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TOWARDS AN INTELLECTUAL COMPONENT OF JOINT DOCTRINE:
THE PHILOSOPHY AND PRACTICE OF EXPERIMENTAL INTELLIGENCE

by

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Abstract of

TOWARDS AN INTELLECTUAL COMPONENT OF JOINT DOCTRINE: THE
PHILOSOPHY AND PRACTICE OF EXPERIMENTAL INTELLIGENCE

The practical application of operational art requires the ability to apply the intellect to solve complex problems in an environment characterized by non-linearity, interaction, and layers of correlative cause and effect that are influenced by unknown and unknowable elements. The Chairman, Joint Chiefs of Staff and Commander, Joint Forces Command, should develop an intellectual component to Joint Doctrine as the foundation for a habit of thought that educates officers to think, plan and execute in that environment. This paper provides the "blueprint of an idea" for developing an intellectual component that has as its practical purpose the application of the tenets of experimental intelligence, theory, and critical analysis to the complex problems inherent to the use of operational art to achieve strategic objectives.

Introduction

"I think with joint staffs we can lick any of these things. In other words, we have to pull together and have the best brains we can get to work on the problems, and I think we can get the solutions"¹

- Admiral Raymond Spruance

Admiral Spruance's lesson---that joint staffs exist to solve problems and that thought must precede action---introduces my thesis: the practical application of operational art requires the ability to apply the intellect to solve complex problems in an environment characterized by non-linearity, interaction, and layers of correlative cause and effect that are influenced by unknown and unknowable elements.

That intellect cannot be assumed; it must be given purpose through the processes of philosophy and theory, developed and honed through the processes of education, and inculcated as a habit of thought through articulation in Joint Doctrine. The tenets of experimental intelligence and critical analysis provide the philosophical and theoretical structure for developing a theory that will form the substance of an intellectual component to Joint Doctrine. Joint education uses philosophy and theory to educate officers to analyze cause and effect, to use experience to inform reason, and to use reason to forecast the possibilities of future experience. Philosophy, theory and education are fused into a conceptual framework that describes and explains the nature of current and future Joint operations. That conceptual framework provides guidance to thought and action in the execution of operations in complex, uncertain environments.

The emergence of Joint Forces Command as a functional command responsible for developing Joint Doctrine provides the opportunity to develop, articulate, and expound an intellectual component to Joint Doctrine. This paper provides the "blueprint of an idea" for developing an intellectual component that has as its practical purpose the

application of experimental intelligence, theory, and critical analysis to solve the complex problems inherent to the use of operational art to achieve strategic objectives.²

Complexity

"Today we operate in an environment of 'many damn things simultaneously' and not an environment of 'one damn thing after another,'"³

- James Rosenau

Complexity theory describes and explains the nature of complex systems, the nature of complex problems, and how complex systems solve complex problems. In 1969, Herbert Simon defined a complex system as a system:

made up of a large number of parts that interact in a nonsimple way. In such systems the whole is more than the sum of its parts, not in an ultimate, metaphysical sense but in the important pragmatic sense that, given the properties of the parts and the laws of their interaction, it is not a trivial matter to infer the properties of the whole.⁴

In the mid-1980s complexity theorists expanded on Simon's definition by describing an adaptive component to complex systems, theorizing that complex systems comprise a:

network of many agents acting in parallel. Each agent finds itself in an

environment produced by its interactions with the other agents in the system.

It is constantly acting and reacting to what other agents are doing. And

because of that, essentially nothing in its environment is fixed.⁵

Complex problems result from the competition between complex systems, the complexity of the problem arising from the complexity of the systems and the competitive nature of the interaction between systems. Because nothing in its environment is fixed, the competition between systems is continuous. A complex system survives by developing a reliable means to continuously solve complex problems.

Simon states that complex systems solve complex problems through a

process of selective trial and error. Complex systems start the process by applying previously proven axioms to a current problem in a system of trial and error that continues until the problem is solved. Once solved, the path to solution assumes the status of an axiom, or rule, to be employed in solving the next problem. Over time the system organizes a body of axioms into principles which guide practical solving.⁶ Simon is emphatic in describing this interaction of experience and problem solving:

All that we have learned about these mazes points to the same conclusion: that human problem solving, from the most blundering to the most insightful, involves nothing more than varying mixtures of trial and error and selectivity. The selectivity derives from various rules of thumb, or heuristics, that suggest paths that should be tried first and which leads are promising.⁷

The source of that selectivity is previous and current experience.⁸

Later theorists observed that as complex systems interacted with their environment, recognizable patterns emerged that were used by the system to predict its future environment. In an environment of constant competitive interaction, the system learned to use patterns to build models that allowed it to anticipate and solve problems. In complex systems:

models and predictions are everywhere...But, then where do the models come from? How can any system learn enough about its environment to forecast future events? Where does the consciousness come from? Ultimately, the answer is "no one." Because if there is a programmer lurking in the background--- then you haven't really explained anything. But, there is an alternative: feedback from the environment. This was Darwin's great insight, that an agent can improve its internal models without any paranormal guidance whatsoever. It simply has to try the models out, see what works, see how well the predictions work in the real world and then adjust the models to do better next time.⁹

Complex systems, in other words, use old experiences to develop new and

better experiences through the discovery of patterns that guide present action and provide a framework for forecasting future actions.

Consider the U.S. Navy and Marine Corps as complex systems within the constructs of this theory. Both are comprised of subsystems---ships, fleets, departments, divisions, air wings, and headquarters---which interact in non-simple ways. Both are more than the sum of their parts.

Both Services have developed a body of axioms derived from a compilation of experiences, memories, and traditions. Those axioms form rules to guide current practice, provide models to anticipate and solve future problems, and form the body of beliefs that define Service culture.

A level of complexity resides in each Service and its subsystems. Both have well developed axioms and models---compilations of 200 years of experiences---that define Service culture, thought process, and methods of practice.

Combine both systems in an Amphibious Ready Force, and the level of complexity increases exponentially. In addition to increasing the non-simple interaction of parts, each Service's compilation of culture, thought, and practice enters into the competition between systems. Add an enemy force to the interaction and the level of complexity increases by an order of magnitude. Still, the Naval Services have developed a body of common experiences, memories, and traditions that guide action and provide models that help anticipate and solve problems in the execution of amphibious operations.

At both levels of complexity, each Service has compiled a body of experiences and thought into doctrine. It is doctrine that provides the

intellectual and practical framework to guide action, anticipate the future, and codify culture. The capstone doctrine of all four Services reveals the same commonality. All four compile a body of experiences, memories, and traditions into a body of thought that guides action. All four address the past as a guide to the future and all four articulate the evolutionary nature of doctrine, acknowledging the continuous nature of the interplay between experience and practice. That interplay, the correlative relationship in which the patterns of experience are used to guide current action and to forecast future possibilities, forms the intellectual foundation of Service doctrine and provides the conceptual framework for solving complex problems.¹⁰

Ratchet the complexity to the operational-strategic level however, and the level of complexity increases by *orders* of magnitude. Consider, for example, the complexity inherent to either the war on terrorism or the requirements of transformation. The complex systems involved include the entire National Security System and its subsystems (one of which is the Department of Defense); international political, social and military systems and their subsystems; and systems whose patterns are indefinable. The U.S. Military competes in this complex system without any axioms, models or common basis of thought to guide present action or to forecast the possibilities of future operations and requirements. The Joint community relies on the intellectual foundations of the Services to manage complexity. Those foundations are insufficient. The Joint community must develop its own rules, models and culture in the form of an intellectual component of Joint Doctrine. This paper argues that experimental intelligence should form the philosophical foundation of that intellectual component, that experimental intelligence is

articulated into doctrine through the processes of theory, that critical analysis is the basis of theory, and that the principles derived from critical analysis form the bridge between the intellectual and practical components of doctrine by providing the axioms and models that guide current action and forecast future possibilities.

The Origin of Doctrine

"Both unconsciously and by definite social requirement individual memories are assimilated to group memory or tradition and individual fancies are accommodated to the body of beliefs characteristic of a community."¹¹

- John Dewey

John Dewey describes doctrine as the codification of assimilated individual and collective experiences. Military theorist James Schneider describes it as the means to integrate a common set of ideas derived from experience into culture and society.¹² Both observed that man, in an attempt to give purpose to his experiences and bring order to his society, consolidated experience into some form of doctrine that "gave general traits to the imagination and general rules to conduct."¹³ These general rules give shape to social behavior and, consolidated as a body of acceptable behavior and common teachings, provide practical guides to social and cultural conduct. The intellectual component of culture emerges as a society engages in efforts "to formulate the things of experience to which they are deeply and passionately attached."¹⁴ That formulation occurs when reason is applied to experience:

Reason is experimental intelligence, conceived after the pattern of science and used in the creation of the social arts, it has something to do. It liberates man from the bondage of the past due to ignorance and accident hardened into custom. It projects a better future and assists man in its realization. And its operation is always subject to test in experience. The plans which are formed, the principles which man projects as guides to action, are not dogmas. They are hypotheses to be worked out in practice, and to be rejected, corrected and expanded as they fail or succeed to give our present experience the guidance it requires...Old experience is used to suggest aims and methods for developing a new and improved experience...We use our past experiences to construct new and better ones in the future...To such

*empirical suggestion used in constructive fashion for new ends, the name intelligence is given.*¹⁵

The observation that societies and organizations assimilate experiences into memories and traditions is the heart of Dewey's philosophy. Those memories and traditions are codified into doctrines that govern acceptable behavior and provide practical guides to action within that society or organization. This process of experience and codification is a closed system however, limited always to the size of the community which is able to collect a common body of experiences, memories, and traditions. Reason, when applied to that body of experience, is analyzed and evaluated from within a cultural prism built on the body of memory and tradition codified into doctrine. The interaction of experience and reason is always hostage to the common set of beliefs developed through the continuity of that interaction. Finally, and critical to understanding this thesis, doctrine is a compilation of experience and reason. It cannot precede either. A doctrine which ignores the interaction and continuity of experience and reason, or that is constructed through deduction with the intent to force experience and reason to conform to preconceived tenets, is a doctrine to which the name intelligence *cannot* be given.

Service doctrine reflects Dewey's philosophical tenets. The intellectual component of all four doctrines is based on an analysis of old experience as a means to "suggest aims and methods for developing a new and improved experience" through a constant, iterative process of analyzing experience to formulate axioms and models. Those axioms and models provide practical guides to present action and a means to forecast the range of potential future experiences.¹⁶

Doctrine codifies how a Service thinks about warfighting and how it executes that thought. In a very real sense, doctrine defines the social, practical, emotional, and traditional norms that govern each Service's culture; cultures that reflect a collection of common beliefs developed over the course of centuries for the three older Services and over the course of one hundred years for the fourth. Joint Doctrine, regardless of its intent or authority, is not going to be able to impose a common culture that replaces the collection of common beliefs to which each Service is "deeply and passionately attached."

To its credit, the current body of Joint Doctrine reflects that truth. The preface to Joint Warfare of the Armed Forces states that its purpose is merely "to assist members of the armed forces of the United States to operate successfully together."¹⁷ It then abdicates any responsibility for developing its own memories or traditions:

Joint Warfare relies upon Service traditions, cohesion, and expertise. Successful joint operations are made possible by the capabilities developed and embodied in each Service, including Service culture, heroes and professional standards.¹⁸

The remainder of the document makes one reference to philosophy---defining joint warfare as team warfare---and then limits itself exclusively to the practical. Discussion of the future focuses on the practical application of emerging technology to joint warfare with no reference to the thought that will guide that practice. There is no attempt to apply experimental intelligence in an attempt to "use past experiences to construct new and better ones in the future."¹⁹ Joint Doctrine struggles with the hard truths of Dewey's philosophy. Unwilling to impose a culture on the Services, and smart enough not to try to invent one, Joint Doctrine has defaulted to a lowest common denominator and become merely a textbook on fundamentals and a compilation of

techniques, tactics and procedures. Within that textbook there exists no foundation of thought to drive action.

Joint Forces Command should develop and codify an intellectual component of doctrine that applies the tenets of experimental intelligence to complex operational-strategic problems. Over time, as experience is used to inform reason and reason to forecast the possibilities of future experience, a collective set of beliefs will emerge that complements Service cultures and provides a foundation of thought to drive the operational and strategic actions of the armed forces of the United States. The first step in developing that foundation is the establishment of a theoretical framework for the intellectual component of Joint Doctrine.

The Purpose of Theory ²⁰

"Theory's main practical value is that it can assist a capable man to acquire a broad outlook whereby he may be surer his plan shall cover all ground and whereby he may with greater rapidity and certainty seize all the factors of a sudden situation."²¹

- Julian Corbett

Dewey refers to the process of theoretical analysis when he states that reason is "conceived after the pattern of science."²² To establish a theory, one must first determine a set of facts then analyze how those facts interrelate to discover patterns. If patterns emerge which suggest a reliable cause and effect, those patterns become principles: the foundation of a valid theory and the means for testing the durability of that theory. With the discovery of principles, theory can be used to explain, describe, or forecast behavior.

In the hard sciences, where behavior follows immutable laws, the

theorist's role is to discover those laws and then to examine their behavior. In military theory that process of discovery is much more difficult. The introduction of the human element, the complex nature of political-military dynamics, and the non-linear and interactive dynamics of human conflict, combine to form an environment that is difficult to analyze. The realities of this environment require the military theorist to temper any discovery of principles with knowledge acquired through experience. A system of reliable cause and effect must still form the foundation for any military theory, but the theorist understands that those principles are not immutable and require careful qualification.

In On War, Carl von Clausewitz states that the purpose of military theory is to develop an analytical tool one can use to understand the nature and conduct of war. That purpose remains valid today. Military theory provides a tool for analysis and not a prescription for action.

Clausewitz believed that theory was developed by "identifying the variables of war and establishing their interrelations."²³ For Clausewitz, the function of theory is to identify and establish the relationships among the elements of a given situation without assigning a relative weight to each element. The principles derived from theory provide a commander with a conceptual framework to guide decision making, but the principles do not provide guidance on *which* decision to make. Clausewitz believed that theory accomplishes its purpose when it provides a commander with "insight into the great mass of phenomena and their relationships" while leaving him free "to rise to the higher realms of action" unencumbered by prescriptive formulas that dictate those actions.²⁴

James Schneider, building on an analysis of Clausewitz, identifies six purposes for theory: to provide a reliable blueprint oriented towards the future, to provide a basis for criticism, to anticipate changes, to recognize those changes, to impart new insights, and to change future reality to our own advantage. ²⁵ Schneider defines military theory as "a reliable system of beliefs, casually sustained and justified by the professional and personal understanding about the nature of war;" a definition that brings us full circle to the requirement to search for a system of reliable cause and effect by "identifying the variables of war and establishing their interrelations."²⁶

Clausewitz and Schneider considered a critical analysis of history as the only means available to determine cause and effect, to establish a reliable system of beliefs based on the interrelationships of those causes and effects, and to separate the enduring principles from the accidental anomalies. This critical analysis of history is the method that comprises Dewey's pattern of science, and it is through critical analysis that we "formulate the things of experience" to establish the foundations of experimental intelligence. ²⁷

In developing an intellectual component to Joint Doctrine, the specific aim of critical analysis is to develop a theory that: (1) describes the nature of the employment of the U.S. military element of national power, in concert with the other elements, to accomplish strategic objectives and, (2) forecasts the nature of future military operations in support of future national objectives. The specific purpose of the resulting theory is to provide the Joint community with the conceptual tools required to solve complex problems. Critical

analysis is the tool used to establish a reliable set of beliefs upon which to build that theory; it is the foundation for developing a habit of thought "whereby [an Officer] may with greater rapidity and certainty seize all the factors of a sudden situation," and it is the means through which we "use our past experiences to construct new and better ones in the future."²⁸

The Eye of Minerva²⁹

"Effects in war seldom result from a single cause; there are usually several concurrent causes. It is therefore not enough to trace a sequence of events back to their origin; each identifiable cause still has to be correctly assessed. This leads to a closer analysis of the nature of these causes, and in this way critical analysis gets us into theory proper."³⁰

- Carl Von

Clausewitz

Clausewitz defined critical analysis as a three step process involving three separate intellectual activities: "first, the discovery and interpretation of equivocal facts...Second, the tracing of effects back to their causes....Third, the investigation of the means employed."³¹

He expands on the second element in a passage that captures the complexity of the environment of study:

But in war, as in life generally, all parts of a whole are interconnected and thus the effects produced must influence all subsequent operations and modify their final outcome to some degree...One can go on tracing the effects that a cause produces as long as it seems worthwhile. In the same way, a means must be evaluated not merely with respect to its immediate end: that end itself should appraised as a means for the next and highest one; and thus we follow a chain of events until we reach one that requires no justification, because its necessity is self evident.³²

Finally, he adds an important caveat that addresses uncertainty:

The disparity between cause and effect may be such that the critic is not justified in considering the effect as an inevitable result of known causes. This is bound to produce gaps...All a theory demands is that such an investigation should be carried out until such a gap is reached. At that point, judgment has to be suspended. Serious trouble arises when known facts are forcibly stretched to explain effects.³³

Clausewitz's description of critical analysis, with its qualifiers and caveats, defines the term as used in this paper.

Clausewitz developed theory through an inductive analysis of history that addressed the social, political, military, moral and emotional dimensions of a complex human endeavor. The tenets of Clausewitzian critical analysis: inductive reasoning, acceptance of the human dimension, the use of history as laboratory, theory as "reference" or "guide" vice "formula", the critical importance of linking theory to practical experience, and the method for tracing effects back to causes, are as valid today as they were 200 years ago.

Inductive logic is the bedrock of critical analysis, the foundation that provides it validity and force of argument. The rigor with which Clausewitz pursued cause and effect---analyzing cause and effect through a prism that viewed history as a series of correlated events occurring in parallel systems and not as linear events to be separated and studied in isolation; the rigorous assessment of each identifiable cause in relation to its effect and the assessment of that effect as another event in the causal chain; his refusal to forcibly stretch known facts to cover gaps in the linkage of cause and effect---allowed "*concepts to combine of their own accord* to form the nucleus of a truth we call a principle."³⁴

"*Combine of their own accord*" is the essence of the inductive logic central to critical analysis. There are no values or judgments assigned to the correlation of facts, cause and effect, and principles derived from critical analysis.

Critical analysis provides the means to develop a reliable system of beliefs to guide present actions, to forecast a range of

possible futures, and to argue the veracity of that future. Critical analysis also provides a means for determining when change occurs and our theory must either be adjusted or declared irrelevant.

The new theory---and it will have to be a new theory---designed to take control of the intellectual foundations of Joint Doctrine begins with a critical analysis of the underlying order resident in the mass of military, social, economic, and political phenomena that comprise the operational art canvas. If, in the course of analysis, "concepts combine of their own accord to form the nucleus of a truth we call a principle" then those principles are incorporated into the body of reliable beliefs which form the foundation of Joint Doctrine.³⁵ In the tasks assigned theory it is the *principle*---emerging of its own accord as a result of rigorous, historically-based critical analysis---that provides theory the means to describe and forecast behavior. It is the *principle* that emerges, through the process of critical analysis, as the practical element of experimental intelligence. In Dewey's philosophy, it is the *principle* that "has something to do."³⁶ And what a principle "has to do" is form the bridge between the intellectual and practical components of Joint Doctrine by providing a reliable frame of reference for solving complex problems.

Synthesis and Anti-Thesis

"Okay. Interesting stuff. But so what?"³⁷

- LtCol, U.S. Army

The reactions of officers who have read early drafts of this paper coalesce around two points: (1) it doesn't tell me how to do anything and, (2) the theory has already been done for us.

An attitude that "it doesn't tell me how to do anything" reflects a U.S. military culture unwilling to accept a framework of thought whose

sole purpose is to provide a framework for thinking. The U.S. military has an almost uncontrollable urge to mold thought into a form that will tell us "how to do something." We either force theory and principles from the realm of thoughtful analysis into a recipe book of tactics, techniques and procedures, or we throw technology at it and declare ourselves revolutionized.³⁸

The argument that the theory has already been done for us reflects an institutional intellectual laziness. Elements of the theories of Clausewitz, Corbett, Alfred Mahan, Sun Tzu and others have modern applicability. However, it is worth considering if the source of Service inertia that resists change is not in fact rooted in an intellectual foundation that has been allowed to stagnate through blind acceptance of old theory. In the absence of an intellectual foundation capable of constantly testing the compilation of old experience against the realities of present practice, it is impossible to determine the validity of those old theories. The default is a projection of old experience into the future. The critical intermediate step---continual analysis of the interaction of experience and practice--- is ignored.

We can see the influence of both attitudes in the current debate on transformation. Ask each Service and the Joint Staff what it the U.S. Military is "transforming to" and you will likely get four different answers and one shrug. Each Service is a prisoner of the body of assimilated memories and experiences which comprise its culture and is capable only of projecting into a future that extends from those experiences. The Joint Staff has not codified a body of assimilated memories and experience and has no foundation of reliable beliefs and principles to forecast the possibilities of future experience. The

result is an anarchic constellation of four separate complex systems whose competition is not harnessed by a hierarchical system that provides guidance and direction. The intellectual component of Joint Doctrine will provide that hierarchical guidance and direction.

This analysis of experimental intelligence, the purposes of theory, the role of critical analysis, and the architecture of complexity, is designed to provide the Chairman, Joint Chiefs of Staff and Commander, Joint Forces Command with a philosophical blueprint for "how to" develop that intellectual component. The use of this blueprint will produce three results: first, an intellectual foundation of thought to drive action as the U.S. Military struggles with the challenges of complex problems in a complex future; second, the development of a theory whose principles provide an analytical framework to guide the practical employment of the Services to achieve strategic objectives; and, third, the codification of a system of beliefs that will define a joint culture in the U.S. Military. There are four steps to putting the blueprint into action:

1. Define the mass of phenomena the theory will describe. The intellectual component of Joint Doctrine should be based on a theory that: (a) describes the nature of the employment of the military element of national power, in concert with the other elements, to accomplish strategic objectives, and (b) forecasts the nature of future military operations in support of future strategic objectives. The political, military, and social environments comprise the mass of phenomena to be studied. That "mass" includes the study of elements normally outside the purview of military analysis, but is from within that mass of phenomena that principles and beliefs will coalesce. In addition, this level of

analysis raises theory to the operational-strategic level and provides the impetus for assimilating and codifying the body of experiences and beliefs that define a joint culture.

2. Invest intellectual capital to develop the theory. This theory, built through rigorous critical analysis of joint operations and the results of joint exercises, must extend beyond a compilation of stove-piped lessons learned to a study of the layers of correlative cause and effect inherent to the political, military, and social dynamics of operational and strategic level operations. It is a herculean task, but a task critical to the development principles that guide present action, forecast the range of future possibilities, and formulate the things of experience that will define joint culture. Without this investment of intellectual capital, Joint Doctrine will be relegated to a bumper sticker "teamwork" philosophy and will remain enslaved to Service cultures.

3. *Require* Top Level Schools to develop a rigorous, challenging, and difficult course of study that educates senior officers to think and execute in complex, non-linear environments. The course of study should be designed to hone the intellect, not to introduce concepts. Selection for attendance should be competitive, and failure possible. A model for this proposed education system exists at the School of Advanced Military Studies, the School of Advanced Warfighting, and the School of Advanced Airpower Studies. All three schools design their curriculums to educate selected officers to solve complex problems. All three schools follow a demanding and rigorous course of study. All three schools focus on the dynamics of experimental intelligence in a course of study that starts with theory, progresses to the study of history as the source of theory,

and then projects that analysis to a future experience. While all are hostage to the cultural prism of their sponsoring Service, it is characteristic of all three that graduates, regardless of which course they graduated from, share a common habit of thought that allows for an intuitive and efficient collaboration of intellect and practice. The Top Level School system should elevate that concept to a higher standard of intellectual rigor and focus the education at the operational-strategic level. Graduates will sow the seed of their education as habits of thought to their peers, their subordinates, and the other actors in the National Security System.³⁹

The final step, institutionalizing experimental intelligence as a habit of thought in the U.S. Military, occurs informally through the processes and results of theory and formally through the education process. The continuity of the interaction between experience and practice combines with a habit of critical analysis to create a system of self-perpetuating experimental reason. This is going to take time. But the result----officers with the ability to apply the intellect to solve complex problems in an environment characterized by non-linearity, interaction, and layers of correlative cause and effect that are influenced by unknown and unknowable elements---makes the effort both worthwhile and necessary.

The question is whether the U.S. Military will invest intellectual capital in an endeavor that will require time, rigorous adherence to the tenets of critical analysis, the study of elements normally considered outside the purview of military analysis, and towards a result whose only purpose is to develop a framework of thinking.

There is no question as to whether we should. We stand on the

precipice of an unknown and complex future. We can decide if we are going to blunder forward in ignorance or march forward with insight and direction.

This paper provides a blueprint for development of a method that allows the U.S. Military to march forward with insight and direction. Putting that blueprint into action is a task of monumental intellectual proportions but, in a vocation where the blood, treasure, and interests of a nation are dependent upon our ability to get the future mostly right; it is a task worth pursuing.

NOTES

¹ Thomas B. Buell, The Quiet Warrior (Annapolis, MD: Naval Institute Press 1974), 419.

² Malcolm Gladwell, The Tipping Point (Boston, MA: Little Brown and Company 2000), 7.

³ James N. Rosenau, "Many Damn Things Simultaneously: Complexity Theory and World Affairs." A paper presented at the Conference on Complexity, Global Politics and National Security, sponsored by the National Defense University and the Rand Corporation (Washington, D.C., November 13, 1996), 3

⁴ Herbert A. Simon, The Sciences of the Artificial (Cambridge, MA: The Massachusetts Institute of Technology Press 1969), 195.

⁵ M. Mitchell Waldrop, Complexity (New York: Simon and Shuster 1992), 145.

⁶ Simon, 205-207.

⁷ Ibid., 207.

⁸ Ibid., 208.

⁹ Waldrop, 179.

¹⁰ U.S. Air Force, Air Force Basic Doctrine, Air Force Doctrine Document 1, (Washington, D.C. 1997); U.S. Army, Operations, Field Manual 3-0 (Washington, D.C.: 2001); U.S. Marine Corps, Warfighting, Marine Corps Doctrinal Publication 1, (Washington, D.C.: 1997); U.S. Navy, Naval Warfare, Naval Doctrine Publication 1, (Washington, D.C.: 1994). The capstone doctrine of all four Service's are replete with reference to tradition, the importance of analyzing history, and the value of using that analysis to forecast future requirements. The following examples, taken from the forewords or prefaces of Service capstone doctrine and signed by the Service Chief, provide a small taste of this common theme:

Operations:

"FM 3-0, Operations, discusses how to master those transitions, how to apply combat power, and how to think about operations. In short, it provides a professional intellectual framework for how we operate. FM 3-0 is the continuation of a work in progress. This edition has been shaped by our experiences and experiments since the first post-Cold War FM 100-5 published in 1993 and the duties we foresee for our nation in this early part of the 21st century."

Air Force Basic Doctrine:

"Air and space doctrine is a statement of officially sanctioned beliefs and warfighting principles that describe and guide the proper use of air and space forces in military operations...Doctrine prepares us for future uncertainties. ...Air and space doctrine is an accumulation of knowledge gained primarily from the study and analysis of experience.... [Air Force doctrinal publications] are not complete--- they are continuous works in progress. We must remain alert and receptive to the lessons of the past and technologies of the future that may alter the art of air and space warfare."

Warfighting:

"Very simply, this publication describes the philosophy which distinguishes the U.S. Marine Corps. The thoughts contained here are not merely guidance for action in combat, but a way of thinking...Doctrine must continue to evolve based on growing experience, advancements in theory, and the changing face of war itself."

Naval Warfare:

"Doctrine is the starting point from which we develop solutions and options to address the specific warfighting demands and challenges we face...Doctrine is conceptual, a shared way of thinking that is not directive...It articulates operational concepts that govern the employment of naval forces at all levels. A product of more than 218 years of U.S. Navy experience in warfighting, it incorporates the lessons of history, learned in both the flush of success and the bitterness of failure."

¹¹ John Dewey, Reconstruction in Philosophy (New York: Henry Holt and Company 1920), 8.

¹² James J. Schneider, Theoretical Paper No. 5, The Eye of Minerva: The Origin, Nature, and Purpose of Military Theory and Doctrine, School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth, KS., 15.

¹³ Dewey, 9.

¹⁴ *Ibid.*, 25-26.

¹⁵ *Ibid.*, 94-95, 96-97. Italics added.

¹⁶ *Ibid.*, 94-95.

¹⁷ Joint Chiefs of Staff, Joint Warfare of the Armed Forces of the United States, Joint Pub 1 (Washington D.C.: National Defense University 2000), i.

¹⁸ *Ibid.*

¹⁹ Dewey, 94-95.

²⁰ Some of concepts in this section were first developed by the author in a monograph written as a student at the School of Advanced Military Studies. Those ideas have matured in the years since as a result of further study of reconstruction philosophy, complexity theory, and another seven years of experience. See: Craig A. Tucker, "False Prophets: The Myth of Maneuver Warfare and the Inadequacies of FMFM-1, Warfighting" (Unpublished Monograph, School of Advanced Military Studies, Ft. Leavenworth, KS: 1995).

²¹ Julian Corbett, Some Principles of Maritime Strategy, (Annapolis, MD: Naval Institute Press, 1988), 4-5.

²² Dewey, 96-97.

²³ Yehoshavet Harkabi, Theory and Doctrine in Classical and Modern Strategy, Reprinted from Working Paper number 35, International Security Studies Program, The Wilson Center, 3-14.

²⁴ Clausewitz, 698.

²⁵ Schneider, 15-16.

²⁶ Schneider, 10; Harkabi, 3-14.

²⁷ Dewey, 25-26.

²⁸ Corbett, 4-5. Dewey, 94-95.

²⁹ Schneider, Title Page. Minerva was the Etruscan mythological goddess of war *and* reason. Her gift to man was the ability to make sense of the passion and chance inherent to war.

³⁰ Clausewitz, 182.

³¹ *Ibid.*, 181.

³² *Ibid.*, 184.

³³ *Ibid.*, 182.

³⁴ *Ibid.*, 698.

³⁵ *Ibid.*

³⁶ Dewey, 96-97.

³⁷ Approximately ten of my fellow students have read portions of this paper. The reaction from the Army Lieutenant Colonel is very typical of the responses from all but one, a School of Advanced Warfighting graduate who engaged the author in an hour conversation concerning the origins of doctrine.

³⁸ Clausewitz fell victim to the former tendency as we ignored his admonition about employing theory as a specific guide to action and forced his principles onto the pages of doctrine as instructions for the development of operational paint-by-number products, expecting the tenets to make sense to those who have not been educated on the theoretical underpinnings. The tenets of complexity theory are falling victim to the latter tendency as we add technology to its more endearing tenets and declare “swarming tactics” and network centric warfare as outriders of a new theory of war. See Thomas K. Adams, “The Real Military Revolution” Parameters, (Autumn 2000), 54-65; and David S. Alberts, John J. Garstka, Frederick P. Stein ed., Network Centric Warfare, 2d ed. (Revised), Washington D.C., CCRP, 2000).

³⁹ The author is a graduate of the U.S. Army’s School of Advanced Military Studies (SAMS) and has been involved in operational-strategic level planning groups at CINCPAC, U.S. Forces Korea, United Nations Combined Forces Command, Korea, and U.S. Central Command. In each planning effort, graduates of SAMS, the School of Advanced Warfighting (SAW), and the School of Advanced Airpower Studies (SAAS) formed the heart of the

planning team and discovered that their education at each school resulted in a common habit of thought about operational level planning and execution. The graduates of all three schools are highly sought after by Service Headquarters, CINCs, and Service component-level commands. All three Services have specified assignment criteria for graduates, requiring them to serve in Service headquarters or at component or senior warfighting commands; an assignment policy that results in a coalescing of graduates at real-world and major exercise planning conferences.

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