

[27] See http://www.usembassy-china.org.cn/english/sandt/index.html.

beyond that of the 2nd Artillery is a serious question, and a difficult one to answer.[28] Changes wrought by the RMA will have an impact on the way this power projection question is answered.

To a western reader, the term 'power projection' evokes images of aircraft carriers, bombers, cruise missiles, or troop transports. Those weapon systems are the implements of airpower, and when someone approaches the term 'power projection' with those physical images in mind they are doing so because they are the immediate heirs of western 20th century military history. If this seems a bit absurd, consider how much more unusual it would seem if a modern day American, upon overhearing the term 'power projection' automatically brought to mind images of medieval catapults, or Spanish galleons. The reason such mental images would seem silly is because they do not represent what the contemporary U.S. military culture has grown up with. Therefore, why should it seem silly that in a few years, a Chinese hearing the equivalent term might bring to mind images of electronic attack across the Internet? After all, the Chinese military culture has virtually no history of airpower application, and the beginning of the 21st century finds China placing plenty of emphasis on acquiring both aerospace weapons and information technology.

That is why understanding the history they do have is considered in this work to be a powerful influence on the way in which China grasps the RMA. Air warfare, in as much as it has not been a significant part of their military culture to date, shares the same degree of influence on future national military doctrine as the influences of contemporary

---

[28] The 2nd Artillery is China's Nuclear Intercontinental Ballistic Missile (ICBM) Force.

information warfare concepts. Even ultimately, it is a less powerful influence since the required development of a targeting framework will tend to settle on prioritizing whatever target sets make the most contemporary sense. What this means is that the target sets that Chinese air assets are likely to attack in a future conflict are more closely related to IW asset target sets than they are related to the targets traditionally attacked by airpower.

What the Chinese institutions are saying is understood to a fair degree. The benefits of hearing from authorities on how they, not just the Party, feel about issues of future military conflict are positive signs that many in the field surely see as a positive sign, a step in the right direction. Still, the effort so far seems to have been mostly a reporting of the situation. The best work that has been done is the translation and summarizing of Chinese PLA texts so that others may read and learn. What the field needs quite a bit more of is analysis of the messages, looking to answer more than just the questions "what are they saying," and "who is saying it?" The field needs to have more analysts writing arguments about the consequences of what is being said.

To that end, the discussion here will turn to examine the observation that certain aspects of Chinese political and military behavior seek to establish and maintain control, including over information. Having already given at least a light treatment of this subject in Chapter 2, the discussion must begin to look first at the evidence and then move to possible consequences of the adoption of U.S. IW doctrine.

Chapter 5 - The Doctrine of Control

Recalling the Doctrinal Overlap Model (on page 6), China's doctrine of control resides outside the boundary of what they have incorporated from U.S. concepts, and is in direct opposition to portions of those concepts. Therefore, unless the Chinese choose to either abandon the American concepts, which they have already begun to incorporate, or move to adopt them wholesale, the resulting divergence within the conceptual boundaries of their IW doctrine will cause their information operations to run into trouble.

The information doctrine of control being mentioned here is not necessarily an outward, deliberate policy, especially in the context of its possible relationship to PLA military doctrine. The claim will be supported through the incorporation of four separate elements. First, the evidence for an information doctrine of control toward the civilian sector is extensive, and appears in official Chinese voices and actions as well as overseas media and government analytical commentary. Second, there is a connection between civilian and military information operations in official policy, which assigns an active, not passive, role to the PLA for implementing civilian information security. The third element is the argument that the Chinese social and political rules that generally restrict access to information will negatively affect PLA operations. The members of the PLA, having grown up in a society given relatively limited access to information, will continue to implement those rules, even impacting their own operations, unless given clear guidance to do otherwise. The fourth element supporting the doctrine of control is another argument, which states the CCP does not, and is not going to, provide the PLA any guidance to deliberately relax the restrictions on information access. By combining

the evidence with the arguments, the case can be made that China is adopting a *de facto* information doctrine of control for the PLA.

A final point to review before moving on into the discussion is that the doctrine of control should not confused with a doctrine of denial, which may at times be a hard distinction. Granted, with a doctrine of control in operation, there may be plenty of times when information is denied. However, as defined earlier, a doctrine of control is one in which governing powers seek to organize, equip, operate, and train their forces in such a way that behavior is centered on the preservation of decision-making authority over critical information. Within such a doctrine, the value of passing information to others is generally recognized and granted. There is not necessarily any need to deny people information, as would be the case in a doctrine of denial. However, domination over decision-making has a higher priority than building and defending an effective network through which information is naturally created, moves, and resides. Just as providing information is important, so is preserving the network that provides it. But in a time of crisis, a doctrine of control will subordinate both to the preservation of control.

Evidence of Control

At least two Chinese sources recognize the policy of controlling information as a guiding force for information operations. Wang Pufeng, a former Director of the Academy of Military Science (AMS) Strategy Department claims "to achieve victory in

information warfare, the central issue is [to have] control of information."[29] From another institution, the Air Force Command College, its President and an Assistant Professor write, "The side that controls information can give full play to the materials and energy possessed, and thereby increase combat power."[30]

However, the form of control, and the methods through which China ought to engage that control, is not clear in these essays. An examination of the actions that China actually does carry out in regard to information operations and their control measures reveal clues to how the PLA may be implemented. As previously outlined, the structure of this argument is to draw out evidence from the civilian sector that shows a government doctrine of control and operationally connect the PLA to that civilian sector.

In the Civilian Sector

There are three unstated themes that appear in the actions that China takes as it seeks to maintain control over information: control of thought, control of profit, and control of monopoly status. These three factors work together to ensure no single actor is able to establish the power to decide what flows through the information infrastructures. As stated by the Agence France Presse, the Communist Party is very interested in

---

[29] Wang Pufeng, "The Challenge of Information Warfare," originally excerpted from China Military Science, Spring 1995, as translated in Michael Pillsbury's Chinese Views of Future Warfare.

[30] Zheng Shenxia and Zhang Changzhi, "The Military Revolution in Air Power," an essay from China Military Science, Spring 1996, as translated in Michael Pillsbury's Chinese Views of Future Warfare.

keeping "a tight rein on the flow of information" and has taken action in a number of areas.[31]

First, the government has sought disclosure of software code that enables encryption capabilities.[32] Similarly, it ordered companies to register software used to transmit sensitive data and "threatened punishment for letting government secrets slip onto the Web."[33]

The foreign control of online markets in China is banned. In associated comments, China watcher Duncan Clarke was quoted saying "These new Internet ventures throw up new problems for the Chinese government's efforts to control information. And that is the government's priority and not joining the WTO."[34]

There is also a ban on the online sale of imported music and videos; the Ministry of Culture requires licenses for all companies selling such products. The government justifies the move on the basis of protecting international copyright law.[35] But the sale of MP3 players in the United States and the ability to download music in that format even from the original production company itself is a strong indication that the international copyright issue is not the real motivation as much as it is likely to be the sheer interest in keeping certain music and images out of the Chinese popular culture.

---

[31] "Sina.com Will Not Use IPO Cash for China Business," Agence France Presse, March 29, 2000

[32] "China To Require Encryption Information," Wall Street Journal, January 25, 2000.

[33] "China Bans Online Sales of Audiovisual Products," Associated Press, March 25, 2000.

[34] "China Moves to Further Control Information," Exchange Telecommunications Newsletter, September 17, 1999.

[35] "China Bans Online Sales of Audiovisual Products"

Cracking down on certain kinds of information is almost a given for the Chinese government, but now that information media are not limited to only the state-run media, the situation presents a much greater challenge. Examples of how the government has attempted to maintain control extend from the legitimate enforcement of copyright law violations, through the suspicious breaching of 'state secrets' on Internet bulletin boards, chat rooms and newsgroups, to the highly questionable practice of tracking dissidents online, for which China's Ministry of State Security has created an entire department.[36] Even more, the government has "also barred web sites from hiring their own reporters and deterred them from publishing news that does not come from official state media."[37]

Second, the government has sought to limit the content of the Internet, preventing unwanted ideas and information from being released to the public, and creates rules and institutions to facilitate these goals.

> According to Wang Qingcun, deputy director of the State Council Information Office (SCIO), commercial [Internet Content Providers] (ICPs) in China must meet two requirements before publishing news online. First, they need to get approval from the appropriate branch of the SCIO. (If the site caters to a local community, it must get approval from the local branch of the SCIO. If it is for a

---

[36] "Internet Users Feel Wrath of Big Brother," Hong Kong Standard, March 24, 2000.
[37] Lee Chyen Yee, "China Slaps Restrictions on Internet IPOs," Reuters, March 29, 2000.

> nationwide or global audience, it must receive approval from the highest levels.) Second, the website must obtain an operating license from the Ministry of Information Industry (MII).[38]

To assist this, the Ministry of Information Industry (MII) tries to distinguish between Internet Content Providers (ICPs) and Internet Service Providers (ISPs).[39] But many feel that such a distinction is headed for trouble in a world where the medium of transmission is just as significant a product as the message that is on it. As the lines between content and medium continue to blur, the distinction being upheld by the government, as in this case, will simply begin to get more and more troublesome to define and therefore to enforce.

All of the above are good examples of how past policies of control have not eased up. If enforced, the above rules (including the restriction on encryption mentioned earlier) would make it financially difficult and nearly impossible realistically, for a viable news site to operate in China.[40] This is the manifestation of a doctrine of control. It is a major issue that many analysts seem to notice quite quickly, such as Jeffrey Hayden, senior research analyst at the International Data Corporation, who said, "that's one of the biggest fears China has – letting go of control."[41]

Where legal or technological restraints on information systems fail to accomplish goals, the government uses bureaucratic delay methods to slow down the real world

---

[38] Lester J. Gesteland, "China ICPs Need Approval, License Before Posting News," February 18, 2000. See also www.chinaonlinenews.com
[39] "Convergence of TV, Phone and Internet 'Unavoidable'," Chinabiz, April 1, 2000.
[40] Lester J. Gesteland.
[41] Lee Chyen Yee.

system to prevent non-governmental entities from operating at a faster rate than the government can manage. This may have been some of the underlying principle behind delaying Ericsson China Co. in its plans to deploy advanced cell phone technology in February 2000. Again, companies in China do not have the freedom to operate according to profit as much as they are allowed to do so while meeting the "whims of...bureaucratic overseers."[42]

In another example of China's bureaucratic method dominating the information realm, Wu Jichuan, the minister of the information industry, announced new regulations to curb both the Internet and telecommunications. He established a policy on March 5th, 2000 that Chinese Internet companies who want to get a listing on the stock exchange needed "not only to get permission from the stock exchange authorities but also from his ministry (Ministry of Information Industry), yet as of the end of February he had not given permission to a single one."[43]

The Connection between the PLA and the Civilian Sector

The measures just examined are restricted to the commercial application of the Internet, which is a far cry from the military applications on other information systems, such as satellite and submarine communications. However, the PRC State Security Bureau has created a deliberate connection between PLA operations and the civilian use of the Internet. In China's own Internet regulation guide, Provisions On Secrecy

---

[42] Matt Forney, "CDMA Deal Put on Hold," Wall Street Journal, February 24, 2000.
[43] Gary Chen, "Dotcoms Need MII Approval Before Listing Abroad," China Online, March 7, 2000.

Management Of Computer Information Systems On The Internet, Article 19 states, "The armed forces can make detailed regulations based on these provisions, with which they will manage the secrecy of computer information systems on the Internet."[44]

The PLA owned up to its responsibilities, and in no small way was motivated by the associated tensions across the Taiwan Strait during the run-up to Taiwan's elections during the spring of 2000. In March, the PLA requested from the National People's Congress faster passage of legislation to "speed up production of a national defence information security act, which will order a united effort among different government organs to prepare for the network warfare."[45]

The Impact of Information Habits

For this argument, one must move from the realm of evidence in media toward the realm where evidence is sensed by the heart and through experience. How a person grows up largely determines what they know about how to act in certain situations. Though not necessarily an influence on character and attitude, whether a person has been allowed the freedom to receive information they need on a regular basis is going to have a serious impact on whether they know how to provide that opportunity to others when they are adults.

---

[44] PRC State Security Bureau, Provisions On Secrecy Management Of Computer Information Systems On The Internet, unofficial translation from text transmitted by Xinhua, Beijing, January 25, 2000

[45] Fong Tak-ho, "PLA Calls for Legislation on Cyber Defence", Hong Kong Standard, March 13, 2000.

In this way, the PLA is unlikely to be able to provide assurances of information to even its own units. Certainly, from individual commander to individual commander, there will be exceptions to this behavior. Some will be able to show delegation to the junior officers, willingly transfer their authority to a peer and exercise or test the survivability of their networks. However, these are exceptions because the society has taught them retention of authority, mistrust, and lack of interest in ensuring network maintenance.

CCP Reluctance to Loosen the Reins

The adoption of a doctrine of control by the CCP may not even be so deliberate as it is simply natural. Certainly this same statement could be applied to many other groups, well intentioned or not. People of all kinds love to be reassured of having control over their lives, even when there is no real control present. But the official policies of the CCP present a special kind of relationship to the control of information, which is simply not present in more open regimes around the world.

The Chinese behavior towards information is relatively well established. Their policies toward information would be exceedingly hard to repeal without a great deal of intentional effort – effort the CCP is not likely to choose to make. Outside elements, such as China's student body, Falun Gong practitioners and foreign governments, have all made their own deliberate attempts at getting the CCP's policies toward information changed, and none have met with any great success. The PRC is naturally interested in maintaining control of vital state functions, and they perceive the function of information flow to be one of those vital to their survival.

Problems Stemming From Excessive Control

The commercial and military aspects of China's information infrastructure, their viability and their productivity, are both very important to Chinese national security concepts and future economic growth.[46] The government does not really want to see either of them stifled. However, good intentions will not always prevent government decisions from running contrary to fundamental principles. The characteristics of information and IT, including but not limited to the Internet, which give information infrastructures such high potential for growth and prosperity, are often the same characteristics that would work in direct opposition to a doctrine of control. Three relationships containing such potential problems are examined here.

Government Relationship to Commercial Networks

The first of these relationships is the difficulty of always approaching civilian operations with government authority. Some evidence from the U.S. experience with law enforcement in connection with the Internet has already turned up practical examples of how efforts to control can be fundamentally at odds with the new information society. In the early 1990s, the U.S. Federal government was committed to fulfilling the role of information protection and criminal prosecution. Since then, the U.S. experience with actual operations against information vandals and hackers has revealed that the FBI

---

[46] Mi Zhenyu, "China's National Defense Development Concepts," originally from China's National Defense Development Concepts, PLA Press, Beijing, 1988, chap. 9, as translated in Michael Pillsbury's Chinese Views of Future Warfare. Also, comments in Fu Quanyou, "Future Logistics Modernization" and Yang Chengyu, "Logistics Support For Regional Warfare" both also in Pillsbury.

> ...is depending heavily on advice and consultation from the technical people at the victim companies...nobody knows these systems and their weaknesses better than the people who design and maintain them. After wrangling with top e-commerce sites over how to best guard against security breaches, the Clinton administration adopted the view that too much regulation and oversight would inhibit dynamism in a sector that's fueled the U.S. economy's record growth. What's more, firms that do business on the Web, particularly financial institutions, are reluctant to divulge any information on their online practices with federal regulators.[47]

This example highlights three factors that would probably apply to information technology companies and individuals in China just as much as they apply to those in America. First is the superiority of local network knowledge. This is related to the exponential growth of complexity compared to network growth. There is no way for a central government to maintain control over a growing network and still know all it needs to know without preventing some growth, or limiting some efficiency, that would otherwise occur. It is exceedingly more likely that the local authority will have the ability to understand whatever aspect of the network is in trouble, ascribe the appropriate response, and take specific action. This factor has direct application in terms of its conceptual similarity to how PLA information operations would be impacted by excessive control measures.

The second factor is that regulation inhibits the ability of business to act dynamically. The dynamism may incorporate several ideas, including innovation,

---

[47] Michael Eskenazi, "On the Web, the patrolmen will be private," February 15, 2000. www.time.com.

creativity, and the flexibility to take opportunities when they appear. Opportunities are an important vehicle to innovation, and when squandered do not necessarily return. The detrimental effect on innovation within the business community would not necessarily impact the PLA directly. The professional culture within the PLA, however, is not likely to be able to maintain or produce a culture of innovation that is superior to the commercial world, which surrounds it in social and economic terms.

The third factor to likely affect China in further carrying out a doctrine of control is the degree of civilian unwillingness to divulge information to the government instead of another company or a non-governmental organization. These latter two aspects do not seem to have as direct an application to military operations, but they still reflect the sort of difficulty which China would face trying to incorporate America's concepts for information operations under a doctrine of control.

Loss of Flexibility and Speed in IW Operations

Asserting control over an information infrastructure that exhibits a high degree of complication and possesses large numbers of network connections is a difficult task. Also, the growth of that level of difficulty is exponentially related to network growth. If control is defined as the ability to retain decision-making authority, at least two things must happen. First, those network entities without decision-making authority that notice the need for a decision to be made must be required to communicate the need up to the proper authority. Second, those entities must wait for the decision to be made before taking action.

These two requirements have correlating results. The first is a loss of flexibility. The ability for a right decision to be made hinges on the network's capability to pass all the required information to the decision-maker. Sometimes, centralized control will actually make a better decision in this regard because the centrally located decision-maker might have information to positively help the decision, which the lower level did not have. Of course, sometimes the central authority, by virtue of the higher position, has either too much information from which to make a clear judgment or the information has been over-simplified for the sake of easy interpretation. In this case, the decision would have been better left with the lower level authority. In either case, there is less flexibility in the network's decision-making processes. Also, with inflexible networks, there is a natural tendency for decisions to be passed up the chain of authority wherever there is a general lack of permission flowing downward, even where decision-making authority is present. Therefore, flexibility possibly decreases even further and the central authority ends up taking on more responsibility for control than originally intended. United States airpower doctrine recognizes flexibility as a fundamental characteristic of airpower, and therefore attempts to impart the same characteristic on the operational forms that command the use of airpower.[48]

The second result, correlating to each entity's required waiting time, is a loss of speed. This result can be tricky to detect, since one of the inherent characteristics of information technology is near-instantaneous processing and the potential for near-real

---

[48] AFM 1-1, p. 82.

time information. Near-real time data allows someone, whether a technician or a commander, to monitor or even participate in an event, whether about the battlefield or a weapon system, while it is going on.

Once IT completes the transmission of information, however, it rarely speeds up the decision-making process on the behalf of the person who has that responsibility. First, there is an amount of time required for the decision-maker to learn that a lower-level authority is waiting on a decision before he begins to look at the situation. Second, decision-making can sometimes take a great deal of time and mental effort to review the facts, consider factors, review with peers, and ensure nothing has been left out. Next, there is an amount of time required for the decision itself to be received by the originator once the decision is available, assuming they have begun to work on other jobs while waiting. Finally there is an amount of time required for the decision to be acted on, and appropriate measures taken.

During these four steps, IT's inherent advantage of high-speed information processing is temporarily suspended, and no longer a great benefit to the conflict. This is why decentralized execution has become a major component of U.S. war-fighting doctrine; it allows the system to make decisions faster, and often more accurately, than when decision-making authority resides with those who seek network control. So, as with flexibility, network speed is indirectly related to the degree of network control.

Therefore, both the speed and the flexibility of network operations are greatly affected by the doctrine of control. In this way, conflict between a doctrine of control and the use of U.S. terminology and concepts occurs whenever and wherever the

opportunity costs of speed and flexibility appear. The detrimental effects of centrally located execution authority have already been felt in airpower history, most recently with President Johnson in Vietnam. His desire to prevent airpower actions from unnecessarily escalating the conflict was a factor leading him to become involved in the weekly targeting decision meetings. This is a history that the PLA Air Force (PLAAF) has not necessarily learned, and a bad lesson they could potentially repeat. Consider the following excerpt from the President of China's Air Force Command College.

> ...The air force, which can avoid direct contact with the opponent and quickly deliver strategic proposal, can start and stop operations easily so they will not result in territorial disputes [by keeping the Army from having to occupy territory]... This is definitely what military decision-makers want to apply in today's conflicts, in which no one wants to escalate the conflicts but everyone is eager to restrain the other... The ultimate goal of the parties involved is...to check the enemy country and take initiative at the negotiation table. Because an air force can achieve such a goal without escalating the conflict, it has more opportunities to be employed.[49]

In other sections of the same article, the writer makes deliberate connections between airpower and IW. "Future information war will rely more and more on air superiority," and "air weapons have become the epitome of contemporary information warfare technology," are two such examples. In this way, the Chinese incorporation of the United States' approach to airpower will collide with the fundamental nature of a doctrine of control. This will be especially true in areas with a high need for network flexibility and speed. The PLA leaders who seek to adopt U.S. terminology and concepts

---

[49] Zheng Shenxia and Zhang Changzhi, "The Military Revolution in Air Power," as translated in Michael Pillsbury's Chinese Views of Future Warfare.

must reconsider IW doctrine incorporation in light of the characteristics present in their own contemporary military and political operations.

Chapter 6 – Targeting Frameworks

This chapter discusses the other of the two claims associated with the paper's argument, that the PLA lacks targeting frameworks, which are required for effective long-range power projection. The problem with the doctrine of control is that it has inherent conflicts with the core issues of speed and flexibility naturally incorporated in U.S. doctrinal concepts. In contrast, the problem associated with targeting frameworks is created by an incomplete incorporation of concepts, preventing the effective operation of long-range precision strikes.

To help make this portion of the work clear, there must be a distinction established between the PLA simply having conversations associated with picking and striking combat targets, and the PLA having a targeting framework resident in their doctrine from which to guide that process of picking and striking combat targets. The discussion here is of the latter condition. Understanding the subject to be Chinese information warfare doctrine, the terminology regarding the United States' application of these ideas is purely airpower related. This framework will be used for the sake of clarity in constructing the argument. At the end, it will be tied to how it impacts PLA IW doctrine specifically.

Target, Target, Who's Got the Target?

A PLA methodology for determining and prioritizing targets is a necessary part of being able to establish a true long-range power projection capability. Coordination is necessary as the military forces first identify, then choose, prioritize, prepare, and finally strike a limited number of targets from a virtually unlimited population. If the

methodology is not there, how can the military leadership expect weapons to be able to strike the targets they really ought to strike? The situation would default to using weapons against the most immediately significant targets without necessarily fitting them into the big picture.

Being ignorant of any targeting framework involvement makes it easy to confuse the efficacy of a long-range precision weapon with its inherent characteristics, when in fact the opposite is true. Since greater range and precision increase the options of where to send the weapon, the huge quantity of target choices makes weapon effectiveness tend to drop, unless guided by a competent and structured targeting system.

The reason the PLA has not adopted a targeting framework may be partly due to its being unaware that such a framework even exists, though they have indicated recognition of it in the analysis of deliberate Gulf War plans to strike command and control sites, radar stations, and so on.[50] Noticing that the strikes were deliberate, and understanding why those choices were made, is different from being able to say whether your own systems should do the same, or understanding how one's own target selections would relate to the applicable national goals.

That this situation of 'seeing yet not fully understanding' is present in Chinese military thought is reflected in the following excerpt explaining how the ways of attack in the Gulf War differed from other wars in the past.

---

[50] Wu Guoqing in "Future Trends of Modern Operations", Cao Benyi in "Future Trends in Stealth Weapons", Ming Zengfu in "21st-Century Air Warfare", Li Jijun in "Notes on Military Theory and Military Strategy" and Zheng Shenxia and Zhang Changzhi in "The Military Revolution in Air Power" all made such observations.

> Take the air strike for example, in the past the first strike would be at the front, and then strike behind the front line. The Gulf War was different in that it first struck headquarters, then the crucial energy and production facilities, then the transportation system, and finally the armed forces. Compared with past strikes, the sequence was turned around. It is very important for the combat commander to learn this change.[51]

The general's observations are very clear and absolutely correct. The actions do reflect a complete reversal from the past. But there is no accompanying explanation after that section as to why it turned around. All other indications, both from that article as well as from other writers, are that the PLA believes the reason for change was because of the use of high-tech weapons. The conclusion one could reach from this belief is that if a country successfully acquires and learns to use the technology, that they could also go out and strike the same targets, and come away victorious. It is as if they see targeting as a formula to be applied and followed.

All Weapon and No Framework Makes Targeting a Dull Boy

But, as this work has made clear already, it is not the weapon that hits the target, it is the framework, which enables the weapon to be directed to hit the target. Not seeing this relationship will result in weapons precisely striking the wrong things. The excerpt used above does not specifically comment on weapons, but there are some examples of the Chinese authors mentioning weapons with a voice that seems to regard the weapon itself as a way of fighting. Thinking of specific weapon use as descriptive of a certain

---

[51] Li Jijun, "Notes on Military Theory and Military Strategy," Military Theory and Conflict, Academy of Military Science Press, 1994, as translated in Michael Pillsbury's Chinese Views of Future Warfare.

way of fighting caused a great deal of trouble during the Cold War. Often a 'strategic' bomber was carpet-bombing an area in preparation for 'tactical' Army operations, while at the same time a 'tactical' fighter was taking out a 'strategic' Surface-to-Air Missile (SAM) site in downtown Hanoi. Airpower history teaches from examples such as these that the role, or purpose, of an air mission is what determines the way of fighting; almost any weapon may possibly be employed. Precision-guided bombs are not concepts, such as interdiction or electronic warfare.

Stated so directly, the point sounds obvious. Yet the distinction is not easy to make; even authors outside China discussing the PLA's modern military developments have made the same mistake. This is the case with Nan Li's essay on China's campaign doctrine and strategy. He includes a reference to precision-guided munitions as one of four items in a list of categories of warfare (the others being electronic warfare, air assault/defense and attacking forces).[52] This is an example of how precision-guided munitions themselves can easily be mistaken for a specific method of fighting, as opposed to simply being weapons that are guided in their use by certain methods of fighting. In other words, the PGM takes on an inherent capability that it does not actually have, but appears to have as a result of the application of specific targeting methodologies that make the most of PGM strengths.

---

[52] Nan Li, "The PLA's Evolving Warfighting Doctrine, Strategy and Tactics, 1985-95: A Chinese Perspective," The China Quarterly, no. 146, June 1996, pp. 443-463.

The lessons that these Chinese authors have drawn show little appreciation or awareness of the more subtle lessons of the Gulf War. Many of the comments simply restate the impressive facts of the air war, such as Colonel Ming Zengfu's comment, "to destroy a strong underground fortification in World War Two, 9,000 bombs were needed; in the Vietnam War, 600 bombs; in the Gulf War, only 1 or 2 bombs." He has identified the incredible trend in bombing accuracy, and carries that lesson out to make a point about how different kinds of ammunition "will play a dominant role in the air battlefield of the 21st century," but misses completely any mention of the second half of that incredible trend in bomb requirements.[53] The important second half is the exponentially rising requirement for information, which is transforming the battlespace in even more fundamental ways. The great need for information is what makes the information processing an important process to target for its own sake. By opening up the field of information systems to possible targeting, literally thousands of different options now need to be considered for attack.

In this sense, the Chinese authors spend no time talking about the choice of targets in the Gulf War, how that choice impacted operations, or the doctrine guiding those choices. Instead, the lesson is continually about how technology brought tremendous advantage to the battlefield and the coalition forces were fortunate to have

---

[53] Ming Zengfu, "21st-Century Air Warfare," from "New Changes in Air Defense Operations," in Chinese Military Science, Spring 1995, as translated in Michael Pillsbury's Chinese Views of Future Warfare.

not met superior strategic thinking on Saddam's part. This is evident in the following excerpt from an essay titled "Notes on Military Theory and Military Strategy":

> The high-tech equipment was intensive and its key links rather weak; once they were damaged, combat effectiveness was greatly reduced. Also, if the adversary of the United States was not Iraq, if the battle was not fought on the flat desert, if the Iraq armed forces struck first during the phase when U.S. Armed Forces were still assembling, or if Iraq armed forces withdrew suddenly before the U.S. Armed Forces struck, then the outcome of the war might have been quite different. High-tech war has not at all changed the decisive role played by the people.[54]

By missing the point regarding targeting doctrine, PLA leaders have yet to understand that what the Gulf War did prove was how the real provision for victory is in matching proper doctrine with capable technology. For the first time, technology granted to conventional forces the opportunity to reach beyond another military force, strike directly at the point of national capacity, and thereby avoid debilitating combat engagements while still managing to achieve political goals against the opponent. This is a much different situation than what military forces have been faced with in the past, and is at the heart of what many information warfare theorists uphold.

The Influence of History

Recalling Chapter 3, the history of warfare in the 20th century has been influenced primarily by ideology and a lack of technology. By not having opportunities to use airpower assets consistently, the PLA has had no reason to seriously approach the questions and theories surrounding its implementation. This has led to not questioning what actual targets they would strike with long-range bombers. By not using the

---

[54] Li Jijun, "Notes on Military Theory and Military Strategy".

opportunities that did arrive, they have not had the opportunity to learn from mistakes. And, finally, by experiencing the Gulf War as the first real experience with modern weaponry, the impression has been set that there are no truly negative lessons to learn.

With such an exciting picture of future war before them, China – as is true for all nations – easily finds itself chasing after policies that led other nations to earlier victories. In the case of the Gulf War and the Chinese analysis, the main lesson to them has been the use of airpower to take out important targets. But by striking these same targets in their own battles would be a case of fighting the previous battle. This is a principle of strategy that many Chinese military leaders understand is to be avoided. Yet the influence of history keeps the blinders on, and they seek to learn lessons about how to use technology because they know technology has been missing from their experience.

What *Is* Present is also Evidence of No Secret Targeting Talk

If there were secret discussions taking place within the PLA that outside analysts are simply not aware of, then the following three conditions would not likely all be present in the literature. First, the authors often seem to work under the assumption that decision making within the military and national structure will be done properly as a natural aspect of having high technology weaponry. An aspect of this is seen in the inappropriate attribution of "automatic searches and identification and attack" to new weapon systems, apparently as a result of their advanced guidance systems.[55]

---

[55] Mi Zhenyu, "China's National Defense Development Concepts"

Second, in many of the authors' works, there is an appearance of presenting knowledge through the outpouring of facts and data. For instance, after a long section listing U.S. military actions in which guided bombs have been used, little if any time is taken to discuss what influenced the success or failure of those same actions.[56] The same is true for authors who spend the entire piece defining and explaining, for example, lists of concepts, principles, modes and methods.[57]

Finally, despite talk about all the upgrading and developing they must do in the area of weapons research, development and acquisition, little if any time is spent on the subject of training the military in how to use (at all, much less with great ability) the advanced weaponry. Again, it seems as if the assumption they are working under is that it is merely the lack of technology that is keeping their military from being modernized; that once the technology is acquired, the natural state of the Chinese military will kick in and they will know what to do, and how and when to do it.[58]

The PLA has the ability and the desire to make very good decisions about how to use its weapons. The arguments being put forth in this work may sound as if they are arguing for or assuming some kind of incompetence or inability on the part of the PLA to 'get it' when it comes to using modern technology. This is certainly not the case. The PLA has plenty of brilliant leaders in its ranks to deal with the issues and come to a

---

[56] Cao Benyi, "Future Trends in Stealth Weapons," in Modern Weaponry, no. 11, November 8, 1992, a publication of SCOSTIND, as translated in Michael Pillsbury's Chinese Views of Future Warfare.
[57] Wu Guoqing, "Future Trends of Modern Operations," in China Military Science, Summer 1994, as translated in Michael Pillsbury's Chinese Views of Future Warfare.
[58] Mi Zhenyu, "China's National Defense Development Concepts."

decision. The difficulty the Chinese face is also not a matter of being unable to use the equipment well. Even if their current capability leaves quite a bit to be desired, with enough time, money and attention the PLA certainly will be able to demonstrate skill and competence in the employment of long-range airpower assets. The difficulty the PLA faces is simply that by not deliberately addressing in their articles questions about targeting they are unlikely to be actually achieving the construction of a targeting framework, and one that is appropriately matched to their technology. They cannot go without a framework as long as they intend on actually acquiring and operating long-range and/or precise weapons, regardless of whether the weapons are physical or virtual.

Targeting Awareness – The Counterargument

Not all the authors reviewed for this work have missed all of these important aspects. Their presence in the PLA's military academic system could be just what is needed to bring about significant awareness. Two in particular stand out. Ch'en Huan includes a comment about the cognitive functions being targeted:

> Striking the other side's effective force is no longer the main starting point, and the focus is now on interfering with and destroying the other side's information and cognitive systems. By striking at one point one can achieve the operation objective of paralyzing the entire body.[59]

This word choice indicates to some degree more grasp of the understanding than a simple copying of 'information systems'.

---

[59] Ch'en Huan, "The Third Military Revolution," Contemporary Military Affairs, March 11, 1996, as translated in Michael Pillsbury's Chinese Views of Future Warfare.

Another indication that some in the PLA are aware of the need for targeting frameworks is the occasional use of the term *diǎnxúe* (点穴).[60] It is a term connected to the "martial arts mythology of paralyzing or killing a person by touching a vital point on the body." However, notice that in this instance of Chinese application of a targeting concept, the connection is not to the western world, high technology and air or information superiority. Instead, the idea of striking *diǎnxúe* (点穴) finds its roots in tradition and culture.

James Mulvenon observes that the Chinese do seem to understand that the "perfect" (*wanshan*) (完善) execution of the Gulf War was connected to the decision to target Command, Control, Communications & Intelligence (C^3I) facilities, but there is no discussion or recognition of why those are targeted.[61]

Why C^3I Shouldn't Be An Assumed Target – A Counterargument Defense

The essence of the counterargument states that as long as the Chinese know what sort of target they ought to hit, the need for their own targeting framework is diminished. This would be a good argument if it weren't for the fact that changes occur too rapidly for the target selection to remain the same for long and still work. The command and control centers, for instance, will probably begin to mobilize and cease sitting in now-

---

[60] Two authors in particular have pointed out the use of *dianxue* in PLA publications. Nan Li, in "The PLA's Evolving Campaign Doctrine and Strategies" and James Mulvenon in "The PLA and Information Warfare," both found in The People's Liberation Army in the Information Age,

[61] Mulvenon, PLA in the Info Age, p. 178.

obsolete concrete bunkers. Flexible locations may be able to keep them from getting hit so quickly in the campaign, thereby allowing defenses a chance to survive and fight.[62] This sort of change to the battlespace will prevent a copy of America's last 'perfect execution' from being able to achieve the same results.

Impact on PLA IW Doctrine

Making a "perfect execution" work right has two parts. First, commanders devote resources to the careful and deliberate planning and use of high technology and well-trained troops. The other part is ensuring the plan includes guaranteeing the inability of the enemy to make his own decision. This is because, whenever the opposing side takes an action, it will inevitably in some way modify the expectation of one's own plan.

Therefore, changing the level at which decisions are made is a vital concept in developing strong IW capability. First, we assume a higher level of command is carried out in relatively few physical locations and over relatively few communications nodes, compared to the number of locations and nodes at which lower levels of command are carried out. Therefore, the higher the level at which command is generated or at which decisions are made the greater the degree of importance of each location to the overall existence of that level of command.

---

[62] This development was noted by Wang Baocun and Li Fei, "Information Warfare", taken from a two article series in Liberation Army Daily, June 13 and June 20, 1995, as translated in Michael Pillsbury's Chinese Views of Future Warfare.

In drawing together the lessons of airpower with their applicability to Chinese information warfare, the important point to notice is the close proximity of both those concepts in the Chinese perspective. Airpower discussions are directly related to information warfare because the Chinese see aerospace assets as the carriers of information warfare. The great benefit of this perspective for the Chinese is that their visions of future airpower do not carry the historical baggage the Americans must naturally attach to air war. Both the computer and the airplane hold equal claimant rights to the implementation of IW in new, creative, and meaningful ways.

Chapter 7 - Assessment

The Chinese have an opportunity to create a new doctrine, motivated entirely from their own history and their current understanding of airpower and IT at the same time. Such a doctrine, if modeled deliberately in the direction of becoming an IW doctrine, could potentially outstrip some U.S. IW doctrinal concepts because the Americans' inherited trappings of conventional airpower would not burden it. This chapter will quickly look at some factors that could assist the PLA in the process of creating a powerful IW doctrine. These factors have not necessarily been introduced earlier in the work since they do not relate directly to the Doctrinal Overlap Model (p. 12), which forms the conceptual framework of this paper's argument.

The first factor is the physically undeveloped IT situation in China. This situation is a potential benefit to the ongoing development of the PLA's IW doctrine. By being physically undeveloped in the IT and networking sense, China has not completely committed its military force structure, information infrastructure and civilian institutions to an established plan for the future. In this discussion, the condition will be called the 'flexible infrastructure option'. The links and nodes of China's national network are not established, personnel have yet to be trained, and the budget has not yet been committed. Compared to the United States, the PRC has not committed itself to a certain national information security strategy. There is still time, in other words, for the CCP and the PLA to sit down and make forward-looking decisions about how much to buy, where to put it, and what to do with it.

The United States does not share this advantage, having already committed to the construction of an information network that includes optic fiber, microwave, radio and satellite networks, none of which were necessarily planned with the others in mind. The United States must place its future information capabilities in a doctrine that will assure the complex network remains viable, but the PRC has no such requirement, retaining the option of designing a structure that may respond more appropriately to the threats of the future.

An example of how this flexible infrastructure may be carried into a physical design for the future can already be seen in the appearance of the cell-phone based network concepts. Without the opportunity to connect to a network via cable, Chinese business people often use a laptop and cell-phone combination. The benefit of maintaining flexibility in the physical structure of the national network is tremendous. Command and control facilities may have a much greater degree of mobility available to them if most of the nation is constructed to deal with cable-less network links. The disadvantage is in the relatively limited bandwidth capability as well as decreased communications security compared to landlines. This could cause a serious problem for command and control facilities, since their data is usually a top security priority.

The biggest challenge or threat to this flexible infrastructure option is the government's tendency to allow the most pressing policy issues of the present time to influence the important decisions shaping the future. Specifically, the way in which the older leaders of the CCP and PLA view contemporary problems, such as re-unification

with Taiwan, will greatly overshadow any suggestions, good or bad, made by younger, more visionary members of their national security community.

The second factor affecting the PLA's IW doctrine development is the fact that IW is not overshadowed conceptually by the power of air assets. The PLA is developing a capacity for modern combat that incorporates several aspects of air warfare, but the absence of airpower history, combined with the PLA's contemporary pursuit of IT and airpower at the same time means that airpower may simply come to be regarded as an aspect of information warfare, not the predecessor to it, as is the case in America. In this way, long-range precision strike could truly become an information warfare tool in the eyes of the PLA, not an airpower attack. This possible approach to the link between aviation and information technologies, combined with the flexible infrastructure option, opens up the doors to creative and innovative solutions for future Chinese national security doctrine.

In practical terms, this factor could mean that China will never see the need to perform interdiction or strategic bombing on industry. However, if they continue to adopt U.S. doctrine without considering their own personal targeting framework, they may default to 'doing what America does, because that's what appears to work', and the interdiction mission will end up in their inventory of missions to choose from.

The third factor is the development and improvement of professional military education. Through institutions such as the National Defense University in Beijing, the

PLA is beginning to seriously address many of their limitations.[63] Officers are getting training courses focused on winning high-tech regional conflicts. Granted, this is not necessarily the same as receiving training in information operations; immediate demands in the field may require teaching about Integrated Air Defense Networks or something conventionally related instead. But the effort to improve is definitely present, and the long road to educating the military in high-tech affairs has begun. The effort is partly due to the PLA's General Staff Headquarters, General Political Department, General Logistics Department and General Armament Department jointly calling for the training. Their effort follows an order in the spring of 1999 by President Jiang Zemin to set up four new colleges to train the military to "learn and master new military theories, new techniques and new arms skills, taking into account scientific military developments and the upgrading of weapons."[64]

The lack of understanding about the need for targeting frameworks, and the inherent conflict between an information control doctrine and the speed and flexibility so central to many U.S. doctrinal concepts, pose a threat to the effective development of Chinese IW doctrine. But the opportunity to self-evaluate on the incorporation of those same concepts, the richness of their military history, plus the three helpful factors

---

[63] See James Mulvenon's Professionalization of the Senior Chinese Officer Corps: Trends and Implications, RAND, Santa Monica, California, 1997, for a full treatment of the long-term changes taking place.

[64] "Chinese Army Officers To Get Training To 'Win Regional Wars'," Agence France Presse, July 11, 1999.

examined in this small chapter, could all combine into a powerful new People's Information War doctrine.

Such a doctrine could utilize IT in very different ways than the rest of the world has already come to expect. Wei Jinsheng has written about People's War as the basis of IW concepts. The essence of his observation is that

> ...a People's War in the context of information warfare is carried out by hundreds of millions of people using open-type modern information systems. Because the traditional mode of industrial production has changed from centralization to dispersion and commercial activities have expanded from urban areas to rural areas, the working method and mode of interaction in the original sense are increasingly information-based. Political mobilization for war must rely on information technology to become effective, for example by generating and distributing political mobilization software via the Internet, sending patriotic e-mail messages, and setting up databases for traditional education. This way, modern technical media can be fully utilized and the openness and diffusion effect of the Internet can be expanded, to help political mobilization exert its subtle influence.[65]

There is some irony here in that the original concepts of People's War were anti-technology; certainly when it came to incorporating and using forms of technology as replacements for human functions. But at the same time, the implications of actually applying concepts of People's War to information operations should be sobering to their potential targets. IW can seem very appealing to those who support or encourage concepts of population-based national security support because it allows anyone who has enough financial and brain power to operate a personal computer (PC) to potentially become a very real and active player in national defense!

---

[65] Wei Jincheng, "Information War: A New Form of People's War".

Remember, however, that for the Chinese, the "people" in "People's War" are only those trusted with the identity of the proletariat. Possibly a very large percentage of the population would not be allowed to participate in a "People's IW" scenario, but how such limitations would be imposed could only be imagined for now. All the same, imagine massive denial-of-service campaigns sponsored by the Chinese government as it directs – via websites – potentially hundreds of millions of PCs to contact various foreign government websites. The sheer volume of requests would shut most servers down. A rotating series of even a few hundred targets could easily cover the effective range of government functions for as long a period of time as the Chinese population could continue to be directed by communications from their own government.

Chapter 8 - Conclusions

Approaching a greater understanding of developing PLA IW doctrine has been valuable in its own right, but greater value is found in the increase of awareness and understanding across the field of China studies as a whole. Being able to increase such awareness is a matter of connecting with an issue that affects the approach of other departments of China studies. One of these 'common thread' issues running through modern Chinese history is the question of whether China can manage to incorporate Western technology without incorporating Western ideology. This thesis is not going to provide an answer to this question, but it does at least provide a new sort of framework from which others might be able to continue work.

That framework, specifics aside, was to incorporate appreciation of what is found in United States history as an influence on those things which the Chinese have not incorporated, but desire to, whether the subject is military, political, or economic. So much of United States history, particularly the 20th century, is defined by technology, and this is so very different from what has affected most of China's modern history. Therefore, when other departmental areas of China studies consider the question of whether China can adopt Western forms without Western thought, perhaps the answer lies not within the Chinese experience itself, but in the incorporated lessons from Western history which the Chinese do not share.

As far as this general framework has been applied in the case of IW doctrine, the thesis has shown that there are two general limitations. One is the inadequacy of their targeting doctrine, of which the leadership seems singularly unaware. The other is the

inadequacy of the political system to stand anything less than an IW doctrine based on the control of information. This limitation is much more noticeable to the government and the people, and finds expression in many of the actions the CCP takes with regard to national information policies. Neither of these limitations on information doctrine are entirely intentional, but they seem to be in place due to the combined effects of politics and history.

Though Chinese military leaders have read, understood and adopted many of the terms of U.S. IW doctrinal thinking, the intellectual inheritance from U.S. airpower theorists is not an important influence or source of inspiration for Chinese military theorists. On the contrary, contemporary PLA strategists are more inspired by their own history. China's own military terminology is intellectually rooted in People's War, an anti-technology doctrine that has had to make a deliberate effort to justify the incorporation of modern technology. Therefore at no time have Chinese military forces even had the opportunity to contemplate making long-range strategic attacks to strike the interior of an enemy, much less any motivation to develop targeting frameworks.

Throughout China's military history there has been no truly operational airpower doctrine to guide their actions. Opportunities to practice aerial combat run through the PLA history, but due to the priority of ideological concerns, the lessons impacting airpower never seem to receive the needed attention for change and improvement to occur. The appearance is of a military that not only didn't have powerful airpower capabilities, but also didn't have the desire to improve the way airpower was used. Having air assets appears to have been the important emphasis, but dealing with how best

to use them was not. The result is a military historical culture that did not recognize airpower as having any ability to influence the flow, much less the result, of battle. Neither the technology nor the desire to use it was there.

In contrast, U.S. Air Forces have been faced with targeting questions throughout their entire history of existence. But just as China has been unaware of the need for targeting frameworks, so America has been unaware of the fact that not everyone appreciates this approach in their own military operations. Correspondingly, this condition has made them virtually unaware of the important difference which technology has created between their own doctrine and China's. Any discussion or debate that seeks to understand PLA intentions by incorporating observations of their behavior should take this dissimilar history into account.

The opening of PLA authorship, and the subsequent translation work, has been a great benefit to this need. Hearing from the PLA directly, instead of reading of their developments and exploits through the eyes and ears of others, is also a tremendous benefit. Moving away from the opaqueness of the past is always welcome. Still, the current condition seems much more translucent than transparent.

In closing, there is an important warning to attach to this lesson about the PLA's IW doctrine. If this work has made the PLA out to look less competent or capable than they make themselves out to be, that is a function of an assumption that believes ones own way of interpreting military strength is the right way. Making mistakes out of ignorance or a lack of skill is human; choosing to not learn from them is costly and the mark of complacency. Therefore, it would be dangerous to interpret China's incomplete

adoption of the U.S. concepts as an indicator of complacency on the part of the PLA. This lesson may be easier to see by taking a quick look at one of Michael Pillsbury's observations regarding how the Chinese leaders view America.

In his book China Debates the Future Security Environment, Mr. Pillsbury presents a list of some of the claims China makes regarding the United States' inability to meaningfully embrace the RMA. The list includes four points: their military arrogance inhibits innovation, the previously restricted access to IT is now universally and commercially available, smaller defense budgets historically produce more innovation, and nations other than America are experimenting with innovation. A U.S. military officer reading such a list may laugh at these claims, since only one of them is even connected to the behavior of the U.S. military. The other items speak of the ability of other nations to improve their own status, instead of mentioning problems the U.S. will face.

On top of this, there is plenty of evidence to show that the U.S. military is stepping forward into the RMA. Already, the U.S. military has created the first Computer Network Attack mission, published JCS Information Assurance doctrine, established a National Computer Defense Center, advanced the JCS C^3I position from a Division to a Directorate level, created a Joint Task Force for Computer Network Defense (JTF-CND), initiated development of the Airborne Laser, and started testing on the Theater Missile Defense system. With these in mind, the comparisons Chinese authors uphold between their own supposed innovation domination and the lack of an U.S. ability to stay on top of the RMA make it seem that China's perceptions of the U.S.

military are unfounded. This conclusion can too easily be transformed into the more emotive feeling that Chinese analysts have faulty conclusion in general, and this of course is not necessarily true.

Notice that this list is all about technology and organization. Those two broad areas are directly connected to things this thesis has pointed (through targeting frameworks and the doctrine of control) are so fundamentally different in terms of the American way of doing things compared to the Chinese. Little wonder, then, that the PLA would not consider them when thinking about the United States' RMA capabilities. In the same way, the Chinese would be likely to defend the integrity and competency of their own development by bringing up evidence connected to areas other than technology and organization; areas that impact their history, but which America does not even regard as important to its own military. These could be the areas of international position and ideological vigor. Notice the evidence in the list of China's claims against U.S. innovation. Three of the four relate to the idea of how one country performs in relation to another, not how it performs in its own right. Another connects the attitudes of the military members to capabilities. By seeing the measure that China uses on America, America can get a better idea of how China measures itself, and the opposite is true as well.

Therefore, let the warning in this work be a reminder to the reader that what we know and how we think about it is inherently connected to what we have seen. As others have not seen the same things as we, there must be an effort made to get outside ourselves in order to understand the other perspective. Having seen other perspectives,

we can understand the United States' position better and may then work in such a way as to come closer to the truth.

Bibliography

In Pillsbury, Michael. Chinese Views of Future Warfare. Washington, D.C.: National Defense University Press, 1996.

Cao Benyi. "Future Trends in Stealth Weapons"

Chang Mengxiong. "The Revolution in Military Affairs: Weapons of the 21st Century"

Ch'en Huan. "The Third Military Revolution"

Chi Haotian. "Future Security Trends U.S.-China Military Ties"

Fu Quanyou. "Future Logistics Modernization"

Li Jijun. "Notes on Military Theory and Military Strategy"

Mi Zhenyu. "China's National Defense Development Concepts"

Ming Zengfu. "21st-Century Air Warfare"

Wang Pufeng. "The Challenge of Information Warfare"

Wang Baocun and Li Fei. "Information Warfare"

Wei Jincheng. "Information War: A New Form of People's War"

Wu Guoqing. "Future Trends of Modern Operations"

Yang Chengyu. "Logistics Support For Regional Warfare"

Yang Wei. "Tactical Studies"

Zheng Shenxia and Zhang Changzhi. "The Military Revolution in Air Power"

Other Works

Allen, Kenneth W., Glenn Krumel, and Jonathan D. Pollack. China's Air Force Enters the 21st Century. Santa Monica, California: RAND, 1995.

Burles, Mark and Abram N. Shulsky. Patterns in China's Use of Force: Evidence from History and Doctrinal Writings, Santa Monica, California: RAND, 2000.

Chen, Gary. "Dotcoms Need MII Approval Before Listing Abroad," China Online, March 7, 2000.

Daley, Secretary of Commerce William M. Comments during an address to the 4th China International Electronic Commerce Summit, Beijing, April 7, 2000.

Eskenazi, Michael. "On the Web, the Police Are Likely To Be Private." February 15, 2000. www.time.com.

Fong Tak-ho. "PLA Calls for Legislation on Cyber Defence." Hong Kong Standard, March 13, 2000.

Forney, Matt . "Beijing Postpones Cell Phone System Licensed From U.S." Wall Street Journal 24 Feb 2000. sec. A, p. 13.

Gesteland, Lester J. . "China ICPs Need Approval, License Before Posting News." February 18, 2000. www.chinaonlinenews.com.

Joint Chiefs of Staff. Information Assurance: Legal, Regulatory, Policy and Organizational Considerations, 4th ed., August 1999.

Meisner, Maurice. Mao's China and After. New York: Free Press, 1986.

Mulvenon, James C.. Professionalization of the Senior Chinese Officer Corps. Santa Monica, California: RAND, 1997.

Mulvenon, James C. and Richard Yang, editors, The PLA in the Information Age, Santa Monica, California: RAND, 2000.

Nan Li. "The PLA's Evolving Warfighting Doctrine, Strategy and Tactics, 1985-95: A Chinese Perspective." *The China Quarterly*, no. 146. June, 1996. pg.443-463.

Pillsbury, Michael. China Debates the Future Security Environment. Washington, D.C.: National Defense University Press, 2000.

Pillsbury, Michael. Chinese Views of Future Warfare. Washington, D.C.: National Defense University Press, 1996.

PRC State Security Bureau. Provisions On Secrecy Management Of Computer Information Systems On The Internet. unofficial translation from text transmitted by Xinhua, Beijing, January 25, 2000.

U.S. Air Force. Air Force Manual 1-1: Basic Aerospace Doctrine of the United States Air Force. vol. 2, March 1992.

U.S. Air Force. Air and Space Power, Ed. Bradford R. Barnett, Captain. Maxwell Air Force Base, Alabama, Air University Press, 1998.

Yee, Lee Chyen. "China Slaps Restrictions on Internet IPOs." Reuters, March 29, 2000.

Wills, John E., Jr. Mountain of Fame. Princeton University Press, N.J. 1994.

Unknown Author

"Sina.com Will Not Use IPO Cash for China Business." Agence France Presse, March 29, 2000

"China To Require Encryption Information." Wall Street Journal 25 Jan 2000 .

"Convergence of TV, Phone and Internet 'Unavoidable'." Chinabiz, April 1, 2000.

"China Bans Online Sales of Audiovisual Products." Associated Press, March 25, 2000.

"China Moves to Further Control Information." Exchange Telecommunications Newsletter, September 17, 1999.

"Internet Users Feel Wrath of Big Brother." Hong Kong Standard, March 24, 2000.

APPENDIX A – Simplified Chinese RMA/IW Vocabulary List

Alphabetically by Pinyin

Bìngdú	病毒	Viruses
Bùduìděng dǎjī	不对等打击	Asymmetrical strikes
Bùshǔ	部署	Deployment
Chōngjī	冲击	Charge, assault
Chaōcháng	超常	Supra-normal
Diǎnxué	点穴	Vital point; touching the vital point
Feīxiànxìng zuòzhàn	非线性作战	Seamless operations, or "War without a front line"
Guójūn	国军	National, (i.e. Apolitical) army
Héchéng	合成	Combined arms
Jīkuìzhàn	击溃战	Rout
Jīngbīng lìqì	精兵利器	Elite forces and sharp arms
Jūnshì gémìng	军事革命	Revolution in Military Affairs (RMA)
Jítuánjūn qún	集团军群	Combined Arms Group
Jiānmièzhàn	歼灭战	Annihilation
Jiāozhī	交织	Intertwine with
Kuàyuè	跨越	Leapfrogging; stride across
Lìtǐ gōngjī	立体攻击	Vertical strike

Liánhé	联合	Joint
Qiángdí	强敌	Powerful adversary; superpower
Rèdiǎn	热点	Flashpoints
Ruǎn shāshāng	软杀伤	Soft destruction
Sùzhàn sùjúe	速战速决	Fighting a quick battle to force a quick resolution
Tūránxìng	突然性	Element of surprise
Tūránxíng yǔ kuàisùxíng zuòzhàn	突然性与快速性作战	Sudden and quick strikes
Wǎngluòhuà	网络化	Networkization
Xìnxī gāosù gōnglù	信息高速公路	Information superhighway
Xìnxī jìngōng	信息进攻	Information offensive
Xìnxī zhànzhēng	信息战争	Information warfare
Xìnxīhuà	信息化	Informationization
Xiāohàozhàn	消耗战	Attrition
Xiétóng	协同	Coordination
Yītǐhuà	一体化	Integration
Yuǎnzhàn	远战	Over-the-Horizon warfare
Zhīxìnxīquán	之信息全	Information dominance
Zhǐhuī	指挥	Command
Zhìmìng dǎjī	致命打击	Mortal strikes

Zhànqū fāngxiàng	战区方向	War zone front
Zhànqu zhànyì	战区战役	War zone campaign
Zòngshēn gōngjī	纵深攻击	Deep strike
Zòngshēn zuòzhàn	纵深作战	Deep operations

Alphabetically by English

Annihilation	歼灭战	Jiānmièzhàn
Asymmetrical strikes	不对等打击	Bùduìděng dǎjī
Attrition	消耗战	Xiāohàozhàn
Charge, assault	冲击	Chōngjī
Combined arms	合成	Héchéng
Combined Arms Group	集团军群	Jítuánjūn qún
Command	指挥	Zhǐhuī
Coordination	协同	Xiétóng
Deep operations	纵深作战	Zòngshēn zuòzhàn
Deep strike	纵深攻击	Zòngshēn gōngjī
Deployment	部署	Bùshǔ
Element of surprise	突然性	Tūránxìng
Elite forces and sharp arms	精兵利器	Jīngbīng lìqì

Fighting a quick battle to force a quick resolution	速战速决	Sùzhàn sùjúe
Flashpoints	热点	Rèdiǎn
Information dominance	之信息全	Zhīxìnxīquán
Information offensive	信息进攻	Xìnxī jìngōng
Information superhighway	信息高速公路	Xìnxī gaōsù gōnglù
Information warfare	信息战争	Xìnxī zhànzhēng
Informationization	信息化	Xìnxīhuà
Integration	一体化	Yītǐhuà
Intertwine with	交织	Jiāozhī
Joint	联合	Liánhé
Leapfrogging; stride across	跨越	Kuàyuè
Mortal strikes	致命打击	Zhìmìng dǎjī
National, (i.e. Apolitical) army	国军	Guójūn
Networkization	网络化	Wǎngluòhuà
Over-the-Horizon warfare	远战	Yuǎnzhàn
Powerful adversary; superpower	强敌	Qiángdí
Revolution in Military Affairs (RMA)	军事革命	Jūnshì gémìng
Rout	击溃战	Jīkuìzhàn
Seamless operations	非线性作战	Feīxiànxìng zuòzhàn

Soft destruction	软杀伤	Ruǎn shāshāng
Sudden and quick strikes	突然性与 快速性作战	Tūránxíng yǔ kuàisùxíng zuòzhàn
Supra-normal	超常	Chaōcháng
Vertical strike	立体攻击	Lìtǐ gōngjī
Viruses	病毒	Bìngdú
Vital point; touching the vital point	点穴	Diǎnxué
"War without a front line"	非线性作战	Feīxiànxìng zuòzhàn
War zone campaign	战区战役	Zhànqu zhànyì
War zone front	战区方向	Zhànqū fāngxiàng