

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY <i>(Leave blank)</i>	2. REPORT DATE 17 December 1998	3. REPORT TYPE AND DATES COVERED Monograph	
4. TITLE AND SUBTITLE Adapting to Chaos: American Soldiers in Siberia, 1918-1920		5. FUNDING NUMBERS	
6. AUTHOR(S) MAJ G. Scott Gorman		8. PERFORMING ORGANIZATION REPORT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) School of Advanced Military Studies Command and General Staff College Fort Leavenworth, Kansas 66027		10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Command and General Staff College Fort Leavenworth, Kansas 66027		11. SUPPLEMENTARY NOTES	
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE. DISTRIBUTION UNLIMITED.		12b. DISTRIBUTION CODE	
13. ABSTRACT <i>(Maximum 200 words)</i> SEE ATTACHED			
14. SUBJECT TERMS Complexity Chaos Siberia Russia mootw Intervention			15. NUMBER OF PAGES 69
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED			16. PRICE CODE
18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

**ADAPTING TO CHAOS: AMERICAN
SOLDIERS IN SIBERIA, 1918-1920**

**A MONOGRAPH
BY
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19990804 051

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First Term AY 98-99

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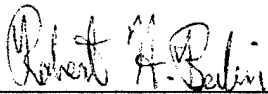
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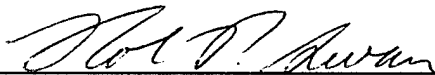
Title of Monograph: *Adapting to Chaos: American Soldiers in Siberia, 1918-1920*

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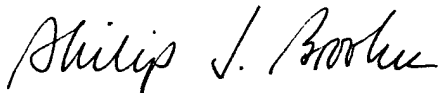
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Accepted this 16th Day of December 1998

ABSTRACT

ADAPTING TO CHAOS: AMERICAN SOLDIERS IN SIBERIA, 1918-1920
by MAJ G. Scott Gorman, USAF, 66 pages.

Military operations are complex and chaotic phenomena. Current theoretical models inadequately deal with the increasing complexity and inherent uncertainty of modern warfare. Relying on mechanistic paradigms and reductionist methods of analysis, these models fail to account for the inevitable uncertainties of military operations, the relationships between the individual military components, and the emergent qualities of the military system taken as a whole.

This monograph suggests a more organic model for military analysis. Beginning with an introduction to the theoretical problem, the monograph presents complexity theory and the concept of adaptation as a more comprehensive theoretical paradigm. Complexity theory originates from the study of complex, adaptive systems that exhibit self-organizing behavior. Adaptation is the action of systems trying to turn interactions with their environment to their advantage. A system adapts by learning about its operating environment, anticipating future changes to the environment, and then reorganizing itself in response to those changes. By presenting the military as a complex, adaptive system, this study examines methods of improving adaptive effectiveness in increasingly complex environments.

Having outlined the theoretical criteria, the monograph looks at the American military intervention in Siberia from 1918-1920 for evidence of tactical adaptation. The intervention in Siberia offers an example of perhaps the most complex of military operations, military operations other than war (MOOTW). Using both primary and secondary sources, the monograph examines those elements of the military system in Siberia most essential for effective adaptation: intelligence, command and control, and information operations. Intelligence provides the awareness of the surrounding environment. Command and control provides a unifying purpose to the system and gives guidance concerning the reorganization of the system to meet the challenges of the environment. Information operations then convey this knowledge about the environment and unifying purpose to agents both inside and outside the system. This monograph demonstrates that the American military system deployed to Siberia relied on these three elements to facilitate tactical adaptation within a complex and chaotic operating environment.

The study concludes that adaptation is essential in complex military operations, especially complex MOOTW scenarios. The failure to adapt to complexity leads to systemic failure in competitive environments. In military parlance, systemic failure equates to military defeat. Through adaptation, military systems can avoid defeat during complex military operations.

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Introduction

But in war, as in life generally, all parts of a whole are interconnected and thus the effects produced, however small their cause, must influence all subsequent military operations and modify their final outcome to some degree, however slight.

Carl von Clausewitz, On War¹

Military systems are non-linear and chaotic.² They are non-linear because the output of the system is not proportional to the input, the whole is not qualitatively equal to the sum of the parts. Like other chaotic systems, military systems are extremely sensitive to initial conditions. Minute changes in the operating environment can drastically affect outcomes. Complexity theory provides a method for analyzing the dynamics of non-linear, chaotic systems.³ Past military analysis has centered on mechanistic, reductionist processes that break down complex problems into manageable pieces. However, by reducing systems to isolated pieces, these methods minimize the role of linkages or interrelationships between the various parts, the dynamic environment in which the system operates, and the sensitivity of chaotic systems to even small changes in initial conditions. Unlike past reductionist methods, complexity theory views the system as a whole, focusing not only on the dynamic elements that make up the system, but more importantly, on the intricate interaction between the system and its environment.

This interaction of system and environment results in adaptation, a central notion within complexity theory. Dynamic, complex systems avoid failure or “systemic breakdown” by adapting to the changing conditions of their environment. Adaptation is the adroit combination of learning from the past with anticipation of the future to provide a present advantage over competing systems and the surrounding environment. As complex, adaptive systems, social organizations such as the military can optimize their

adaptive effectiveness and increase their chances of success by managing processes within their system. Facing increasingly complex environments, modern social systems require adaptive effectiveness to prevent “systemic breakdown.” For military systems, systemic breakdown equates to military defeat. Military systems rely on adaptation to prevent breakdown in the midst of increasing complexity.

The more complex and dynamic the environment, the more important adaptation becomes to the health of the system. Thanks to the diversity of tasks they encompass, military operations other than war (MOOTW) present one the most challenging environments for the military system. According to *Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms*, the term MOOTW describes military actions that may occur before, during, or after war that encompass military capabilities across the range of military operations short of war.⁴ Achieving success across the entire spectrum of conceivable actions within the complex, chaotic, and dynamic environment of MOOTW requires adaptive effectiveness from military systems.

MOOTW taskings are not new, exclusively post-Cold War phenomena. These unconventional, politically complex missions have played a shaping role throughout American military history. From 1918 to 1920, American forces took part in a MOOTW intervention in Russia as part of a coalition that included Great Britain, France, and Japan. Initially meant to encourage Russia to stay in the First World War against Germany, the intent of the Russian intervention transformed after Germany’s surrender in November 1918 to include shaping the outcome of the Russian Civil War and protecting national interests. Like other MOOTW environments, the environment of intervention in 1918 was extremely dynamic and complex. American military forces landing in Siberia

in 1918 soon found themselves engulfed in a chaotic tactical environment. Given unclear mission directives, ill-defined operations areas, and the fluid environment of the Russian Civil War, success or failure hinged upon the Army's ability to adapt to its changing surroundings. Although national policy failed to adapt to the dynamic strategic situation in Russia, the military system was relatively successful at the tactical level. American forces in Siberia achieved tactical mission success by demonstrating adaptive effectiveness.

Facing the prospect of similar interventions into even more complex and chaotic environments, the American military today needs a systematic approach to military operations, to include military operations other than war. The application of complexity theory and its associated concept of adaptive effectiveness provides this systematic approach. The case study of MOOTW in Siberia in the light of complexity theory is especially relevant to military operations outside of the umbrella of the Cold War, where MOOTW type scenarios will predominate. Just as was true in Siberia following the Russian Civil War, adaptation will be a prerequisite for success within the complex environment of MOOTW.

This paper offers a new perspective on military operations and provides a historical example viewed from this perspective. The monograph's goal is to underscore the importance of adaptation in the face of increasing military complexity. To accomplish this goal, the monograph first outlines chaos and complexity theory, relating these theories to military operations in general and MOOTW in particular. The monograph next explores the concept of adaptive effectiveness in a complex, non-linear environment. Having laid the theoretical groundwork, the monograph presents the Siberian intervention

of 1918-1920 as a historical case study, stressing the tactical complexity of the mission. By first examining the chaotic strategic environment of the intervention and its governing directives, and then surveying the tactical experience of American forces, this study analyzes the adaptive effectiveness of the military system within the complex environment of “peaceful” intervention. This method of analysis provides not only a clearer tactical understanding of the intervention in Siberia, but also sheds light on future requirements for the healthy survival of military systems within the complex and challenging environment of MOOTW.

Complexity Theory and Military Operations

*Chaos umpire sits.
And by decision more embroils the fury
By which he reigns: next him high arbiter
Chance governs all.*

John Milton, Paradise Lost

Theory provides a working model with which to react to the world around us, a lens that clarifies the view of the surrounding environment. It is a mold that shapes ambiguous, amorphous surroundings into understandable forms. Since the Enlightenment of the 18th century, Western theory has centered on scientific interpretations of the world. Specifically, Newtonian physics has shaped Western understanding of cause and effect.⁵ Taken from the world of physical mechanics and applied across the academic and social disciplines from psychology to government, Newtonian models speak mechanistically of “the clockwork universe”, describing efficient social systems as “well-oiled machines”. Military theory is not exempt. Thanks in large part to the nineteenth century fathers of modern military thought, Carl von

Clausewitz and Antoine de Jomini, modern military theory also rests upon physical concepts borrowed from the Newtonian paradigm: friction, centers of gravity, geometric points and lines, and mechanical synchronization of military operations. The Newtonian paradigm dominates modern military theory.

Even Clausewitz, however, felt the vague nagging that linear, mechanical theories inadequately described the complexity of war.⁶ “Everything in war is very simple,” wrote Clausewitz, “but the simplest thing is difficult.”⁷ With the explosion of information technologies and resulting increased awareness of our surroundings, the shortcomings of the Newtonian paradigm are readily apparent, with or without the gift of Clausewitzian insight.⁸ The sufficiency of theory depends upon the ability of that theory to closely match and describe reality. The recognized disparity between theory and reality across numerous academic disciplines suggests the need for a new theoretical paradigm.⁹ This new paradigm has emerged as “the New Sciences”, the holistic, systematic approaches that today are pushing aside the reductionist, linear methods of the Newtonian scientific model.¹⁰

At the heart of the New Sciences are the theories of chaos and complexity.¹¹ A chaotic system is one that is extremely sensitive to initial conditions. Small changes in input result in dramatic and unpredictable changes in output. Weather is perhaps the most frequently cited example of a chaotic system and one of the first experimentally encountered.¹² Meteorological phenomena are extremely sensitive to small changes in initial conditions. Taken to the extreme, even the harmless flapping of a butterfly’s wings could conceivably cause the development of a fierce thunderstorm.¹³ This extreme sensitivity to initial conditions creates uncertainty within the system. We can not

anticipate the behavior of the system with certainty because of the relationship of the parts to the whole. When describing system outcomes, we can only speak in terms of chance and probability, not mathematically predictable results. Although unpredictable, chaotic systems are not entirely random. Even though there is not a direct linear connection between the butterfly and the thunderstorm (i.e. the input is not directly proportional to the output), there is still a causal relationship between the two events, although extremely complex and difficult, if not impossible, to forecast. From these complex causal relationships, chaotic systems may produce distinct patterns as evidenced in the dramatic art of fractal geometry.¹⁴

The second integral concept to the new paradigm is that of complexity. In a complex system, "...a great many independent agents are interacting with each other in a great many ways."¹⁵ This description implies that there are two different types of complexity. The first is detail complexity, where numerous parts or agents make up the whole. The second is dynamic complexity, systems with numerous interactions between agents, where cause and effect are subtle and the effects over time of various interactions and inputs are not obvious.¹⁶ Full awareness of systems complexity requires not only a recognition of the vast number of parts, but also an understanding of the elaborate relationships between the individual parts that produce the characteristics of the system as a whole. Open systems, subject to inputs and interactions from outside systems and the surrounding environment, present yet another level of dynamic complexity.¹⁷ Reductionist methods, like Newtonian physics, that first isolate system components to gain a better understanding of the whole acceptably explain detail complexity, but do not adequately address dynamic complexity. The study of individual trees and animals

within a forest does not precisely describe the entirety of the forest because it ignores the synergistic qualities that emerge from the intricate relationships within this unique ecosystem.

Like the forest, the military system is both complex and chaotic.¹⁸ The military system is made up of hierarchically-nested components, each dynamically interacting with one another to produce chaotic effects.¹⁹ As an open system, the military system is subject to additional complexity as the result of interactions with the outside environment. The weather, the enemy, political relationships, and other external factors provide inputs that change both the qualities and the output of the military system. Owing to these interactions, the military system is non-linear; the outcome of military operations is not necessarily proportional to the inputs to the system. Massive inputs are not always required to produce proportionally extensive results. Uncertainty is not only an initial condition in war, but is also a product of its dynamic actions.²⁰ Not only is there uncertainty of information, but also uncertainty of effects. This uncertainty and unpredictability, a result of the complexity of interactions within and upon the military system, is inherently characteristic of military operations.²¹ Traditional reductionist models inadequately account for the unavoidable uncertainty of complex military operations.

The dynamic nature of modern war adds to the complexity of military systems. Changing environments, changing missions, and changing opponents contribute to the chaos of current and future military operations. The environment of military operations continues to change temporally, spatially, and mechanically. Temporally, command and control conducted at the speed of light and weapons delivered at the speed of sound have

contributed to the increased tempo of military operations. Spatially, the expanse of the battlefield has grown to cover the globe; in the future, there may be little distinction between the battlefield and the homefront. Recognizing the changing spatial dimensions of modern war and the expanding array of possible military environments, military theorists and doctrine writers have replaced the word “battlefield” with the more inclusive “battlespace”. Mechanically, technological innovations have produced quicker, deadlier, and more destructive ways of interacting within the military environment. The diversification of military missions has created additional complexity by adding both to the details (increasing the number of parts) and dynamics (increasing the number of interactions between agents) of the military system. Military agents must be familiar not only with more tools, but also with new and innovative ways of using these tools. As the system changes, so too does that of possible opponents. The “systems” opposing future military operations will consist not only of conventional military forces, but also of terrorists, computer hackers, economic criminals, and even Mother Nature. Changes inherent in modern war have greatly increased the complexity of the military operating environment.

More than any other type of military operation, military operations other than war (MOOTW) typify the growing complexity of modern military problems. *The Joint Task Force Commander’s Handbook for Peace Operations* lists some of the characteristics associated with MOOTW to include the increased use of asymmetrical means by belligerents, the dominance of political objectives, numerous parties to the conflict including non-governmental and international organizations, the absence of law and order, and poorly defined operations areas.²² The US Army’s *Field Manual 100-23*:

Peace Operations notes that the MOOTW environment is often less well-defined than in war. “The identity of belligerents may be uncertain and the relationship between a specific operation and a campaign plan may be more difficult to define than would normally be the case in war.”²³ Chaos and uncertainty reign over the fields of MOOTW, making them particularly difficult to plan and conduct using traditional reductionist and linear military models.

From the failings of traditional theory arise new paradigms. These paradigms emerging from the “New Sciences” not only better describe complex phenomena, but also suggest prescriptive measures for operating more effectively within increasingly complex environments. Cognition of the system as a whole, the systematic approach identified by Peter Senge as “The Fifth Discipline”, provides the first means of dealing with complexity. This systematic approach allows individuals and organizations to avoid the reductionist traps of the past by focusing on wholes instead of the numerous parts, on interrelationships rather than things, on patterns of change rather than static snapshots.²⁴ Systems thinking, taking what Clausewitz identified as the “comprehensive rather than the specialized approach”,²⁵ provides an antidote for the sense of helplessness in the face of increasingly complex situations. It facilitates holistic analysis that does not become bogged down in the details. It breaks the deterministic shackles of linear thinking and allows guiltless recognition of the existence of uncertainty within complex systems. This recognition suggests that the ability to think and respond to events as they unfold is more important than the ability to mechanically follow preconceived plans.²⁶

The second measure centers on the concepts of self-organization and adaptation of systems in the face of dynamically complex environments. Living systems survive by

attempting to create advantages for their system over other systems in their environment. Within this evolutionary competition, self-organization is the spontaneous arrangement of groups of agents seeking mutual accommodation and self interest to promote the good of the system. From this self-organization within the system comes the concept of emergence, the recognition that collectively the whole transcends the parts because the agents of the system act in mutually beneficial ways. Qualitative improvements of the whole emerge because of interactions of the parts. As a spontaneous and unconscious phenomenon, self-organization is essentially an undirected and unscripted occurrence. Theory can describe its occurrence and perhaps strengthen an awareness of emerging systematic qualities, but can not influence its effects.

Adaptation, on the other hand, can at least be facilitated, if not developed, as a trained system characteristic. It involves the constant revising and rearranging of the building blocks of a system to give it an advantage over its environment.²⁷ Adaptation is more than just passive defense and survival; it is a proactive measure to meet change head on. To be adaptive requires not only learning, but also anticipation. Learning is gaining knowledge from the past; anticipation is essentially knowledge of the future. To effectively adapt, a system must not only recognize past failures or present opportunities to gain an advantage, but also forecast conditions in the future to anticipate which adaptations will be most effective within this new environment. Successful system adaptation requires knowledge of the past and present combined with cognitive anticipation of the future.

Military systems improve their chances of success by increasing their ability to adapt in a dynamically complex environment. Military systems that adapt in the face of

dynamic complexity survive and prosper; military systems that fail to adapt, fail to thrive, often suffering the catastrophic consequences of systemic breakdown. Military failure is essentially the failure to cope with complexity. In their historical analysis of military failure, *Military Misfortunes: The Anatomy of Failure in War*, Eliot Cohen and John Gooch, distinguished strategic analysts, stress that military failures are not individual failures, but systematic failures. Misfortune in war is not the failure of individuals to act but rather the failure of the system to adequately function within its environment. Increasing complexity relieves the burden of responsibility from individual shoulders and places it on the back of the system.²⁸

Recognizing that chaos and uncertainty inherently exist on the battlefield, complexity theory suggests that the key to competing within this environment is not to eliminate these conditions. Instead, the key is to learn to thrive within the inevitable chaos. Accomplishing this requires not only cognition of chaos and uncertainty (the role of theory²⁹), but also increased flexibility and adaptiveness to effectively operate within this dynamic environment. The mechanisms that facilitate adaptive effectiveness reside primarily within the cybernetic domain of the military system.³⁰

Shaping the substantive agents of *intelligence, command and control, and information* operations provides evolutionary advantage to the military system. These three areas represent sub-systems critical to adaptation. The intelligence sub-system provides data about the adversary, the environment, and the military system itself necessary for learning and anticipation. To adapt to changing conditions, the system must know that change has occurred. Intelligence, in essence, provides the required feedback from the complex of interactions within and upon the system. Based upon this knowledge, the

command and control sub-system directs the reorganization of the building blocks, the combat and support components, within the overall system. It furnishes the purpose or overall goal to unite and guide the future actions of these individual components. This is the critical role of leadership, an essential element of the command and control sub-system, in an adaptive military organization. The information sub-system then conveys this goal and knowledge about the changing environment to elements within the system to ensure their mutual cooperation.³¹ Additionally, it presents a perception of the system to outside agents to affect the evolution of the operational environment. The information sub-system is the conduit for feedback to and from the system. These three sub-systems thus work hand in hand allowing the system to adapt: intelligence operations gather data about past, present, and future; command and control processes this data into meaningful actions and directions; information systems disseminate these directions to agents both within the system and in the outside environment. An alternative way of viewing these three components essential to military adaptation is the intelligence sub-system provides feedback, the command and control sub-system provides purpose and organization, and the information provides “feedforward” to the system and its environment (see Figure 1).³²

Optimizing each of these sub-systems maximizes the adaptive efficiency of the system as a whole. Maximizing adaptiveness requires not only efficacy, but also speed. A military system must not only functionally adapt to its dynamic surroundings, it must also adapt quicker than its adversary. Like other living systems, the military system must contend with an opposing system that is also adaptive and is, in the creative dance of

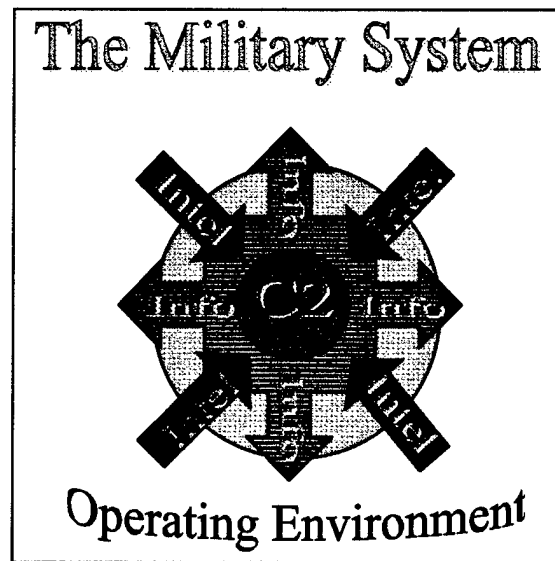


Figure 1

coevolution, seeking to gain an advantage over its opponent.³³ Military operations are not aimed at static, unchanging adversaries. They are aimed at dynamic, thinking, similarly adapting systems with hostile intentions.³⁴ The field of military operations, the battlefield, is after all a competitive environment.

Given the requirements for successful adaptation, the level of adaptive effectiveness of a military system (past, present, or future) can be measured to determine its stamina under the stress of increasingly complex military environments. Adaptive potential can thus be weighed using three criteria. First, intelligence systems provide accurate data about the changing operational environment in a manner that allows the timely adaptation of the system. Second, command and control systems furnish a unifying purpose to the system as a whole and allow for flexibility and initiative within the system. Finally, information systems rapidly disseminate feedback in the form of both knowledge and guidance between systems components to contend with the ever-changing environment.

By molding these cybernetic elements, the military system can improve its adaptive effectiveness within an increasingly complex environment. Using these three interwoven parameters as a historical measure, this study examines the American intervention in Siberia from 1918-1920 for evidence of tactical military adaptation within the complex environment of MOOTW.

The Siberian Intervention, 1918-1920

*Peace hath higher tests of manhood
Than battle ever knew.*

John Greanleaf Whittier, The Hero

Although the Armistice of November 1918 signaled the end of the “war to end all wars” against Germany, it did not bring a definitive end to Allied military operations. The war-weary West found itself still mired in the chaos of the Russian Civil War with British, French, and American troops in Northern Russia around Archangel while Japanese, British, French, Polish, American, and forces of various other nationalities were in the Russian Far East near Vladivostok.³⁵ Russia, in turbulent transition since February 1917, had left the war against Germany in October 1917 with the arrival of Lenin and the Bolsheviks and their offers of “peace, land, and bread”.³⁶ Lenin was initially unwilling to accept German terms of peace. On 3 March 1918, however, the Bolsheviks, under military duress, signed the harsh and punitive Treaty of Brest-Litovsk, losing two million square kilometers of territory that provided nearly one third of Russia’s agricultural output and was home to nearly 60 million of its inhabitants.³⁷ No longer subject to the demands of a two-front war, Germany was free to concentrate its

forces against the Western Allies. Lenin, Trotsky and the Bolsheviks, unfettered by the war against the Central Powers, could focus on eliminating the disparate elements of White opposition to their foundering Communist regime. In this complex concoction of political and military agents and relations, the Allies saw cause to add their own mixture of military forces.

In his book *The Art of War*, Baron Antoine de Jomini a preeminent Swiss military theorist of the nineteenth century, identifies three essentials in wars of intervention: "...to secure a general who is both a statesman and a soldier; to have clear stipulations with the allies as to the part to be taken by each in the principal operations; finally, to agree upon an objective point which shall be in harmony with the common interests."³⁸ The Allies met none of these strategic essentials during the Russian intervention. Each participant in the first anti-Teutonic, but later pro-Russian intervention had their own agenda that competed with the agenda of their co-interventionists; furthermore, all saw profit in refraining from clearly and openly delineating individual responsibilities and objectives.³⁹ Histories of the intervention typically associate each agent with distinct, self-serving motives. The French sought to relieve pressure from the Western Front by reopening an Eastern Front against Germany. The British, agreeing in principle with the French, campaigned to rid the Bolshevik scourge from Russia, continuing to actively promote and encourage the intervention even after the end of the war with Germany. The Japanese saw an opportunity to build upon their new-found status as a world power by playing on the weakness of Russia in eastern Siberia, where they had fought the Russians just thirteen years earlier in an attempt to cleanly separate overlapping spheres of interest. The Americans, torn between Wilsonian idealism and the wartime demands of

realpolitik, were unenthusiastic about intervention in the internal affairs of Russia yet willing to assist their wartime allies and maintain watch with a suspicious eye over competitors for post-war influence.⁴⁰

These simplified and reductionist explanations of strategic causation fail to adequately portray the depth of the complexity of the intervention. An examination of any one agent in the operation must necessarily account for its relationships within the complex of agents to arrive at a clearer understanding of historical cause and effect. Within each country there was intense wrangling over the wisdom of intervention and its intended effects. In the United States, the Secretary of War Newton D. Baker counseled against sending military forces into Russia.⁴¹ General William S. Graves, the commander of the expedition to Siberia personally recommended to Wilson by Secretary Baker, was an exemplary soldier but drew complaints from Allies about his brusque manner and unwillingness to compromise.⁴² His interpretation of American policy vastly differed from that of the State Department, greatly complicating the diplomatic process. Viewed either under the lens of complexity theory or traditional criteria offered by Jomini, the lack of common purpose and intentions predestined the intervention in Russia to strategic failure from the outset.

In the famous *aide-memoire* issued to Allied ambassadors on July 17, 1918, the American government approved participation in the intervention and outlined acceptable reasons for “military action” in Russia.⁴³ American military intervention in Russia would only be admissible to extricate Czech forces trapped in Russia attempting to reach the Western Front, to guard Allied military stores at the various ports, and to aid the Russian people themselves in “self-government and self-defense”. The Czech Legion consisted

of 65,000 Czech and Slovak soldiers, originally recruited from Austro-Hungarian POWs and organized to fight against the Germans, that later challenged Soviet authorities along a 4000-mile stretch of the Trans-Siberian railroad.⁴⁴ Clearing the Trans-Siberian between the Czech Legion and Vladivostok might rescue a sizable combat force for employment in the West against the Germans and facilitate the delivery of supplies stockpiled in Vladivostok (some 725,000 tons valued at \$750 million)⁴⁵ should the Russians choose to reopen the Eastern front.⁴⁶

Behind the muddled contents of the *aide-memoire* (which Russians were the Allies to aide in organizing their self-defense?) were unspoken reasons for intervention, both political and economic. Under the guise of “The Russian Railway Service Corps”, led by Colonel George Emerson, some 350 American railway engineers had already been in the Far East since February 1918 assisting Russian railroad operations.⁴⁷ Beginning in April 1918, the Japanese had landed a sizable force in the Russian Far East, ostensibly to live up to their alliance agreements with the Western powers against Germany.⁴⁸ Wary of Japanese intentions, fearful of the closing of the American “Open Door” in China, and pressured by the British and French to live up to her own alliance obligations, the United States committed forces to Siberia.

As commander of AEF in Siberia, Major General William S. Graves faced the daunting task of translating these equivocal instructions into concrete military guidance. Handing him the *aide-memoire* during a secret meeting at a train depot in Kansas City, Secretary Baker warned Graves: “Watch your step; you will be walking on eggs loaded with dynamite.”⁴⁹ Military adaptation to complex and chaotic conditions requires a clear statement of purpose; Graves was responsible for deriving this “unifying determinant” for

the military system deployed into Siberia.⁵⁰ For Graves, the instrumental part of the *aide-memoire* was the dictum of non-interference with Russian sovereignty. Graves translated non-interference into impartiality and neutrality and steadfastly stuck to this position throughout his nineteen months as commander of the American Expeditionary Force (AEF) in Siberia.⁵¹ Although drawing the anger of practically everyone else involved, Graves' steadfastness, in fact, provided a unifying purpose for the AEF in Siberia to guide its tactical adaptation to the dynamic environment.⁵² In the absence of any updated guidance, Graves' inflexible adherence to his interpretation of stated policy, although arguably a contributing factor to strategic failure by straining relations within the political-military system, provided direction for effective adaptation within the dynamic and confusing tactical environment.

Under Graves' command, the AEF in Siberia was drawn from two understrength infantry regiments, the 27th and 31st, from the Philippine Islands whose combined strength of 3100 was less than the authorized strength of a full regiment. Graves received orders to bolster these units with an additional 5000 troops from his own 8th Division stationed at Camp Fremont, California. Included in this pile of building blocks that Graves would organize into a military system were a field hospital (including 17 female nurses), an ambulance company, a telegraph company, along with staff and intelligence personnel from the 8th Division.⁵³ All of the nearly 9000 troops that eventually filtered in and out of Siberia were Army regulars; only 5000 of these were truly "combat troops".⁵⁴ These units set sail for Vladivostok beginning August 7, closing out the deployment on September 29.

American troops got their first taste of their chaotic operational environment upon arrival in Vladivostok in late August 1918:

When American troops walked down the gangplanks at Vladivostok, they entered a world in which chaos was the normal state of affairs. The city teemed with thousands of military and civilian personnel from more than a dozen nations, and no one was in charge. In order to safeguard their rear, the Czechs had recently overthrown the local administration, which they suspected of being too friendly toward the Bolsheviks. Adding to the disorder were uncounted tons of supplies and equipment strewn about the city and the surrounding hillsides. Mouldering bales of cotton lay next to uncrated automobiles and machinery of all kinds. Vladivostok was a microcosm of Siberia: the old order had broken down and nothing stable had arisen to take its place.⁵⁵

The 9000 American troops were joined in Siberia by some 72,000 Japanese, 65,000 Czechs, 12,000 Poles, 4200 Canadians, 4000 Romanians, 4000 Russian auxiliaries, 2000 Italians, 1600 British, and 760 French by the end of 1918.⁵⁶ On 18 August, General Kikuzo Otani, the Japanese Commander-in-chief, informed Colonel Henry D. Styer, the acting commander of AEF in Siberia in the absence of Graves, that Allied powers had entrusted him with supreme command of Allied forces in the Far East, to include the American contingent.⁵⁷ Given that Japanese troops outnumbered American forces by a margin of nearly ten to one, Colonel Styer, in the absence of higher guidance, chose to obey. Under Otani's orders, elements of the 27th Infantry began work as railroad guards between Vladivostok and Nikolsk-Ussuri, while the 31st Infantry moved into quarters in Vladivostok. On September 1, Graves arrived on scene only to find his units taking part in "combined action against the enemy."⁵⁸ General Graves quickly corrected Otani's error of command, informing him of limitations placed upon the use of American troops and the necessity for Graves to give all orders for future movements.⁵⁹ So began the expedition that General Graves would later label "the Siberian adventure".

The Americans found an opposing system in Siberia that was in reality a confusing conglomeration of numerous agents, each acting for their own diverse interests, united only in opposition to American intervention.⁶⁰ In the summer of 1918, there were no less than 30 governments in existence in Russia.⁶¹ Buffered by the vast distance from the Bolshevik capital in Moscow, pillaging bands of peasants and partisans roamed Siberia recognizing no authority beyond their own. The Czechs, portrayed by the *aide-memoire* as in need of help, were strung along the entirety of the Trans-Siberian railroad and had seized control of the city of Vladivostok at its easternmost reaches. White forces under the self-proclaimed Russian dictator Admiral Aleksandr Kolchak dominated the western end of the Trans-Siberian from his seat of power in Omsk.⁶² Further east, two Cossack chieftains, Semenov and Kalmykov, both known for their barbarity and the atrocities committed by their forces and nominally under the command of Kolchak, attempted to fill in the gaps along the railway left by the Czechs, Japanese, and the Russians. The success and prosperity of the American military system in Siberia depended upon its ability to adapt to this hostile and dynamic environment. The environment became even more confused with the signing of the German armistice on November 11, 1918 that cast a dark shadow over the legitimacy of American intervention as outlined by Wilson's *aide-memoire*.

By November 1918, most of the fighting associated with the initial Japanese and American push along the railway toward the "Ussuri front" had subsided. The AEF in Siberia settled into what became their primary tasks: railroad garrison duty, care of prisoners of war, and guarding the stockpiles of Allied supplies at Vladivostok. In the spring of 1919, the United States signed the Inter-Allied Railway Agreement concerning

the guarding of the Trans-Siberian Railroad that placed American forces along 316 miles of widely separated sections of the railway: elements of the 31st Infantry covered the line from Vladivostok to Nikolsk-Ussuri; other units of the 31st guarded from Ugolnaya to the Suchan Mines; the 27th Infantry was responsible for the railroad from Spasskoe to Ussuri, and also from Verkhne-Udinsk to Mysovaya, some 1700 miles further to the west.⁶³

From May through August 1919, strikes, riots, and partisan guerrilla activities plagued the garrisons at Ugolnaya, Ussuri, Razdolnoe, the Suchan Mines, and Shkotovo, resulting in the heaviest casualties of the expedition. Several of these attacks came from Cossack forces whom General Graves suspected his Japanese “ally” had encouraged in order to drive the Americans out of Siberia.⁶⁴ Conditions became so bad that American troops withdrew from the Shkotovo sector and the Suchan Mine area in August, in opposition to British calls for expanded American involvement to keep the lifeline open to anti-Bolshevik forces in Western Siberia and to counterbalance Japanese influence.⁶⁵ Despite rumors of a total American withdrawal propagated by the Japanese press,⁶⁶ other American forces maintained their stations until January 9, 1920 when the War Department ordered the entire AEF to concentrate in Vladivostok for transportation to Manila. On April 1, 1920, General Graves closed his headquarters and the last American units departed from Siberia.

Strategically, the mission had strained and collapsed under the weight of complexity. Although the Czechoslovak Legion was completely withdrawn from Siberia by May 1920, it did not make any positive military contribution either to the war against Germany or in stabilizing the situation in Russia. Those Allied stores in Vladivostok not

used by American troops or delivered to the failing Kolchak regime, for the most part, dwindled in place. Limited transportation assets prevented withdrawal of little beyond individual equipment.⁶⁷ Having intervened to keep a watchful eye over the Japanese, it was the Japanese who remained in Siberia to watch American troopships pull out of Vladivostok as a Japanese military band seated on the docks played the popular American song “Hard Times Come No More”.⁶⁸ Although they had carried away some eighty new Russian brides, American troops had in the end done little to aid the Russian people in “self-organizing and self-defense”.⁶⁹

As in other MOOTW environments, the tactical military mission was intricately tied to the complex of national strategic policy. In the words of one participant, the intervention was one of “political motives rather than military necessity.”⁷⁰ Military victory in the traditional sense was dependent upon political success, not just military effectiveness. Tactical success could not be defined in conventional military terms: a decisive battle against an enemy center of gravity. Instead, success hinged merely upon the political impacts of American military presence and the negative objective of unmolested survival. In essence, tactical success meant the avoidance of failure or in other words, the prevention of systemic breakdown.

The AEF in Siberia did avoid a systemic breakdown, despite the stress placed upon the military system. Tactically, the intervention had cost the U.S. Army 35 combat-related deaths, 135 deaths due to disease, 52 wounded and 50 deserted. Given the complex and chaotic nature of the operation, the length of the expedition (20 months), and the dispersion of troops, these casualty figures are remarkably low.⁷¹ Although smaller in number and of shorter duration (10 months), the North Russian Expedition

experienced 144 combat-related deaths, 100 deaths due to disease and 305 wounded in action.⁷² U.S. Army Chief of Staff Peyton C. March recognized the tactical accomplishments of the AEF in Siberia:

The situation which confronted the commanding general, his subordinate commanders, and troops was a particularly difficult and hazardous one. The manner in which this difficult and arduous task was performed is worthy of the best traditions of the Army.⁷³

This tactical success in Siberia was due at least in part to the military system's ability to adapt within the chaotic and complex operating environment. Although not perfect, this adaptation was at least good enough to avoid systemic breakdown at the tactical and operational levels.

Having outlined a theoretical background and described the nature of the operational environment, this study will now examine the substantive elements within the cybernetic domain of the military system deployed to Siberia, and then selectively present examples of tactical adaptation within the chaotic MOOTW environment. The first necessity of adaptation to changing environmental conditions is recognition that change has occurred. This is the function of the intelligence sub-system of the military system.

Intelligence and Adaptation

The intelligence sub-system of the military system facilitates adaptation by providing knowledge about the environment and an awareness of change in the environment requiring adaptation. To promote adaptation to change, the intelligence sub-system must provide accurate data about the environment in a manner that allows timely and responsive adaptation of the system. Faced by an obscured and confusing environment,

the intelligence sub-system of the AEF in Siberia met the challenge, providing the necessary understanding required for adaptation.

A lack of knowledge of the operating environment plagued General Graves and the AEF in Siberia before the arrival of the expedition. Graves later wrote: "Up to the time of my arrival in Vladivostok, I had received no information as to the military, political, social, economic, or financial situation in Russia... I have often thought it was unfortunate I did not know more of the conditions in Siberia than I did when I was pitched into the melee at Vladivostok."⁷⁴ This lack of knowledge and understanding of the situation also extended to the War Department as a whole. At one point a War Department staff officer ordered one American officer to report to Archangel via Vladivostok despite the some 6000 miles and the intense civil war that separated these two cities.⁷⁵

Upon arrival in Vladivostok, Graves set to work building a formal intelligence system to provide him with a better understanding of his operating environment. The Intelligence Section of the AEF in Siberia landed in Vladivostok on 15 August 1918. It consisted of 51 enlisted men selected for their knowledge of languages, a detachment of 18 enlisted men of the Engineer Corps with equipment for mapping and map reproduction, and 18 enlisted men of the Signal Corps to maintain communication from the field. Five officers accompanied this group of enlisted men, the senior in command being Major David P. Barrows.⁷⁶ On 29 September, the unit was augmented by the addition of sixteen officers and fifteen Army field clerks specially selected by the Military Intelligence Division in Washington.⁷⁷ The Intelligence Section was centrally

located in Vladivostok, but dispersed agents as far away as Omsk some 1700 miles to the West.

Obtaining tactical intelligence was extremely difficult given the vastness of the operations area and the nature of the situation. A majority of the marauding forces that threatened the American garrisons up and down the rail lines wore no distinctive uniforms and “were difficult to distinguish from other natives”.⁷⁸ To develop their understanding of the environment, the Intelligence Section compiled detailed reports for each of the various significant villages along the railways. These reports included intelligence about local military, political, and economic conditions and stressed in particular analysis “...as to local personalities, their political affiliations, military and civil, history, education, attitude toward the United States and other Allied Governments, etc.”⁷⁹ These snapshots of the tactical operating environment were written not only by the Intelligence but also by local commanding officers. Local units sent the reports telegraphically to Vladivostok each week and as necessary to report important political changes in the situation.

Even more important than this formal intelligence mechanism was the informal intelligence gathering system. The AEF in Siberia relied on intelligence from other agents from the external environment to shape their understanding. These informal sources included liaison with Allied militaries and foreign ministries, civilians living in and around Vladivostok, and summaries collected from local newspapers. Colonel Emerson and the Americans in the Russian Railway Service provided essential maps collected from the Russian General Staff collection that served as the primary cartography throughout the operation.⁸⁰ In a coevolutionary manner, these relationships

with other agents in the environment proved the best source of knowledge about the environment for the military system in Siberia.

The real problem with this informal intelligence was authenticating its veracity.⁸¹ Graves lamented, "In a situation such as existed in Siberia, one is very frequently confronted with statements designed to deceive, and the facts are unimportant when such efforts are undertaken."⁸² General Graves was particularly wary of information coming from the Japanese, since he suspected that they were twisting their intelligence reports to draw the Americans further into the struggle and further their own national interests.⁸³ To remedy this information bias, General Graves and the AEF in Siberia increased the quantity of available information to improve its reliability, openly promoting the free-flow of information by allowing various characters off the streets of Vladivostok and elsewhere to wander in to the AEF Headquarters to present their views on the situation.

In at least one instance, this free flow of information proved invaluable to military adaptation. In September 1919, General Horvath, a former Tsarist officer in charge of the Russian railways in China, came to General Graves with reports that the Cossack Kalmykov, with the moral support of the Japanese, was going to attack several dispersed detachments of Americans along the railroads. Graves confirmed this intelligence with other information collected from the Foreign Minister of Kolchak's Omsk government, the head of the local Zemstvo government, and a Colonel of the French Army. Graves then precluded the attacks by delivering a stern warning to Kalmykov's Cossacks and requesting an apology for an earlier incident against an American corporal.⁸⁴

The intelligence system was perhaps too good at accurately depicting the operating environment. The State Department refused military intelligence as a source of

information, instead relying on reports from their own agents and Allied representatives. Military intelligence correctly portrayed anti-Bolshevik elements as weak, disparate, and failing, a view the State Department felt hindered its attempts to turn the expedition into a crusade against Bolshevism.⁸⁵ With the lack of a need for conventional military intelligence and the success of the informal system of intelligence gathering, the Intelligence Section in Vladivostok was reduced in January 1919 to one commissioned officer (a 2nd Lieutenant) and a skeleton staff of clerks and enlisted personnel.⁸⁶ The Signal Corps took over photographic work and communications previously handled by members of the Intelligence Section. Adapting to the unconventional environment and the success of the informal intelligence system, the formal intelligence system became less important to the operation.

Despite success, there were also deficiencies in the intelligence gathering system. With the Intelligence Section centrally located in Vladivostok, American units dispersed along the railways were often left without a clear picture of their rapidly changing local environment. These units adapted by organizing a system of reconnaissance patrols consisting of not less than one non-commissioned officer and three men, sent out each morning one hour before daybreak and patrolling along a different route each day to a distance of about one mile.⁸⁷ With the drawdown of the formal intelligence collecting system in Vladivostok, there was an associated decrease of available military intelligence, a gap the informal system was hard-pressed to fill. In August and September 1919, General Graves himself, accompanied by the State Departments Consul from Vladivostok, traveled all the way to Omsk along the Trans-Siberian Railway in search of information about the changing situation.⁸⁸ On 2 September 1919, the Chief of

Staff of the AEF in Siberia, Col. C.P. Robinson issued a memorandum imploring all local commanding officers to continue intelligence reports to Vladivostok as per earlier instructions.⁸⁹ This dearth of intelligence contributed to the rash of attacks the AEF suffered during the summer in the Suchan Mine district, a time Graves referred to as “the stormy petrel of all our Siberian experiences”.⁹⁰ Learning about the increasingly hostile nature, especially after the “Romanovka Massacre” in which a platoon of the 31st Infantry was nearly wiped out by Bolshevik forces, was gained as much by direct experience as by formal intelligence channels.⁹¹

Nevertheless, despite these shortfalls, the effective work of both the formal and informal intelligence sub-system adequately provided knowledge of the changing environment required to facilitate adaptation to agents within the system. An intelligence system designed to collect conventional military information had favorably adapted itself in a coevolutionary dance with other agents and systems to the unconventional nature of the operating environment. Having been provided with the necessary knowledge of the changing environment, the system next required an adaptive command and control sub-system to act upon this knowledge.

Adaptive Command and Control

To facilitate adaptation of the military system, command and control sub-systems should provide a unifying purpose to the system as a whole without overly constricting local agents. Using measures such as mission type orders to decentralize control, command and control sub-systems allow for flexibility and at the local or tactical level where it is most needed.⁹² Truly adaptive command and control systems, recognizing the

inherent uncertainty accompanying complex military operations, are weighted toward command, not control.⁹³ Control within an adaptive system is more likely than not implicit rather than explicit. The key to surviving in the midst of chaos is not to vainly attempt to regulate friction and uncertainty through extensive planning and control measures, but rather to provide command and leadership that allows elements within the system the autonomy to quickly adapt to ever-changing circumstances. The goal of command and control in a complex environment should not be to impose order, precision, and certainty, but instead to facilitate a continuous repeating loop of guidance and feedback necessary for effective adaptation.⁹⁴

Under the leadership of General Graves, the command and control system of the AEF in Siberia was largely decentralized and allowed for initiative of subordinate agents. The spacious buildings of a former German mercantile company in Vladivostok served as the main headquarters of the AEF in Siberia for the duration of the mission.⁹⁵ The headquarters of the 27th and 31st Infantry Regiments were located at various locations along the railways as the mission progressed. General Graves saw his primary role as commander as defining the mission or purpose for the American military system deployed in the Russian Far East. The political nature of the intervention, the intentional ambiguity of the *aide-memoire*, and the very short meeting with Secretary of War Baker in Kansas City made defining the military mission a difficult exercise. By Graves' reading, the unifying purpose of the AEF was to provide an American military presence that refrained from interference in Russian internal affairs and was impartial to all parties. Graves' steadfastness to the principle of impartiality gave troops of the AEF a guiding vision with which to mold their tactical adaptations to the chaotic environment.

In as much as was possible, Graves' tried to mold additional taskings, duties resulting from the dreaded creep of politically-oriented MOOTW scenarios, within this rubric of impartiality. Protecting military stores in Vladivostok and guarding the Suchan mines to provide stability to the local area arguably met the criteria of impartiality. Guarding the railways under the Inter-Allied Railway Agreement of January 1919 was not impartial to all parties since keeping the railways open and clear of marauding Bolsheviks greatly benefited Admiral Kolchak, the "supreme leader" of the White forces in Omsk. The agreement resulted not only in open hostility from Red forces, but also ill feelings on the part of White forces who thought that the Americans were not doing enough. Graves reported that feelings against the Americans "...were now becoming so bitter that each faction claims that if you are not with them you are against them."⁹⁶ Graves recognized this conflict between the new environment and the original purpose of the mission, recommending either strengthening the force to win the fight against the Reds (thus changing the original intent of the mission) or withdrawal since impartiality was now impossible.⁹⁷ Denied either option, Graves' only choice was to continue to precariously follow the original aim of impartiality until the withdrawal in January and February of 1920.⁹⁸

Despite Graves' endeavors to clearly communicate his vision of impartiality, there was still confusion about the American position in the minds of many of his subordinates, especially after the Armistice in November and the signing of the Inter-Allied Railway Agreement that scattered the AEF across the Trans-Siberian railway. Although open-ended, goals for the system should be clearly defined and unambiguously communicated to provide a unifying sense of the adaptation required and where this adaptation should

lead the system.⁹⁹ This may be the single most difficult task facing the military commander in complex MOOTW environments. Although Graves had pondered extensively over the *aide-memoire*, he apparently did not share the full text with his subordinates.¹⁰⁰ One of Graves' imperfections in facilitating adaptation was this failure to use a more collaborative style of leadership. By closely holding guidance from higher authority, Graves failed to fully exploit the relationships between the many agents of the system to more clearly discuss, define, and communicate the purpose of adaptations within the challenging environment.

Having struggled to define a guiding purpose, Graves allowed local commanders to exercise initiative under the umbrella of his overall intent. In June 1919, as two battalions of the 27th Infantry under the leadership of Colonel C.H. Morrow, moved to Trans-Baikal in accordance with the Inter-Allied Railway Agreement, they came into direct contact with the forces of Cossack leader Semenov. Semenov came into the American sector and arrested some Russian railway employees on the grounds that they were Bolsheviks. Morrow, known for his toughness¹⁰¹, notified him that he would not allow the arrests to take place. Semenov responded indignantly that no foreigner could tell him what he could or could not do in Russia and that he intended to repeat his former act. Morrow then deployed his 37mm artillery pieces (the largest caliber at his disposal) on each side of the railroad, threatening to destroy Semenov's armored train if it approached. Graves, although worried about the lack of firepower available to make good upon Morrow's threats, decided "...not to take any part in the controversy and let Morrow handle it."¹⁰² Graves' trust in Morrow paid off. Semenov cowered before Morrow's bluff and did not return. Colonel Emerson of the Russian Railway Service

Corps later commented that "...were it not for the firm stand taken by Colonel Morrow to protect our officers assigned in that district, I am satisfied they would have been annihilated by the renegade bands operating under Semeonoff [sic]."¹⁰³

Although allowing freedom of action for his subordinates, Graves nevertheless exercised explicit control as necessary when individual agents deviated from the defined purpose of the military system. In January 1919, Colonel Henry D. Styer, commander of the 27th Infantry found himself protecting three hundred Russians who had deserted from the White Cossack leader Kalmykov. Styer proposed turning the deserters back either to Kolchak or Horvath for reorganization or discharge. Graves, suspecting that the men would end up in the vengeful hands of Kalmykov, directed Styer to leave the question of the men's disposition to their own decision and that the Americans should take no part. The result of Graves' intervention was the eventual release of all deserters and the avoidance of a direct clash with Kalmykov's remaining forces and their Japanese supporters, a clash that would have been disastrous for the mission.¹⁰⁴

Self-discipline provided a means of implicit control over American actions. Major Sidney C. Graves reported one incident where a Japanese officer with an infantry company and two artillery pieces unsuccessfully tried to talk him into taking his troops along with them to attack a Bolshevik force. The Japanese force was not heard from again and presumably destroyed by the Bolsheviks.¹⁰⁵ Although decentralized, control was not entirely absent, coming both directly from AEF Headquarters and self-imposed by individuals acting within their understanding of mission intent.

Decentralized command and control systems require increased judgement and decision-making at the lowest levels of command. In Siberia, this requirement created a

degree of uneasiness and anxiety amongst soldiers in the field. Facing the fuzziness of a complex MOOTW intervention, many subordinate agents desired more detailed planning and clearer guidance from higher on acceptable actions. Captain Owen Rhoads, a tactical participant in the Suchan Mine district, complained of the lack of military necessity, the indefinite character of instructions, and the predominantly political nature of the mission. "Troops were sent to perform tasks with no knowledge of a general plan."¹⁰⁶ The intentional absence of an overall plan, however, was an implicit acknowledgement of the complexity of the mission and the inability to precisely predict and plan for future events. Trained for a trench war in France where initiative was less important than detailed planning and strict obedience to the plan, soldiers were uncomfortable with the political nature of the intervention and the need to exercise individual judgement in the absence of higher guidance.¹⁰⁷

Although somewhat problematic, the American command and control system in Siberia met the basic criteria for adaptive effectiveness. Under the leadership of General Graves, the system developed a unifying purpose and then allowed the agents of the system to adapt locally to changing environmental conditions so long as their actions fell within the framework of the overall purpose of the system. Graves did not try to deterministically control the chaos and uncertainty of the operation through overly detailed planning, but instead left the details of adaptation to the initiative of subordinate agents. Graves intervened as necessary to guide adaptation, but for the most part, left local agents to their own innovation to meet the challenges presented by the complexity of the operating environment. What was problematic was not Graves' formulation of a unifying purpose or his method of command, but rather the system's inability to

effectively communicate information flowing from the command and control sub-system both internally and externally.

Information Operations

Having learned about changes in the environment and organized its behavior to meet these changes, the military system must next communicate its actions to adapt effectively. This communication, both internal and external, is the critical role of the information sub-system within the military system. To be adaptive, the information sub-system should rapidly disseminate “feed-forward” in the form of both knowledge of the environment and unifying guidance internally between systems components. Internally, this information aids the system in its self-organization. Externally, the information sub-system is responsible for shaping a perception of the military system to outside agents to affect the evolution of the operational environment. Internal and external roles of information are not always clearly divided. Messages intended for the external environment are usually received and interpreted by internal agents as well.

The crux of information lies in these interpretations. As it flows across the system, information is important not for the quantity of data it conveys, but rather for the quality of meaning it presents. The measure of effectiveness is not how much information there is, but how well it is used.¹⁰⁸ Given the tangled web of information that enmeshes all agents of the system and lashes the system to the environment, this effectiveness can be difficult to measure. Information is not, as reductionist models often portray it, a unidirectional phenomena, but is instead a continuous loop of “feedforward” and “feedback” interspersed with nodes of interpretation.

The substantive agent that acted as the conduit for information in the AEF in Siberia were detachments of the Army Signal Corps, primarily Company D, 53rd Telegraph Battalion of the Army Signal Corps that arrived in Vladivostok on 14 September 1918.¹⁰⁹ The physical means of communicating internal information within the AEF consisted of telegraph, telephone, and even, as was the case in Vladivostok and the Suchan district, Russian messengers.¹¹⁰ By 4 September 1918, this communications network was open from Vladivostok as far as Irkutsk.¹¹¹ The communications infrastructure was primarily tied to the rail lines, so as troops distanced themselves from the rail lines, communication of information became more difficult and less reliable.

There were other technological and physical limitations of these conduits of information. The immature levels of technology and the rigors of climate in Siberia resulted in frequent interruptions to telegraph and telephone service. The telegraph lines presented easily accessible targets for marauding partisan bands. Not only unconventional forces, but also the Japanese presented blocks to the internal dissemination of information. At one point, the Japanese tried to coerce the United States to pay for messages carried across the wires through their sectors, first in money, then in food and supplies.¹¹² All of these factors reduced both the clarity and timeliness of information to and from the field.

General Graves claims that the willingness to openly receive the messages he conveyed also hindered the flow of information within the AEF in Siberia. Frequently, the only way to pass information along the rail lines was through diplomatic or consular agents. "If these agents had a closed mind, which was almost universally the case, it was not difficult for them to accept what information that came to them tending to show a

need for intervention, and discard, as propaganda, all information opposed to their view, and this could be done with the most honest intentions and with a sincere conviction that they were advancing the interests of their government.”¹¹³ Troops on the ground also interpreted messages from Headquarters in Vladivostok according to their own local vision of the situation. Thus, technological limitations, opposing objectives, and differing interpretations frequently clouded internal information, preventing the acuity of guidance Graves struggled so hard to provide.

The AEF in Siberia used information in several ways to shape the external environment. Before occupying the various American sectors in accordance with the railway agreement, General Graves distributed a proclamation, in Russian, throughout the villages and towns along the rail lines.¹¹⁴ The proclamation contained both reassurance and warning. It reassured that “All will be equally benefitted...irrespective of persons, nationality, religion, and politics” but warned that “...interference with [railway] traffic will not be tolerated.” The immediate protests from representatives of the State Department showed the extent of the information’s circulation and its accuracy in portraying Graves’ intended message of impartiality to the Russian people. Mr. DeWitt C. Poole, the head of the Russian Division of the State Department, openly criticized Graves for using the words “irrespective of party” and thus including the Whites with the Bolsheviks.¹¹⁵ Information intended for one external audience was consumed and unfavorably digested by another.

Another way of providing information to the external environment, especially applicable to the local or tactical level, was through direct action. Colonel Morrow’s actions at Chita against the Cossack Semenov were one example of giving a clear signal

to the outside environment through direct action. In one participant's view, "American prestige was positively enhanced by positive aggressive actions against every potential enemy."¹¹⁶ Another method was through the use of liaisons with the various environmental agents both in Graves' Vladivostok headquarters and in units in the fields. When a mutiny occurred among Russian troops in the Suchan Mine area in the fall of 1919, American units were forbidden from intervening but one squad with a telephone was positioned inside the Russian headquarters to facilitate the flow of information.¹¹⁷ Through each of these means, the military system in Siberia exchanged information with the outside environment to enable learning and to shape the operational situation.

Just as with the internal dissemination of information, the AEF in Siberia faced several challenges in distributing information and shaping perceptions in the external environment. Perhaps the biggest challenge was combating opposing information designed to adversely shape the operational environment. The American military system faced hostile information systems that actively sought to prevent its adaptation through the manipulation of information. The Japanese military and the Japanese press launched a coordinated information campaign in order to impel the Americans toward a more aggressive stance against the Bolsheviks and to generate resentment against the American presence in Siberia.¹¹⁸ Soon after his arrival in Vladivostok, General Graves met with General Nakajima of the Japanese Army who innocently suggested that any important messages communicated to Washington should also be communicated to Tokyo and promised that the Japanese would do the same. Graves, unwilling to play the Japanese information game, asked for the Japanese to deliver a dispatch to the Americans first; their scheme exposed, the Japanese never carried out this "innocuous" exchange of

information.¹¹⁹ In April of 1919, the Japanese press published an accusation that American troops had stood by idly as their Japanese ally had been slaughtered by a Bolshevik contingent.¹²⁰ These biased and untrue reports eventually found their way to the American press, creating resentment toward Graves and further confusion concerning the mission.¹²¹ The source of propaganda aimed against the Americans was not limited to the Japanese. The situation at one point became so severe that a Russian liaison with the American headquarters offered to stop the propaganda from the Russian Army for a bribe of twenty thousand dollars a month.¹²² In the competition with external agents for advantage over the environment, conveying a clear purpose to guide adaptive actions proved a difficult proposition.

Of the three criteria for adaptive effectiveness, the military system in Siberia was most lacking in the area of information. Despite Graves' best intentions, both situational knowledge and clear guidance were often not transmitted to internal and external agents in a timely manner due to technological, organizational, and political factors. In one example of the tardiness of internal information, troops were forced to wear heavy muskrat hats in sweltering heat because the headquarters had not yet "taken official notice of improving temperatures."¹²³ Guidance concerning tactical actions of troops was often reactive, not proactive, tending to be delivered after the fact either as admonition or praise.¹²⁴ Lacking clear and timely information, local agents were often left to adapt of their own accords, often diverging from the unifying purpose of the system. Hindered by the reactive nature of the flow of information, adaptation was thus not as effective and efficient in Siberia as it might otherwise have been had the military system more proactively shared and distributed information to internal agents of the system.

Further Examples of Tactical Adaptation

According to military theorist John R. Boyd, both cognitive *decisions* and physical *action* are critical for coping within a challenging environment.¹²⁵ The preceding study of the cybernetic domain focused primarily on the background, conduct, and dissemination of decisions; assessment of adaptive effectiveness, however, also requires a brief exposition of adaptive actions. Although admittedly limited and somewhat selective, this paper will now present several additional examples of tactical adaptation by the AEF in Siberia from 1918 to 1920.

American forces arrived in Siberia with a traditional operationally oriented mindset. Expecting to find a clearly defined enemy who operated in similarly traditional military ways, the AEF found only disorganized bands of marauding partisans and even greater threats from Allies, climate, and disease. The prescribed format for war diaries, the official record of combat action forwarded to the War Department, was well-suited for conventional military campaigns, but not for the intervention in Siberia. Almost from the beginning, the war diaries coming out of Vladivostok adaptively diverged from the format stipulated in regulations, containing more about economic, political, and social conditions in Siberia than combat actions. The war diaries would also include English translations of pertinent items from Russian, Japanese, and Chinese newspapers published in or near eastern Siberia.¹²⁶

Tactically, after suffering casualties in hit and run raids by partisan forces, the AEF developed better methods to defend isolated garrisons. American forces contracted Russian laborers to build blockhouses consisting of two concrete walls with sand in between, surrounded by dirt abutments. Where materials or labor were not available,

American troops frequently resorted to using boxcars, wheels removed and surrounded by small dirt walls or sandbags, as fortified living quarters.¹²⁷ Standard operating procedures were changed to increase the size of security details and authorize search and destroy missions to preemptively avoid partisan raids. As the Russian Civil War intensified throughout the summer and fall of 1919, American forces adapted to their surroundings, better preparing themselves for attacks against their isolated outposts. Owing in part to these tactical adaptations, there were no attacks against Americans in the Suchan valley during the period from 8 August to 10 December 1919.¹²⁸

The supply system also necessarily adapted to ensure the survival of the AEF. The first adaptation was Graves' request to process supply requisitions directly through the depot in San Francisco instead of through Washington, D.C.¹²⁹ This request, approved by the War Department, allowed for more timely supply service due first to geography and also Washington's preoccupation with American troops in France. The depot in San Francisco had been for years the supply center for Alaska and was well fit to the logistical necessities of a harsh, Siberian climate.¹³⁰

There were numerous logistical adaptations at the tactical level as well. The Americans found the Russian telega or wagon to be more dependable than the truck on the underdeveloped Russian road system.¹³¹ The supply system creatively adapted to maintain isolated units after the Suchan rail line was knocked out of commission. On 5 July 1919, elements of the 31st Infantry from the Suchan mine district opened a new supply route by pushing south through a wide valley with comparably better roads to America Bay on the Yellow Sea. At America Bay, two supply ships and a landing contingent of 100 Americans and 100 Russians met this force. The combined force then

carried supplies north to Suchan by wagon on 9 and 10 July.¹³² The end result of adaptations in the supply system was that “American soldiers in Siberia never lacked for food, clothing or, for that matter, any other article of supply.”¹³³

Disease, not hostile enemy action, was the real threat in Siberia. Graves observed: “From the standpoint of an American, the sanitary conditions were deplorable.”¹³⁴ The Chief Surgeon reported the prevalent diseases as being “plague, typhus, relapsing fever, typhoid fever, scarlet fever, and malignant sore throat.”¹³⁵ The AEF adapted to this threat, especially the threat of typhus, by reserving a special train for the movement of Americans on the rails, forbidding travel on any other train except in case of emergency. At the local level, troops found that even with the lack of clean water, coal oil could be used avoid typhus and “obtain bodily cleanliness.”¹³⁶ With great emphasis on the medical care of the command, the AEF established a hospital in Vladivostok for the treatment of both U.S. soldiers and civilians.¹³⁷ Besides improving the medical conditions in Vladivostok, treating civilians had the added benefit of creating positive impressions about the American intervention. Although there were still 100 deaths in the AEF in Siberia, this number might have been much higher were it not for these adaptive measures.

Military adaptation was essential for mission success in Siberia. In a continuous loop of learning about threats in the environment, anticipation of the future operational conditions, and adaptation for those conditions, the military system sought to provide itself advantage over its environment. Facilitated by adaptive intelligence, decentralized command and control, and a struggling information sub-system, adaptation occurred at both the tactical and operational levels of war. When it did not occur at the strategic

level, when national policy failed to adapt to changing international conditions, the mission suffered strategic systemic breakdown, forcing the withdrawal of the AEF from Siberia in 1920.

The Future of Military Adaptation

*Sonorous metal blowing martial sounds:
At which the universal host upsent
A shout that tore hell's concave, and beyond
Frighted the reign of Chaos and old Night.*

John Milton, Paradise Lost

Having studied the Siberian Expedition through the lens of complexity theory, several conclusions are worth noting. The most important is that all elements of the military system are intricately woven into a complex pattern that determines the shape of the military system. It is impossible to adequately analyze any individual sub-system or agent without accounting for its causal relationships with other elements of the system. This is especially true of the elements of intelligence, command and control, and information in the cybernetic domain. Another insight is that leadership is essential to adaptation, both in allowing adaptation to occur and then in providing unifying guidance concerning the direction of the adaptation of the military system. General Graves provides a positive example of facilitating adaptation of the military system in this manner. It is also important to emphasize that when adaptation occurs, timeliness of adaptation is critical. Timeliness of information is especially important in this respect. Without timely information, cybernetic elements of the military system cannot effectively

anticipate and prepare for future environmental conditions. This was perhaps the most serious failing of the military system deployed to Siberia.

Uncertainty is an inevitable component of complex military like the MOOTW intervention in Siberia. Planning should focus not on eliminating this uncertainty, but on facilitating flexibility and adaptiveness of the military system. It may not be how well planners predict unforeseen circumstances, but rather how well operators adapt to them when they occur, that determines success. Although adaptation is required at all levels, as evidenced by the intervention in Siberia, adaptation is most important and is required most frequently at the local or tactical level. For a force trained to dogmatically follow doctrine and standard operating procedures, this requirement for flexibility and adaptation can be a source of great discomfort. Finally, innovation and adaptation lie primarily within the human domain. Behind all of the adaptations within the AEF in Siberia was a human mind, whether that of General Graves or the lowest private deployed across the vast Siberian wilderness. Adaptation, although it may involve technological solutions, does not originate from technology. Adaptation springs from the minds of both leaders and followers. Human ingenuity is a great military weapon.

This study of the AEF in Siberia also suggests several issues for further study. These include: shaping the environment to the system rather than shaping the system to the environment, the importance of redundancy in military adaptation, the employment of overwhelming mass as a method of adaptation, and the use of deception and physical interference to prevent the adaptation of competing military systems. The value of any new paradigm lies in the intellectual spark it ignites and the ensuing intellectual conflagration that engulfs old theoretical models to make way for new understandings.

The richness of a theoretical model is not dependent upon the initial answers it provides, but on the web of ideas it generates. From the simplicity of new theoretical models emerges complex understanding.

The modern military system is at the edge of a revolution in military affairs. Contrary to popular opinion, this revolution is not exclusively about changing technology and methods in warfare. It is more importantly a revolution of cognition, paradigms, and ideas.¹³⁸ It is a revolution in the ways that military theorists think about warfare, offering forth a new more organic vision that sees the importance of relationships and interactions, not individual components and details. It will provide mental and organizational tools to more effectively cope with the chaos of high-tempo, dispersed, multilateral military operations. It is a revolution that will change not only how the military operates in the future, but will also redefine the meaning of past experience. Complexity theory will provide a more brilliant light in which to view military history, uncovering previously unseen meaning and relevance from the shadows of linearity and reductionism.¹³⁹

Although this study recommends a less mechanistic approach to warfare, it does not prescribe a “devil may care” attitude to military operations where outcomes are left only to the vagaries of the mythical fates. Paraphrasing Barry Watts, who first noted the limitations of mechanistic paradigms in his 1984 study of Air Force doctrine, all that can be engineered in war should be, but success in war as a whole can not be reliably engineered.¹⁴⁰ What is required is a paradigm shift away from the clockwork notions of military operations toward a respectful recognition of the increasing complexity and inherent uncertainty of modern military actions.

Effective adaptation provides the prophylaxis for healthy survival in the midst of uncertainty and chaos. Given the chaotic and uncertain nature of warfare, recognized by Clausewitz and reaffirmed by the New Sciences of the twentieth century, and the growing complexity of the global environment, successful adaptation will be critical to the military in general and the United States Army in particular. Current doctrine acknowledges the challenge of the future:

*The Army faces a unique set of challenges as it adapts to a world that has changed more broadly and fundamentally than at any other time since the end of World War II. The Army must continue to adapt to ensure success in a rapidly changing strategic environment. Now, more than ever before, it serves as a strategic Army, a land force that the United States and its allies rely on to meet global challenges.*¹⁴¹

Whether in Siberia following World War I or in Bosnia following the Cold War, organic models based on adaptation enable armies and soldiers to cope with increasingly complex military operations.

¹ Carl von Clausewitz, On War, Peter Paret and Michael Howard, eds. (Princeton: Princeton University Press, 1984, p. 158

² The most popular work on chaos theory is James Gleick, Chaos: Making a New Science (New York: Viking, 1987). For a detailed analysis of the military applications of chaos theory, see Glenn E. James, Chaos Theory: The Essentials for Military Applications Newport Paper No. 10 (Newport, RI: Naval War College, 1996).

³ For an accessible account of complexity theory, see M. Mitchell Waldrop, Complexity: The Emerging Science at the Edge of Order and Chaos (New York: Simon and Schuster, 1992). For the military applications of complexity theory see David S. Alberts and Thomas J. Czerwinski, eds. Complexity, Global Politics, and National Security (Washington: National Defense University, 1997).

⁴ Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms (Washington: Government Printing Office, 1996), p.

⁵ John F. Schmitt, "Command and (Out of) Control: The Military Implications of Complexity Theory," Marine Corps Gazette (September 1998), pp. 55-56.

⁶ See Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," International Security 17, No. 3 (Winter 1992/93), pp. 59-90. Clausewitz well understood the problems of reductionist analysis: "If a useable theory does indeed exist, the inquiry can refer to its conclusions and at that point end the investigation. However, where such theoretical criteria do not exist, analysis must be pressed until the basic elements are reached. If this happens often, it will lead the writer into a labyrinth of detail; he will have his hands full and find it almost impossible to give each point the attention it demands. As a result, in order to set a limit to his inquiries, he will have to stop short of arbitrary assumptions after all. Even if they would not seem arbitrary to him, they would to others, because they are neither self-evident nor have they been proved." Clausewitz, p. 157.

⁷ Clausewitz, p. 119.

⁸ For insight into the limitations of mechanistic scientific theories in modeling organic phenomena such as war, see Barry D. Watts, The Foundations of U.S. Air Doctrine: The Problem of Friciton in War (Montgomery, AL: Air University Press, 1984). See especially Watts' chapter, "Toward a Less Mechanistic Image of War", pp. 105-121. Watts', drawn to the human psyche as "the most stable, most timeless dimension of war", recommends to "...embrace a less mechanistic view of war as a whole is to place the phenomena of combat in their proper context, meaning the *psychology of combatants*" (pp. 111-112). Watts fails to point out, however, that change itself is also a timeless constant, and the most important aspect of combatant psychology is its critical importance in adaptation within a complex and changing environment.

⁹ In the words of Albert Einstein, "No problem can be solved from the same consciousness that created it." Quoted in Margaret J. Wheatley, Leadership and the New Science: Learning About Organization From an Orderly Universe (San Francisco: Berrett-Koehler Publishers, Inc., 1992), p. 5

¹⁰ Tanner, Jason B. et ali., "Looking at Warfare Through a New Lens," Marine Corps Gazette (September 1998), p. 59. See also Waldrop, pp. 327-330 and Ludwig von Bertalanffy, General System Theory (New York: George Braziller, 1968), pp. 17-19. The new approaches to theoretical understanding are currently being applied across the academic spectrum, from legal studies (J.B. Ruhl, "Thinking of Mediation as a Complex Adaptive System", Brigham Young University Law Review 3 (1997), pp. 771 ff.) to economics and business (John Mariotti, "A New Science for Business Strategists: Complexity, Chaos, and the 'Natural Laws' of Business," Industry Week 245, No. 19 (21 October 1996), p. 12) to psychology (Holbrook Mahn and Vera John-Steiner, "Psychological Uses of Complexity Theory," The American Journal of Psychology 109, No. 3 (Fall 1996), pp. 465 ff.) and even to English (Donald A. McAndrew, "Chaos, Complexity, and Fuzziness: Science Looks at Teaching English," English Journal 86, No. 7, pp. 37-43).

¹¹ For a description of our still developing understandings of chaos and complexity, see Waldrop, pp. 9-13.

¹² Beyerchen, p. 66.

¹³ For an explanation of "the butterfly effect", see Gleick, pp. 20-23.

¹⁴ For a discussion of the utility of patterns to military theory, see Tanner, p. 61.

¹⁵ Waldrop, p. 11.

¹⁶ Peter M. Senge, The Fifth Discipline: The Art and Practice of the Learning Organization (New York: Currency Doubleday, 1990), pp. 71-72. Schmitt refers to "detail" complexity as "structural" complexity and "dynamic" complexity as "interactive" complexity. Schmitt, p. 57.

¹⁷ See Bertalanffy pp. 39-41 and 139-154.

¹⁸ SLA Marshall wrote: "In battle there is very little order. Many times the course of events is shaped by purest accidents and much that one witnesses does not seem to make sense." SLA Marshall, Men Against Fire: The Problem of Battle Command in Future War (Gloucester, MA: Peter Smith, 1954), p. 180.

¹⁹ Shimon Naveh, In Pursuit of Operational Excellence: The Evolution of Operational Theory (London: Frank Cass, 1998), p. 5. See also Schmitt, p. 57.

²⁰ Schmitt, p. 57.

²¹ "In war...all action is aimed at probable rather than at certain success." Clausewitz, p. 167.

²² The Joint Task Force Commander's Handbook for Peace Operations (Fort Monroe, VA: Joint Warfighting Center, 1997), p. .

²³ United States Army Field Manual 100-23: Peace Operations (Washington: HQ, Department of the Army, 1994), p. v.

²⁴ Senge, pp. 68-69.

²⁵ Clausewitz, p. 112.

²⁶ Roger Beaumont, War, Chaos, and History (Westport, CT: Praeger Publishers, 1994), pp. 154-155.

²⁷ Waldrop, p. 146.

²⁸ Eliot A. Cohen and John Gooch, Military Misfortunes: The Anatomy of Failure in War (New York: The Free Press, 1990), pp. 21-23. See also pp. 161-163. Cohen and Gooch identify three reasons for military failure: failure to learn, failure to anticipate, and failure to adapt. Of these three elements, they identify adaptation as the most important capability for a military organization. "Indeed, the ability to adapt is probably most useful to any military organization and most characteristic of successful ones, for with it, it is possible to overcome both learning and predictive failures." Cohen and Gooch, p. 94.

²⁹ Effective military theory and its associated doctrine should address the concepts of non-linearity, uncertainty, and adaptation to provide an accurate and flexible model for complex military operations. Good theory, theory that is not dogmatic in application, provides flexibility for adaptation rather than restricting actions based only on past precedents. "Production of an unchanging set of laws or even principles to be employed in all 'similar' contexts is not merely useless, it can become counterproductive and lead to the kind of fixed, inflexible, mechanical mentality that is overwhelmed by events. Adaptability is as important in doctrine as on the battlefield." Beyerchen, p. 90.

³⁰ The cybernetic domain of conflict is the domain of command and control, an increasingly important and controversial function given the complexification of warfare in the modern era. For the origins of the concept of cybernetics see Kevin Kelly, Out of Control: The New Biology of Machines, Social Systems, and the Economic World (New York: Addison-Wesley Publishing Company, 1994), pp. 119-120. See also W. Ross Ashby, An Introduction to Cybernetics (Chapman and Hall, 1956). For a discussion attacks upon an opponent's cybernetic domain to achieve "cybershock" of the opposing military system as a new form of warfare, see James J. Schneider, "Cybershock: Cybernetic Paralysis as a New Form of War," Unpublished paper (Fort Leavenworth, KS: School of Advanced Military Studies, 1995).

³¹ For the role of information as the "creative energy of the universe" and "a dynamic element, taking center stage" in self-organizing and adaptive organizations, see Wheatley, pp. 101-119.

³² James J. Schneider, "Black Lights: Chaos, Complexity and the Promise of Information Warfare," Joint Forces Quarterly 15 (Spring 1997), p. 22.

³³ Waldrop, pp. 259-260. The ancient Chinese military theorist Sun Tzu recognized the significance of coevolution in military systems when he wrote of the importance of shaping oneself in accordance with the enemy. "Water configures its flow in accord with the terrain; the army controls its victory in accord with the enemy... One who is able to change and transform in accord with the enemy and wrest victory is termed spiritual." Sun Tzu, The Art of War, Ralph D. Sawyer, trans. (Boulder: Westview Press, 1994), p. 193.

³⁴ "War is always the collision of two living forces". Clausewitz, p. 77.

³⁵ The intervention in Russia has been the topic of numerous historical works (see the bibliography below). The most objective and well-researched account of Allied intervention in Siberia can be found in Betty M. Unterberger, America's Siberian Expedition, 1918-1920 (New York: Greenwood Press Publishers, 1969). Unterberger focuses on the diplomatic aspects of the intervention. For a military account of the intervention, see R. Ernest Dupuy, Perish by the Sword: The Czechoslovakian Anabasis and Our Supporting Campaigns in North Russia and Siberia 1918-1920 (Harrisburg, Pennsylvania: The Military Service Publishing Company, 1939). Numerous first-hand accounts of the expedition exist including the personal memoir of the commander of the AEF in Siberia, Major General William S. Graves. See William S. Graves, America's Siberian Adventure, 1918-1920 (New York: Peter Smith, 1941). For the British perspective of the intervention, see John Ward, With the Die-Hards in Siberia (London: 1920). Daily unit reports, contemporary maps of the operation, and personnel correspondence of the leading military figures during the intervention are compiled in Historical Files of the American Expeditionary Forces in Siberia, 1918-1920 (Washington: National Archives Microfilm Publications, 1973).

³⁶ For a readable account of the chaos of the Russian Revolution and Civil War, see W. Bruce Lincoln, Red Victory: A History of the Russian Civil War (New York: Simon and Schuster, 1989).

³⁷ *Ibid.*, pp. 89-90.

³⁸ Antoine de Jomini, The Art of War in Roots of Strategy: Book 2 (Harrisburg, PA: Stackpole Books, 1987), p. 441. With accurate prescience, Jomini warns: "Because of the neglect of these precautions the greater number of coalitions have failed, or have maintained a difficult struggle with a power more united but weaker than the allies."

³⁹ Michael Jabara Carley, "Allied Intervention and the Civil War," The International History Review XI, No. 4 (November 1989), p. 690.

⁴⁰ Historians are divided into two basic schools of thought on American intervention. The first school portrays Wilson as anti-Bolshevik and describes the intervention as providing military aid to White forces. See for example: George F. Kennan, The Decision to Intervene (Princeton NJ: Princeton University Press, 1958), p. 404; Gordon Levin, Jr. Woodrow Wilson and World Politics: America's Response to War and Revolution (New York: Oxford University Press, 1968), p. 109; Robert J. Maddox, The Unknown War with Russia: Wilson's Siberian Intervention (San Rafael, CA: Praesidio Press, 1977), p. 237; and William Appleman Williams, American-Russian Relations, 1781-1947 (New York: Octagon Books, 1952), p. 129.

The second school of thought stresses Wilson's concerns about Japanese ambitions in the Far East and the maintenance of America's "Open Door". For examples of this line of reasoning, see: Alfred Whitney Griswold, The Far Eastern Policy of the United States (New York: Harcourt Brace and Co., 1938, p. 239; Pauline K. Thompkins, American-Russian Relations in the Far East (New York: Macmillan Co., 1949), p. 141; and Betty M. Unterberger, America's Siberian Expedition, 1918-1920: A Study of National Policy (New York: Greenwood Press, 1956), p. 232.

⁴¹ Robert J. Maddox, The Unkown War With Russia (San Rafael, CA: Praesidio Press, 1977), p. 46.

Secretary Baker later recalled that he told Wilson that intervention was "... unwise, but he told me that he felt obliged to do it anyhow because the British and French were pressing it on his attention so hard and he had refused so many of their requests that they were beginning to feel that he was not a good associate, much less a good ally."

⁴² General William Sidney Graves is recognized as an officer of great integrity, military skill, and high standards and was greatly respected throughout the armed forces. Born in 1865 to a military family, Graves graduated from West Point in 1889. His military service included garrison duty in the American West, combat during the Philippines Insurrection (1899-1902), service on the General Staff in Washington D.C. before and during WWI, and commander of the 8th Infantry Division before his selection to command the AEF in Siberia. After leaving Siberia, General Graves commanded various units including the 1st Division, the VI Corps Area, and the Panama Canal Division. Having retired in 1928, General Graves published his account of the Siberian expedition in 1931. He died in 1940 prior to America's entry into WWII and was buried in Arlington National Cemetery. Trevor N. Dupuy et alii, ed., The Harper Encyclopedia of Military Biography (Edison, New Jersey: Castle Books, 1992), pp. 293-294.

⁴³ The full text of the *aide-memoire* is in Unterberger, pp. 235-238. The *aide-memoire* cautiously distinguished between "intervention" in Russian internal affairs, which the Wilson administration felt was unjustified, and "military action" to achieve explicitly limited objectives in support of the war against Germany. Despite having been formulated and written while the war with Germany was still in progress, the *aide-memoire* served as the guiding policy document until the withdrawal in 1920.

⁴⁴ Lincoln, pp. 93-100.

⁴⁵ Karl H. Lowe, "American Polar Bears' Defense of Vladivostok," Military History (Oct 1997), p. 39.

⁴⁶ General Graves, doubted the sincerity of the motive of removing the Czechs from Russia to fight on the Western Front: "If the Allies were really trying to get the Czechs to the Western front in France, it seems peculiar that no arrangements had been made for ships to take them from Vladivostok. I am clearly of the opinion that as early as May 28, 1918, there was no intention of sending the Czechs to the Western front. I am unable to say exactly when this decision was made, but it was at least two months and six days before I received my instructions in which appeared the sentence, "For helping the Czecho-Slovaks, there is immediate necessity and justification." All foreign representatives were not informed of the intent, relative to [the] Czechs until about one month later." Graves, pp. 44-45.

⁴⁷ Dupuy, p. 290. See also Unterberger, pp. 9-10.

⁴⁸ See James W. Morley, The Japanese Thrust Into Siberia (New York: Columbia University Press, 1957).

⁴⁹ Graves, p. 4.

⁵⁰ For a discussion of the purpose or aim of a system as the unifying determinant that maintains system integrity, see Naveh, p. 6.

⁵¹ Maddox, pp. 61-62. See also Graves, pp. 10-11.

⁵² For the clash of ideas between Graves and representatives of the State Department, see especially Judith A. Luckett, "The Siberian Intervention: Military Support of Foreign Policy," Military Review 64, No. 4 (1984), pp. 54-63.

⁵³ Information on troop strengths primarily drawn from United States Army War College, Order of Battle of the United States Land Forces in the World War, American Expeditionary Forces in the World War (Washington: Government Printing Office, 1937), pp. 385-389.

⁵⁴ Hayes, p. 21.

⁵⁵ Maddox, p. 61.

⁵⁶ Lowe, p. 40.

⁵⁷ Graves, pp. 57-60.

⁵⁸ Graves initially determined that "American troops were not departing from the announced policy of the United States Government to refrain from taking any part in Russian affairs" since the actions were

directed against German and Austrian prisoners and their agents, the Bolsheviks. He would later be more skeptical of Japanese information and intentions. *Ibid.*, p. 57.

⁵⁹ Graves somewhat naively ascribes Otani's presumption of command of American forces to an error in communication, perhaps because "...some diplomatic agent, not knowing the difference between 'Allied Commander' and senior of the Allied Commanders, in order to appear agreeable, told some Japanese representative that General Otani would be the Commander of the Allied Forces." *Ibid.*, p. 59.

⁶⁰ For a flowing description of the chaos that dominated Siberia in 1918, see Lincoln pp. 230-269.

⁶¹ Harold B. Hayes, III, "The Iron Horse from Nikolsk." *Military Review* 62, No. 5 (1982), p. 20.

⁶² To provide a perspective of the geographic dimensions involved, the distance between Vladivostok and Omsk is the same as the distance between New York and San Francisco.

⁶³ Dupuy, pp. 291-292.

⁶⁴ Unterberger, p. 172.

⁶⁵ *Ibid.*, p. 171.

⁶⁶ *Ibid.*, pp. 171-172

⁶⁷ J.C. Baker, "A Study of the Supply of the 31st Infantry, A.E.F. Siberia, From August 20, 1918 to April 1, 1920", Student paper (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1931), pp. 14-15.

⁶⁸ Charles S. Stevenson, "The Forty Below Zero Campaign," *Army Magazine* (February 1969), p. 50. The Japanese would themselves withdraw in 1922 under intensifying domestic opposition, Western pressure, and Bolshevik action in the Russian Far East. Maddox, p. 135.

⁶⁹ *Ibid.*, p. 131.

⁷⁰ Owen R. Rhoads, "A Study of the Operations and Supply of the American Forces in the Suchan Mine Area Siberia, September 1918 – January 1920," Student paper (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1932), p. 19. Rhoads, a Lieutenant commanding in the Suchan mine district during the intervention, was overly critical of the lack of a general plan for the mission. Schooled in traditional military operations where intricate and detailed plans were the keystone to success, Rhoads was uncomfortable with the open-ended and indefinite nature of the Siberian operation.

⁷¹ The United States Army Chief of Staff Peyton C. March concurred about the potential dangers of the tactical environment in Siberia, noting that had Graves not so judiciously handled the operation, it might have taken "...100,000 men to get them out alive." Peyton C. March, *The Nation at War* (New York: Doubleday, Doran and Company, Inc., 1932), p. 131.

⁷² March, p. 132 and 150.

⁷³ Quoted in William D. Leipold, "America's Siberian Expedition." Student Paper (Fort Leavenworth, Kansas: United States Army Command and General Staff College, 1981), p. 15.

⁷⁴ Graves, p. 55. General Graves thought that his lack of intelligence might actually have been fortunate. "Due, in part at least to my ignorance of the conditions, I landed in Vladivostok without any preconceived ideas as to what should or should not be done. I had no prejudice against any Russian faction and anticipated I would be able to work harmoniously and in a cooperative spirit with all the Allies." Graves, p. 56.

⁷⁵ Edward M. Coffman, "The Intervention in Russia, 1918-1921," *Military Review* 68, No. 9 (1988), p. 70

⁷⁶ R. L. Eichelberger, "Report of the Intelligence Section, AEF Siberia," *Historical Files of the American Expeditionary Forces in Siberia, 1918-1920*, (Washington: National Archives Microfilm Publications, 1973), 21-21.1.

⁷⁷ David P. Barrows, "Report in Detail of Operations of the Intelligence Section...", *Historical Files of the American Expeditionary Forces in Siberia, 1918-1920*, 21-21.1, p. 3.

⁷⁸ T.S. Arms, "Siberian Expedition: The Shktovo Sector, 31st Infantry, from September 1919 Until the Withdrawal of the Expedition," Student paper (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1931), p. 9. Arms was a commanding officer with the 31st Infantry Regiment in the Shkotovo sector.

⁷⁹ Most of these reports can be found in the *Historical Files of the American Expeditionary Forces in Siberia, 1918-1920*. For the format of the reports and the nature of the information they contained, see C.P. Robinson, letter to "All Commanding Officers", *Historical Files of the American Expeditionary Forces in Siberia, 1918-1920*, 21-27.2.

⁸⁰ David P. Barrows, "Report in Detail of Operations of the Intelligence Section...", p. 7.

⁸¹ "In this vast country, with limited means of obtaining information, it was a difficult problem to check the accuracy of information." Graves, p. 26.

⁸² *Ibid.*, pp. 288-289.

⁸³ "...[O]ne must conclude that the Japanese Military Intelligence was absolutely ignorant of the real conditions, or that their statement was not candid, but aimed to satisfy what they presumed to be Allied desires, by exaggerating the magnitude of the military problem and recommending heavy reinforcements." *Ibid.*, p. 62. See also David P. Barrows, "Report in Detail of Operations of the Intelligence Section...", p.3.

⁸⁴ Graves, pp. 251-252.

⁸⁵ *Ibid.*, pp. 119-121.

⁸⁶ R.L. Eichelberger, "Report of the Operations of the Intelligence Section from January 1st to June 30th 1919," Historical Files of the American Expeditionary Forces in Siberia, 1918-1920, 21-21.1, p. 4.

⁸⁷ Arms, p. 9.

⁸⁸ Robert James Maddox, "Doughboys in Siberia," American History Illustrated, 12 (August 1977), p.18.

⁸⁹ C.P. Robinson, letter to "All Commanding Officers", Historical Files of the American Expeditionary Forces in Siberia, 1918-1920, 21-27.2.

⁹⁰ Graves, p. 94.

⁹¹ The "massacre" occurred on 25 June 1919 at Romanovka. A detachment of platoon of Company A 31st Infantry, commanded by Lieutenant Lawrence D. Butler fought with numerous Bolshevik irregulars (mostly miners from Petrovka and Novo Rossskaya). American losses were 19 killed and 25 wounded, of whom five later died – a death toll of almost half the unit's strength. See Sylvian G. Kindall, American Soldiers in Siberia (New York: R.R. Smith, 1945), p. 56. See also Dupuy, pp. 227-228.

⁹² Mission-type orders are orders that supply an objective and time limit for an operation to subordinate units but leave the ways the mission will be accomplished to the subordinate unit. Mission type orders tell what to do, not how to do it. These types of orders originate from the Prussian General Staff in the nineteenth century and the concept of *aufstragtaktik*. Edward Luttwak and Stuart L. Koehl, The Dictionary of Modern War (New York: Harper Collins Publishers, 1991), pp. 68-69 and p. 402.

⁹³ See Kevin Kelly, Out of Control: The New Biology of Machines, Social Systems and the Economic World (New York: Addison-Wesley Publishing Company, 1994). Kelly's thesis is that as a system becomes more complex, central authority loses its ability to deterministically control the individual parts of the system. Decentralized control, not more rigid and centralized control, becomes the only viable option.

⁹⁴ Schmitt, pp. 57-58.

⁹⁵ Graves, p. 57.

⁹⁶ *Ibid.*, p. 159.

⁹⁷ Luckett, p. 61. Graves later commented: "The United States' troops tried, very conscientiously, to carry out the policy of avoiding the conflicts between the Russian factions, and this could be done until the military was ordered to guard the railroads which made it necessary to take sides, as the railroads were, in practice, operated by Kolchak adherents for the specific benefit of the Kolchak forces." Graves, pp. 346-347.

⁹⁸ For Graves' own description of the evolution of his conception of the purpose of the mission, see Graves, p. 218.

⁹⁹ Cohen and Gooch, p. 162.

¹⁰⁰ Virginia Cooper Westall, "AEF Siberia – The Forgotten Army," Military Review (March 1968), p. 15. General Robert L. Eichelberger, who served as the chief of the intelligence section in Siberia under Graves as a Major, later reflected: "One would think that General Graves would have discussed the *aide memoire* with his principal staff officers. At times General Graves would read me a paragraph and ask my opinion about what it meant but I never saw the *aide memoire* in complete form until just before I left Siberia."

¹⁰¹ Graves described Morrow as "...admirably equipped for this particularly duty. He could be genial, he could be politic, he could be stern; and, if occasion demanded, he could bluff." Graves, p. 183.

¹⁰² *Ibid.*, p. 184.

¹⁰³ *Ibid.*, p. 299.

¹⁰⁴ *Ibid.*, pp. 130-136.

¹⁰⁵ Coffman, p. 69.

¹⁰⁶ Rhoads, p. 19.

¹⁰⁷ This discomfort is best reflected in the papers of both Arms and Rhoads, written more than ten years after the expedition while attending the U.S. Army Command and General Staff School.

- ¹⁰⁸ John F. Schmitt and Gary A. Klein, "Fighting in the Fog: Dealing with Battlefield Uncertainty." Marine Corps Gazette 80, No. 8 (August 1998), p. 66.
- ¹⁰⁹ United States Army War College. Order of Battle of the United States Land Forces in the World War, American Expeditionary Forces in the World War, p. 387. For the format of reports and numerous examples of internal communications, see Historical Files of the American Expeditionary Forces in Siberia, 1918-1920.
- ¹¹⁰ Rhoads, p. 18.
- ¹¹¹ Ira C. Nicholas, "A Critical Analysis of the A.E.F. Siberia, Including Relations with Other Allies," Student paper (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1932), p. 3.
- ¹¹² *Ibid.*, pp. 12-13.
- ¹¹³ Graves, p. 192-193.
- ¹¹⁴ "Major General William S. Graves Proclamation to the Russian People, 21 April 1919, Historical Files of the American Expeditionary Forces in Siberia, 1918-1920, 21-7.
- ¹¹⁵ Graves, pp. 186-187.
- ¹¹⁶ Rhoads, p. 20. In his Annex, Rhoads describes a skirmish near Novo Litovskaya where an American patrol was sent out to actively hunt down Russian partisans. The force killed a number of Russians with no American casualties and reportedly diminished harassment of American troops in the local area.
- ¹¹⁷ Arms, pp. 14-15.
- ¹¹⁸ See Unterberger, pp. 171-172. See also Graves, pp. 108-109.
- ¹¹⁹ Graves, pp. 166-167.
- ¹²⁰ *Ibid.*, p. 163.
- ¹²¹ *Ibid.*, pp. 163-164.
- ¹²² *Ibid.*, pp. 152-153.
- ¹²³ Kindall, p. 54.
- ¹²⁴ Upon learning that a soldier had arrested a Russian because he was a Bolshevik, Graves issued the following statement, "Whoever gave you those orders must have made them up himself. The United States is not at war with the Bolsheviki or any other faction of Russia. You have no orders to arrest Bolsheviks or anybody else unless they disturb the peace of the community, attack the people, or the allied soldiers." Lowe, p. 41.
- ¹²⁵ John R. Boyd, "Destruction and Creation," Unpublished paper. 23 March 1976. Drawing from Godel's Proof of Incompleteness, Heisenberg's Indeterminacy Principle and the Second Law of Thermodynamics, Boyd's incisive essay uncovers a "dialectic engine", a cyclical process of destruction and creation, that permits the construction of decision models needed by organic systems for determining and guiding actions to provide systems advantage over their environment (or in Boyd's words, "improve their capacity for independent action"). The result of Boyd's dialectic engine is "...a changing and expanding universe of mental concepts matched to a changing and expanding universe of observed reality."
- ¹²⁶ From the introductory remarks to the Historical Files of the American Expeditionary Forces in Siberia, 1918-1920, p. 4.
- ¹²⁷ Graves, pp. 76-77. See also Arms, pp. 4-6.
- ¹²⁸ Rhoads, p. 16.
- ¹²⁹ Graves, p. 35.
- ¹³⁰ Dupuy, p. 110.
- ¹³¹ J.C. Baker, "A Study of the Supply of the 31st Infantry, A.E.F. Siberia, From August 20, 1918 to April 1, 1920," Student paper (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1931), p. 13.
- ¹³² Rhoads, pp. 7-10.
- ¹³³ Dupuy, p. 110.
- ¹³⁴ Graves, p. 140.
- ¹³⁵ *Ibid.*, p. 140.
- ¹³⁶ Baker, p. 14.
- ¹³⁷ Graves, pp. 140-142.
- ¹³⁸ See Thomas Kuhn, The Structure of Scientific Revolutions, 2d ed. (Chicago: The University of Chicago Press, 1970), pp. 6-7.
- ¹³⁹ Watts, p. 112, offers the benefits of a more organic paradigm. Watts sees three advantages: an organic paradigm would be more useful in revealing the lessons of past military experience, would offer better

guidelines for what military organizations ought to be emphasizing in the present and would produce more “fruitful exemplars” for the conduct of future operations.

¹⁴⁰ Ibid., p. 110.

¹⁴¹ United States Army Field Manual 100-5: Operations, p. 1-5.

Appendix I: Selected Glossary of Terms

Adaptation: The action of systems trying to turn interactions with their environment to their advantage. Successful adaptation requires learning from the past and then anticipation of what is likely to happen in the future to effectively shape the system in the present. Identifying and taking full advantage of the opportunities offered by enemy actions or by chance combinations of circumstances to win success or to stave off failure. (Cohen and Gooch, p. 161)

Adaptive Effectiveness: The ability of a complex, dynamic system to adjust successfully to changes in its environment in a timely manner in such a way as to provide evolutionary advantage over competing systems.

Chaos: Result of a non-linear system in which output is extremely sensitive to initial conditions, i.e. immeasurably small differences in input can produce entirely different outcomes, creating complex system characteristics approaching randomness.

Coevolution: Evolution and adaptation of a system that is dependent on the evolution of surrounding systems. Systems judge their evolutionary success based not upon some preconceived criteria but on the advantage gained over competing systems in their surrounding environment.

Command and Control: The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. (JP 1-02)

Command and Control System: The facilities, equipment, communications, procedures, and personnel essential to a commander for planning, directing, and controlling operations of assigned forces pursuant to the missions assigned. (JP 1-02)

Complexity: Characteristic of a system containing a great many independent agents that interact with each other in a great many ways. (Waldrop, p. 13)

Complexity Theory: The study of systems that exhibit complex, self-organizing behavior.

Cybernetics: Theoretical study of control processes in electronic, mechanical, and biological systems, especially mathematical analysis of the flow of data in such systems.

Emergence: Property of a complex system in which the global behavior of the system is qualitatively different from the behavior of the individual parts.

General Systems Theory: Discipline whose subject matter is the formulation and derivation of those principles which are valid for “systems” in general. (Bertalanffy, p. 32)

Information: 1. Facts, data, or instructions in any medium or form. 2. The meaning that a human assigns to data by means of the known conventions used in their representation. (JP 1-02)

Information System: The organized collection, processing, transmission, and dissemination of information, in accordance with defined procedures, whether automated or manual. In information warfare, this includes the entire infrastructure, organization, and components that collect, process, store, transmit, display, disseminate, and act on information. (JP 1-02)

Intelligence: 1. The product resulting from the collection, processing, integration, analysis, evaluation, and interpretation of available information concerning foreign countries or areas. 2. Information and knowledge about an adversary obtained through observation, investigation, analysis, or understanding. (JP 1-02)

Intelligence System: Any formal or informal system to manage data gathering, to obtain and process the data, to interpret the data, and to provide reasoned judgments to decision makers as a basis for action. The term is not limited to intelligence organizations or services but includes any system, in all its parts, that accomplishes the listed tasks. (JP 1-02)

Learning: The acquisition of wisdom, knowledge, or skill from past experience.

Linearity: A system characteristic that requires two conditions, proportionality and additivity. Proportionality indicates that changes in system outputs are proportional to system input. Additivity is the concept that the whole is equal to the sum of its parts, allowing the system to be broken down into smaller pieces that can be reassembled without consequence to the system. (Beyerchen, p. 62)

Military Operations Other Than War (MOOTW): Operations that encompass the use of military capabilities across the range of military operations short of war. These military actions can be applied to complement any combination of the other instruments of national power and occur before, during, and after war. (JP 1-02)

Non-linearity: A system characteristic describing a system that does not meet the conditions of linearity: it is not proportional, i.e. the output of the system is not proportional to the input and it is not additive, i.e. the whole is greater or lesser than the sum of its parts. (Beyerchen, pp. 62-63)

Open System: A system that interacts with its environment, both receiving inputs and delivering feedback; a system that exchanges matter with its environment. (Bertalanffy, p. 32)

Peace Operations: A broad term that encompasses peacekeeping operations and peace enforcement operations conducted in support of diplomatic efforts to establish and maintain peace. (JP 1-02)

System: Any organized assembly of resources and procedures united and regulated by interaction or interdependence to accomplish a set of specific functions. (JP 1-02) A complex of interacting elements. (Bertalanffy, p. 32)

Appendix II: Timeline of Events During the Siberian Intervention¹

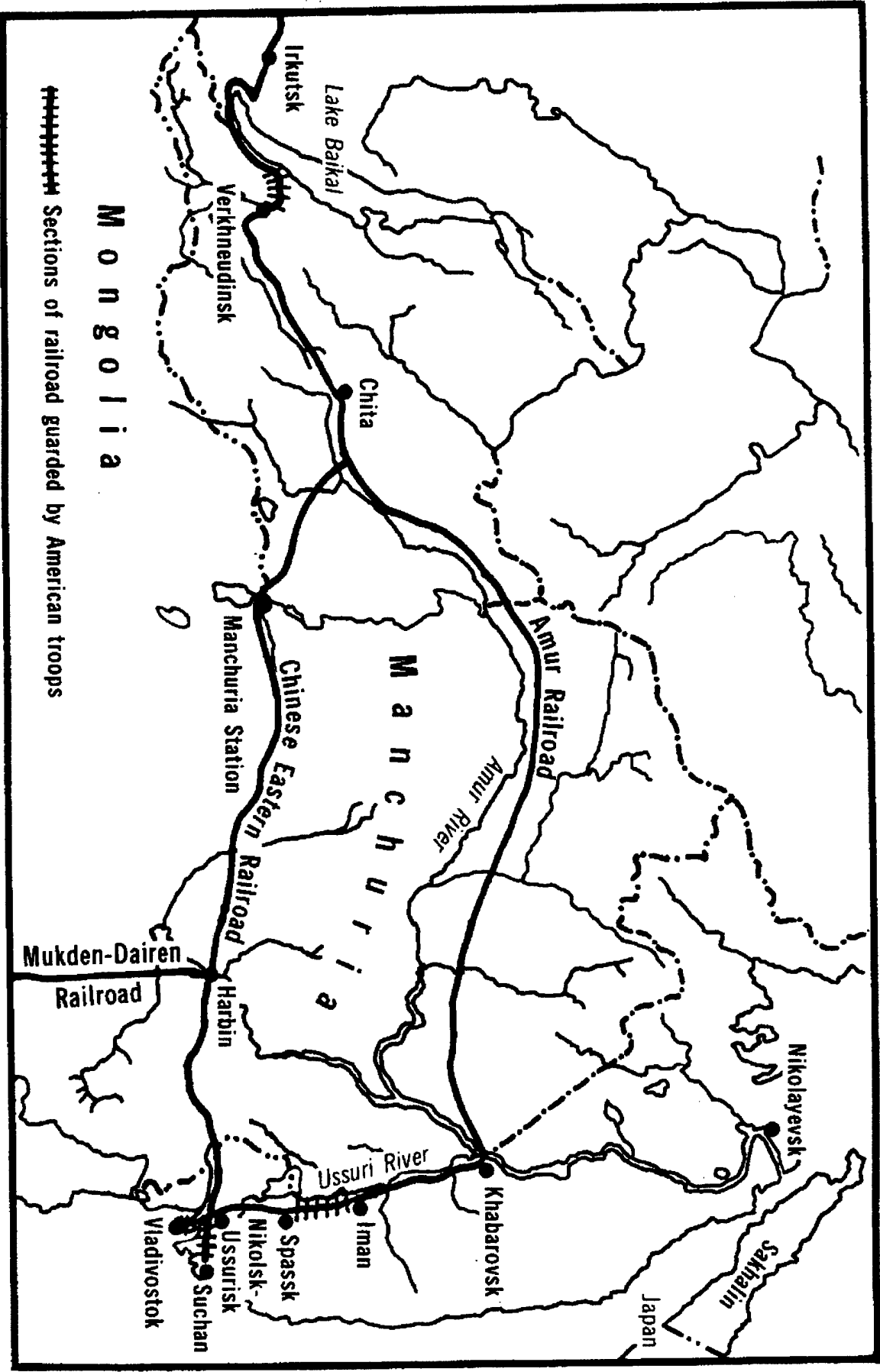
1918	April	Japanese forces begin deploying to Siberia
	June	Czech troops take control in Vladivostok
	July	War Department designates 27 th and 31 st Infantry for Siberian duty
	3 August	Maj Gen Graves receives “ <i>aide-memoire</i> ” from Secretary of War Baker in Kansas City
	7 August	Advance elements sail from Manila for Vladivostok
	12 August	Gen Graves and element of his 8 th Division based at Camp Fremont sail from San Francisco to Siberia
	15 August	Colonel Styer and advance elements of AEF in Siberia arrive in Vladivostok
	18 August	Elements of 27 th Infantry begins work as railroad guards between Vladivostok and Nikolsk-Ussuri
	24 August	27 th Infantry accompanies Japanese advance to Ussuri and Khabarovsk and beyond pursuing Bolshevik forces
	2 September	Gen Graves arrives in Vladivostok and assumes command of AEF in Siberia
	29 September	Deployment of American troops to Siberia is complete; total strength is 253 officers and 8699 enlisted
	October	American troops begin garrison duty, the 31 st located primarily within Vladivostok and the 27 th dispersed around Khabarovsk
	11 November	Armistice with Germany
	18 November	Admiral Aleksandr Kolchak overthrows “the Directory” in Omsk and declares himself “Supreme Ruler of Russia”
1919	20 January	Kolchak replaces all Czech troops at front with White Russian troops

¹ Information regarding troop strengths and dispositions drawn primarily from United States Army War College, Order of Battle of the United States Land Forces in the World War, American Expeditionary Forces in the World War (Washington: Government Printing Office, 1937), pp. 385-389.

- 9 January Allies sign Inter-Allied Railway Agreement dividing the Siberian railways into guard sectors with control delegated to Japanese, Chinese and American troops
- April Americans assume control of several widely separated sections of the Siberian railways totaling 316 miles. After assuming these duties, there are several encounters with hostile forces resulting in the death of 36 American soldiers
- 25 June 24 Americans killed and 25 wounded at Romanovka
- July AEF in Siberia comprises 338 officers and about 8100 enlisted. American forces are deployed as follows: in Vladivostok are HQ AEF in Siberia, a machine gun company (-), a supply company, three companies of the 31st Infantry, an ambulance company, a field hospital and an evacuation hospital, a training company, detachments of engineers, signal corps, quartermaster corps, veterinary corps, and dental corps; Company B of the 31st Infantry is on detached service at Kharbin; Companies F and L of the 31st Infantry are guarding the railroad section between Vladivostok and Nikolsk-Ussuri; 7 companies, two machine gun platoons, and one signal section of the 31st are deployed along the railroad from Ugolnaya to the Suchan mines; guarding the railroad between Spasskoe and Ussuri are 6 companies and a machine gun section of the 27th Infantry and a medical detachment; along the railway frp, Verkne Udinsk to Mysovaya are 5 infantry companies, HQ, HQ company, a supply company, and a machine gun company all from the 27th Infantry along with a medical detachment. These deployments remained essentially unchanged, with the exception of the withdrawal from the Suchan mine district, until the American withdrawal in January 1920
- 20 August Withdrawal of American troops from Suchan mine area following several intense engagements completed
- 24 October Cossack leader Gregory Semenov stops American train bound for Omsk in Chita and attempts to "requisition" 15000 rifles. Standoff nearly results in battle between Cossack, Japanese, and American forces
- 15 November Kolchak's capital in Omsk falls to Red forces
- 16 November Czech General Radola Gaida leads revolt against Kolchak regime
- 18 November Gaida's rebellion defeated

- 31 December American forces receive orders to withdraw and outlying garrisons begin concentrating in Vladivostok
- 1920 17 January First American units sail from Vladivostok to Manila
- 31 January Anti-Kolchak coup overthrows General Rozanov in Vladivostok. Zemstvo government now in charge
- 6 February Admiral Kolchak caught trying to flee Siberia and is turned over to Red troops. Military court finds him guilty and he is shot the next day
- 1 April HQ AEF in Siberia and all remaining units depart from Vladivostok for Manila
- 23 May Last Czech contingent leaves Vladivostok
- 31 August War Department officially disbands AEF in Siberia
- 1922 October Last Japanese troops withdraw from Siberia

Appendix III: Map of Siberian Operation



Taken from Harold B. Hayes, "The Iron(ic) Horse From Nikol'sk", *Military Review* LXII, No 5 (May 1982), p. 23.

Bibliography

The Military Application of Chaos and Complexity Theory

- Alberts, David S. and Thomas J. Czerwinski, eds. Complexity, Global Politics, and National Security. Washington: National Defense University, 1997.
- Beaumont, Roger. War, Chaos and History. Westport, CT: Praeger Publishers, 1994.
- Bertalanffy, Ludwig von. General System Theory: Foundations, Development, Applications. New York: George Braziller, 1968.
- Beyerchen, Alan. "Clausewitz, Nonlinearity, and the Unpredictability of War." International Security 17, No. 3 (Winter 1992/93), 59-90.
- Boyd, John R. "Destruction and Creation." Unpublished paper. 23 March 1976.
- Clausewitz, Carl von. On War. Michael Howard and Peter Paret, eds. Princeton: Princeton University Press, 1984.
- Cohen, Eliot A. and John Gooch. Military Misfortunes: The Anatomy of Failure in War. New York: The Free Press, 1990.
- Durham, Susan E. "Chaos Theory for the Practical Military Mind." Student paper. Montgomery, AL: Air Command and Staff College, 1997.
- Gleick, James. Chaos: Making a New Science. New York: Viking, 1987.
- Gore, John. "Chaos, Complexity, and the Military." Student paper. Washington: National War College, National Defense University, 1996.
- James, Glenn E. Chaos Theory: The Essentials for Military Applications. Newport Paper No. 10. Newport, RI: Naval War College, 1996.
- Jervis, Robert. System Effects. Princeton: Princeton University Press, 1998.
- Johnson, Stuart E., and Levis, Alexander H., eds. Science of Command and Control: Coping with Complexity. Fairfax: AFCEA International Press, 1989.
- Johnson, Stuart E., and Levis, Alexander H., eds. Science of Command and Control: Coping with Uncertainty. Washington, D.C.: AFCEA International Press, 1988.
- Jomini, Antoine de. The Art of War in Roots of Strategy: Book 2. Harrisburg, PA: Stackpole Books, 1987.

- Kelly, Kevin. Out of Control: The New Biology of Machines, Social Systems and the Economic World. New York: Addison-Wesley Publishing Company, 1994.
- Kelly, Patrick III. "Modern Scientific Metaphors of Warfare: Updating the Doctrinal Paradigm." Monograph, School of Advanced Military Studies. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1993.
- Kuhn, Thomas. The Structure of Scientific Revolutions, 2d ed. Chicago: The University of Chicago Press, 1970.
- Mann, Steven. Chaos, Criticality, and Strategic Thought. Strategic Operations Coursebook. Montgomery, AL: Air Command and Staff College, 1995.
- Mann, Steven. "Chaos Theory and Strategic Thought." Parameters (Autumn 1992): 54-68.
- Marshall, S.L.A. Men Against Fire: The Problem of Battle Command in Future War. Gloucester, MA: Peter Smith, 1954.
- Naveh, Shimon. In Pursuit of Operational Excellence: The Evolution of Operational Theory. New York: Frank Cass, 1997.
- Nicholls, David and Todor D. Tagarev. "What Does Chaos Theory Mean for Warfare?" Airpower Journal (Fall 1994): 48-57.
- Saperstein, Alvin M. "War and Chaos." American Scientist (November-December 1995): 548-557.
- Senge, Peter M. The Fifth Discipline: The Art and Practice of the Learning Organization. New York: Doubleday, 1990.
- Schmitt, John F. "Command and (Out of) Control: The Military Implications of Complexity Theory." Marine Corps Gazette (September 1998): 55-58.
- Schmitt, John F. and Gary A. Klein. "Fighting in the Fog: Dealing with Battlefield Uncertainty." Marine Corps Gazette 80, No. 8 (August 1998): 62-69.
- Schneider, James J. "Black Lights: Chaos, Complexity and the Promise of Information Warfare." Joint Forces Quarterly 15 (Spring 1997): 21-28.
- Sun Tzu. The Art of War. Ralph D. Sawyer, trans. Boulder: Westview Press, 1994.
- Tanner, Jason B. et al. "Looking at Warfare Through a New Lens." Marine Corps Gazette (September 1998), 59-61.

- Waldrop, M. Mitchell. Complexity: The Emerging Science at the Edge of Order and Chaos. New York: Simon and Schuster, 1992.
- Walt, Stephen J. "The Hidden Nature of Systems." The Atlantic Monthly 282, No. 3 (September 1998), 130-134.
- Watts, Barry D. The Foundations of U.S. Air Doctrine: The Problem of Friction in War. Montgomery, AL: Air University Press, 1984.
- Wheatley, Margaret J. Leadership and the New Science: Learning About Organization From an Orderly Universe. San Francisco: Berrett-Koehler Publishers, Inc., 1992.

MOOTW and Military Doctrine

- Center for Army Lessons Learned. Operations Other than War, Vol. IV: Peace Operations. CALL Newsletter 93-8. Fort Leavenworth, KS: U.S. Army Combined Arms Center, 1993.
- Corelli, Rae. "An Army's Hidden Wounds." Maclean's 107, No. 28 (28 March 1994): 31-33.
- Cumner, Sandra. "The Challenges Faced by the Military in Adapting to Peacekeeping Missions." Peacekeeping and International Relations (Jan/Feb 1998), 13-16.
- Greenberg, Keith E. "The Essential Art of Empathy." MHQ: The Quarterly Journal of Military History 5 (Autumn 1992): 64-69.
- Joint Publication 1-02: Department of Defense Dictionary. Washington: Government Printing Office, 1997.
- Joint Publication 3-0: Doctrine for Joint Operations. Washington: Government Printing Office, 1995.
- Joint Publication 3-07: Joint Doctrine for Military Operations Other than War. Washington: Government Printing Office, 1995.
- Joint Publication 3-07.3: Joint Doctrine for Peacekeeping Operations. Washington: Government Printing Office, 1994.
- Joint Task Force Commander's Handbook for Peace Operations. Fort Monroe, VA: Joint Warfighting Center, 1997.
- Rinaldo, Richard J. "Warfighting and Peace Operations: Do Real Soldiers Really Do MOOTW?" Joint Forces Quarterly 14 (Winter 1996-1997): 111-116.

United States Army Field Manual 100-5: Operations. Washington: HQ, Department of the Army, 1993.

United States Army Field Manual 100-23: Peace Operations. Washington: HQ, Department of the Army, 1994.

The Siberian Intervention

Ackerman, Carl W. Trailing the Bolsheviki: Twelve Thousand Miles with the Allies in Siberia. New York: 1919.

Albertson, Ralph. Fighting Without a War. New York: Harcourt, Brace & Howe, 1920.

Arms, T.S. "Siberian Expedition: The Shktovo Sector, 31st Infantry, from September 1919 Until the Withdrawal of the Expedition." Student paper. Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1931.

Baker, J.C. "A Study of the Supply of the 31st Infantry, A.E.F. Siberia, From August 20, 1918 to April 1, 1920". Student paper. Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1931.

Bolger, Daniel P. "Cruel Russian Winter." Military Review 67, No. 6 (1987): 63-77.

Bradley, John F.N. Allied Intervention in Russia. New York: Basic Books, 1968.

Brislawn, Mark G. "Allied Intervention in Russia". Student paper. Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1932.

Carey, Donald E. and Neil G. Carey. Fighting the Bolsheviks: The Russian War Memoirs of Private First Donald E. Carey, U.S. Army, 1918-1919. Novato, California: Presidio, 1997.

Carley, Michael Jabara. "Allied Intervention and the Russian Civil War, 1917-1922." International History Review 11, No. 4 (1989): 689-700.

Channing, C.G.F. Siberia's Untouched Treasure, Its Future Role in the World. New York: 1923.

Coffman, Edward M. "The Intervention in Russia, 1918-1921." Military Review 68, No. 9 (1988): 60-71.

Connaughton, R.M. The Republic of Ushakovka: Admiral Kolchak and the Allied Intervention in Siberia, 1918-1920. New York: Routledge, 1990.

- Dobson, Christopher and John Miller. The Day They Almost Bombed Moscow: The Allied War in Russia, 1918-1920. New York: Atheneum, 1986.
- Dupuy, R. Ernest. Perish by the Sword: The Czechoslovakian Anabasis and Our Supporting Campaigns in North Russia and Siberia 1918-1920. Harrisburg, PA: The Military Service Publishing Company, 1939.
- Ekhbladh, David. "Wise as a Serpent and Harmless as a Dove: John F. Stevens and American Policy in Manchuria and Siberia, 1918-1924." Prologue, 27, No. 4 (1995): 318-333.
- Fogelsong, David Scott. America's Secret War Against Bolshevism: United States Intervention in the Russian Civil War, 1917-1920. 1991.
- Goldhurst, Richard. The Midnight War: American Intervention in Russia, 1918-1920. New York: McGraw-Hill, 1978.
- Graves, William Sidney. America's Siberian Adventure, 1918-1920. New York: J. Cape and H. Smith, 1931.
- Hayes, Harold B., III. "The Iron Horse from Nikolsk." Military Review 62, No. 5 (1982): 18-28.
- Historical Files of the American Expeditionary Forces in Siberia, 1918-1920. Washington: National Archives Microfilm Publications, 1973.
- Hunt, Frazier. "I Capture Vladivostok." In Ernest Hemingway, ed. Men at War. New York: Bramhall House, 1979..
- Hunt, George. History of the Twenty-seventh Infantry. Honolulu: Star-Bulletin, 1931.
- Joseph Longuevan Papers. Army War College. Carlisle, PA.
- Kindall, Sylvian G. American Soldiers in Siberia. New York: R.R. Smith, 1945.
- Korablev, Iu. I. And Shishkin, V.I. Iz Istorii Interventsii i Grazhdanskoi Voiny v Sibiri i na Dal'nem Vostoke 1917-1922 gg (From the History of Intervention and Civil War in Siberia and the Far East, 1917-1922). Novosibirsk: Izdatel'stvo Nauka, 1985.
- Leipold, William D. "America's Siberian Expedition." Student Paper. Fort Leavenworth, Kansas: United States Army Command and General Staff College, 1981.
- Lincoln, W. Bruce. Red Victory: A History of the Russian Civil War. New York: Simon and Schuster, 1989.

- Lowe, Karl H. "American Polar Bears' Defense of Vladivostok." Military History (Oct 1997): 38-44.
- Luckett, Judith A. "The Siberian Intervention: Military Support of Foreign Policy." Military Review 64, No. 4 (1984): 54-63.
- Mal'kov, V.L. "*Amerikanskie Soldaty v Sibiri* (American Soldiers in Siberia)." Istoriia SSSR, Vol 1 (1969): 161-169.
- Maddox, Robert James. "Doughboys in Siberia," American History Illustrated, 12 (August 1977): 10-21.
- Maddox, Robert James. The Unknown War with Russia: Wilson's Siberian Intervention. San Rafael, CA: Presidio Press, 1977.
- Manning, Clarence A. The Siberian Fiasco. New York: 1952.
- March, Peyton C. The Nation at War. New York: Doubleday, Doran and Company, Inc., 1932.
- Melton, Carol Kingsland Willcox. "Between War and Peace: Woodrow Wilson and the American Expeditionary Force in Siberia, 1918-1920." Dissertation. Duke University, 1991.
- Millman, Brock. "The Problem with Generals: Military Observers and the Origins of the Intervention in Russia and Persia." Journal of Contemporary History 33, No. 2 (April 1998): 291-320.
- Morley, James W. The Japanese Thrust Into Siberia. New York: Columbia University Press, 1957.
- Nicholas, Ira C. "A Critical Analysis of the A.E.F. Siberia, Including Relations with Other Allies." Student paper. Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1932.
- Pelzel, Sophia Rogoski. American Intervention in Siberia. Philadelphia: 1946.
- Rhoads, Owen R. "A Study of the Operations and Supply of the American Forces in the Suchan Mine Area Siberia, September 1918 – January 1920." Student paper. Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1932.
- Sherower, Miles M. "The Nikolaevsk Massacre." Nation 111 (21 August 1920): 211-213.

- Shishkin, V.I. "*Sovremenaia Sovetskaia Istoriografiia Interventsii i Grazhdanskoi Voiny v Sibiri* (Contemporary Soviet Historiography on Intervention and Civil War in Siberia)." Izvestiia Siberskogo Otdeleniia Akademii Nauk SSSR No. 3 (1983): 88-94
- Silverlight, John. The Victor's Dilemma: Allied Intervention in the Russian Civil War. New York: Weybright and Talley, 1970.
- Smith, Erik A. Partisans and Polar Bears: The Story of the 31st U.S. Infantry Regiment in Siberia. 1993.
- Somin, Ilya. Stillborn Crusade: The Tragic Failure of Western Intervention in the Russian Civil War, 1918-1920. New Brunswick, N.J.: Transaction Publishers, 1996.
- Stevenson, Charles S. "The Forty Below Zero Campaign" Army Magazine (February 1969): 49-50.
- United States Army War College. Order of Battle of the United States Land Forces in the World War, American Expeditionary Forces in the World War. Washington: Government Printing Office, 1937.
- United States Senate Document No. 60, Sixty-sixth Congress, Second Session. American Troops in Siberia. Washington: 1919.
- Unterberger, Betty Miller, ed. American Intervention in the Russian Civil War. Lexington, MA: Heath and Company, 1969.
- Unterberger, Betty Miller. America's Siberian Expedition, 1918-1920: A Study of National Policy. New York: Greenwood Press, 1956.
- Ward, John. With the Die-Hards in Siberia. London: 1920.
- Westall, Virginia Cooper. "AEF Siberia – The Forgotten Army." Military Review (March 1968): 15.
- White, John Allen. The Siberian Intervention. Princeton: Princeton University Press, 1950.
- Whitehorn, Joseph W.A. "Three Wilsonian Military Interventions: Insights Through Command and Staff Operations." Dissertation. George Mason University, 1995.
- Wilson, Ross L. "Operations Other Than War: U.S. Intervention into Russia 1918-1920." Student paper. National War College, 1994.