

Philosophy *driving* Ontology:
Ideas from the Past Influencing the Future of Command (and Control)

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ABSTRACT

Invariably, every issue concerning command and control evolves into a discussion of information reliability and validity. How much should commanders trust the data they perceive? How much data should they trust if they perceive it indirectly through hardware and software? Answering them well will determine how an advanced command concept will emerge. Yet they reflect one of the oldest philosophical questions known to humans: how does one know?

This paper provides insight by describing the relevant ideas on command from two classical political philosophers, Jean-Jacques Rousseau and Thomas Hobbes. Policy echoes of these philosophers' ideas compete in the current (and future) command and control environment in the debate on how the military should utilize communications advances (e.g. Facebook and Twitter.)

Tying these echoes to modern command doctrine are the thoughts of the late D.M. Malone and John Boyd. Both understand the world in Hobbesian terms, yet endeavor to evolve their professional institutions into a Rousseau-like world. The key to such successful evolution is the development of mutual respect and appreciation leading to implicit trust among members of the same organization.

This paper concludes with some implications of these ideas as applied to current and future command and control venues.

First Story:

At the 14th ICCRTS Conference held in Washington, D.C., a senior military leader held the audience enthralled with his enthusiastic description of the importance that “smartphones” held for the future of military command and control. He praised the private sector’s “bottom-up” approach that resulted in a powerful, multi-faceted product that the public, including members of the military, embraced. He chided the government’s own efforts calling them slow, clumsy, and hardly user-friendly, particularly in comparison to the private sector’s work. He gleefully held high his own smartphone, touting his frequent use of it and his expectations for the next generation smartphone, then about to be introduced to the marketplace. This leader concluded his remarks stating unequivocally that this was the wave of the future and that all government leaders, military and civilian, had to get used to the idea or become obsolete. The audience provided him with a standing ovation for his insightful and challenging remarks.

In the audience, one junior officer of the same service as this senior leader quietly shook her head from side to side as the leader spoke. Later at a panel session of the conference, one member of the audience who had witnessed this officer’s behavior asked her why she apparently disagreed with her senior officer. This officer, a member of the communications specialty of her service, responded: “he doesn’t understand. We can’t secure his communications with that (particular smartphone.) Anyone can listen. They (senior leaders) don’t understand that.”

Second Story:

The campus information assistance and security department invited me to give a talk on cyber-security. I accepted the invitation and then tried to think about what a political scientist could say about cyber-security. However, I also was a communications and electronic intelligence officer at one time, and as a result of some informal education at graduate school in the 1970s, a prototypical hacker of sorts. So, after obtaining an existing social network member’s user name and password, I checked in with a FACEBOOK “friend,” who at one time was a senior military leader. With very little effort and no hacking, I found where he and his wife lived, how many children and grandchildren they had and where they lived. I found out where his favorite vacation spots were (overseas) and when his wife and he liked to go there. I found out where his grandchildren went to school, accompanied by detailed pictures of these children. He provided information on these children’s daily routines, including extra-curricular activities.

Someone who thought that my friend had valuable information easily could have developed a plan to get that information using just the data my friend eagerly shared. He had exposed himself to electronic national security blackmail.

Introduction

This paper discusses the relationship between the virtue of trust and command and control. It does so from a philosophical perspective, setting the context of the relationship in terms presented by two of the most famous philosophers dealing with the human condition, trust, and the necessary actions humans must take to enable human progress, Thomas Hobbes and Jean-Jacques Rousseau. From this beginning, the paper develops the idea of trusting command and control systems using two modern military philosophers: Dandridge Michael Malone and John Boyd. This development produces one major recommendation that goes to the heart of existing and future command and control systems: paradoxically, this recommendation is to distrust all such systems as soon as they are implemented, taking all necessary precautions to minimize potential and actual loss of critical national security information. Paraphrasing a recent philosophy of action concerning arms control, this recommendation may be called Distrust and Engage.

Trust means complete confidence regarding the truth of something or someone. Command and control discussions explicitly or implicitly always revolve about the issue of trust. Can the transmitter trust who is receiving his information? Can the receiver trust the information he/she is receiving? Both questions must be answered in the affirmative if there is to be an effective command and control system. At the core, every effort to compromise command and control systems means undercutting the trust that the users of the system have in that system.

From where does trust originate? Certainly, trust involves at least two people. Trust is asymmetric: I can trust you, but you do not have to trust me. Thus trust is relational. Authority provides an inclination to trust: I trust police to uphold the law. Expertise likewise provides such an inclination: I trust my climbing instructor not to lose the rope connecting me to him. Close human relationships, like family or tribe or neighborhood, also provide this: I trust my brother even though I do not see him often more than people with whom I interact every day. However, trust most often occurs as a result of recurrent behavior: I observe how you act over time and I believe I can trust you in certain situations consistent with my observations. Behavioral trust is a very strong form, built upon experience and observation; it is a key variable in identifying cohesive groups. These brief and incomplete descriptions of the attributes of trust demonstrate one central aspect of the term: trust is essential for social and psychological development. Without it, no one can be safe or secure in anything they do or say. One can state that George Orwell's novel, 1984, depicts a world in which trust is absent.

Command and control systems depend completely on trust – as behavior, as authority, and as expertise. As alluded to above, trust as behavior is the strongest form. Such systems essentially have three basic parts: transmitter,

receiver, and operating environment (or medium.) These systems communicate information through messages. They may or may not require intermediary hardware (means.) If one says that one trusts a command and control system, one really is saying that he/she trusts the medium, message and means associated with that system. Conversely, if one says that one does not trust a command and control system, one really is saying that he/she does not trust at least one part of the medium, message and means associated with that system. Thus stated, it is plainly and logically observed that it is easier to distrust a command and control system than to trust it. Until recently, this last observation has been the philosophical and practical basis upon which all military command and control systems were based: the idea of this is captured by the standard protocol for cryptographic systems that once a new system is released for field use, it is assumed to be compromised.

With the coming of the digital era, characterized by an explosion in the amount of data that can be communicated at any given time, an unprecedented expansion in the means of that communication, particularly with respect to bandwidth and the number of channels, and the apparent need for such data delivered across the bandwidth and channels by strategic and operational commanders, the idea of inherent distrust of data has become apparently unnecessary and out-of-date.⁰ Military communications media now include sophisticated time-division multiplexing, frequency-hopping spread-spectrum technologies that confound traditional efforts to intercept and decrypt messages. Add to this the fact that encryption devices now are built-in, rather than added on (with significant weight) to the communications gear, the argument for technological trust seems unassailable. Speed of maneuver, whatever the operation, is a critical key to success especially in this era of plentiful data; anything that slows down maneuver must be assumed to be “bad” and proven necessary before adopted.

Still, there are incidents that provide testimony that the current communications technology is able to be penetrated and hacked by a determined and skilled foe. Two examples illustrate two different approaches. In the first, military researchers now know that Hezbollah forces were able to intercept and listen to Israeli tactical communications during the 2006 Lebanon War.¹ Israel used frequency hopping technologies similar to, but different from, American tactical communications systems, like SINGARS (Single Channel Army Radio System.) Israeli soldiers may have contributed to the compromise of their system through errors in procedure in the heat of battle, and through providing necessary coding information to friendly forces over cell phones which are easily hacked and intercepted. The second case is the interception of video feeds from Predator UAVs by enemy receivers. Apparently software designed to enable media customers to obtain satellite signals for the Internet in places that have limited commercial access also can be adapted to obtain encrypted video feeds,

sent by satellite, from Unmanned Aerial Vehicles.² This case is most troublesome because there was no error on the part of the operators; the problem is inherent in the system itself.

There exists yet another form of error briefly glanced upon by the case of the Israeli soldiers in Lebanon in 2006. Armed forces working in today's operating environments typically bring two basic types of communications devices with them to action: their issued equipment that meets military standards for security, and their own personal equipment, like smart-phones. Sometimes the presence of civilian equipment can help: there is the proverbial military urban legend about the Army officer who, during Operation URGENT FURY on Grenada in 1983, used a phone card to dial Ft. Bragg, North Carolina to obtain a critical connection to a Navy ship providing gunfire support; he allegedly did this because of a lack of interoperability between Navy and Army radios.³ More often the risks of co-existence of two types of communications gear available to the same person can lead to their misuse, and the compromise of the more secure one.

There is an old military electronic warfare proverb of sorts: every measure taken invariably invokes a countermeasure. This proverb holds true in communications. What makes the implications of this saying even worse is a cultural aspect of the United States. Americans by nature are a talkative people; it seems intuitive to them to attempt to share some situational awareness. Small, easy-to-use, easy-to-transport communications devices, like smartphones, amplify this tendency immensely. On the whole, American talkativeness has been a good thing for this country.⁴ However, on the battlefield, this tendency can lead to disaster if the talk is intercepted by the foe. So, in addition to possible command and control systems challenges with technology and with the communications themselves, there also is a background operating environmental issue: the inclinations of the armed forces themselves.

The above discussion is not novel within the technical communities of the United States military; means and procedures exist to restrain and control software, hardware and messages.⁵ Why should leaders and practitioners of these systems be any more concerned than they already are?

The reason for additional concern is straightforward: increased military leadership dependence on communications within operating environments spills over into a civilian world of enormously increased information and communications. This observation is practically irreversible; what is happening is not amenable to mere technologies or procedural fixes, tidied up by ontologisms of defined meanings; those are mere band-aids. What must be addressed are the underlying view of the nature of communications among people; this means looking at the philosophies concerning human nature in the world and the roles

that information has had in enabling human progress in civilization that have driven the United States and the rest of the world to this predicament, and how to adapt that nature in the face of an incessant data and meaning assault.

Fortunately, two distinguished Western philosophers already have reflected and written of this very kind of challenge; they were Thomas Hobbes and Jean-Jacques Rousseau.⁶ They lived during the 16th and 17th centuries respectively. The only difference between their situation and the one addressed in current times is one of degree, not kind.

Hobbes, Human Nature and the Price of Progress:

Thomas Hobbes (English, 1588-1679) lived an unusually long life that encompassed the birth of the Enlightenment. He personally knew Francis Bacon and Galileo. A life-long scholar who maintained connections with the English political leadership through his employer sponsorships, Hobbes knew well the kings of England of his time, and the leaders of the Parliament. He also knew Cromwell for during his life, the very bloody, religious and political English Civil War occurred. One can well argue that this event well formed his thinking on things that will become important for the current discussion. Hobbes lived in a world of ideological, scientific, religious, and political tumult. New information about everything and anything quickly spread across countries and classes; that was a main benefit of printing machines. This second revolution and democratization of knowledge (following the invention of alphabets and writing), had just happened a mere 150 years before his birth.⁷

Two questions about ideas drove Hobbes' thinking. First, how could he incorporate the new scientific ideas with existing natural philosophy (here it is important to note that at Hobbes – and Rousseau's – time, there was no definition of science, just natural philosophy, which incorporated the behavior of man?) Second, how could he make a deep sense of the chaos and violence that he witnessed in his life? For this he developed a framework – an analytic one based on the science of his time – that he was to return to several times throughout his literary and philosophical career. This was Hobbes' "Grand System" found initially in The Elements of Law (1647.)⁸ Central to answering his two key questions was understanding the state of nature from which humans came; that state of nature was the operating environment for the human race.

Two key human characteristics dominate Hobbes' discussion of humans in the state of nature: their rationality and their own self-interest. Humans could reason; that, Hobbes believed, was what gave humans a decisive edge over other animals (recall that at this time, evolutionary theory would be almost 300 years in the future.) From this, he argued that humans could deduce what they needed and wanted to survive. That they should so reason was that it was in

their own interest to do so. Hobbes went as far as to write that, indeed, such self-interest was the one true natural right that all people had. The problem was therefore quite plain: what happened when one person's need conflicted with another's? How could such a conflict be resolved? Based on his observations, Hobbes had an answer: war. His best known quotation captured the problem and the answer in almost poetic language:

"In such condition (the state of nature,) there is no place for Industry; because the fruit thereof is uncertain: and consequently no culture of the Earth, no Navigation, nor use of the Commodities that may be imported by Sea; no commodious Building; no Instruments of moving, and removing such things as require much force; no Knowledge of the face of the Earth; no account of Time; no Arts; no Letters; no Society; and which is worst of all, continual fear, and danger of violent death; and the life of man, solitary, poor, nasty, brutish, and short."⁹

This is the war of all against all that cannot end. Unending war is the human fate unless he/she can use reason to solve the conundrum. Therein lay the way out of a hellish environment.

Hobbes believed that humans could use reason to come to a mutually beneficial agreement, or contract, in which each person in the contract would give the right of self-defense in exchange for security from attack. Since two persons could not make such a compact because there could be no trust between people, the agreement would have to be made with something more than just a person: an institution or, in Hobbes' terms, a sovereign. The resulting compact would be a commonwealth.¹⁰

Trust emerges from the Hobbesian state of nature as the thing that cannot be assured between persons unless there is a mitigating or lawful presence that ensures implementation of whatever agreements or contracts so state. Trust is imposed, not given. Trust is an externally mandated virtue, not an internal or natural one. Thus speaks the father of the Leviathan.

The Hobbesian commonwealth enables security, but the cost is high: eternal submission to the sovereign, who alone (regardless of governance type) determines all matters of right or wrong. The Hobbesian citizen has the right not to rebel. Hobbes goes as far as to write that through education, the history of past rebellions, and their reasons, can be edited out of the shared past.¹¹ The shadow of Big Brother finds definition first in Hobbes' desperate effort to avoid endless war.

Au contraire: Jean-Jacques Rousseau and the General Will:

Jean-Jacques Rousseau (Geneva-France, 1712-1778) lived a world apart from Thomas Hobbes. Less than one hundred years separated the two men's lives, but the knowledge gulf was light-years beyond that. By the time Rousseau matured as a thinker and writer, most of the violence of the previous century had evaporated. The scientific age of Enlightenment had taken a strong hold of the minds of men. The modern nation-state, born from the Treaty of Westphalia in 1649, ending the exceeding bloody Thirty Years War, bloomed in terms of monarchies across the face of Europe. Most relevant for Rousseau, his life spanned the regime of Louis XIV, the "Sun King" of France, the absolutist monarch who dominated European politics for most of the 18th Century. It was to Louis that the phrase, "L'état c'est moi," was attributed. These were the decades in which all things seemed possible; science and engineering appeared on the verge of discovering the all matters of things, from gravity to the circulatory system of the human body, from the foundations of chemistry to the technologies of mechanical power generation. The times were such that great wealth became accessible to more people, but also at the cost of incredible poverty due to mainly agrarian labor intensive societies. Rousseau's compatriots and friends included Voltaire, Diderot, and Hume. His ideas inspired Kant and Goethe, fostering the birth of Romanticism. Indeed, his whole intellectual life could be said to be a counter to the certainties attributed to the Enlightenment.¹²

While Rousseau's mind and writings ranged across a wide swath of intellectual territory (like so many of his age, he was a true Renaissance man), it was his thoughts on the social contract, the nature of man, and the means by which the human race could escape corruptive influences that are of interest to this paper. He was an eminent critic of his times. He saw great vice amidst great virtue. Rousseau eventually came to pose the question: how did things get this way? Why did such corruption emerge? How could it be avoided? What needed to be done to repair such a mess?

Rousseau, a self-made intellectual, applied a literary as opposed to Hobbes' scientific approach. Today, one would call Rousseau's method scenario-scripting. He imagined how societies got started, and developed his arguments and theories from there. If he got the first part wrong, everything that followed would have to be flawed.¹³

"Man is born free, and everywhere he is in chains."¹⁴ That was the most famous line from Rousseau's writings and summarized the problem as he faced it. He therefore imagined the state of nature with humans in it before the chains were set. Curiously, he found this state of nature not much different than Hobbes. However, where Hobbes found violence and death in the hearts and minds of humans, Rousseau found compassion a ruling emotion that mitigated the violence. If the predominant human feeling in Hobbes' world was fear, the

equivalent in Rousseau's was ignorance of anything better. In both philosophers' worlds, human life was perilous and short. Humans in Rousseau's state of nature were equal because they were ignorant of the idea of property. When humans discovered the idea of property, they left their Garden of Eden, for the institutions humans developed to enforce and encourage property (from wants beget more wants) also created moral inequality.¹⁵ At that point, Rousseau came closest to the ideas of Marx and Engels: that the root of all corruption in human society was moral inequality, and the root of that was the concept of property. However, Rousseau also identified that property was the origin of the way out of a rather boorish and brutish state of nature. How could Rousseau make property work to the betterment of humankind?

Rousseau's answer was similar to Hobbes: the social contract. In both Hobbes' and Rousseau's states of nature, humans had reason. This was the primary tool that led them out of the wilderness and into civilization. But Hobbes required something supra-human to overcome the innate distrust and fear pervading human life and undercutting any contract for security among people, and so called for an ultimate third-party or artifice, the Sovereign as Leviathan. For Rousseau and his gentler vision of human life in the state of nature, there was no need for a third party, but rather an elevated level of human consciousness to bring them to the realization that there could be something better for them. Rousseau called this idea the General Will:

"Each of us puts his person and all his power in common under the supreme direction of the General Will, and in our corporate capacity, we receive each member as an indivisible part of the whole."¹⁶

This is "all for one and one for all." The concept of General Will as sovereign enables the development of a society that, respecting each other's needs, avoids the property trap that leads to inequality, competition, and eventually war. The "public person," as Rousseau describes General Will, has enforcement power, but it is more implicit than arrogant. He writes, "In order that the social compact may not be an empty formula, it *tacitly* includes the undertaking, which alone can give force to the rest, that whoever refuses to obey the general will shall be compelled to do so by the whole body."¹⁷ For Rousseau, human nature is inherently good and, if inspired like his native Geneva – a republic, could overcome the limits of the state of nature and the corruptive influences of historical civilization.

John Boyd, "Mike" Malone, and Modern C2 Implications of Old Masters:

Two classical Western philosophers write about the sorry state of man in nature; they are similar in their depictions of that state. They differ significantly

on the means to get out of that state. One, Thomas Hobbes, requires an explicit overpowering presence: Leviathan as sovereign. The other, Jean-Jacques Rousseau, requires an implicit and equally overpowering presence: General Will of the people as sovereign. What does this mean for command and control systems today? How does this address the critical questions posed at the end of the Introduction to this paper?

Translation is necessary to convert meaning from the 17th and 18th centuries to current day. Consider first the state of nature. The concept smoothly transfers into the virtual reality that pervades the Internet and related communications; anything that can interface with the Internet is assumed to be a part of the Internet. There are few rules or laws on the Internet; there is one basic individual right: the right of virtual self-preservation.¹⁸ This is the same starting point, except in an alternate reality, as that of Hobbes and Rousseau. One may note that the Internet is a highly complex, if not chaotic system of systems, or network of networks, in which the casual user floats on the top of easily accessible information and relationships while the vast bulk of the system/network remains unfathomable to that user. In other words, the casual user is ignorant of most of what goes on in the Internet. There also is an invisible Internet, or Deep Web, that contains information beyond the reach of current search engines; by at least one estimate it comprises fully 99 percent of the Internet.¹⁹ This deep part of the web includes some truly dangerous places where one's virtual right of self-preservation becomes endangered, let alone one's *physical* right of same. Thus, the casual user also has cause to fear the Internet as well. Fear and ignorance are the two dominant emotions of humans in the state of nature for Hobbes and Rousseau. Thus, it follows that these two philosophers' recommendations for dealing with the state of nature – or current *operating environment for military communications* – also may have merit.

One immediately senses the idea of communications-electronics operating instructions (CEOI) in Hobbes' explicit watchman and sovereign. These instructions have been doctrine within the American military for decades; likewise has been the instructions' necessary hardware, communications security (comsec) encryption machines, truly artifices of inherent and valid distrust of communications media and means. These work as long as the military can control all communications, in terms of means, media and message.²⁰ When the military cannot, then either comsec must extend to all, or something else must extend the idea of comsec to the population that is not covered, namely all civilian communications and information. This is where Rousseau's ideas concerning General Will come into play.

The translation of General Will to the modern operating environment is the armed forces themselves, each one and together. That which binds them, beyond mere formal oaths of service, is quite similar to Rousseau's description of the social contract stated above: summarily, this is "all for one and one for all."

To empower this will requires one basic virtue: trust. It is a straightforward virtue, and it is well-nigh black-and-white: one either trusts another or one does not. But the practice of trust is fraught with complications. Here, it is worth recalling the two stories that introduced this paper.

In the first story, about the senior military leader touting the virtues of private smartphone technology, it is clear that he does not trust his subordinates, though when faced with this, I am sure he would vehemently disagree. Nonetheless, his words and actions speak for themselves; he does not trust his uniformed subordinates to develop means by which they can assure some level of communications security for his device. In the second story, my FACEBOOK senior military “friend” clearly trusts the entire world, at least that portion who can access this software and search his name. Again, I am sure he would vehemently disagree if I presented him with this case, but one more actions speak for themselves. Rousseau likely would call both of them ignorant of the potential and dangers in their state of nature; Hobbes likely would puzzle why they do not appear to feel any fear in their respective situations.

The reason for confusion is that militaries have forgotten just what trust, and its close cousin loyalty, really means for an armed force. To wit, trust and loyalty in any military, given its extraordinarily risky and dangerous job, requires symmetry in the relationship if that military is going to succeed in the complex operating environments of the 21st century. There must be a Rousseau-like population to call for a statement of General Will, or as now it shall be referred to, implied trust. Yet the rank structure and traditional hierarchy of the military impedes, if not blocks, this symmetric statement and practice. So, the armed forces continue to be corrupt in Rousseau’s parlance, and therefore impossible to mature with respect to communications and information. Thus, there cannot be any progress with respect to command and control systems in this new age of merged military and civilian communications and information media, means, and message.

Two modern American military thinkers provide possible alternatives to this bleak conclusion. Dandridge Michael Malone and John Boyd lived as contemporaries. Both finished their careers below their potential because of their outspoken natures. Both were “mustangs,” that is officers who come up through the enlisted ranks. Both took advanced degrees in scientific disciplines, but they did not graduate from service academies. Both came from working class American parents in small-town America. Both fought in Korea and Vietnam. Both finished their uniform careers before the end of the Cold War. Both stayed active and in touch with the military after their retirement. Malone and Boyd died within a year of each other.²¹

Although Malone and Boyd had many similarities, their lives and careers were quite disparate. Malone, who retired as an Army infantry colonel, was a proven combat leader; he was an up-and-coming officer well-respected by senior leadership – until he ran afoul of the Army personnel system that he severely and scientifically excoriated in an Army magazine article.²² Boyd, retired as an Air Force colonel and fighter pilot, always was an outsider. He served in combat theaters, but never saw air-to-air combat. Boyd was a restless and relentless mind, always seeking an edge, a way to achieve victory – at first tactical, but later in life, operational and strategic. He had a tendency to look for such edges outside normal parameters; he tended to look at problems from the top down. Malone worked from inside the system and tended to address problems from the bottom up. Boyd wrote and published very little; Malone was the reverse. It should come as no surprise to readers then that they both ended up facing the issue of trust of information on the battlefield from two very different perspectives.

Malone was a key part in the Army organizational and technological transformation following the Vietnam War. Generals Abrams, Dupuy, Meyer, Gorman and Starry were the critical senior leaders of this transformation; they named several subordinates to address issues associated with what they observed as necessary core changes to the Army. One of these subordinates was Colonel Mike Malone. His job, given by General Starry, was to find ways to improve force readiness (and therefore, hopefully, battle readiness.)²³ Using his role as director of a staff office for General Starry, Malone gathered an assortment of Army soldiers from different backgrounds and experiences, civilians from the public and private sectors, and academics to explore how find ways to improve the readiness of the Army force.²⁴ The first published observation of Malone and his group was eye-opening: the solution to force readiness was information – processing and management.²⁵ Using social science research that the Army already had done for most of two decades, and then augmenting it with research that his office sponsored, Malone's group found that units that handled information, and resulting information overload, in combat situations and scenarios best were significantly more successful than those units that did not handle information as well. The key to how units handled information was leadership. Further, they understood that leadership was a process entailing learning – structured processing of information.²⁶

Research relied on by Malone's group discovered that effective organizational learning, and thus leadership, could best occur in conditions in which relevant organizational members and leaders exhibited high degrees of trust.²⁷ Malone himself summarized this: "It is the leadership of the unit, not the individual leaders by themselves, but the whole leadership of the organization, each piece functioning properly, and all hooked together right, developing the individual and unit skills needed to fight and win."²⁸ Only trust among the

leaders and led, at all levels, exhibiting the right skills and the right levels, could enable this concept to work. Later in his life, following his retirement, Malone would attempt to summarize his military career's concentration on leadership and trust in an unpublished essay, "Army of Excellence."²⁹ In this comprehensive work, he described a future Army that implemented his group's findings; it was a high-performing team.³⁰ The driving force of this future Army was its values: courage, competence, candor, and commitment. Backing these values was an implicit trust among all unit soldiers that was tacitly enforced, if not easily externally observed. Symmetrical trust as a form of dynamic social contract adjusting to specific situations was an absolute necessity in this Army.

Though the most tangible result of Task Force DELTA was a new Army regulation FM 22-100, Army Leadership,³¹ empirical results of the Army's implementation of Task Force DELTA and Malone's ideas also demonstrated the power and validity of shared information and symmetrical trust. During the mid-1980s, a peer of Malone's, Lieutenant General Walter Ulmer took command of III Corps, a major Army formation headquartered at Ft. Hood, Texas. Ulmer was familiar with Malone's ideas; he implemented them throughout his corps using the slogan, "Power Down to Power Up."³² This initiative pushed responsibility and accountability for corps operations down to the lowest levels appropriate for action. In one case, non-commissioned officers planned and executed an entire corps exercise, leaving the officers to observe and critique. The initiative called for reduction and, if possible, elimination of unnecessary reports and petty operating procedures (e.g. painting rocks around billets.) Within one year, Ulmer's corps reported unprecedented readiness levels; its retention rates set Army records; the corps' reputation made it an attractive place for soldiers to ask to be assigned – they wanted to join this organization. If peacetime readiness rates could be related at all combat readiness, then III Corps during Ulmer's command was the most combat ready unit in the American Army. In actual combat, the effectiveness of Army performance in operations JUST CAUSE and DESERT SHIELD/STORM, were testimony to the efficacy of Malone's ideas.

Whereas Malone approached the subject of trust from the unit level upward, John Boyd approached it from strategic level downward. Boyd was not as prolific as Malone and he had little or no "top cover" from senior leadership for development of his ideas. In fact, most of his work was done as a professional avocation. Initially, Boyd, who was a professional aeronautical engineer, focused his thoughts on building the better fighter aircraft. He invented Energy-Maneuverability Theory to examine the trade-offs between thrust and drag of fighter aircraft:

The E-M Theory, at its simplest, is a method to determine the specific energy rate of an aircraft. ... In an equation, specific energy rate is denoted by " P_s ". The state of any aircraft in any flight regime can be defined with Boyd's

simple equation: $P_s = [T-D/W]*V$ or thrust minus draft over weight multiplied by velocity.³³

During his assignment to Nakom Phanom Air Force Base in the Vietnam War, Boyd started expanding the scope of his intellectual interests, and upon his return to the United States and the Pentagon formalized his now famous Decision Cycle or Loop, or Observation-Orientation-Decision-Action (OODA) Cycle. Franklin Spinney, a close friend and colleague of Boyd wrote:

"He thought that any conflict could be viewed as a duel wherein each adversary observes (O) his opponent's actions, orients (O) himself to the unfolding situation, decides (D) on the most appropriate response or counter-move, then acts (A). The competitor who moves through this OODA-loop cycle the fastest gains an inestimable advantage by disrupting his enemy's ability to respond effectively. He showed in excruciating detail how these cycles create continuous and unpredictable change, and argued that our tactics, strategy, and supporting weapons' technologies should be based on the idea of shaping and adapting to this change — and doing so faster than one's adversary."³⁴

With this insight and his Energy-Maneuverability Theory (EMT), he quickly gained fame as the major force behind the development of the F-15 and F-16 (and by way of unsuccessful competition, the F-18) fighters that have dominated the skies of aerial combat since their fielding in the mid-1970s.³⁵ These actions assured Boyd of some fame as an aircraft designer and engineer. However, all this was merely preface for what Boyd developed next.

Possessed of what his biographers called "a restless mind,"³⁶ Boyd realized that his OODA loop was more than just an engineering phenomenon. It was a cycle of learning and adaptation. Moreover, it applied to organizations as well as individuals. As such, he theorized that the loop concept could apply to warfare in general. His first exploration of this resulted in "Patterns of Conflict," a historical literature review of military leaders' behaviors and battles coupled with philosophic and scientific discoveries that paralleled the events.³⁷ Four points emerged from this research: (1) information was central to all warfare; (2) those military leaders who processed information best won; (3) the OODA loop was the means by which they processed the information; wars appeared increasing in uncertainty and ambiguity. Rephrasing these observations, those militaries who could process information quicker than their foe and could act on it accordingly, across both affective and cognitive informational domains won. Their battle rhythms had a quicker tempo, which in turn led to their foes' slowing down their rhythms and tempo in a complex feedforward and feedback system of systems.

Boyd then considered generalizing from battle to strategy. He presented his research and findings in his briefing, "The Strategic Game of ? and ?"³⁸ Here he incorporated biological, systems and physics concepts to understand how living systems, like individuals, organizations and nations survive. Boyd found they survived by being able to adapt to uncertain and complex circumstances better than those that failed. These systems did this by remaining open to new information and adequately processing such information; that information comes from an active operating environment.³⁹ Those systems that interacted well with their environments survived or "won;" those that were more closed, or in Boyd's terms, "isolated," did not or "lost." Equally important, he also discovered, using the ideas of Heisenberg's Uncertainty Principle and Gödel's Incompleteness Theorems that living systems *never* could achieve certainty with respect to their actions because their reality was indeterminate. Thus, as Franz Osinga, a close observer of Boyd's theories, has written, John Boyd became the first post-modern military thinker and strategist.⁴⁰

Having generalized his theories to battle and strategy, Boyd then returned to the application of these ideas to leadership. He captured the essence of his ideas in yet another presentation, "The Organic Design for Command and Control."⁴¹ At the time of his writing, the United States had experienced a series of embarrassing military misadventures culminating in the failure of Operation EAGLE CLAW, more popularly referred to as Desert One (May, 1980), the aborted and tragic rescue attempt of the American hostages held in Iran. Even America's most elite forces apparently couldn't perform effectively. Boyd concluded that the American solution to these problems, all dealing with communications, was wrong-headed. The solutions called for more and better technologies. Boyd believed that problem was behavioral, not technological.

The challenge of command and control was twofold: (1) making their OODA loops as fast and appropriate as possible, and (2) making the foe's OODA loops as slow and inappropriate as possible. Doing so meant acting with variety and harmony among one's own forces while sowing the seeds of discord and predictability among the enemy's. The emphasis for Boyd was on "orientation" in the OODA loop – the component that required the most information processing and depended so much on organizational culture (and training.)⁴² Boyd believed that orientation held the potential to breakthrough or breakdown decision cycles by way of conducting the orientation process. He knew the American culture: explicit communications and orders coupled with strong, positive oversight (control.) To accomplish this required extremely large bandwidth and multiple communications channels and means to handle the huge amounts of data necessary to conduct military operations. It also called for a very "scientific management" style of leadership, micromanagement.⁴³ For Boyd, this approach meant that American decision loops were doomed to slowness and predictability, the two things he believed would cause failure. He expressed this

using the scientific concepts of Evolutionary theory, coupled to systems theory, and setting both in the context of the friction and necessary uncertainty of the operating environment. His conclusion: "any command and control system that forces adherents to look inward (internally) leads to dissolution/disintegration (i.e. the system comes unglued)." ⁴⁴

The problem was the explicit nature of the American orientation process. Boyd's solution was simple and straightforward: change "explicit" to "implicit." From his historical research, he knew that implicit command was the preferred German method, *auftragstaktik*, or mission tactics. The method emphasized individual initiative and innovation in adapting to the specific challenges of a relevant operating environment; it was a complement to *befehlstaktik*, or ordered tactics, the method upon which Americans primarily relied. Both were necessary but when engaged in an operation, the former method prevailed. This meant that senior leaders provided their subordinates with clear intent and resources, expected their subordinates to meet their objectives, and then *stood out of their way*, trusting their subordinates to do the job. In turn, subordinates did what was necessary to accomplish the mission, often sacrificing individual glory for that of the unit; the entire idea focused on the tasks at hand that needed to do the job. The Germans trained relentlessly and ruthlessly to achieve this method of operation. The result was a highly successful German armed force that was only defeated through sheer size and poor strategy. ⁴⁵ Boyd argued that the terms command and control belied the problem: command referred to explicit direction; control referred to unambiguous restraints on action. Better terms for Boyd were leadership with monitoring; leadership meant provision of general direction and inspiration coupled with monitoring meaning assessment of the meeting of objectives. ⁴⁶

Osinga writes what this change would accomplish:

"The key challenge is maintaining cohesion while conducting fluid, varied and rapid actions, despite uncertainty and threats. In his presentation, *Organic Design for Command and Control*, Boyd advocates an agile cellular organization – networked thru ideology, shared ideas, trust, goals and orientation patterns – that thrive in uncertainty and fosters innovation, creativity, and initiative." ⁴⁷

Here Boyd meets Malone and Task Force DELTA. Boyd understands that the critical means of achieving such cohesion, such leadership with monitoring, lies training, but not only training. Necessary for the emergence of agile cellular organizations, akin to Malone's Army of Excellence, is an intimacy among unit members built on familiarity and clear standards. The underlying value desired by both thinkers to achieve their ideal is symmetric trust.

Integration and Recommendation:

Command and control systems exist within and without friendly forces' physical and virtual terrain. They can be effective only if there is trust. The terrain of these systems, now referred to as operating environments, has incredibly expanded over the last twenty years to include not only friendly and enemy environments, but also third-party environments. Efforts to isolate one from another appear futile with only draconian measures (e.g. SIPRNET, compartmentalization, and TEMPEST measures) having any measure of success. How can leadership handle the ontology demanded by this expansion?

The classic answer is to turn to philosophy to find clues. For the issue of a public trust, Thomas Hobbes and Jean-Jacques Rousseau offer two complementing portraits on how to do so. Hobbes considers the state of nature, the operating environment in a manner of writing, to be a terrible place from which humans should try to escape, not embrace. His solution is to place all control in a single entity that ruthlessly, if justly, rules over all. That entity, the Leviathan, equates to a super net-control system for command and control. Those within the system follow the rules (think of a CEO), use the issued equipment, and communicate with no one else. In reverse, no one outside the net can communicate with the command and control system. In effect, this is the way the American military (and most other militaries) operated until the dawn of the Internet. To the extent of military command and control systems, the Hobbesian approach still is valid. But it fails to consider the vast and growing influence and importance of civilian communications and virtual realities, most notably the Internet.

For this, Rousseau offers some guidance. He agrees with Hobbes in his diagnosis that the state of nature is a place of great challenge. But he also notes that human institutions, like the Leviathan, also corrupt and invade. Rousseau's answer lies with the General Will. Embrace openness and open sources, educate all to consider the Public Good in their actions and let the communications flow. Even Rousseau knew this concept is utopian. However, the idea that militaries should limit communications to a minimum that are subject to Hobbesian controls, while embracing the opportunities that new information technologies provide, is valid. Distrust by exception is an easier idea to implement in a command and control system than either trusting everyone or distrusting everyone. In short, leaders must engage in the new information era but also must be careful when they do.

Malone and Boyd provide the ideas on how to engage and how to be careful. These, therefore, become the recommendations of this paper. First, build a system of trust within the command and control system. That means from top to bottom and back up again. Symmetric trust is a recurring

theme of these two thinkers that is necessary for effective command and control. This is no silver bullet as it requires altering the very relationships of all armed forces members, as well as their civilian leadership. It means significantly changing personnel systems to enable and enhance small unit cohesion. It means significantly increasing leader education for all members, not just those of certain ranks. If one desires a benchmark, consider the German Bundeswehr of the Cold War; it inherited the virtues of the Wehrmacht training system without the nefarious vices. But one must always remember a simple truth: Americans are not Germans; a blind one-over-the-world transfer of one culture's method onto another's is recipe for failure. There is ample guidance in the public to take on a task of this size, and one would hope that leadership would use it.⁴⁸

Second, having succeeded at erecting a system of symmetric trust, based on the basic virtue of trust, military and civilian leadership must practice it. That means enabling and empowering subordinate units and people to do their jobs to meet clear statements of object and intent. As many writers and researchers of leadership have written, leaders must indeed lead, not take cover behind vague words and slogans. This, too, is extremely difficult to implement in a twenty-four hour, seven days a week, information cycle in which even the smallest errors of language can be magnified out of context. The natural tendency of anyone is to couch one's words in ways that are effectively devoid of meaning. This may work in political debates but it will most certainly kill on the battlefield, even a postmodern one. Vague statements lead to confusion, increasing friction, and invariably slowing individual and unit decision cycles. Opponents' cycles, not being equally affected, then can obtain the initiative, succeeding at both the information and physical battle. Likewise, senior leaders must discipline themselves with the new information technologies that power command and control systems. They cannot merely embrace the technologies because "it's out there" and because everyone's using it. They cannot place the blame for their inevitable mistakes on their own staffs (violates symmetric trust.) They must account for their own actions or inactions, their own messages and mistakes.

Third and finally, with a system of symmetric trust, adequately practiced throughout the armed forces, it is time to embrace the new information technologies that promise so much for command and control systems. The heart of a working democracy, including its armed forces, lies with the free and open sharing of information. Sheldon Wolin, noted political philosopher, has noted with remorse that the United States in the twenty-first century seems to have drifted from this ideal, and calls for the nurturing of a civic conscience to reverse the invidious trends of a political economy gone imperial.⁴⁹ The military has developed an extensive and sophisticated system of security compartmentalization to restrict this sharing of information – even among its own sub-divisions. There have been too many illustrations – failed operations, poor intelligence – where the primary reason of failure is lack of needed

information.⁵⁰ To counteract this trend, the use of the technology needs to be matched with the users' behavior to maximize the potential of the systems. Simply put, that means flooding operating environments with many information technologies, enhancing the information flow, and minimizing information compartmentalization and securitization to that which directly affects national security. Does this seem radical? On the face of it, perhaps it does, but also perhaps one should consider these three recommendations in perspective. Taken together, they approach the method of the American civil and military leadership in the late 1980s – after Contragate – when the Soviet Union was deluged with information about things that were real (Pershing II deployments) and things that were not (Star Wars projects.) At that time, the American military was approaching the ideals of Boyd and Malone, becoming a very potent force. The closed information fist of the Director of Intelligence Casey and Secretary of Defense Weinberger had given way to an openness that at least matched Gorbachev's *perestroika*. And we won the Cold War.

⁰ The paramount reference for this phenomenon is captured in William A. Owens and Ed Offley, Lifting the Fog of War; Baltimore, Maryland: The Johns Hopkins Press, 2001. However, the spirit of optimism concerning the influence of data on operations also pervades the entire Revolution in Military Affairs (RMA) movement, illustrated by Andrew Krepinevich's national security think tank, the Center for Strategy and Budgetary Assessment (CSBA.)

¹ Mohamad Bazzi, "Hezbollah cracked the code: Technology likely supplied by Iran allowed guerrillas to stop Israeli tank assaults," Newsday, September 18, 2006.

² Mike Mount and Elaine Quijano, "Iraqi insurgents hacked Predator drone feeds, U.S. official indicates," CNN.com, December 17, 2009.

³ I call this an urban legend for, although I have heard and repeated the story many times among communicators of all services, I have never found a reliable reference for its actual occurrence. Nonetheless, I use it here because it makes the point.

⁴ A classic illustration of this is found in Alexis De Toqueville, Democracy in America (translation by George Lawrence); Garden City, New York: Anchor Books, 1969. This is truly a case of "passim," but for specifics consider his discussion on pp 303-304.

⁵ The capstone American reference is Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3320.03A, Joint Communications Electronics Operation Instructions; Washington, D.C.: Joint Chiefs of Staff, 19 November 2007.

⁶ These two gentlemen were just the most obvious and well-known thinkers at the time dealing with these kinds of problems. There were many other, lesser known figures who also contributed, however anonymously, to the arguments and ideas of Hobbes and Rousseau.

⁷ The information on Hobbes has been compiled from several sources, the most recent and relevant of which is the introduction by J.C.A. Gaskin of Thomas Hobbes, The Elements of Law Natural and Politic; Part 1: Human Nature; Part II: De Corpore Politico; Oxford, England: Oxford University Press, 2008, pp. xi-xlii. Also consulted has been Richard Tuck, Hobbes: A Very Short Introduction; Oxford, England: Oxford University Press, 2002.

⁸ Ibid, p. xliii.

⁹ From Leviathan XIII, this quotation is from Ibid, p. xxxi.

¹⁰ Tuck, Hobbes..., pp. 78-79.

¹¹ Hobbes, The Elements of Law..., pp. 176-177.

¹² General information concerning Rousseau is from Robert Wokler, Rousseau: A Very Short Introduction; Oxford, England: Oxford University Press, 2001; Christopher Betts Introduction to Jean-Jacques Rousseau, The Social Contract; Oxford, England: Oxford University Press, 2008, pp. xi-xxiii; Jeffrey Abramson, Minerva's Owl: The Tradition of Western Political Thought; Cambridge, Massachusetts: Harvard University Press, 2009, Chapter 11; and G.D.H. Cole Introduction to Jean-Jacques Rousseau, The Social Contract and Discourses; North Clarendon, Vermont: Tuttle Publishing, 1993, pp. xix-xi.

¹³ Wokler, Rousseau..., p. 68; Rousseau recognized this and called his imagining a "speculative" history meant to illustrate rather than define.

¹⁴ From Cole translation of Rousseau, The Social Contract..., p. 181.

¹⁵ Ibid, p. 97.

¹⁶ Ibid, p. 192.

¹⁷ Ibid, p.195.

¹⁸ This is a debatable proposition due to the constraints of highly controlling institutions, like companies and nation-states. Nonetheless, I consider this statement valid as a start of virtual human rights.

¹⁹ One systematic analysis, from 1997, indicates that the Library of Congress, the largest library in the world, contains 3,000 terabytes of information; the searchable Web in 2009 is about 167 terabytes. A University of California at Berkeley extrapolation from 1997 to the present shows a possible whole web size exceeding 91,000 terabytes. Michael Lesk, "How Much Information Is There In the World?," 1997, accessed from <http://www.lesk.com/mlesk/ksg97/ksg.html>.

²⁰ Means, media and message is a robust way to describe information and is derived from a classic information warfare article by John Arquilla and David Ronsfeldt, "Information, Power, and Grand Strategy: In Athena's Camp-Section 1," in Arquilla and Ronsfeldt (editors), In Athena's Camp: Preparing for Conflict in the Information Age; Santa Monica, California: Rand Publishing, 1997, pp. 141-175, especially p.153.

²¹ John Boyd is the more famous of the two, being the subject of two biographies from which his background information has been garnered and summarized. The first, by Grant Hammond, is The Mind at War: John Boyd and American Security; Washington, D.C.: Smithsonian, 2004. The second is by Robert Coram, Boyd: The Fighter Pilot Who Changed the Art of War; New York: Back Bay Books, 2004. Also The Marine Corps University contains an archive of John Boyd's writings and references. D.M. Malone, the less famous, nonetheless has an extensive archive in the Center for Military History, Carlisle Barracks, Pennsylvania. At the time this author investigated this archive, it was generally unorganized (2004), but contained 48 boxes of material. The demographic and career information about Malone is from Box 18.

²² This article, critiquing the abuse of officers assigned as staff officers in the Pentagon, is found in Army Magazine, Volume 23, Number 4, 1973. Malone used survey research and social statistics to demonstrate that Army officers' attitudes towards Pentagon assignments were negative due to cost-of-living and duty stresses that generally exposed combat experienced officers ("winners as losers" in Malone's language) to degrading and humiliating conditions in the Pentagon.)

²³ This tasking, the so-called "Malone Memo," is found in the Headquarter Training and Doctrine Command Memorandum for Action, "SUBJECT: How to Develop and Sustain Highly Effective Army Forces," Headquarters, Training and Doctrine Command, Office of the Commanding General, dated 8 June 1978.

²⁴ This group became known as Task Force DELTA – not the special operations Delta Force that was in the future. The name DELTA originated in the Starry Memorandum noted above. The group's history remains unwritten, but it was unique in many ways.

Among the most notable differences: DELTA was an "Edge" organization in which anyone could contribute anything at anytime. The organization chart was a bullseye based on the centrality of communications. The second way it was unique is that it used a "chatroom" independent of DARPA net (now Internet) *thirty* years before the term became popular and a full eight years before the first virtual community, The Well, existed in public. This chatroom was made possible through an innovative consortium of academic resources (University of Michigan), private resources, and the Army. Nothing even close has ever succeeded DELTA in the military. At its peak, over 200 persons and organizations, from the public and private sector, were connected via networks. A short and informal history of DELTA is found in COL Mike Malone, "Creative Leadership and the Future," Greensboro, North Carolina: Center for Creative Leadership Creativity Week V, September 20-24, 1982. This article can be found in the Malone Archive at CMI mentioned above.

²⁵ The article, called a Task Force DELTA Concept Paper, authored by Malone, was titled "X=H," dated 1980. Found in the Malone Archive.

²⁶ Best summarized in a EXCELnet paper (a short-lived follow-on to DELTA) by Major Michael McGee, "Battle Staff Integration," EXCELnet Paper 28-85, and "What Did We Learn During the Year of Leadership: An After Action Review of the 1985 Army Theme," both from the Malone Archive. EXCELnet was an expanded version of DELTA, existing in the Office of the Chief of Staff, Army, from 1985 to 1986. The effort produced several dozens of papers, condensed into two volumes under the title EXCELNET Concept Papers; Washington, D.C.: Chief of Staff, Army, 1985 and 1986.

²⁷ See Joseph Olmstead, Battlestaff Integration; Alexandria, Virginia: Institute for Defense Analysis, Report P-2560, 1992.

²⁸ Colonel Dandridge M. Malone, "The Essence of Army Leadership," Army Magazine, Volume 20, August, 1980. p. 35.

²⁹ D.M. Malone, "Army of Excellence," unpublished, 1990. Malone Archive.

³⁰ The term is technical here, based on Peter Vaill's article, "High Performing Units," University of Michigan, 1980.

³¹ This regulation now has been superseded by FM 6-22. However, there is considerable loss of meaning of organizational leadership and the trust necessary to achieve high performance in the new regulation.

³² A summary article on the III Corps program is Colonel (R) Dandridge M. Malone, "Implementation of the Leadership Goal: A Summary," Army Organizational Effectiveness Journal, No. 1, 1985, pp. 8-14.

³³ Coram, The Fighter Pilot..., pp. 147-148.

³⁴ Franklin Spinney, "Genghis John," Proceedings of the U.S. Naval Institute, July, 1997, p. 46.

³⁵ Even more, many consider him the "father" of the F-16, an aircraft that the USAF did not want (in favor of the F-15), but that Boyd, supporting a formidable coterie of Washington personalities (the so-called Defense Reform Movement), insisted upon. Boyd and Movement won. For this episode, consult James Fallows (a bona fide member of the Movement), National Defense; New York: Random House, 1981.

³⁶ Coram and Hammond use the phrase repeatedly in their biographies to describe Boyd's intellectual approach.

³⁷ John Boyd, "Patterns of Conflict," unpublished presentation, 1976. Author personal copy. All Boyd's presentations now are available at a number of internet web sites, most notably, www.globalguerillas.com.

³⁸ Ibid, "The Strategic Game of ? and ?," unpublished presentation, 1987. Author personal copy.

³⁹ Ibid, slide 29.

⁴⁰ Post-modernism is a very squishy term to pin down. Here it refers to the idea that all knowledge is relational and dialogic, that is self-discovered. Rather than the X-Files dictum that "The Truth is Out There," the reality according to new science is that the truth is within us and must be drawn out. Frans P. B. Osinga, Science, Strategy, and War: The strategic theory of John Boyd; New York: Routledge, 2007, especially Chapter 7.

⁴¹ John Boyd, "The Organic Design for Command and Control," unpublished presentation, 1987. Author personal copy.

⁴² Ibid, slides 11-17.

⁴³ Referring to Frederick W. Taylor, Principles of Scientific Management; Bellingham, Washington: Enna Publishing, 2007. Taylor's ideas, the precursors of modern management, called for intense supervision of workers' actions by engineers. The ideas formed the essence of military reforms in the US military espoused by Elihu Root in 1904. The echo of these ideas can be found in the military personnel systems still in operation today. For this read Donald Vandergriff, The Path to Victory: America's Army and the Revolution in Human Affairs; New York: Presidio Press, 2002.

⁴⁴ Boyd, "Organic Design...", slide 21.

⁴⁵ Although one can argue the German reputation is overstated, nonetheless the Germans in both WWI and WWII severely tested their opponents before succumbing. Read T.N. Dupuy, A Genius for War; Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

⁴⁶ Boyd, "Organic Design...", slides 35-37.

⁴⁷ Franz Osinga, "John Boyd and Strategic Theory in the PostModern Era," in Mark Safranski (editor), The John Boyd Roundtable: Debating Science, Strategy and War; Ann Arbor, Michigan: Nimble Books, 2008, p. 39.

⁴⁸ The best and most relevant is Vandergriff, Path to Victory...

⁴⁹ Sheldon Wolin, Politics and Vision; Princeton, New Jersey: Princeton University Press, 2004. This is the focus of his last chapter (seventeen) that he has added to the original 1960 version.

⁵⁰ Jonathan E Czarnecki, "The Limits of Information: Thinking about the Possible," PROTEUS Intelligence Conference, Carlisle Barracks, Pennsylvania, 2004.