

# **Searching for the Essence of Red Teaming: Linearity, Overcoming Rationality, Toward Sensemaking**

**A Monograph  
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## **Abstract**

Searching for the Essence of Red Teaming: Linearity, Overcoming Rationality, Toward Sensemaking by MAJ Jesse W. Bell III., United States Army, 42 pages.

The strategic and operational environment in which the United States military will operate in for the foreseeable future is characterized by its complexity. Historically the United States military has taken a linear approach to understanding the environment as well as problem solving. This linear approach limits the ability of the military to adapt when faced with rivals who do not adhere to similar methodologies. Often when placed in environments whose logic differs from what is expected, the system seems chaotic when in fact it is not. This seeming chaos reduces the effectiveness of military action because the military may try to solve the wrong problem with limited capacity to assess whether their efforts are achieving success. Given that the military will need to be able to operate within this environment, new methodologies have been incorporated into Army staffs including red teams. The author argues that red teaming combats a historical legacy of linear thinking and bounded rationality by providing an alternative perspective to the staff triggering sensemaking. From sensemaking emerges adaptation and creativity better enabling the Army to manage complex systems within limits of tolerance. The author recommends the Army invest additional resources in its red team members in order to enhance their ability to use the considerable arsenal of tools at their disposal.

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## Introduction

For thousands of years man has sought ways to make better decisions. The ancients consulted fortune tellers, mystics, and soothsayers in an attempt to foresee the future, and make decisions to change its outcome. Today as one looks back upon what many might consider primitive people, one is tempted to smugly say to oneself how much more sophisticated he is at prediction than were the ancients. Westerners point to the science of warfare, to the power of the decision-making processes, and to scientific reductionist methodologies as evidence of superiority. The United States military can point to its ability to arrange vast forces, synchronize its efforts, and organize vast amounts of information to support operations. After all, the United States put a man on the moon, how much more complicated does it get?

Western militaries comfort themselves that science will save them from their cognitive limitations. Net-centric warfare will give to military forces what approaches near real time situational awareness.<sup>1</sup> New and advanced weapons allow military forces to target with precision and strike only targets worth destroying, greatly increasing their lethal efficiency factor. The military will be faster, more lethal, and make better decisions than its opponents, and within these aspects reside the keys to future victories.<sup>2</sup> Yet these decisions must be appropriate to the situation and assumes the definition of “victory” means the same to the United States as it does to the opponent.

Arguably the machine age and information revolution gives some military planners comfort. Westerners look to greater technological advancements as the grease that reduces the friction of war and lifts the fog of uncertainty. Advancements in technology lead the United

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<sup>1</sup> U.S. Department of Defense, Office of Transformation, United States of America, *The Implementation of Network-Centric Warfare* (Washington, D.C.: 2005), 4.

<sup>2</sup> William A. Owens and Edward Offley, *Lifting the Fog of War* (New York: Farrar, Straus, and Giroux, 2000), 14-15.

States military to believe that one day, if only its technology advances enough, if only its staffs can include and categorize enough variables, and only if computers can display everything to the commander, then the commander will have the understanding to make the right decision at the appropriate time.

The Army's decisionmaking process is a reflection of the scientific revolution and was born from it. Army staffs have long shown through their actions that the most important part of this process is planning, and that through analysis they can accumulate enough information to reduce uncertainty and increase their ability to discern the enemy's disposition and intentions.<sup>3</sup>

A plethora of acronyms support this assertion. PMESII-PT, METT-TC, ASCOPE, and SWEAT-MS are some of those better known. These acronyms seem to grow over time, gaining more letters, seemingly in an attempt to capture more of something that is missing, with the assumption that it is that "something" which prevents full analysis of the environment in which the military operates. Furthermore, the United States military assigns civilian experts who directly advise the staff and commander on cultural matters, and organizations such as red teams are created to enhance the decisionmaking process.<sup>4</sup>

The journey on which this monograph takes the reader excludes simple problems. A key assumption taken by the author is that if a problem is simple or linear, a red team is probably unnecessary. Complexity populates the landscape over which the reader will journey and it is on this same landscape that the United States Army operates today and for the foreseeable future.

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<sup>3</sup> Martin L. Van Creveld, *Command in War* (Cambridge, MA: Harvard University Press, 1985), 264.

<sup>4</sup> Jacob Kipp, Lester Grau, Karl Prinslow, and Captain Don Smith III, "The Human Terrain System: A CORDS for the 21st Century," *Military Review* (September-October 2006): 8-15; U.S. Department of the Army, *A Statement on the Posture of the Army 2009*, [http://www.army.mil/aps/09/information\\_papers/red\\_team\\_education.html](http://www.army.mil/aps/09/information_papers/red_team_education.html) (accessed March 19, 2010).



The type of red teaming that forms a feature within the landscape of this journey is one that does not just emulate rivals, but explains rivals and the rationality under which they function within the system, and then turns its lens onto friendly forces and examines their actions in context holistically within the environment and in relation to the rivals rationality. This type of red teaming does not attempt to predict the future, it attempts to bound the possibilities of the rival based upon what can be, and seeks the source of difference rather than just a description of what one observes within the environment. Likewise, it turns its lens back toward friendly forces placing their desired end state in context with the rival's objectives.

The premise of this monograph is that conceptually red teaming serves as a self-reflective holistic assessment and offers the Army opportunities for understanding that were previously elusive. Within this monograph are three interrelated concepts that together emerge and comprise the central aspects upon which effective red teaming acts. First, Western armies often fail to effectively manage the complexity of the environment. Over time Western civilizations grew increasingly dependent upon technology, especially for archiving and organizing large amounts of information. Equally, Westerners tend to then use this information to draw inferences about the nature of the environment, typically using a scientific process more suitable to the laboratory where it is possible to control variables more easily. When applied to the often multidimensional environment where the military conducts operations, this scientific approach often fails to holistically acknowledge the complexity of the environment. The military then tries to solve the wrong problem better rather than identifying the right problem and managing the system within a determined limit of tolerance. The second idea is the concept of rationality. Rationality is the standard by which humans frame their possible decisions and evaluate the actions of other agents within the environment.<sup>5</sup> When a Western army's rival is one that shares similar rationality to its

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<sup>5</sup> Robert Nozick, *The Nature of Rationality* (Princeton, NJ: Princeton University Press, 1993), xi-xii.

own, it is simpler to evaluate actions of agents within the environment. Systems begin to appear chaotic when agents and rivals acting within it apply different rules of rationality than those of the United States military. This further compounds the problem of a linear rather than nonlinear approach to understanding the environment because the actions of agents within the environment appear irrational, and even less susceptible to reductionist methodologies Western armies are comfortable utilizing. The last notion is the red team's use of difference to spur learning and adaptation within the staff. It is the author's premise that the difference between the staff's analysis and that of the red team is a primary driver of creativity and adaptation. Without a "difference generator" the staff has a tendency to continue analysis bound by the same linearity and rationality which impedes a holistic understanding of the environment. Red teaming thusly becomes a positive change agent within the staff. In short, red teaming serves as the spark that lights the flame of creativity within a staff using the medium of difference, opening up possibilities previously hidden from view.

The intent of this monograph is to examine red teams and their potential to enable better decision making in the United States Army. There is considerable research suggesting that red teaming does indeed enable the staff to more holistically frame the environment. Thusly framed, the staff can better aid the commander in learning about the environment so that the commander's decisions are applicable to the environment. The question which seems lacking an explanation is why? What is it about the way that a staff approaches decisions which requires a red teaming effort, and in what ways might the red team impact this approach in a positive way? In short, why is the Army expending resources to facilitate increased integration of red teams into staffs? What is missing out of the military decisionmaking process that caused their evolution?

## War is Risky, Complex and Requires Adaptation

Carl Von Clausewitz acknowledges war as extremely risky and always a gamble when he uses the metaphor of a game of cards to describe war.<sup>6</sup> Clausewitz also seems to understand war as inherently complex, nonlinear, and unpredictable.<sup>7</sup> There is nothing that an army or nation can do to eliminate the inherent unpredictability of war, though militaries try through increasingly complex and sophisticated information technology systems to mitigate the unpredictable aspect of warfare. The only successful approach to winning a war in a nonlinear environment is to adapt, and this adaptation must occur faster for the Army than for the rival.

Adaptation can take many forms. As observed in Iraq and Afghanistan, most of these adaptations focus at the tactical level. Various tactics, techniques, and procedures as well as new equipment serve to further the effort of adaptation, mostly in response to changes in enemy tactics, techniques, and procedures. However, at the strategic and operational level adaptation seems notably sluggish, despite historical precedence that it is operational and strategic agility that decides war while superior tactics decide only battles. Despite sluggish adaptations at the operational and strategic levels, adaptations do occur. One of these adaptations is red teaming.

According to the United States Army's posture statement, red teaming accomplishes a variety of tasks:

Graduates of UFMCS (University of Foreign Military and Cultural Studies) will enhance mission planning by helping the staff to look at problems differently; account for the perspective of the adversary, multinational partners and others; frame alternative perspectives to problems; and aid in the discovery of alternative strategies. Effective red teaming ensures that unit planning and operations staffs avoid group think, tunnel vision, cultural missteps, and mirror imaging. Red teams will challenge the staff's planning assumptions and assessment systems,

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<sup>6</sup> Carl Von Clausewitz, *On War*, eds. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 85-86.

<sup>7</sup> Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security* 17, no. 3 (Winter 1992-1993): 61.

help the staff account for the complexity and relationships of the key variables found in the operational environment, identify the consequences of proposed actions, and provide timely critical insights to enable better decisions during planning and operations.<sup>8</sup>

These are not simple tasks. Each task touches on key variables which are a composite of how one constructs their version of the world and the string of causality and rationality holding it together.

Red teaming seeks to be an agent of change within the organization by causing changes in thinking and behavior. Red teaming enables change by helping to frame problems from a different position in the cognitive landscape, which allows the staff to see emerging contours, different than those previously observed. In helping the staff to see new perspectives, red teaming helps to influence the foundation of an organization's logic and induces systemic changes in the staff and the commander's perception of the environment. When the way an army thinks, the way an army organizes, and the way it fights are manifestations of the greater context of the civilization from which it was born, helping to induce systemic change is no easy task. Placing red teams at the strategic and operational levels is a significant step forward to possibly enhancing military adaptability at the strategic and operational levels. Understanding how a military thinks is crucial to understanding how its organization copes with the complexity of the world around it.

## **The Search for Relevant Information**

If red teams are change agents within the military organizational structure, what exactly is it that they are trying to change? What is it about the way one views the world which results in the need for red teaming? Perhaps the reason the military has difficulty in adapting and changing, especially when faced with an asymmetric threat, is the legacy of a collective Western cognitive

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<sup>8</sup> U.S. Department of the Army, *A Statement on the Posture of the Army 2009*.

history. Westerners are information hungry. A cursory examination of Western civilization shows this to be true. Cellular phones, computers, and twenty-four-hours-a-day news gives ample evidence of this characteristic. The information age is in full swing everywhere and permeates all parts of Western society, including the military.<sup>9</sup> How a military manipulates, interprets, and analyzes this plethora of information manifests itself through the way it chooses to organize its armed forces, and this organization defines how these forces engage in combat operations.

If viewed holistically, how the United States military organizes for combat reveals much about how it thinks and how this thinking has evolved over time. Though the United States military is information hungry, so are virtually all other militaries. The search for information is not at issue here but rather how the United States military uses the information it gleans to define the environment. The way militaries interpret information shapes the lens through which it looks at problems and the environment.

## **The Traditional Route to Understanding: Deconstructionism and Linearity**

For the most part Western scientific heritage leads Westerners to think linearly. Many examples of linearity reveal themselves to a keen observer of Western civilization.<sup>10</sup> A student's progress through school is one example of linearity. Society expects students to master certain skills enabling their success at the next higher educational level. Similarly, an athlete progresses from little league to a college athletics program, and then potentially to a professional athletic program. Linearity further manifests itself in the way Westerners organize for work. Usually hierarchical structures exemplify this linearity, with those occupying higher levels exercising

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<sup>9</sup> Van Creveld, *Command in War*, 237-238.

<sup>10</sup> Wesley C. Salmon, *Causality and Explanation* (New York: Oxford University Press, 1998), 38-39.

greater decision-making authority than those at lower levels in the organization. Group decision-making processes often take the form of linear processes as well. For example, practitioners often view the military decisionmaking process (MDMP) as a step-based process, almost like a big machine with raw material input (data) and finished product output (decision).<sup>11</sup>

Linearity is a product of simplistic deduction stemming from the Western adoption of classically Greek ideals.<sup>12</sup> The legacies of these classically Greek ideals result in a methodology which seeks to break down complex behavior into smaller and smaller parts so that the practitioner can understand the whole. Hard sciences such as mathematics relentlessly strove to break down complex problems into the simplest possible states to be able to isolate conditions. Essentially, linear systems allowed scientists to build systems which were easier to control and predict.<sup>13</sup> Analysts expended considerable research and energy to model the world in an effort to predict outcomes and thusly control the outcome.

Many of these deconstructionist tendencies were the result of early philosophical thought, as previously noted. The philosopher Descartes perhaps most heavily influenced the scientific revolution after the Enlightenment.<sup>14</sup> Descartes was the father of the scientific method and attempted to discern the truth by following four rules:

The first was never to accept anything for true which I did not clearly know to be such; that is to say, carefully to avoid precipitancy and prejudice, and to comprise nothing more in my judgement than what was presented to my mind so clearly and distinctly as to exclude all ground of doubt.

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<sup>11</sup> U.S. Department of the Army, *Field Manual 5-0 Army Planning and Orders Production* (Washington, D.C.: Government Printing Office, 2005), 3-3.

<sup>12</sup> Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," 61.

<sup>13</sup> Antoine Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (New York: Columbia University Press, 2009), 165.

<sup>14</sup> Alex J. Ryan, "What is a Systems Approach?" Cornell University Library, <http://arxiv.org/abs/0809.1698v1> (accessed March 5, 2010).

The second, to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution.

The third, to conduct my thoughts in such order that, by commencing with objects the simplest and easiest to know, I might ascend by little and little, and, as it were, step by step, to the knowledge of the more complex; assigning in thought a certain order even to those objects which in their own nature do not stand in a relation of antecedence and sequence.

And the last, in every case to make enumerations so complete, and reviews so general, that I might be assured that nothing was omitted.<sup>15</sup>

All four of these rules greatly impacted how modern science and philosophy would later develop.

The first and fourth rules apply primarily to philosophy. The first rule places the philosopher in the position of an outside observer, looking at a system and observing its behavior from a distant perspective. It is a detached viewpoint with the observer not a part of the system, but rather apart and godlike. The fourth rule implies that when making a finding or conclusion, it must apply to a broad range of cases. Essentially, a theory must be applicable across a spectrum of conditions. The theory must be broad enough to account for different behavior within the system.

The second and third rules pertain mostly to the harder sciences. As such, they have governed the nature of what Westerners understand modern science to be since the Enlightenment. Together rule two and three advocate the breaking down of larger constructs into smaller ones to explain how they work. Much like you would take apart a complex machine to see what makes it function and then reassemble it, so would a scientist break down and isolate nature, thus determining the cause and effect relationship that are so often elusive when looking

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<sup>15</sup> Rene Descartes, *Discourse on the Method of Rightly Conducting the Reason, and Seeking Truth in the Sciences*, trans. L. Lafleur (Englewood Cliffs, NJ: Prentice Hall, 1960).

at the whole. Deconstruction simplifies these relationships. These two principles are what today is called the Cartesian analytic method.<sup>16</sup>

Together these rules potentially allow the practitioner the to predict outcomes and predict the behavior of discreet parts of the environment. Historically the rules served as the seed for later philosophical and scientific inquiry. Additionally, Newtonian logic contributed to modern scientific development.

Sir Isaac Newton was a keen observer of his environment and sought to explain observed phenomenon using mathematics. He developed “laws” based upon relatively simple mathematics by which the outcomes of diverse activities could be predicted. For example he developed the Universal Law of Gravitation which explained the behavior of the planets in the solar system. As a result of the proof of the predictive power of mathematics, Newton’s mechanics played a primary role in the 19th century physics community’s view of a deterministic, mechanistic universe.<sup>17</sup> This view led to a deterministic outlook on the world. In essence, all that had to be done to predict the future was gather enough information, determine the mathematical formula to account for everything, and with great accuracy predict future events. This type of hard mathematical science approach was encouraged by scientists for use in not only explaining physics, but also social phenomenon.

In summary, linearity is the basis for how the West entered the era of modern science. Two key attributes identify a linear systems methodology. First, it is a methodology in which a problem is broken down into smaller parts. These smaller parts are easier to analyze in isolation from the whole because the system is less complicated once broken down into subcomponents. Once study of the subcomponents is completed scientists reassemble the subcomponents back together, after which everything should work the way it did prior to disassembly. This concept is

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<sup>16</sup> Ryan, “What is a Systems Approach?” 4.

<sup>17</sup> Ibid.



known as additivity, basically that the whole of the system is equal to the sum of its parts.<sup>18</sup> The second attribute of linear systems is that they demonstrate proportionality. For a system to be linear, it must show that changes in output are proportional to changes in input.<sup>19</sup> By its very nature, linearity encourages the isolation of variables, teaches the value of consistency of regularities, and constructs models based upon causality in an attempt to predict the behavior in a given system.<sup>20</sup> Red teaming can help a staff to recognize that the rival system does not necessarily follow a linear pattern and that it must be understood as a whole rather than as a sum of its parts.

### **The Attraction and Limitations of a Linear Approach**

Linearity is incredibly attractive because it is simple and Westerners tend to see a certain elegance in simplicity. It allows demonstrations of cause and effect. With linearity one can predict outcomes. The variable “X” always means “X” and “X” multiplied by “Y” always equals “Z.” Inherently, there is nothing wrong with linearity. It was and still is essential to explaining how many phenomena work. However, unlike physics and mechanics, linearity applied to the social sciences it is not effective and lacks explanation because linearity explains component parts not the whole.

### **The Search for Order**

The difficulty of isolating variables in an open system did not stop the United States military from trying to isolate variables within the environment. The idea of predicting behavior was simply too great to ignore. During the Vietnam War, Robert McNamara established the

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<sup>18</sup> Beyerchen, “Clausewitz, Nonlinearity, and the Unpredictability of War,” 62.

<sup>19</sup> Ibid.

<sup>20</sup> Alan Beyerchen, “Nonlinear Science and the Unfolding of a New Intellectual Vision,” *Papers in Comparative Studies* 6 (1988-1989): 30.

Office of Systems Analysis. The methodology used by this office was the classical Cartesian approach. It attempted to model and quantify the complex aspects of higher-level decision making. The Office of Systems Analysis attempted to clearly define the parameters of each separate problem as part of a larger problem, make underlying assumptions more explicit, and quantify as many variables as possible.<sup>21</sup> This methodology attempted to control costs and determine which type of units and the quantity of those units to deploy. It also accounted for various other measurements in an attempt to assess success. The ubiquitous enemy body count and pacified village count are indicative of this approach.

Operations research is a further example of the Cartesian approach. The RAND Corporation helped to pioneer operations research. Operations research was a scientific approach to management. Its goal was giving management a quantifiable basis for making decisions.<sup>22</sup> Like the approach used by the Office of Systems Analysis, operations research worked quite well in certain cases. Mainly, those systems that analysts could isolate and control responded well to an operations research approach. Clear and identifiable objectives also enhanced operations research. However, both of these approaches fell short of expectations when applied to the real world; they gave the illusion of certainty, and were only successful in static systems. Unfortunately, neither approach allowed analysts to predict conditions except in a very short time horizon. The other disadvantage was that the analysis required huge information requirements to calculate and quantify conditions in the system.

Though these methodologies did not offer an explanation for events, nor were they successful in predicting the future behavior of social systems, the methodology itself was highly predictable and in line with a mechanistic and methodological view of the world. It is this

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<sup>21</sup> Van Creveld, *Command in War*, 240.

<sup>22</sup> Ryan, "What is a Systems Approach?" 15-16.

predictability which Westerners prize.<sup>23</sup> Practitioners of the Army's decisionmaking process can still see the ghosts of these past methodologies. The strong force of cybernetics is evident everywhere. The United States Army describes its decisionmaking process as having seven steps. Army staff members often regard step two, mission analysis, as the most important.<sup>24</sup> Mission analysis orders information and then breaks down this information into its component parts so that the staff can better understand the environment. The staff later reassembles these information segments when they conduct course of action development and determine the enemy's most likely course of action.

The Army prizes order; the combined history of Western scientific development teaches military staffs that creating rigid order is the best way to be successful. Disorder is not desirable because disorder leads to a lack of control, without which commanders are unable to impose order. This methodology is directly in contrast to the real world. The real world is adaptive and seeks its own order and stability which may not align with how the Western warfighter defines order. The real world is nonlinear. Like nature, it adapts and changes. Sometimes stable, but waiting for energy to be introduced into the system, after which the environment suddenly shifts, and suddenly looks different and disorderly. Yet within this disorder and asymmetry lay the seeds of success.<sup>25</sup> Red teaming aims to feed and water these seeds so they bloom within the organization by helping the staff to recognize the inherent opportunities which lay within nonlinear systems.

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<sup>23</sup> Francois Jullien, *A Treatise on Efficacy: Between Western and Chinese Thinking*, trans. Janet Lloyd (Honolulu, HI: University of Hawai'i Press, 2004), 4.

<sup>24</sup> U.S. Department of the Army, *Field Manual 5-0 Army Planning and Orders Production*, 3-15.

<sup>25</sup> Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*, 176.

## The Real World: Nonlinear and Complex

Linear thinkers and organizations have difficulty dealing with nonlinearity. Whereas linear systems can be broken down and analyzed into progressively smaller bits and pieces, nonlinear systems refuse to give up their secrets via reductionist methodologies. For an organization grounded in reductionist techniques a system which balks at being understood through reductionist techniques is frustrating. Nonlinearity can quickly overwhelm an organization seeking to analyze it through linear methods. When applying linear methods to nonlinear problems, the complexity of the relationships within the problem can quickly and rapidly overwhelm the analytical capabilities of the organization.

The attributes of nonlinear problems cause these problems to be difficult to analyze using traditional scientific methods. Nonlinear systems show the following characteristics:

In non-linear systems, the output is not directly proportional to the input. The ratio of output to input can radically shift.

In non-linear systems, the sum of inputs does not equal the same results as if each of these are input individually and their result summed. In short non-linear systems do not obey the rule of additivity. The emergent behavior may be greater or less than the sum of the individual parts.

Non-linear systems tend to bifurcate or diverge into multiple states and thus are adaptable and unpredictable.<sup>26</sup>

If humans are components within a system the system will tend to exhibit signs of nonlinearity. This is because nonlinear systems are the result of the collective interaction between multiple agents acting within it. Since each agent, and each agent could be a compilation of multiple individuals, acts independently, it is unlikely that analysts can predict long-term deterministic behavior. Any change one agent makes impacts the entire system, leading other

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<sup>26</sup> Linda P. Beckerman, "The Non-Linear Dynamics of War," The Complexity & Artificial Life Research Concept for Self-Organizing Systems, <http://www.calresco.org/beckermn/nonlindy.htm> (accessed March 5, 2010), 2.2-2.4.

agents to modify their behavior in response, a sort of ripple effect. These modifications cause the system to bifurcate causing greater differentiation. With each bifurcation, the future behavior of the system becomes less and less certain. When an organization imposes a linear type of internal decision-making methodology, the organization becomes increasingly predictable to rival organizations who are able to adapt.

## **Exploring Systems: Mono-stable, Multi-stable, and the Edge of Chaos**

One of the characteristics of nonlinear systems is a capacity for multiple stable states.<sup>27</sup> In contrast, linear systems do not have this emergent characteristic. A nonlinear system has a range of possible stable states in which it can exist. Within a single large system it is possible for multiple stable systems to exist simultaneously. These possible stable systems could range from peaceful coexistence to open conflict. In terms of nonlinear systems, stability does not have a negative or positive connotation.

Some nonlinear systems are mono-stable. Inherently high stability characterizes these types of systems. Though nonlinear, they tend to snap back to a single stable state regardless of how much energy is applied. A historical example of a mono-stable system is World War I trench warfare. Both allies and central powers injected vast resources into this war in an attempt to adapt and thus achieve an advantage. Technology made great leaps, armies committed huge amounts of manpower and employed new tactics. Despite these efforts, neither side adapted sufficiently to gain an asymmetrical advantage over their opponent. This type of nonlinear system remains trapped in a single state of action. The system cannot adapt, except for a short time, and therefore becomes predictable because it cannot adapt. If a system is in a mono-stable state, the only way to

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<sup>27</sup> Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*, 177.

change it is through a major reorientation.<sup>28</sup> In the case of World War I, Germany decided that it was not worth the continued effort and sacrifice required to continue fighting.

The multi-stable system is slightly more complex than a mono-stable system. This system is stable in more than one state. For one set of conditions and perturbations it will settle down into one stable state, and when faced with another set of condition and perturbations it will start to shift to a different stable state.<sup>29</sup> Thus, a multi-stable system is capable of being more adaptive than a mono-stable system because it has the potential to be stable in more than one state. One of the reasons nonlinear systems appear chaotic is that they often shift from stable state to stable state rapidly, without apparent cause. An example of a multi-stable system is the mechanized maneuver warfare which emerged during World War II. Mechanized forces rapidly transitioned from offense to defense while at the same time moving rapidly in time and space, always seeking the asymmetric advantage over their rival. Multi-stable systems are slightly less predictable and much more complex than mono-stable systems due to their ability to switch between multiple stable states. Further along the complexity spectrum reside systems classified as being in an opportunistic region in terms of their complexity.

Systems which reside in the opportunistic region are opportunistic for a simple reason; there are so many stable states available to them.<sup>30</sup> These systems can move to any number of stable systems in order to adapt to the environment around them. The most opportunistic systems operate right on the edge of chaos. Waldrop sums this up when he says:

Right in between the two extremes, at a kind of abstract phase transition called “the edge of chaos”, you also find complexity: a class of behaviors in which the components of the system never quite lock into place, yet never quite dissolve into turbulence, either. These are the systems that are both stable enough to store information, and yet evanescent enough to transmit it. These are the systems that

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<sup>28</sup> Beckerman, “The Non-Linear Dynamics of War,” 3.3.

<sup>29</sup> Ibid., 3.1.

<sup>30</sup> Beckerman, “The Non-Linear Dynamics of War,” 3.4.

can be organized to perform complex computations, to react to the world, to be spontaneous, adaptive, and alive.<sup>31</sup>

Systems which operate in this region of the nonlinear spectrum, between multi-stable and chaos, are complex adaptive systems. These systems seem most chaotic because they have so many stable states in which to operate. If the system is large enough, it may operate in multiple stable states simultaneously. These systems exhibit signs of self-organization, but rather than organize from the top down, as is common in linear systems, they tend to organize from the bottom up. This organization adds to their seemingly chaotic nature. An example of a complex adaptive system is al Qaeda. Al Qaeda displays many of the attributes of a complex adaptive system from the way it organizes to the high number of discreet cells operating nearly autonomously with little guidance and direction from those in charge. Because these cells operate by mostly simple rules, they are free to take whatever action is necessary within broad guidance issued from their leaders to achieve their ends. Elimination of cells has little impact overall since few of the discreet cells rely on one another for guidance or aid. By operating under simple rules, with leadership willing to give up a certain amount of control, all cells combined can have a greater effect on achieving the organizations aims. Al Qaeda does in fact achieve greater effects than the sum of its parts. By continually changing and adapting, mostly from the bottom up, decentralized organizations are extremely difficult to defeat as well. Each cell is able to modify its tactics, techniques, and procedures to achieve a better fit on the fitness landscape.

This position and relative value is called the fitness landscape. Within the environment some positions on the fitness landscape offer more advantages than others. For a military organization the position it occupies on the fitness landscape defines how well suited its

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<sup>31</sup> M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Simon and Schuster, 1992), 293.

occupants are to winning tactically, operationally, and strategically.<sup>32</sup> Within this fitness landscape military forces continually move around in an attempt to optimize their position within the landscape in relation to their rival. Each move by a military force and its rival alters the fitness landscape.

An example of the fitness landscape changing during war is how insurgent tactics changed in Iraq in relation to changes in United States force capabilities. When there were few armored wheeled vehicles in Iraq, improvised explosive devices were relatively simple. When the United States sustained too many casualties from these devices, the military moved to higher ground on the fitness landscape and deployed increasing numbers of armored, wheeled vehicles. The insurgents then used increasingly sophisticated devices to penetrate the armor of these vehicles, thus effectively negating the fitness peak U.S. forces climbed out from under them by rendering this armor inadequate. This type of adaptation and travel across the fitness landscape continually alters the landscape.

Consider also the activities of U.S. special forces operators. The Army considers them one of the most flexible and adaptive of all U.S. combat units. This force continually achieves success far out of proportion to their sheer numbers. Despite this, their conventional counterparts sometimes view the members of these special units unfavorably. Conventional forces often accuse special forces operators as being poorly disciplined, not following the “rules,” and having a “loose cannon” mentality. Their very structure, decentralized and flexible, lets them achieve multiple stable states within the fitness landscape. This structure allows each individual element to find the nearest fitness peak to climb in its vicinity, while at the same time loosely coordinating among teams to prevent a slip into a chaotic state. These special forces units operate close to the edge of chaos and their results speak louder than words.

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<sup>32</sup> Beckerman, “The Non-Linear Dynamics of War,” 5.1.



The events in Afghanistan during 2002 demonstrate the type of synergy created utilizing this methodology. In this case, a very small group of operators defeated a much larger opponent, the Taliban. Observing the events unfolding in isolation would yield a chaotic landscape of movement and countermovement. Yet within this system, very few agents (special forces operators) achieved astounding success, far beyond a mere summation of their number. They succeeded because they could rapidly move from fitness landscape peak to fitness landscape peak, thus adapting rapidly and continually undercutting the fitness peaks scaled by their Taliban opponents. These types of agents seem to have just the right balance of control, with just the right amount of information and direction flowing down from the top as is flowing from the bottom up.<sup>33</sup>

Red teaming seeks to serve as an agent of change within the staff organization. It should enable the command and staff to see these fitness peaks better, and help develop better tools to climb them. Simultaneously red teams continually scan this landscape as well as aid the staff's perception of the landscape to identify elusive fitness peaks. Red team members, while small in number, can have a disproportionate effect within the organization.

So far this author discussed how Westerners tend to view information when interpreting their environment. As part of this Western civilization, one with a strong scientific approach to problem solving, the military tends to also follow this tendency. The tendency is to view the environment as linear and deterministic, an environment which the staff deconstructs to determine how it ticks. While this works well in isolated systems in analysts can isolate variables, it is less useful when trying to understand sociological systems in which humans are a key component. The real world is not linear and cause and effect relationships are often lost if not viewed holistically. Systems involving human interaction range from mono-stable to occupying a

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<sup>33</sup> Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos*, 294.

region characterized as complex and adaptive. When faced with other than mono-stable or multi-stable systems Western armies often have difficulty gaining a clear understanding of the environment because critical relationships between agents are broken during reduction, relationships which one can only understand through a holistic approach. Without a holistic approach, fitness peaks are more difficult to recognize, leaving the staff and commander potentially climbing the wrong fitness peak or potentially digging a fitness pit. Red teams assist the staff and commander in viewing the environment more holistically by highlighting key relationships within the system. Observing the system holistically is only part of the value of red teaming; equally important is being able to view the environment from multiple rationality perspectives. Without rational actors within a system, what the staff and commander observe seems irrational and without purpose. Red teaming can assist here also, helping to model the rationality of rivals within the system.

### **Rationality: A Key Component to Providing Context**

Part of effective red teaming must be to explain the enemy's rationality. Why is the enemy moving through the fitness landscape in the way that they do? Why are the other agents within the environment behaving in the way that they are? Why is the environment displaying the behavior that it is? These are all questions the red team should help to explain. A key aspect to explanation of these behaviors is explanation of systems rationality. Often the reason the environment seems so chaotic is that it seems to the observer to be irrational.<sup>34</sup> If the staff bases its entry argument for trying to understand a system on the unacknowledged assumptions that the system is behaving irrationally and that the military must impose rationality upon it, then these hidden assumptions can and will have unintended consequences in reshaping the fitness

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<sup>34</sup> Frank Heller, *Decision-Making and Leadership* (Cambridge, MA: University Press, 1992), 180-181.

landscape. Instead, the key assumption should be that every agent within a system is acting rationally, and what needs explanation is the rationality under which they are acting, not that they are acting irrationally or chaotically. For example, only if an agent is insane or purposefully acting irrationally in order to deceive are these acts irrational and unpredictable. Otherwise the agent is acting under a different rationality that the staff is either unknowing of or refuses to acknowledge. Red teams must help bring this rationality to the surface so that the staff and commander can learn its nature. This is important because rationality can shine light on which fitness peaks along the fitness landscape a rival might attempt to climb.

Decision making and rationality are closely coupled concepts. Decisions are of little use if not based upon some sort of rationality. In terms of red teaming, it is the explanation of the decisions made by the rival and the rationality behind those decision outcomes that can help the organization better appreciate and understand why the system is behaving according to a specific pattern, or why rivals change from one state to another. Explaining the rationale of decisions made by the rival by the red team can also aid the staff in predicting what state a system might move to, given friendly actions, as well as aid in identification of the limits of tolerance within which friendly forces might manage the system.

In terms of decision making, one might define rationality in two different ways. First, one might see rationality as a process, procedural rationality. Alternately, one might define rationality as the intelligence of its outcome, substantive rationality.<sup>35</sup> How organizations view the rationality of the system and their rivals can have a significant effect on how they interpret the decision of agents within the environment. For red teams to be effective they must help the organization they support understand both its own rationality and the rationality of its rival as well.

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<sup>35</sup> James G. March, *A Primer on Decision Making: How Decisions Happen* (New York: The Free Press, 1994), 2.

## Substantive Rationality's Limitations

Rational choice is a key aspect of substantive rationality. In this view of rationality the agent observes the world, collects information, and based upon that information makes the best decision possible. The first modern research into rationality began at the RAND Corporation in the 1950s. Here, game theory was the prominent methodology influencing rationality, and rationality in decision making was understood as making a choice in order to maximize the expected utility of outcomes, weighted by their probabilities and known as the expected utility model.<sup>36</sup> What this model failed to include was the psychological aspect of decision making, primarily the heuristics employed by individuals to simplify the process of actually making decisions.<sup>37</sup> Heuristics are essentially the mental shortcuts humans use to make decisions. Sometimes these mental shortcuts work against their user, reducing the apparent rationality of decisions. These false mental shortcuts are termed cognitive biases.

Different cultures apply heuristics differently. Some research shows that Westerners, for example, think differently than Asians and use a vastly different system of thought, perceiving things differently and thus one culture may question the rationality of another.<sup>38</sup> Since different cultures think about different aspects of the world and do so differently, they envision different future states, as well as the causality chain which brings them to their desired condition. These factors affect how both cultures view the rationality of one another. Where one participant's actions may seem completely rational to them, the same actions may seem irrational to another.

Substantive rationality then is more of a "pure" theory of rationality. In its purest form, rational choice theory assumes that all decision makers share a common set of preferences, that

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<sup>36</sup> Mie Augier and Kristian Kreiner, "Rationality, imagination and intelligence: Some boundaries in human decision-making," *Industrial and Corporate Change* 9, no. 4 (December 2000): 659.

<sup>37</sup> *Ibid.*, 659.

<sup>38</sup> Richard E. Nisbett, *The Geography of Thought: How Asians and Westerners Think Differently...and Why* (New York: The Free Press, 2003), XVII.

the environment defines alternatives as well as consequences, and that those who make the decisions have perfect knowledge of those alternatives and their consequences.<sup>39</sup> This type of rational theory struggles to effectively explain rationality when applied to real-world decision making. At the root of those difficulties is a series of assumptions which may or may not be applicable in any given problem solving situation.

The first assumption is that decision makers all share a common set of preferences. This may be true when applied to a small sample size. However, this assumption does not hold firm when applied broadly under real-world conditions. For example, an insurgent certainly does not share a common set of preferences with the counterinsurgent; both have widely divergent preferences. The second assumption is that decision makers define their environment the same way and by similar rules. Again, this is not necessarily true. A land developer might see a proposed location for an airport as an excellent money making opportunity though nearby residents might see it as creating unacceptable level of noise and traffic congestion. The third assumption is that decision makers have perfect knowledge of alternatives and consequences. As discussed earlier, it is unlikely in a complex environment that a decision maker has perfect knowledge of either alternatives or consequences. In the real world there is necessarily uncertainty when contemplating decisions with future implications. In order to attempt to account for this uncertainty, theorists developed additional decision-making rationality theories.

### **Procedural Rationality: Moving Closer to Reality**

Procedural rationality does not acknowledge the assumptions made by substantive rationality theorists; rather it accepts that uncertainty exists and that it affects the way people make decisions. In later theories of rationality it is acknowledged that not only does uncertainty impact decisions, so too does risk affect the value attached to a potential alternative's expected

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<sup>39</sup> March, *A Primer on Decision Making: How Decisions Happen*, 3-4.

return.<sup>40</sup> Although risk versus expected return was an important addition to rationality theory, it failed to cope with other key elements such as how the passage of time affected decision makers, for example a short-term lesser gain versus a long-term greater return.

In order to better account for rational behavior, theorists further modified the original assumptions. These modifications form the basis of most modern decision theory and are as follows:

1. Knowledge: What is assumed about the information decision makers have about the state of the world and about other actors?
2. Actors: What is assumed about the number of decision makers?
3. Preferences: What is assumed about the preferences by which consequences (and therefore alternatives) are evaluated?
4. Decision rule: What is assumed to be the decision rule by which decision makers choose an alternative?<sup>41</sup>

These assumptions get closer to acknowledging the realities of the rationality of decisions made by decision makers in real world contexts. In the real world decision makers do not have unlimited information on which to judge their answers. Information is costly to capture as well as analyze into something useful for the decision maker. It is also likely that analysts understand the preferences of decision makers. Additionally, these preferences will change based upon environmental conditions such as cost and risk. Finally, the decision rule, or what is a good enough outcome for the decision maker, is dependent on multiple variables including the complexity of the decision, time constraints within which the decision must be made, as well the uncertain value of the expected outcome. These assumptions form the base of the theory of bounded rationality.

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<sup>40</sup> March, *A Primer on Decision Making: How Decisions Happen*, 6.

<sup>41</sup> *Ibid.*, 7.

Bounded rationality bases itself on the assumption that reality is complex and full of uncertainty resulting in people finding ways of coping rationally rather than acting rationally.<sup>42</sup> Bounded rationality acknowledges the limited cognitive capacity of decision makers and postulates that in reality decision makers do not calculate the best possible action, instead searching for an action that is good enough.<sup>43</sup>

This theory of bounded rationality is a close fit to the United States military's view of the rationality of its own decisionmaking. It is an acknowledgement that it is impossible to know and understand everything; therefore, the military decisionmaking process leads planners to decisions which may be suboptimal, but are good enough to work, though not necessarily the best fit for the environment. The measure by which a commander chooses between courses of action is a reflection of the acknowledgment of bounded rationality. For a course of action to meet the screening criteria, and thus seem rational, it must be feasible, acceptable, suitable, complete, and distinguishable.<sup>44</sup> Typically, a staff develops multiple courses of action all of which must successfully pass the screening criteria to gain acceptance as viable. Multiple courses of action represent a methodology by which staffs and commanders cope with the uncertainty of future outcomes as well as an acknowledgement that it is beyond the capability of the staff to fully understand the complexity of the problem it needs to solve. Branch plans and sequels further acknowledge these uncertainties. But are the courses of action that satisfy the screening criteria rational?

If the staff's screening criteria bound the staff's rationality, essentially acknowledging that what the military can achieve is only good enough rather than optimal, then what the staff is

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<sup>42</sup> Augier and Kreiner, "Rationality, Imagination and Intelligence: Some Boundaries in Human Decision-Making," 661.

<sup>43</sup> March, *A Primer on Decision Making: How Decisions Happen*, 9.

<sup>44</sup> U.S. Department of the Army, *Field Manual 5-0 Army Planning and Orders Production*, 3-29–3-30.

really bounding is its ability to solve the decisionmaking problem, not the rationality of the decision.<sup>45</sup> This is a continued effort to attempt to calculate a way to a rational decision based upon a classical scientific heritage. It reflects a Western propensity to break down problems into their component parts rather than acknowledge the complexity of the environment holistically. The feasible, acceptable, suitable, complete, distinguishable test acknowledges that staffs do not have the cognitive capability to calculate rational choices in the face of immense complexity.<sup>46</sup> Thus, staffs also calculate multiple courses of action to address this uncertainty.

### **Rationality and Imagination, A Powerful Combination**

Red teams can help the staff make better decisions by thinking about rationality in a subtly different way. Instead of bounding rationality, based upon working from the objective back to the mission, red teams can help staffs work forward toward the desired state by more carefully examining the problem rather than immediately exploring how to achieve objectives. Red teams can help a staff bound its uncertainty and imagination and helping it them understand what is possible, rather than bounding the rationality of the decisionmaking process itself.<sup>47</sup>

Bounding uncertainty and imagination is different from bounding rationality because it approaches rationality from a completely different angle. Where bounded rationality binds by deconstructed information about the environment around the decision maker, bounding uncertainty and imagination binds by learning and explaining the environment in a holistic manner by learning how it works together as a whole, and then imagining if the military end state can exist within a future state. By first learning about the environment in which decision makers

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<sup>45</sup> Augier and Kreiner, "Rationality, Imagination and Intelligence: Some Boundaries in Human Decision-Making," 662.

<sup>46</sup> Ibid., 666.

<sup>47</sup> Augier and Kreiner, "Rationality, Imagination and Intelligence: Some Boundaries in Human Decision-Making," 662,664.



make decisions and studying how it works together holistically, it places the environment in context, rather than just describing it. By taking a synthetic approach rather than a systematic approach, a staff and decision maker can bound the possible courses of action by imagining whether these courses of action are actually realistic given the greater holistic understanding of the system. In this way a visualization of the possible becomes more real.

The Army acknowledges the importance of visualization. In particular, the commander's visualization is an attempt to bind the imagination of the staff. The commander potentially introduces visualization bias when the commander attempts to articulate his visualization based on incomplete understanding of the environment. This disconnect arises from the tools provided to the commander that enable him to visualize. Within the bounded rationality methodology, gaining a common operational picture facilitates the commander's understanding.<sup>48</sup>

Theoretically this should lead to greater situational understanding but instead leads to greater situational awareness. An excellent commander, perhaps akin to the genius described by Clausewitz in his book *On War*, might be able to make the cognitive leap from awareness to understanding, but this is difficult to accomplish unless the commander can place the environmental system in context.<sup>49</sup> Without environmental context the commander experiences a limited situational understanding bound by the cognitive inability to process and mechanistically break down the system into its component parts. Since these are complex and nonlinear systems, breaking them down breaks the context and interconnectiveness of the component parts which give them meaning greater than the sum of their parts and strips the environment of its richness and texture. Furthermore, seeing the picture is different than understanding the picture.

Understanding comes from learning about the environment as a whole, not breaking it down into component parts. The common operational picture derived from systematically

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<sup>48</sup> U.S. Department of the Army, *Field Manual 5-0 Army Planning and Orders Production*, 1-9.

<sup>49</sup> Clausewitz, *On War*, 100-112.

breaking down the environmental system rarely offers explanation in context. When an explanation is given, it is given in a Western context, which is not always appropriate given the nature of the operation and the time and space within which events occur. This lack of understanding, based upon an initial lack of explanation and learning is what leads the staff and commander to a state of uncertainty. This uncertainty results in a feeling that it is unlikely the plan will survive first contact, and the need to plan for increasing number of contingencies, further taxing an already overburdened staff. The red team approach can help add a holistic flavor to the decisionmaking process, helping the staff to remain aware of the greater systemic ramifications beyond a narrow set of mission requirements.

While it is likely true the plan as written will not proceed exactly as imagined, the red team can help bind the limits of the imagined divergence, greatly reducing the feelings of uncertainty that feed an increasingly information hungry strategic and operational staff. In order to help bring clarity to what can rapidly become an overwhelming avalanche of information, a red team must approach the environment in a different way, distinct from the mechanistic lens through which many staffs evaluate the environment. The red team accomplishes this by looking at the agents acting within a system holistically rather than component parts focusing on explanation of agent's actions from the agent's perspective rather than description of their actions.

In the last section, the author explained the background of how Westerners tend to explain other agents rationality. Rules derived from observing agents operating within one's own cultural environment often do not translate well when interpreting the actions of agents operating with different rationality rules. Rivals may not view feasibility, acceptability, or suitability in the same context as Western armies. This causes agent's actions within the system to often seem irrational when in fact they are not. Learning the rules which guide the rival's decisions are key components in understanding complex interactions. Of the two forms of rationality discussed, substantive and procedural, theorists have accept procedural rationality over time as the better

model to judge agents decision-making behaviors.<sup>50</sup> When combined with a bounded imagination approach facilitated by the red team, this methodology can enable a staff to have greater confidence in their planning due to a better shared understanding of the range of rival actions. Though complexity and rationality are important aspects of a shared understanding of both the environment and action within it, the greatest benefit is achieved when the staff blends both together through the medium of “sensemaking,” initiated by a red team.

## **Finding the Opportunity in Difference and Sensemaking**

Within difference lays opportunity. In this case, the opportunity is different approaches to evaluating the environment as well as rationality. Where the Western traditional doctrinal approach tends to be linear, good red teaming tends to be nonlinear. Where traditional doctrine tends to bind rationality, good red teaming binds imagination. In between lays difference, understanding, and learning. Standing alone, neither red teaming nor the decisionmaking process sufficiently nuances the environment or imparts the “flavor” of the environment to the decision maker. Red teaming helps to add symmetry back into the decisionmaking process by asymmetrically challenging bounded rational and linearity, becoming the “jelly” to planning’s “peanut butter.”

Because the methodologies used by the red team and the staff differ, so will their environmental frameworks differ. They differ because their perspectives are different. Similar to the dual pictures used in a stereoscope, the images look similar until viewed simultaneously. These pictures yield little if viewed separately and represent independent pictures. But when presented together, allowing the landscape to mingle, a third dimension emerges. The third

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<sup>50</sup> March, *A Primer on Decision Making: How Decisions Happen*, 8-9.

dimension is depth, transforming the flat, two-dimensional pictures into something more than when they stand alone.<sup>51</sup>

The concept of difference is important to understanding how red teaming can enhance the staff's ability to provide the commander with a framework from which to visualize or create a framework of the future strategic or operational environment. It takes at least two somethings to create a difference.<sup>52</sup> Taken separately, they represent sameness which does not lead to sensemaking, but a continuation of action along the familiar trajectory. In order to alter that trajectory, some measure of difference must be introduced into the system, otherwise the system will continue to move along an already charted course. Humans recognize difference and ignore sameness. In fact, the only way humans perceive is through the news of difference coded into events in time to be perceptible.<sup>53</sup>

When the two environmental narratives of red teaming and planning collide, it results in an asymmetry of understanding. This asymmetry serves as a challenge to attempt some sort of sensemaking between two divergent frameworks. These divergent frameworks will likely result in two tendencies. The staff will either cultivate a dialogue between the divergent frameworks, or lay down one coherent solution to correct the divergence.<sup>54</sup> This confrontation between the two opposing frameworks is held in tension by their differing views, beliefs, and perspectives. These differences are likely to create uncertainty, which the staff must address. Within the decisionmaking environment this is a positive and healthy tension. A staff must grapple with these apparent differences in order to make sense of the divergent red team narrative. Red

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<sup>51</sup> Gregory Bateson, *Mind and Nature: A Necessary Unity*, (Toronto: Bantam Books, 1979), under "The Case of Binocular Vision," <http://www.oikos.org/m&nmultiple.htm> (accessed March 20, 2010).

<sup>52</sup> Ibid., under "The Case of Difference."

<sup>53</sup> Ibid., under "The Case of the Planet Pluto."

<sup>54</sup> Elinor Ochs and Lisa Capps, "Narrating the Self," *Annual Review of Anthropology* 25 (1996): 32.

teaming challenges the staff's interpretation of the environment. It helps reduce their "sense" of the environment, and forces the staff into a discovery and invention cycle to reestablish their "sense."<sup>55</sup> This in essence is the need to recreate their understanding of the system.

Sensemaking is not about a perfect understanding of the environment, but rather a plausible explanation that allows the staff to move forward with a sense of certainty based on learning about the emergent qualities of a unique environment. Sensemaking is the state of being "...thrown into an ongoing, unknowable, unpredictable streaming of experience in search of answers to the question, what is the story?"<sup>56</sup> It is while in the state of sensemaking that the staff moves beyond the realm of mere analysis and steps into the richer environment of synthesis. It is by achieving a state of synthesis, resulting in effective surprise, through the combination of what is known and what is learned which can produce creative leaps and effective adaptation.<sup>57</sup>

It is this sensemaking driven by the different frames, each describing the same environment in unique ways, that makes red teaming such a powerful agent of change within the staff. Sensemaking is much more than it would appear upon casual inspection. "Sensemaking is about authoring as well as interpretation, creation as well as discovery."<sup>58</sup>

As previously discussed, the environment in which the military operates is complex and complex problems do not lend themselves easily to solutions. In fact, the word solution is probably not a very accurate term. Complex problems usually do not have solutions, but rather problematic situations which a staff cannot solve out of existence but must rather manage within

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<sup>55</sup> Karl E. Weick, *Sensemaking in Organizations* (Thousand Oaks, CA: SAGE Publications, 1995), 14.

<sup>56</sup> Karl E. Weick, Kathleen M. Sutcliffe, and David Obstfeld, "Organizing and the Process of Sensemaking," *Organization Science* 16, no. 4 (July-August 2005): 409.

<sup>57</sup> Vera John-Steiner, "Beyond the Transmission of Knowledge: A Vygotskian Perspective on Creativity," *Papers in Comparative Studies* 6 (1988-1989): 53.

<sup>58</sup> Weick, *Sensemaking in Organizations*, 8.

acceptable limits of tolerance.<sup>59</sup> Based upon its linear nature, the military decisionmaking process leads the staff to believe there is a solution, but red teaming can help redefine the system, redefine the boundaries of the systems logic, and through discourse, impose upon the situation a coherence which allows the staff to better understand the direction toward which the system must move.<sup>60</sup>

Red teaming assists the staff in gaining an appreciation for how the system is able to move in a new direction by providing context apart from a mechanistic survey traditionally associated with military decisionmaking. This new context gives the staff the opportunity to think differently about not only their analysis, but also of the potentially surprising way in which an alternative methodology injects into the dialogue. While the red team's viewpoint is different, because the perspective taken is different, it remains tied to the past, in events familiar to the staff. The divergent viewpoints of the staff and red team, while being different and at the same time familiar, can spark a leap in creativity that the staff's analysis alone might not yield.

Creativity emerges when existing knowledge creates new knowledge.<sup>61</sup> Red teaming provides the fuel in the form of an alternative viewpoint that can enable the creation of new knowledge. It enables the staff to combine their information with the red team's explanation in a new combination of what was previously not thought combinable, thus breaking some of the heuristics which had up to now bound their rationality and prevented the staff from seeing new and novel approaches.<sup>62</sup> The combining of the two divergent frameworks yields a new framework within which to explore new options and approaches and to see the environment and the important role the military plays within it. This, not as an outside observer looking in, but as an

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<sup>59</sup> Peter Checkland and John Poulter, *Learning for Action: A Short Definitive Account of the Soft Systems Methodology and its use for the Practitioner, Teachers, and Students* (West Sussex, UK: John Wiley and Sons Ltd., 2006), 1-6.

<sup>60</sup> Weick, *Sensemaking in Organizations*, 9.

<sup>61</sup> Jeffrey Goldstein, "Emergence, Creativity, and the Logic of Following and Negating," *The Innovation Journal: The Public Sector Innovation Journal* 10, no. 3 (2005): 4.

<sup>62</sup> Ibid.

integral part of the new environment in which it must serve as the energy that helps to move the system into more favorable alignment.

The new framework is not a break with the past or an abandonment of beliefs or values. It is an appreciation for those beliefs and values overlaid by the beliefs, values, and rules of the environment. It is the sensemaking of what the difference means that provides the lumber to build a different construct, a model of the environment that makes sense, and although not perfect, gives shared understanding and visualization on which to base future action and goals. Equally important, it creates within the organization a dialogue and helps to break down stovepiped analysis fostering an appreciation for the whole, and how the whole operates together, rather than a focus on individual parts.

Which of the two resulting tendencies prevail, dialogue about the divergent frameworks or smoothing of the frameworks, might very well depend on how much time is available to the staff. In a time-constrained environment, smoothing the frameworks leads to rapid shared understanding and possibly inhibited limited creativity and adaptation as the staff attempts to rapidly rationalize the difference between the two frameworks. If time is overly constrained, there is a danger of smoothing the frameworks in that the divergence, so key to the richness of the environment, may dissolve; a result of the smoothing of the rich topography of difference which the staff glimpses, yet not appreciated or fully capitalized upon. In this case, the dominant narrative may prevail leading to oversimplification, stasis, and irreconcilable discrepancies between the narrative the staff inculcated and the red team's alternative visualization.<sup>63</sup>

Given a less time-constrained environment, the red team's divergent framework would ideally result in dialogue. This dialogue aims to uncover the sources of divergence. Potentially this approach yields an infinite range of interpretive frames, each one a candidate for adaptation

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<sup>63</sup> Ochs and Capps, "Narrating the Self," 32.

which the staff could build upon, as well as an increasing openness to new perspectives and ideas.<sup>64</sup> It is the mixing of what is known, the rearward-looking experiences carried forward by the staff during planning, and the forward-looking, not yet realized, imagined future proposed by the red team which provides the rich soil of learning from which adaptation can grow and flourish.

Dialogue facilitates the rich soil of critical thinking, watered by synthesis, fertilized by surprise, and seeded by difference. The difference helps the staff to realize that perhaps they did not have the environmental frame just right, and that perhaps there are some boundaries to their logic that went unnoticed. Red teaming helps to foster a learning organization by structuring a learning situation.<sup>65</sup>

One of the aspects of this learning situation is the movement away from a sense of confusion to a sense of curiosity, which leads the staff to a process of experimentation with new ideas and possibilities.<sup>66</sup> This is a movement from analysis, back to synthesis. It is a movement from looking only at past history as a source of knowledge and intuition, and creating new knowledge and new intuition. It is an examination of the core assumptions by which drives planning, and challenging these assumptions in light of the new learning and new understanding driven by the difference between two competing perspectives.

What is different is often what is most important, more so than what is the same. Humans are not doomed to repeat history; they repeatedly demonstrate an amazing capacity to find creative adaptation which enables their continued survival. Humans do not have to wait millions of years for biological evolution to affect this change. Humans imagine the change which they

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<sup>64</sup> Ibid.

<sup>65</sup> John W. Thompson, *Learning Organizations*, eds. Chawla Sarita and John Renesch. (Portland, OR: Productivity Press, 1995), 92.

<sup>66</sup> Ibid., 93.



need to make and create the environment to facilitate it. Red teaming helps speed up the staff's evolutionary clock by energizing the creative essence which often remains dormant without sufficient stimulation. Humans can learn from difference as well as sameness, but it is the difference in environmental framing which drives sensemaking and leads to discourse and adaptation.<sup>67</sup> Red teaming exploits the difference, challenging the staff's process and rationality, thus inspiring learning and creativity. Creativity is not the creation of something out of nothing; it is the creation of new thought and logic out of difference between what is observed and what is desired. Red teaming is a teaching tool and a creativity generator within the staff construct. It works by creating difference. Difference creates tension. Tension induces adaptation. Adaptation leads to complexity. Complexity leads to multiple possible stable states, which enhances the ability of the military to adapt and shift strategy, operations, and tactics more rapidly than do a military force's opponents.

## **Education, Integration, and Establishing Legitimacy**

In light of the nature of the military decisionmaking process and the rationality governing it, what does this mean and what is the way ahead in terms of using the red team construct to complement both the military's process and rationality? Enhanced education and better integration can better facilitate red teaming's effect on the Army's decision making process.

With regard to education, this author sees two key audiences. First are the red team practitioners themselves. It is this author's belief that a generalist is the best fit for the red teaming role. A red team member does not need to be an expert on any one particular region or culture, but a member does need a broad appreciation of how such things as language, culture, mythology, and various other aspects of the agents operating within the observed system

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<sup>67</sup> Weick, *Sensemaking in Organizations*, 100-105.

influence how the system behaves as a whole. It is both impractical and beyond the capability of most officers to become an expert on all regions in which the United States military might conduct operations.

The important aspect of red team member's education is that it must enable them to rapidly learn and inculcate numerous aspects of the region. The education must imbue the practitioner with the skills of knowing where to look for this type of information and how to evaluate the sources of difference between what the United States wants as opposed to that of the rival. Most importantly, red team members must be able to articulate this knowledge in the form of explanation, and then place this explanation in context in order that the rest of the military staff can gain a richer picture of the problem.

Red team members, as Soldiers, have a unique capability to combine the distinctive perspectives of the actions military forces have in relation to strategy and tactics to the system. In order to realize this distinct perspective, the red team members themselves must innately understand the environmental conditions mentioned above and be able to rapidly shift perspectives to help make the environmental framework richer and more meaningful to the staff.

The United States military currently educates its red teams at the University of Foreign Military and Cultural Studies. Red team courses include a team member course, 9-weeks long, as well as a red team leader's course which is 18-weeks long. The author attended the team member course and found it to be an intellectually rewarding military course. However, this course is inadequate to fully equip the red team member with the depth of understanding necessary to be an effective member of a red team. This is not because of the quality of instruction, nor the topics, but in fully indoctrinating the aspiring red teamer with the depth of understanding needed to be truly effective in practice.

Though the University of Foreign Military and Cultural Studies provides students with a large repertoire of tools to use in red teaming activities, this author was unclear how, what, and why these tools work, beyond a superficial level of understanding.<sup>68</sup> The methodologies proposed by the University have great potential, but with only a thin understanding of the context of how they work, what it is they produce, and most importantly why the tools work the way they do, the immense potential of these methodologies may not be realized. Without a deeper understanding of the tools, the practitioner has little reference for further learning and understanding or using the tools provided in new and creative ways.<sup>69</sup> The United States military must make a stronger commitment to the depth of education for the current red team construct to reach its full potential and become fully valued by organizational leaders and their staff, the benefactors of the red team's potentially unique contribution. Furthermore, Army doctrine should more clearly enunciate the role and value of red teaming.

Red teaming must become increasingly integrated with the decisionmaking process, though this will be difficult without more emphasis placed on it in the Army's operational-level doctrine. Published simultaneously with this monograph, Field Manual 5-0, *The Operations Process*, dated March 2010, takes steps to acknowledge the importance of red teaming. Field Manual 5-0 devotes two paragraphs toward furthering a red team concept.<sup>70</sup> Within the United States Army's current doctrinal construct, red teaming is gaining representation.

Field Manual 3-0, *Operations*, strongly encourages commanders to employ red teams. This guidance comes in the form of a single paragraph which states:

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<sup>68</sup> University of Foreign Military and Cultural Studies. *Red Team Handbook: version 5 draft*, (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, 2009), 131-178.

<sup>69</sup> Donald A. Schon. *Educating the Reflective Practitioner*, (San Francisco, CA: Jossey-Bass A Wiley Imprint, 1987), 44-79.

<sup>70</sup> U.S. Department of the Army, *Field Manual 5-0 The Operations Process*, (Washington, D.C.: Government Printing Office, 2008), 1-7-1-8.

“Whenever possible, commanders employ red teams to examine plans from an opponent’s perspective. Red teams provide insight into possible flaws in the plan as well as potential reactions by the enemy and other people in the area of operations. This information helps the staff improve the plan and develop more effective branches and sequels.”<sup>71</sup>

Despite the strong verbiage represented by this single paragraph, Field Manual 3-0 makes no further direct reference to red teaming. These sentences represent the single reference to red teams within Field Manual 3-0. In contrast, the new Field Manual 5-0 better acknowledges the importance of red teaming activities.

In Field Manual 5-0, *The Operations Process*, the key purposes of red teaming are outlined in paragraphs 1-37 and 1-38. According to Field Manual 5-0, the commander uses the red team in order to:

1. Broaden the understanding of the operational environment.
2. Assist the commander and staff in framing problems and defining end state conditions.
3. Challenge assumptions.
4. Ensure the perspectives of the adversary and others are appropriately considered.
5. Aid in identifying friendly and enemy vulnerabilities and opportunities.
6. Assist in identifying areas for assessment.
7. Anticipate cultural perceptions of partners, adversaries, and others.
8. Conduct independent critical reviews and analyses of plans and concepts to identify potential weaknesses and vulnerabilities.<sup>72</sup>

All of these activities, some of which significantly overlap each other, focus on a common goal. This goal acknowledges the complex nature of the environments in which the United States Army frequently operates in, as well as challenging linear sensemaking tendencies, and traditional western concepts of rationality. *The Operations Process* acknowledges these goals in other ways as well.

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<sup>71</sup> U.S. Department of the Army, *Field Manual 3-0 Operations*, (Washington, D.C.: Government Printing Office, 2008), 5-18.

<sup>72</sup> U.S. Department of the Army, *Field Manual 5-0 The Operations Proces*, 1-7.

The new Field Manual 5-0 emphasizes or reinforces several key concepts within the operations the United States Army will conduct within the near future. Key concepts such as critical and creative thinking, collaboration and dialog, cultural understanding, complexity, the rapidly and ever changing environment, as well as uncertainty represent key areas touched upon in the most recent iteration of Field Manual 5-0.<sup>73</sup> Many of these are focus areas the previous version of Field Manual 5-0 either did not acknowledge, or if it did, did so shallowly. All of these are indications that the Army is moving in the right direction, away from linearity and toward a better understanding of the non-linear nature of the environment, as well as the opportunities which lay therein.

Furthermore, Field Manual 5-0 introduces the new concept of design. This concept acknowledges the power of critical and creative strategic thinking as key to a staff and commander's understanding of the environment in which the military seeks to affect change.

Though beyond the scope of this monograph, this approach places increasing emphasis on framing the problem, acknowledging the tensions which exist within the environment, the differences between the observed system and desired system, and how those tensions inhibit or facilitate solutions visualized in the desired end state. Field Manual 5-0 indicates the red team is a component of the design methodology. This methodology places great emphasis on the true problem, drilling down into the sources of the difference, and yielding a better situational model from which the military decisionmaking process can begin. Similar to red teaming, the design methodology as described in *The Operations Process* is a thin description of the methodology and significant efforts by the Army are required for practitioners to make the cognitive leaps to utilize it to its potential. The design methodology is a further acknowledgement of the aspects of the environment outlined in Chapter 6 of Field Manual 5-0.

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<sup>73</sup> U.S. Department of the Army, *Field Manual 5-0 The Operations Proces*, 1-1-1-7.

Beyond acknowledging the benefits of red teaming, and defining what use to which the commander should leverage the red team, is beyond the scope of Field Manual 5-0 which appears to see the red team as playing a primary role during course of action analysis. Field Manual 5-0 neglects the red teams' potentially unique contributions during the other steps of the military decisionmaking process. For the red team to truly be effective the commander must employ it early in the process, beginning with mission analysis. The *Red Team Handbook* published by the University of Foreign Military and Cultural Studies rightfully petitions for early integration of the red team throughout the decisionmaking process.<sup>74</sup> This early integration of red teams likely streamlines the decisionmaking process because the staff can account for the red team perspective during early critical steps. While the red team could generate surprise solely during course of action analysis and rehearsals, ideally the staff would account for the red team's perspective during mission analysis and course of action development.

Since the red team has is a part of Field Manual 5-0, one of the Army's keystone doctrinal publications, it is this author's recommendation that the Army produce a red team field manual, increasing its legitimacy and recognizing its unique capabilities and benefits. This field manual would help fill in the gaps in regards to red team activities which are beyond the scope of Field Manual 5-0.

Specific gaps in knowledge might be the composition of the red team, what expectations the red team is to fulfill during each phase of the military decisionmaking process, as well as how the red team integrates with the other staff sections during planning. This manual should maintain a high degree of flexibility in red team employment, lest a too rigid framework be established which might snuff out the creativity and critical thinking which a red teams intend to generate. More importantly, this manual would serve as a guide not only to the red team, but also to the rest

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<sup>74</sup> University of Foreign Military and Cultural Studies, *Red Team Handbook: version 5 draft*, 65-73.

of the staff and commander, as to what to expect from the red team and the best employment options for it.

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