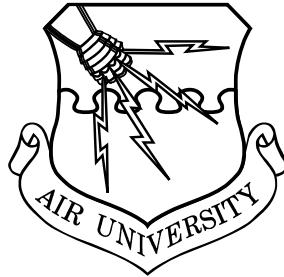# A Discourse on Winning and Losing

John R. Boyd

A Discourse on Winning and Losing

Col John R. Boyd, USAF, Retired
Edited and Compiled by
Dr. Grant T. Hammond

Editorial Note: Colonel Boyd's typography, spellings, and punctuations have been retained for the sake of historicity. Copy the graphic below to make an aid for scanning the QR codes.

Contents

Introduction to "A Discourse on Winning and Losing"

Having written the first book on John Boyd that focused more on his ideas than his personal story, I have been asked by colleagues at Air University Press to edit and introduce the publication of John Boyd's famous briefing entitled "A Discourse on Winning and Losing." I am happy to do so. This is an important event and will make Boyd's original presentation of his ideas available to a wider audience. Moreover, it will allow readers to have their own interaction directly with Boyd's thought rather than through an interlocutor. For those who know of Boyd and/or his ideas, you may want to skip this introduction and go directly to the briefings. This would not be as good as a conversation with Boyd, but it is as close as we can have.

In introducing the 327 slides of "A Discourse on Winning and Losing," I am hesitant. Boyd's briefings were never meant to be a compilation of doctrine or dogma about how to fight and win wars. They were meant to be conversations between him and his audiences. He never gave a briefing in which he did not learn something. He might have poorly conveyed a particular idea or skipped a step in the logic trail. Alternatively, perhaps, he forgot something or someone had added to the examples he used, the references he had consulted, or provided a different interpretation that he should have considered more deeply. Consequently, the briefings were always in flux. He would agonize for weeks over a single word for just the right meaning. The

August 1987 briefing reproduced here is but one of 19 different versions that I have seen. However, it is the most widely distributed one and has become the touchstone of Boyd's thinking and most readily referred to corpus for many.

What follows is only a thin veneer, to whet your appetite for Boyd in the "original," an effort to allow you to have your conversation with his ideas. I do not wish to poison the well with my own interpretations. They are available in more detail elsewhere. Rather, I seek to give a brief overview of the richness of some of his ideas as an invitation to explore further. To give you a flavor of Boyd's briefings, the staff at Air University Press has inserted QR codes for YouTube clips of portions of the briefings as Boyd gave them in the early 1990s. You may not be able to have a conversation with Boyd yourself, but you can partake of the experience vicariously as he interacts with his audiences in the "Discourse."

While Boyd's initial focus was a 193 slide summation of military history in the "Patterns of Conflict" brief, his effort soon expanded dramatically. As he read, he thought, and as he thought, he tried to explain the connections, the anomalies, the advantages, and limitations of various forms, styles, and strategies of military conflict. His insights led him to introduce the theory of maneuver warfare as critical to military success in general as it had been for successful air-to-air tactics where his intellectual journey began. His study and thought led

him to produce a series of other briefings becoming parts of the larger "Discourse." They included a 37 slide briefing entitled "Organic Design for Command and Control," a 58-slide briefing entitled "The Strategic Game of ? and ?," a 27-slide briefing entitled "Conceptual Spiral," and one of the few essays he ever wrote called "Destruction and Creation." This latter piece, placed near the end of the compilation, was actually the beginning of Boyd's intellectual odyssey in earnest, as it was written and mimeographed on 3 September 1976, only a year after his retirement. It was for Boyd, in many ways, the alpha and omega, the beginning and the end of his thinking. He debated where it belonged in the sequence but chose ultimately to place it near the end. The larger "Discourse" ends with his summation entitled "Revelation." To this we have added a four slide brief on "The Essence of Winning and Losing" produced on 28 June 1995. It is an effort to compress all that he had learned into a simple, yet elegant and comprehensive, conclusion embedded in his concept of OODA Loops, what they mean and why they are important. Combined with the "Discourse," this is the main body of Boyd's thinking, leaving his "Aerial Attack Study," and "Fast Transients," essays he wrote while on active duty.[1]

For those unfamiliar with John Boyd or his importance in military thought, I wish to present a succinct introduction to the man and his accomplishments as I did in my book about him, *The Mind of War: John Boyd and American Security*. The reader can find a great deal more in the bibliography of materials about Boyd and the influence of his ideas at the end of this volume.

Aerial Attack Study

Fast Transients

John R. Boyd

This nation lost an incredible array of talent in 1997. A premier fighter pilot, a man of legendary skill and scholarship who wrote the first manual on jet aerial combat, developed tactics against Soviet planes and surface-to-air missiles (SAM), and thereby saved innumerable lives in Vietnam, died. So too did one of the nation's premier aircraft designers whose work on something called Energy-Maneuverability Theory changed the way aircraft were designed and tested. He, more than anyone else, was largely responsible for the development of both the US Air Force's premier fighters, the F-15 Eagle and the F-16 Fighting Falcon.

One of the more original students of military history was also lost. His studies of war and warfare through the ages changed how the US armed forces prepared for warfighting in the last quarter of the twentieth century. His views on maneuver warfare helped change the US Marine Corps and the US Army. He succumbed laboring behind the scenes, waging a more-than-decade-long campaign to change how the US military went about the business of defense, changing the procurement process, and helping to improve the weaponry in the US arsenal.

A great original thinker, whose views on learning and thinking, surviving, and prospering in a complex world have infected American business and education, also passed from the scene. His notions of competition and time cycles—observation, orientation, decisions, action, the OODA Loop—have followers around the

world who study and employ his insights in a variety of ways and professions. Lastly, a paragon of virtue—loved by many in politics, business, and the military for his character and integrity—was gone. He shunned personal wealth and private gain for service to his country. That the nation is less for the passing of all of these should be obvious. That they were little honored is regrettable, but perhaps understandable. None was a published author, decorated hero, high-ranking government official, or academician of renown. They were one man—Col John R. Boyd, USAF (ret.).[2]

John Boyd spent 25 years on active duty and 22 more years of his retirement in service to the nation. He spent the first 12 of those retirement years working on his magnum opus, a set of briefings collectively entitled "A Discourse of Winning and Losing." His original 90-minute briefing, called "Patterns of Conflict," had grown considerably. It was now 327 view graphs and was the focal point of an interactive discussion with a variety of audiences. These ranged from impromptu Saturday morning sessions with interested officers in the Pentagon, presentations at the Army War College, the Institute of Advanced Study at Princeton, people in the defense industry, newspapermen, politicians, and academics. Boyd arranged the briefings into a sequence he thought appropriate and shared with friends and colleagues, his disciples, and audiences inside and outside the military. Nearly twenty years after his death, there are scores of articles, PhD dissertations, and more than a dozen books about Boyd and his ideas. There are numerous courses about him and his ideas taught in business schools and war colleges around the globe. There are hundreds of websites, blogs, and sources of commentary and discussion about Boyd and his ideas on the Internet in several languages.[3] However, until now; there has not been a book publication of "A Discourse on Winning and Losing." This Air University Press volume reproduces an enhanced facsimile of Boyd's August 1987 version of "A Discourse." This is the most widely disseminated and copied version, passed from one person to another over the years until it was made widely available on the Internet from a variety of sources.

It is about time; one would think, and fitting that his beloved Air Force, which he mercilessly criticized as he strove to make it better, would, at long last, accept his ideas as worthy. In the service and retirement, Boyd was a thorn in the side of senior Air Force leadership and was either loved or hated by them. The maverick that helped design the F-15 earned unending scorn from the plane's champions. They despised Boyd's effort to design and promote the lightweight fighter that became the F-16. His criticisms of the military and leadership as part of the Defense Reform Movement from the mid-1970s to mid-1980s did not endear him to the Air Force. Nevertheless, the power of his insights and ideas gradually took hold on those, not only throughout the Air Force and the US military but also from all walks of life and among strategists around the world.

Boyd was recognized shortly after his death, largely as the result of a Congressional inquiry, with the naming of a building at Nellis AFB, Nevada, for him. Colin

the OOda Loop

Gray, the distinguished British academic and the most quoted author about strategy since Clausewitz, bestowed an encomium on Boyd in praising his concept of the OODA Loop, saying that it "may appear too humble to merit categorization as grand theory, but that is what it is. It has an elegant simplicity, an extensive domain of applicability, and contains a high quality of insight about strategic essentials, such that its author well merits honorable mention as an outstanding general theorist of strategy."[4] Boyd was studied over the years at various USAF professional military education schools, most notably as part of the curriculum of the School of Advanced Air and Space Studies that awards both master's and doctoral degrees. His full and formal rehabilitation came when I was asked to deliver the prestigious Harmon Memorial Lecture about him at the US Air Force Academy in 2012—finally, 15 years after Boyd's death.

John Boyd was a maverick fighter pilot who challenged orthodoxy.[5] In the hierarchy of the military, doing this once and getting away with it is possible, though risky. Doing so two or more times is not conducive to career advancement. Doing so routinely courts dismissal. John Boyd challenged Air Force orthodoxy continuously and did so at the heart of the service's very identity. He challenged fighter tactics in his "Aerial Attack Study," revolutionized fighter aircraft design with Energy-Maneuverability Theory, and developed the F-15 and F-16 aircraft themselves with his design work. Moreover, he challenged the theory of how wars were to be fought and won in his 15-hour briefing, "A Discourse on Winning and Losing."

If he had been less pugnacious, if he had not been so cocksure of himself, if he had not end run the system constantly, if he had played by the rules, he might not have had the difficulties he had. However, then, he would not have been successful either. Revolutions are neither begun nor won by moderates. They require zealots committed to the cause. Boyd was passionately committed to being the best at his craft. He was devoted to the Air Force and its mission—air superiority with the best aircraft, training the best pilots, and developing the best military strategy—to fly, fight, and win. He just happened to be convinced that the Air Force had it all wrong. Understandably, the Air Force did not appreciate being told so.

To accept Boyd's ideas was an indictment of the service, its leadership, its tactics, technique, and procedures (TTP) and its doctrine. That sort of thing is not easy to admit, or even to suspect, and Boyd's era was a rough time for the Air Force. Coping with the disaster of Vietnam was difficult. Though air support was a major contribution on the ground, the Air Force did not distinguish itself in the air. Half of our F-105s were lost, the 10 to 1 kill ratio against MiGs in Korea came closer to 1 to 1 in Vietnam, the air-to-air missiles were not nearly as good as claimed, and ground-based fires—antiaircraft artillery (AAA) and SAMs—took a heavy toll.[6] This experience meant tactical air operations had to be greatly improved if the Air Force was to be successful in the future. From 1965 until 1982, the Air

maverick fighter pilot

Force chiefs of staff and most of their senior officers were bomber generals from Strategic Air Command, who had risen under the tutelage of Gen Curtis LeMay. Reinventing tactical aviation was difficult, particularly in that environment, and John Boyd was at the heart of it.

Boyd had briefly served in the Army in occupation forces in Japan after WWII. He joined the Air Force in 1951 and retired in 1975 as a colonel. His military career spanned the Cold War from the Berlin Airlift to the fall of Saigon. He flew briefly in Korea at the very end of the war and became fascinated with air-to-air tactics. He went to the Fighter Weapons School, teaching and studying aerial tactics for six years, flying the F-100 Super Sabre like no one else. He had a standing $40 bet with all comers at Nellis AFB that he could put them on his "six" and outmaneuver them for a kill in less than 40 seconds. He never lost the bet. A demanding instructor in the air and the classroom, he questioned the tactics of the day. At night and on his initiative, he wrote the "Aerial Attack Study," the first manual on air-to-air jet combat. It was rejected, at first; then distributed surreptitiously, pilot to pilot, squadron to squadron until the Air Force decided to adopt it. He left Nellis AFB for Systems Command at Eglin AFB, Florida, where, with civilian mathematician and later Defense acquisition chief, Tom Christie, he developed the Energy-Maneuverability Theory. Using stolen computer time in dummy accounts, Boyd diverted several hundred thousand dollars of computer time to studying the comparative flight performance envelopes at different speeds, altitudes, and G-forces for every American fighter and plotted them against every Soviet fighter. He discovered that every Soviet fighter had greater maneuverability when compared to its American counterpart. He was nearly court-martialed for theft before being presented two Air Force awards for his work.

Sent to the Pentagon to assist in the development of the next Air Force fighter, which became the F-15, Boyd was given the materials submitted to that date, told to review them, and report back in a couple of weeks. When asked for his opinion, he replied, "I've never designed an airplane before, but I could f--- up and do better than this."[7] Thus began his work on the F-15 and his change of the original design of an 80,000-pound swing-wing F-111 based "fighter" to the smaller, twin tailed, twin-engine F-15 we know today. Along the way, he thought the F-15 was too big and too costly. Too few could be built to allow for the inevitable losses in Europe against the Warsaw Pact ground and air defenses. He quietly, without approval, began to design the Light Weight Fighter that became the F-16. It nearly cost him career and promotion. The F-15 was the "Holy Grail" for the Air Force. Opposing the plane, the size of the buy, or proposing an alternative to it was simply unacceptable and treasonous in the eyes of most of his superiors. However the F-16 was adopted, over the objections of the Air Force leadership. The secretary of defense made the decision. It is the only fighter in Air Force history that cost less than its predecessor. Nearly 5,000 have been built, and it has been purchased by 25 countries, making it the most widely adopted fighter

since World War II. That is quite an accomplishment for a plane the Air Force thought it did not need and didn't want.

To one senior Air Force four-star, Boyd was "a 24 karat pain in the ass." To a Marine four-star he was "the quintessential soldier-scholar." While one fellow student called him "the 'cussingest' man I ever met," another four-star called him "Christ-like." To those in the Pentagon whose ire he garnered, he was "that f------ Boyd." He was known by various names including "the Mad-major," "the Ghetto colonel," and "Genghis John."[8] To those who believed in him and his causes, he was more than a hero, he was a virtual saint and they would have followed him anywhere and taken on any foe, regardless of the odds.

How did one man inspire such radically different opinions? Boyd was both brilliant and a misfit who was his own worst enemy. He did not do things by the book or play by the rules. He did not care much for shined shoes, immaculate uniforms, or protocol niceties. On a visit to the Air Force Academy driving with his host, he noticed the superintendent in the car behind him on base. Boyd rolled down the window in the cold and snow and started pumping his middle finger in the air at the car behind, in front of several dozen cadets. His host, appalled by the action, tried to stop him, but Boyd said, "Aw hell, we were in pilot training together and this is just a fighter pilot greeting." After that, the superintendent decided to approve all visitors to the Academy in advance.[9]

Boyd was both vilified and respected by those who knew him. To many, he was not very likable. He smoked smelly cigars, talked loudly, and got right in your face when he argued with you, spittle flying. He was pushy, arrogant, and profane in the extreme and would frequently end run his boss, or his boss's boss, up to, and including, the secretary of the Air Force and the secretary of defense. He had the courage to state his views—and defend them regardless of consequence. His supporters admired and respected his integrity and willingness to challenge and persevere. He was totally incorruptible, had little use for money, and refused to cash dozens of TDY reimbursement checks for speaking engagements after he retired. He inspired intellectual respect and virtual awe, intense loyalty, and unbounded compassion for those who became "the acolytes" of Boyd's small but intense following on his various crusades.

Despite his often prickly personality and somewhat eccentric habits, Boyd received numerous Air Force awards during his career. He won the Air Force Systems Command Scientific Achievement Award, the USAF Research and Development Award, the Arnold Society Hoyt S. Vandenberg Award, and the Dr. Harold Brown Award for his work on energy maneuverability, fighter design, and air tactics. After his retirement, he remained a consultant to the Office of the Secretary of Defense. He wanted this to be unpaid but accepted a day's pay per pay period to be on the rolls, which was required to access to the Pentagon. He continued to work on a variety of projects and stay close to the circle of friends, defense correspondents, industry people, academics, and politicians.

In the process, he became the power behind the throne for a major effort to reform the US military.

Boyd led a diverse group of people, known as the Defense Reform Movement, behind the scenes from 1975–1985, by orchestrating staffers, congressional representatives, and senators on the Hill, journalists, and those in other services. Among them were Congressmen Norman Dicks, Dick Cheney (future secretary of defense), Newt Gingrich (future speaker of the House), and some 130 members of the House of Representatives in the Military Reform Caucus, along with Senators Gary Hart (future presidential candidate), Charles Grassley, William Cohen (future secretary of defense), Sam Nunn, and others. He developed a national network of defense correspondents and influential writers—George Wilson of the *Washington Post*, James Fallows of *The Atlantic*, and reformers inside and outside the military. Along the way, he was largely responsible, along with Gen Al Gray and Col Mike Wyly, for the adoption of Maneuver Warfare Doctrine of the US Marine Corps and had frequent talks with Army generals Donn Starry and Huba Wass de Czege regarding the development of AirLand Battle. Fallows wrote a number of articles for which Boyd was largely the source, and an award-winning book, *The National Defense*, that raised the views and charges of the defense reformers to national attention.[10]

Boyd railed against gold-plated weapons systems with 20-plus-year acquisition cycles and no fly-offs or testing in their selection processes. He worried about the Army trying to fit synchronization into its doctrine.

For five years, a retired Air Force colonel taught every Marine officer that went through the Basic Course at Quantico about maneuver warfare. Moreover, he kept in touch with those concerned about these and other issues, visiting then Secretary of Defense Dick Cheney with some frequency before the First Gulf War. Boyd was pleased when military commanders and news anchors explained the US victory as being attributable to "getting inside the enemy's decision cycle," a phrase from his strategic insight and briefings. Some of the ideas seemed to have hit home; others fell on deaf ears. John Boyd died wondering if he had made a difference. His legacy was largely unknown. Nearly 20 years after his death, he has a global reputation and his ideas have influenced business, politics, education, and strategy as well as the militaries of the world.

The Origins of the "Discourse"

As important as all of these accomplishments in the Air Force may have been, Boyd's real importance came after he retired with his work on a series of briefings that eventually became known as "A Discourse on Winning and Losing." The endeavor began, as with most things with Boyd, his concern for air tactics and work with Pierre Sprey on the design of the A-10, the first specifically designed ground attack aircraft since the Douglas Invader A-26 of 1942. As a part of the discussions for the design of a ground attack aircraft, Sprey and others consulted German armor commanders from World

War II, Stuka pilots, and others to refine the details of attack profiles, speeds, and times to acquire and successfully attack tanks and other targets. Boyd participated in these sessions and became interested in German armor tactics, the concept of blitzkrieg, and its origins. Pierre Sprey said he should go back and read about German infiltration tactics in World War I as the origin of the ideas incorporated into blitzkrieg. Upon retirement, Boyd began to spend many hours in the Pentagon library reading military history. He read and read about Friedrich Wilhelm von Mellenthin, Erwin Rommel, Erich von Manstein, Hans Rudel, and World War II. Then he went back to study the 1930s, the theories of B. H. Liddell-Hart, Heinz Guderian, Charles de Gaulle, and how German ideas had developed about blitzkrieg and infiltration tactics in World War I. He kept going backward reading military history—all the way back to Sun Tzu.

Doing it backward emphasized continuity, not change. He pondered what the essence of success was for those who won battles and wars across different times and continents. He began to focus on maneuverability, quickness, attacks in flank or rear, and rapid adaptation to tactical developments. These were the constants, and winning was often about getting inside the adversary's decision cycle, controlling the tempo of battle, being unpredictable, causing friction for the adversary, and taking advantage of the element of surprise. He noticed that the larger forces did not always win battles. Attacks from the flank or the rear, contrived misdirection, timing, and deception all played important parts in achieving victory. These became the themes of

the "Patterns of Conflict" briefing that grew from 90 minutes to more than four hours. It was frequently given both inside and outside the Pentagon, on the Hill, to academic groups, and interested others.

Along the way, as Boyd studied patterns of conflict and military history more intensely, he became concerned about better understanding the orientation of an adversary. This was critical to success in war. What does he value? What does he fear? How has he acted in the past? What does he seek to do? For Boyd, cultural anthropology and ethnography became more important than military intelligence. The latter developed a physical order of battle, but Boyd wanted to develop a psychological order of battle. He wanted to know intentions as well as capabilities to devise a strategy that would allow moral and psychological leverage, as well as the physical capability to defeat an opponent. A strategy to be successful had to account for the moral/mental/physical aspects of competition and conflict along with another of Boyd's frequent trinities, the mind/time/space components of those interactions.

Central to Boyd's view of conflict is the fact that organisms and organizations seek to survive and prosper. Doing so generally depends on maximizing freedom of action or by making common cause with those who seek the same goals. Boyd understood and emphasized that war is a human endeavor begun and ended for moral purposes. It involves mobilizing people to fight and sacrifice for a cause. You need to understand why and how they fight if you seek to defeat your opponents. This simply cannot be ignored. Along the way, Boyd devel-

oped the most important of his many trinities: people first, ideas second, and things third. That is the priority for developing successful strategies. It is also good advice for leading a successful life. Most militaries, however, do it in reverse—people must be interchangeable parts to avoid single-point failures in combat. However, Boyd wanted to emphasize the human dimension of conflict.

The essence of Boyd's strategy for accomplishing goals can be summarized by the combination of variety, rapidity, harmony, and initiative. *Variety* entails denying pattern recognition and predictability to an adversary, adopting multiple, simultaneous actions to confuse and confound an opponent, and being able to transition from one initiative to another sequentially or concurrently. *Rapidity* means the ability not only to act quickly but also to act to modulate the tempo of action, to know when to speed up or slow down. *Harmony* refers to the ability to blend one's actions to fit time and circumstance, to co-evolve with the strategic landscape and the tactical realities. It is achieving the "fit" of what Boyd called the mind/time/space arena where thought and action converge appropriately. *Initiative* is the willingness to lead, to take action, to identify and act upon the mismatches, and to do so at the right time. One achieves advantage by causing friction for an adversary, by oscillating between interaction and isolation over time, and by modulating time to one's advantage. For Boyd, time and timing were weapons that did not have to be logistically supported. They were free goods and bestowed advantage upon those who understood how to use them well.

Taken together, these were the keys to a successful strategy. Boyd tested these concepts on blitzkrieg, the defense against it—"counterblitz," guerilla warfare, and counterinsurgency. He was fascinated with them and sought to understand how to prosecute and defeat each. That said, like the Chinese colonels who wrote *Unrestricted Warfare* in 1999,[11] Boyd was concerned about the wider arena of competition and conflict. At the base, in his view, was the constant reminder that war is a human activity begun and ended ultimately for what is seen as moral purpose. Ultimately, one's target was always the same: the perception of the adversary leadership. If you could change their minds, you could change their behavior. If you could change their behavior, you might not need to defeat their fielded forces or occupy their capitol. The enemy always has a vote and must decide to end the conflict for you to win. Boyd was always reminding others, "Terrain does not fight wars. Machines do not fight wars. People fight wars. It is in the minds of men that war must be fought."[12]

His study of military history and the synthesis he made using the insights of Sun Tzu, Liddell-Hart, Miyamoto Musashi, Carl von Clausewitz, and others led Boyd to believe that the Germans had gotten it right. Commander's intent was the key. To have a force well schooled and trained in doctrine, well rehearsed or experienced, to understand perfectly the commander's intent and implement it through mission-type orders was essential. Such a force must be grounded in the empowerment of subordinates to do what the situation requires and to trust in their ability to make the right decisions.

This decentralization enables variety, rapidity, harmony, and initiative. Everything begins with increased situational awareness and the OODA Loop process.

This was an expansion on his experience of air-to-air combat in Korea: commander's intent, good TTP, and understanding where and when advantage could be had leads to achieving a successful kill. One should seek out the disposition of the enemy, much as Napoleon's skirmishers had done, then infiltrate and penetrate, as the Germans had learned in World War I and World War II, to exploit the surfaces and gaps, the strong and weak points, of opposing forces. Maneuver warfare was the way to do so, and learning how to do it quickly and well was the key to victory.

Boyd, Science, and Synthesis

Along the way, as Frans Osinga so thoroughly details in his book, *Science, Strategy, and War*, Boyd read widely in science and philosophy. Boyd retired in 1975, but he read voraciously all the major books and articles on science that appeared in the last 20 years of his life. He engaged in numerous studies and discussions, ranging from mathematics to psychology, physics to biology, computing, and cosmology. He would call distinguished scientists to ask a question, stating he "was just a retired fighter pilot who reads a lot."[13] He addressed a collection of Nobel Prize winners at the Santa Fe Institute and the Institute for Advanced Studies at Princeton. Unable to buy all the books in which he was interested, he hung out in bookstores and read whole volumes, transfixed in the subject matter and unperturbed by the entreaties of store owners to simply purchase the book and leave. He was interested in neuroscience and how the brain worked, how scientific progress was made, and in fields as disparate as epistemology and relativity. He explored a variety of concepts, trying to integrate them into his understanding of how the world and its conflicts worked. These included the essence of such things as numerical imprecision, quantum uncertainty, entropy, the causes of irregular or erratic behavior, Heisenberg's uncertainty principle, incomprehensibility, mutations and how and why they occur, the nature of ambiguity and its effects, and the origins of novelty.

In doing so, he created what he came to call the "Conceptual Spiral," in which he tried to explain how we learn and why constant learning and refinement of the process are so important. One began with a question and set about to find answers. It was a spiral process that included a series of processes as follows:

Table 1: The Conceptual Spiral

Exploration	Discovery	Innovation
Thinking	Doing	Achieving
Learning	Unlearning	Relearning
Comprehending	Shaping	Adapting
Insight	Imagination	Initiative

Adapted from John Boyd, "The Conceptual Spiral," Slide 34.

For Boyd, these insights were critical in explaining how he had come to fashion the ideas that he had and

to understand better how people learn. More important was to learn *how* to learn.

Boyd wrote little. Most important is a short 15-page essay on "Destruction and Creation," which several notable physicists have thought a brilliant work. A few articles and a handbook on aerial combat are the only things he penned other than his 327-slide magnum opus briefing, "A Discourse on Winning and Losing." He could not bring himself to publish anything because it was never complete. Coming from an essentially oral culture of briefings in the military, Boyd put carefully chosen words on view-graphs, but never in print. The "Discourse" was an unfinished conversation with each audience, part of a perpetual learning experience. He learned every time from each discussion with his audiences, and this necessitated changes for the next iteration. There was a succession of unfinished OODA Loops.

Boyd's counsel for winning is first to understand the strategic context of the contest. You could have a perfectly well defined objective, all the resources and capabilities required, and an excellent and detailed plan to accomplish your mission—but if you do not fully understand the tactical, operational, and strategic environments, you would not contend successfully. If you understand the context and the setting of the contest, you can shape the battle space and manage the opponent's cycle time. Look for mismatches, places where things do not fit. Analysis of "big data" does this—finding anomalies and correlations to explore. Exploit the mismatches. Use mission-type orders. Maneuver your adversary to where he decides he cannot win.

Chairman of the Joint Chief Gen Martin Dempsey's directives on Mission Command seem to indicate the adoption of Boyd's advice.[14] However, making such actual by studying, practicing, exercising, war gaming, and in routine operations according to those directives and their spirit will be a never ending process, searching for the excellence required to survive and prosper.

It is my hope that the ideas and legacy of Col John R. Boyd, USAF, retired, will become even better known, more studied, and heeded with Air University Press's making this work available with the video clips and bibliography that support it. So I end this introduction as I did my book, *The Mind of War*: "Rest in peace, John. The discourse on winning and losing continues. *Semper Fi*."[15]

The author of three books and numerous articles, book chapters, briefings, and studies for the USAF and other government agencies, Dr. Grant T. Hammond has taught at the Air War College and led and worked at the USAF Center for Strategy and Technology and its Blue Horizons Program at Air University, Maxwell AFB, AL. The views expressed here are his own and do not necessarily reflect those of the Department of Defense, the US Air Force or Air University.

Much 1

Much 2

Aircraft

Gen Dempsey

Notes

1. These are available from several online sources.

2. Grant T. Hammond, *Mind of War: John Boyd and American Security* (Washington, DC: Smithsonian Books, 2001), 1–2.

3. *See* the bibliography for a complete listing of these sources.

4. Colin S. Gray, *Modern Strategy*, (Oxford: Oxford University Press, 1999), 91.

5. Much of the next few paragraphs are excerpts from my Harmon Memorial Lecture, "On Making History: John Boyd and American Security," US Air Force Academy, 12 January 2012. Available at http://www.usafa.edu/df/dfh/docs/Harmon54.pdf. Other paragraphs are interwoven with portions published as "The Essential Boyd," available at http://radio-weblogs.com/0107127/stories/2002/12/20/theEssential-Boyd.html.

6. "List of Aircraft Losses of the Vietnam War," *Wikipedia*, http://en.wikipedia.org/wiki/Aircraft_losses_of_the_Vietnam_War; Robert D. Goertz, "Analysis of Air-to-Air Missile Capability in Southeast Asia" (research report, Air Command and Staff College, June 1968), 1–2; and Christopher Hobson, *Vietnam Air Losses: USAF, Navy, and Marine Corps Fixed-Wing Aircraft Losses in SE Asia 1961–1973*, North Branch, MN: Specialty Press, 2002.

7. Hammond, *Mind of War*, 77.

8. Ibid., 2–4.

9. Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (Boston: Little, Brown and Company, 2002), 342–43.

10. James Fallows, *National Defense*, (New York: Vintage Books, 1982).

11. Qiao Liang and Wang Xiangsui, *Unrestricted Warfare*, (Beijing: People's Liberation Army, 1999).

12. John Boyd quoted in Henry Eason, "New Theory Shoots down Old War Ideas," *Atlanta Journal–Constitution*, 22 March 1981.

13. Hammond, *Mind of War*, 171–92.

14. Gen Martin E. Dempsey, chairman, Joint Chiefs of Staff, "Mission Command White Paper," 3 April 2012, http://www.dtic.mil/doctrine/concepts/white_papers/cjcs_wp_missioncommand.pdf.

15. Hammond, *Mind of War*, 211.

A

Discourse

on

Winning and Losing

ABSTRACT

To flourish and grow in a many-sided, uncertain and ever-changing world that surrounds us, suggests that we have to make intuitive within ourselves those many practices we need to meet the exigencies of that world. The contents, hence the five sections that comprise this *Discourse,* unfold observations and ideas that contribute toward achieving or thwarting such an aim or purpose. Specifically:

- "Patterns of Conflict" represents a compendium of ideas and actions for winning and losing in a highly competitive world;

- "Organic Design for Command and Control" surfaces the implicit arrangements that permit cooperation in complex, competitive, fast moving situations;

- "The Strategic Game of ? and ?" emphasizes the mental twists and turns we undertake to surface schemes or designs for realizing our aims or purposes;

- "Destruction and Creation" lays out in abstract but graphic fashion the ways by which we evolve mental concepts to comprehend and cope with our environment;

- "Revelation" makes visible the metaphorical message that flows from this *Discourse.*

As one proceeds from *Patterns* through *Organic Design*, *Strategic Game*, and "Destruction and Creation" to "Revelation" he or she will notice that the discussion goes from the more concrete and obvious to the more abstract. In this sense, one will notice the rise away from many particular actions and ideas to fewer and more general concepts to account for these many actions and ideas. In this context, *Patterns* emphasizes historical readings, primarily military, as the backdrop for its discussion, while the final four sections draw away from the historical framework and increasingly emphasize theory spread over a scientific backdrop as the medium for discussion.

Yet, the theme that weaves its way through this *Discourse on Winning and Losing* is not so much contained within each of the five sections, per se, that make up the *Discourse*; rather, it is the kind of thinking that both lies behind and make-up its very essence. For a process of the interested, a careful examination will reveal that the increasingly abstract discussion surfaces reaching across many perspectives; pulling each and every one apart (analysis), all the while intuitively looking for those parts of the disassembled perspectives which naturally interconnect with one another to form a higher order, more general elaboration (synthesis) of what is taking place. As a result, the process not only creates the *Discourse* but it also represents the key to evolve the tactics, strategies, goals, unifying themes, etc., that permit us to actively shape and adapt to the unfolding world we are a part of, live in, and feed upon.

PATTERNS OF CONFLICT

December 1986

John R Boyd

OUTLINE

- Point of departure
- Historical snapshots
- Categories of conflict
- Synthesis
- Application
- Wrap-up
- Epilogue
- Sources

FOCUS AND DIRECTION

<u>Mission</u>

- To make manifest the nature of <u>Moral-Mental-Physical Conflict</u>
- To discern a <u>Pattern for Successful Operations</u>
- To help <u>generalize Tactics and Strategy</u>
- To find a basis for <u>Grand Strategy</u>

<u>Intent</u>

- To unveil the character of conflict, survival, and conquest

POINT OF DEPARTURE

Air-to-Air

GENERALIZATION

- Need a fighter that can both lose energy and gain energy more quickly while outturning an adversary.

- In other words, suggest a fighter that can pick and choose engagement opportunities—yet has <u>fast transient</u> ("buttonhook") characteristics that can be used to either force an overshoot by an attacker or stay inside a hard turning defender.

IDEA

IDEA EXPANSION

- Idea of fast transients suggests that, in order to win, we should operate at a <u>faster tempo or rhythm</u> than our adversaries—or, better yet, get inside adversary's <u>Observation–Orientation–Decision–Action time cycle or loop</u>.

- Why? Such activity will make us appear ambiguous (unpredictable) thereby generate confusion and disorder among our adversaries—since our adversaries will be unable to generate mental images or pictures that agree with the menacing as well as faster transient rhythm or patterns they are competing against.

EXAMPLES

- Blitzkrieg vs. Maginot Line mentality (1940)
- F-86 vs. MiG-15 (1951–53)
- Israeli raid (1976)

NEW CONCEPTION

Action

- Exploit operations and weapons that:
    - Generate a rapidly changing environment (quick/clear observations, orientation, and decisions, fast tempo, fast transient maneuvers, quick kill)
    - Inhibit an adversary's capacity to adapt to such an environment (cloud or distort his observations, orientation, and decisions and impede his actions)

Idea

- Simultaneously compress own time and stretch-out adversary time to generate a favorable mismatch in time/ability to shape and adapt to change

Goal

Collapse adversary's system into confusion and disorder causing him to over and under react to activity that appears simultaneously menacing as well as ambiguous, chaotic, or misleading.

A–to–A and A–to–G
RECIPE FOR GENERATING CONFUSION AND DISORDER

Observations

- Quick/Clear Scanning Sensors
- Suppressed/Distorted Signatures

Activity

- Fire
  — Quick shoot fire control systems and high speed weapons

- Movement
  — High Speed (supercruise)
  — Rapid energy gain and rapid energy loss coupled with high turn rates and low turn radii
  — High pitch rates/high roll rates/high yaw rates coupled with ease of control

HISTORICAL SNAPSHOTS

HUMAN NATURE

<u>Goal</u>

- Survive, survive on own terms, or improve our capacity for independent action.

   The competition for limited resources to satisfy these desires may force one to:

- Diminish adversary's capacity for independent action, or deny him the opportunity to survive on his own terms, or make it impossible for him to survive at all.

<u>Implication</u>

- Life is conflict, survival, and conquest.

COMMENT

In addressing any questions about conflict, survival, and conquest one is naturally led to the

Theory of Evolution by Natural Selection

and

The Conduct of War

since both treat conflict, survival, and conquest in a very fundamental way. In this regard, many sources (a few on natural selection and many on war) are reviewed; many points of view are exposed.
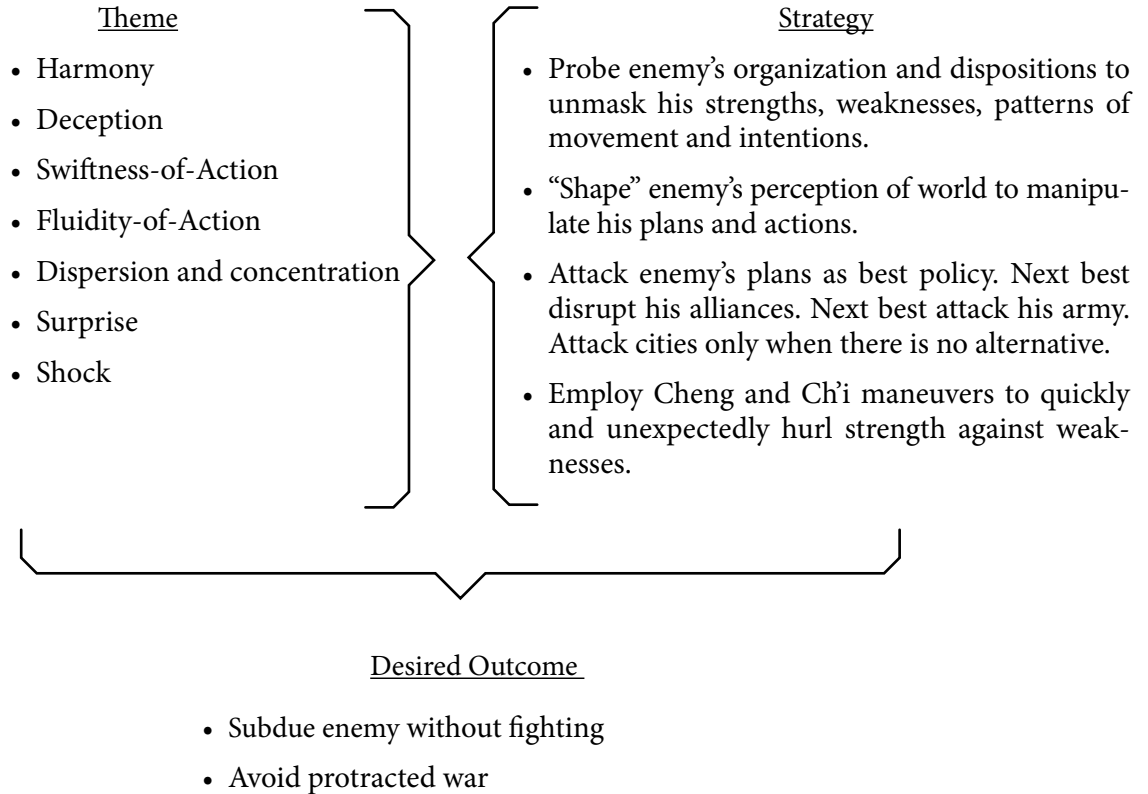
IMPRESSION

- In examining these many points of view one is bombarded with the notion that:

    — It is advantageous to possess a <u>variety</u> of responses that can be applied <u>rapidly</u> to gain sustenance, avoid danger, and diminish adversary's capacity for independent action.

    — The simpler organisms—those that make up man as well as man working with other men in a higher level context—must cooperate or, better yet, <u>harmonize</u> their activities in their endeavors to survive as an organic synthesis.

    — To shape and adapt to change one cannot be passive; instead one must take the <u>initiative</u>.

- Put more simply and directly: the above comments leave one with the impression that <u>variety/rapidity/harmony/initiative</u> (and their interaction) seem to be key qualities that permit one to shape and adapt to an ever-changing environment.

- With this impression in mind together with our notion of getting inside an adversary's OODA loop we will proceed in our historical investigation.

HISTORICAL PATTERN
SUN TZU—"THE ART OF WAR"—C. 400 BC

Theme

- Harmony
- Deception
- Swiftness-of-Action
- Fluidity-of-Action
- Dispersion and concentration
- Surprise
- Shock

Strategy

- Probe enemy's organization and dispositions to unmask his strengths, weaknesses, patterns of movement and intentions.
- "Shape" enemy's perception of world to manipulate his plans and actions.
- Attack enemy's plans as best policy. Next best disrupt his alliances. Next best attack his army. Attack cities only when there is no alternative.
- Employ Cheng and Ch'i maneuvers to quickly and unexpectedly hurl strength against weaknesses.

Desired Outcome

- Subdue enemy without fighting
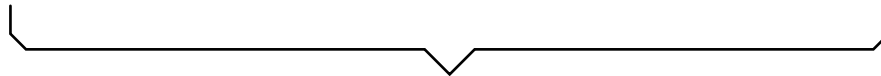- Avoid protracted war

HISTORICAL PATTERN

<u>Early Commanders</u>

- Alexander
- Hannibal
- Belisarius
- Jenghis Khan
- Tamerlane

<u>Impression</u>

- Early commanders seem consistent with ideas of Sun Tzu
- Western commanders more directly concerned with winning the battle
- Eastern commanders closer to Sun Tzu in attempting to shatter adversary prior to battle

<u>Action</u>

Cheng and Ch'i*

* Cheng/Ch'i maneuver schemes were employed by early commanders to expose adversary vulnerabilities and weaknesses (a la Cheng) for exploitation and decisive stroke (via Ch'i).

HISTORICAL PATTERN

Keeping in mind the ideas of Sun Tzu and our comments about Early Commanders, let's take a look at an early tactical theme and some battle (grand tactical) situations to gain a feel for the different ways that the Cheng/Ch'i game has been (and can be) played.

HISTORICAL PATTERN

<u>Tactical Theme (from about 300 B.C. to 1400 A.D.)</u>

- Light troops (equipped with bows, javelins, light swords, etc.) perform reconnaissance, screening, and swirling hit-and-run actions to:

  – Unmask enemy dispositions and activities.

  – Cloud/distort own dispositions and activities.

  – Confuse, disorder enemy operations.

- Heavy troops (equipped with lances, bows, swords, etc.) protected by armor and shields:

  – Charge and smash thinned-out/scattered or disordered/bunched-up enemy formations generated by interaction with light troops; or

  – Menace enemy formations to hold them in tight, or rigid, arrays thereby make them vulnerable to missiles of swirling light troops.

- Light and heavy troops in appropriate combination pursue, envelop, and mop-up isolated remnants of enemy host.
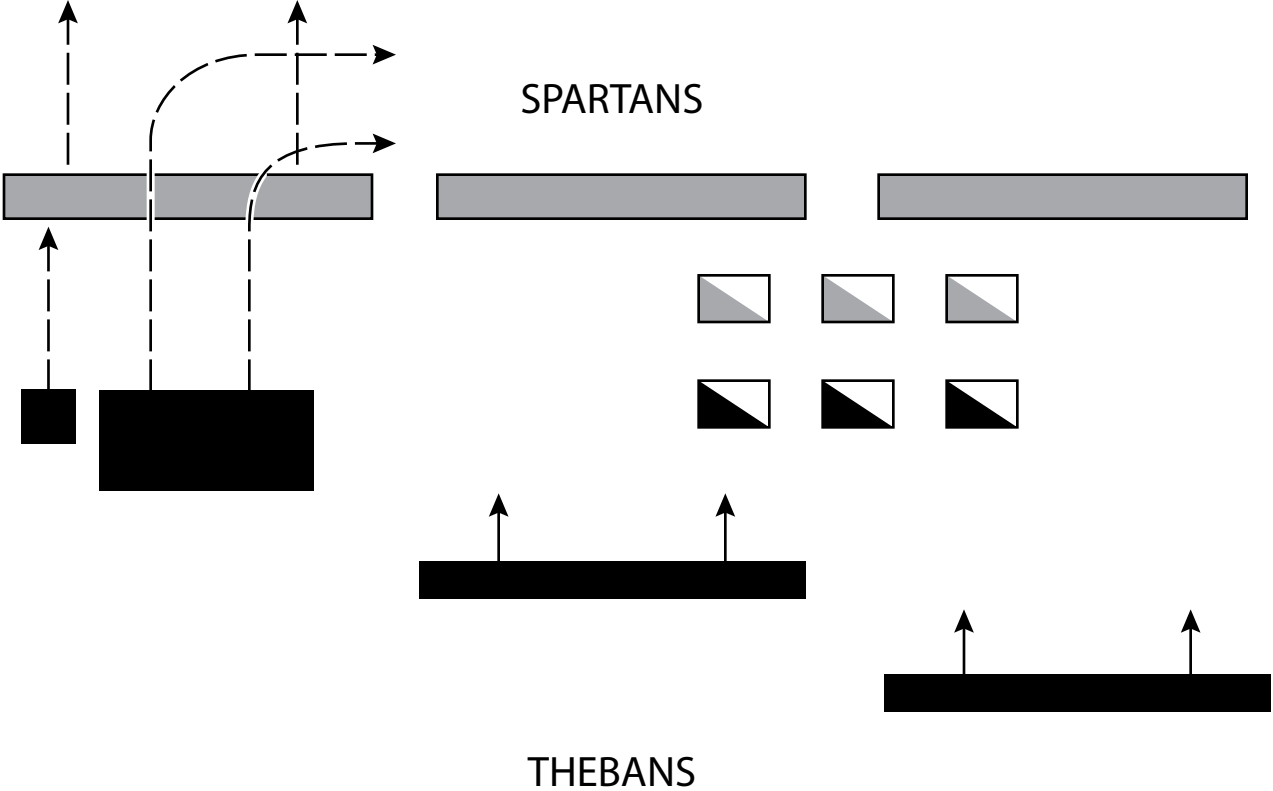
<u>Idea</u>

- Employ maneuver action by light troops with thrust action of heavy troops to confuse, break-up, and smash enemy formations.

Battle of Marathon
(490 BC)

BATTLE OF LEUCTRA

(371 BC)

SPARTANS

THEBANS
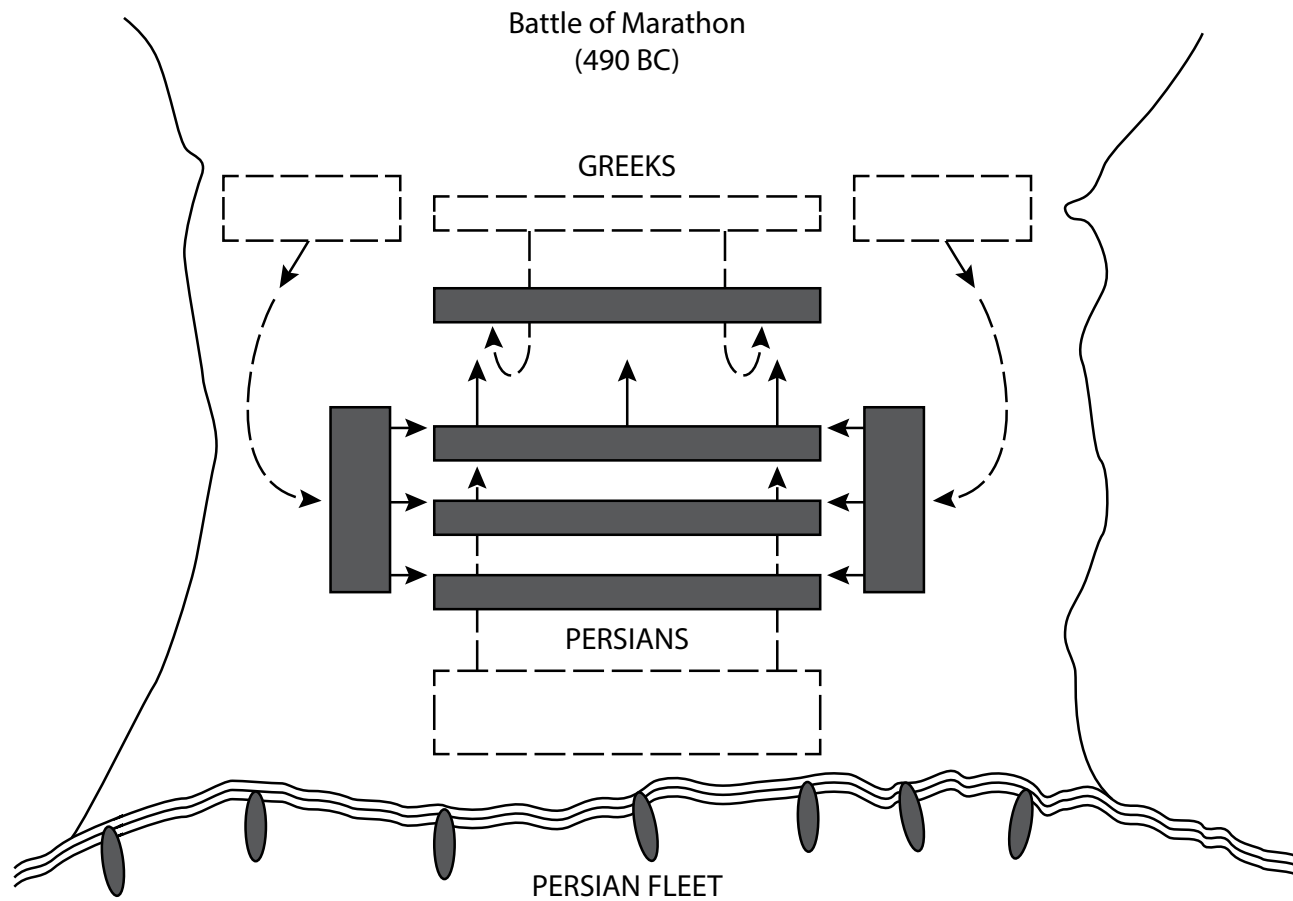
Y. E. SAVKIN—"THE BASIC PRINCIPLES OF OPERATIONAL ART AND TACTICS"—(1972)

PAGES 7 and 203

Battle of Leuctra (371 BC)

At this battle Frederick Engels (according to Savkin) credited Epaminondas for having first discovered and employed an unequal or uneven distribution of forces across a front as basis to concentrate forces for the main attack at the decisive point.

BATTLE OF GAUGAMELA

(331 BC)

MAZEUS

DARIUS

BESSUS

CHARIOTS

ALEXANDER

COMPANIONS

PARMENION

RESERVE LINE

Battle of Arbela
(331 BC)

PERSIAN FLEET

DARIUS

COMPANIONS

BESSUS

MAZAEUS

ALEXANDER

PARMENION

RESERVE
LINE

Battle of Cannae
(216 BC)

AUFIDUS RIVER

OPENING PHASE

BATTLE OF CANNAE

(216 BC)

AUFIDUS RIVER

FINAL PHASE
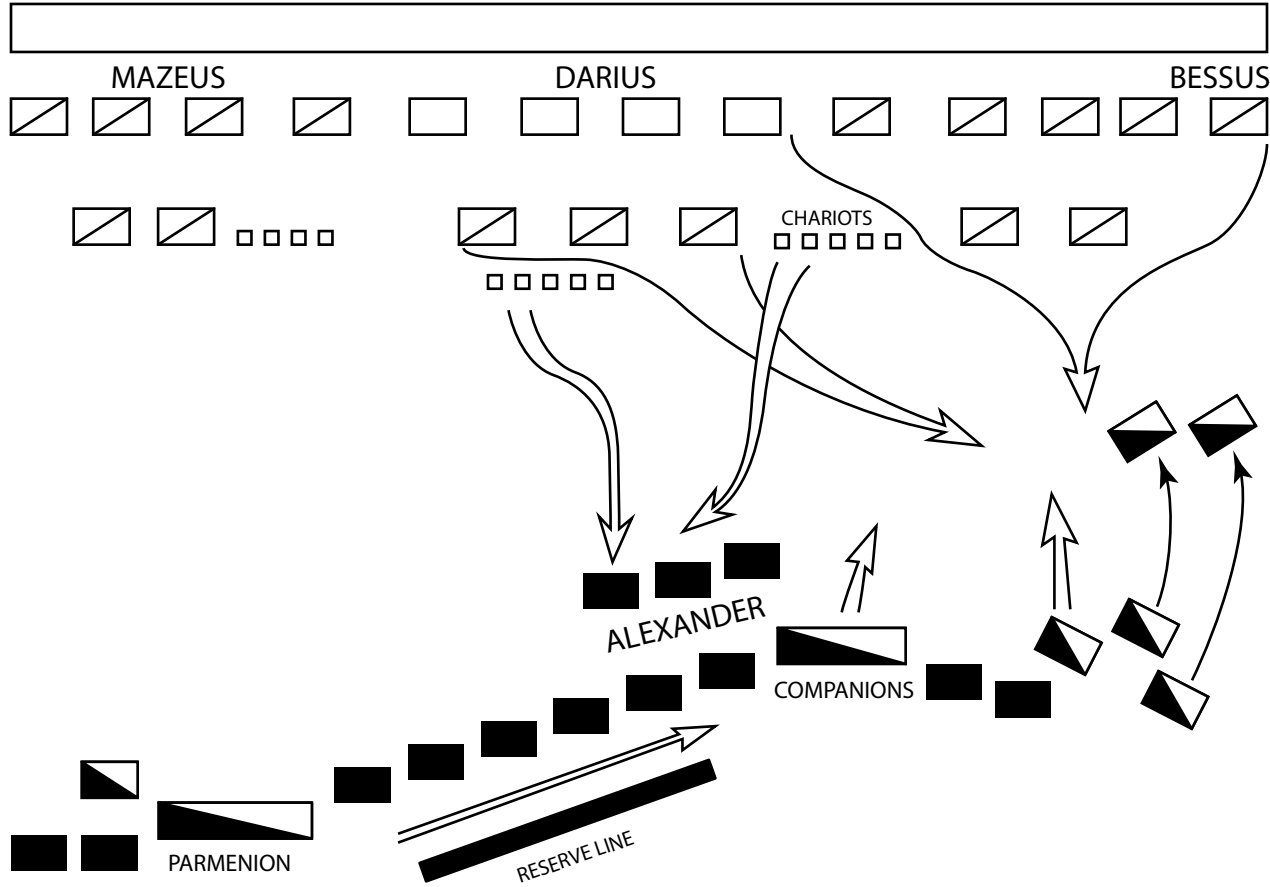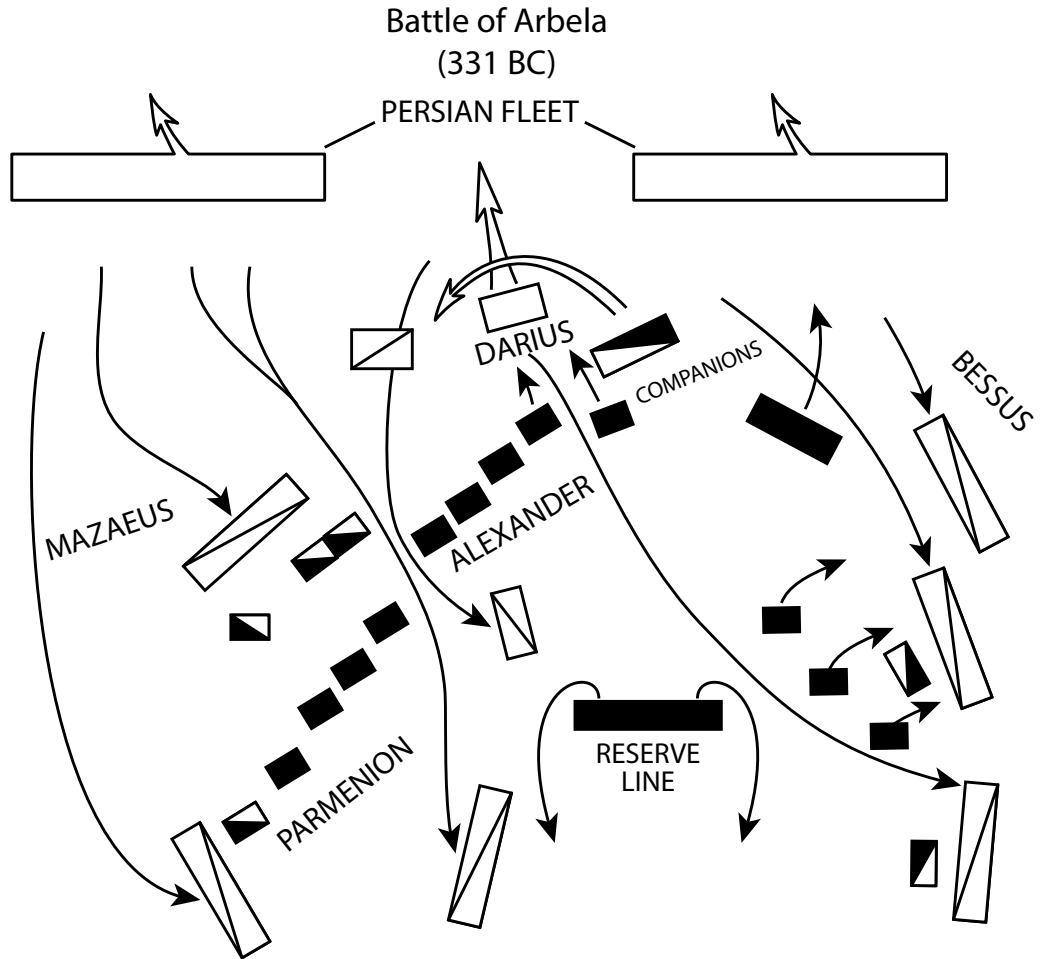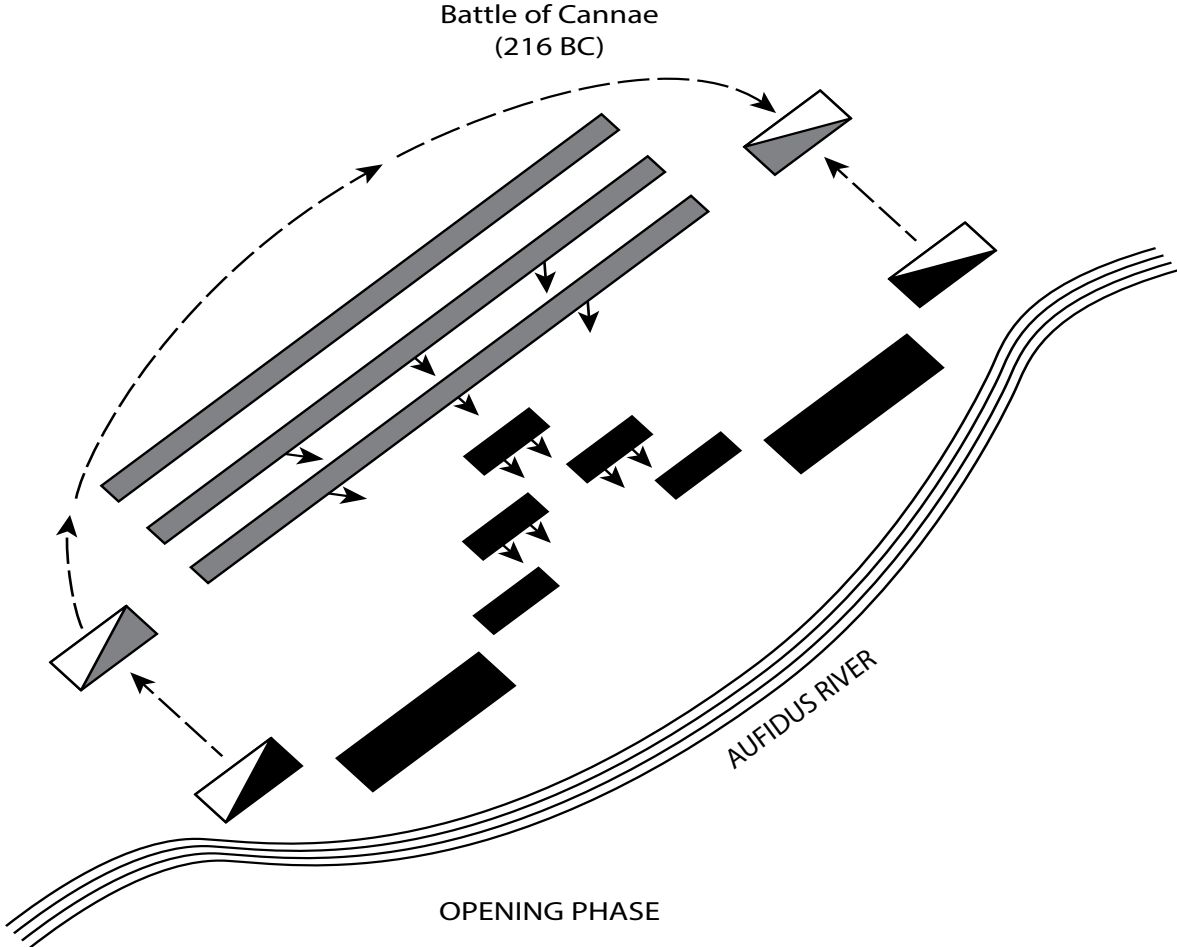
<u>IMPRESSION</u>

- Battles of Marathon, Leuctra, Arbela, and Cannae emphasize an unequal distribution as basis for local superiority and decisive leverage to collapse adversary resistance.

<p align="center">on the other hand</p>

- The discussion (so far) provides little insight on how these battle arrangements and follow-on maneuvers play upon moral factors such as doubt, fear, anxiety, etc.
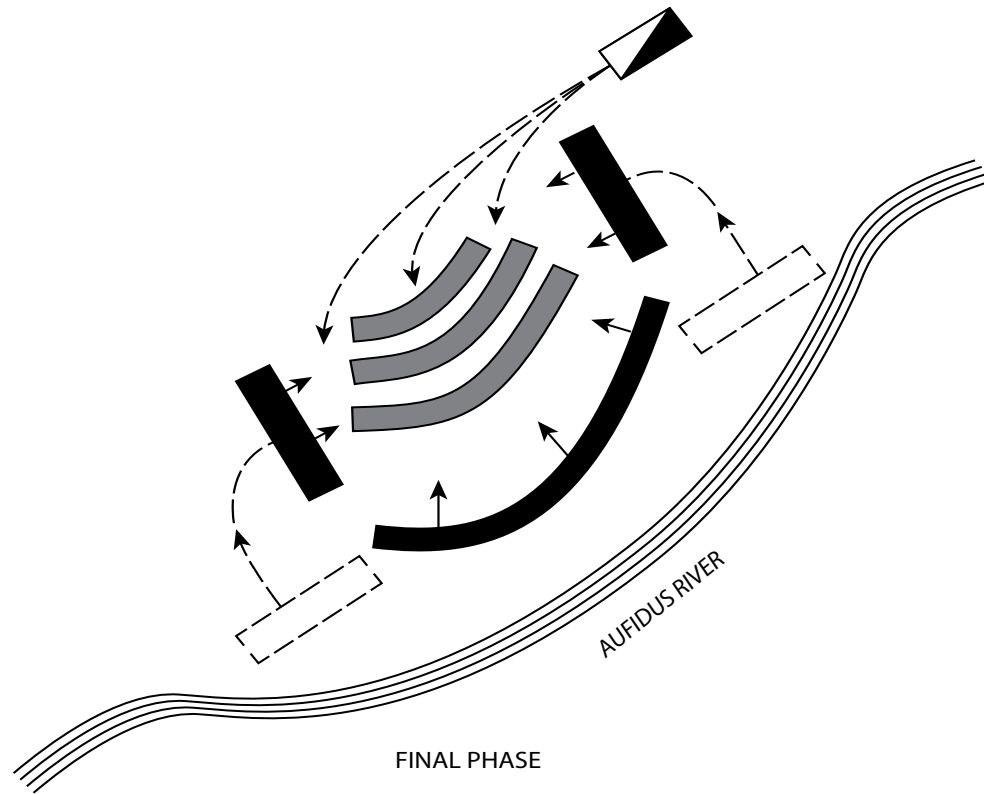
HISTORICAL PATTERN
CHINGIS KHAN AND THE MONGOLS

Key Asymmetries

- Superior Mobility
- Superior Communications
- Superior Intelligence
- Superior Leadership

Theme

- Widely separated strategic maneuvers, with appropriate stratagems, baited retreats, hard-hitting tactical thrusts, and swirling envelopments to uncover and exploit adversary vulnerabilities and weaknesses.

in conjunction with

- Clever and calculated use of propaganda and terror to play upon adversary's doubts, fears, and superstitions in order to undermine his resolve and destroy his will to resist.

Aim

Conquest, as basis to create, preserve, and expand Mongol nation.

Mongol Strategic Maneuver
(1219-1220)

CASPIAN SEA

GENGHIS KHAN

CHAGATAI

JOCHI

JEBE

ARAL SEA

OXUS RIVER

KIZYL KUM

BUKHARA

SAMARKAND

500 miles
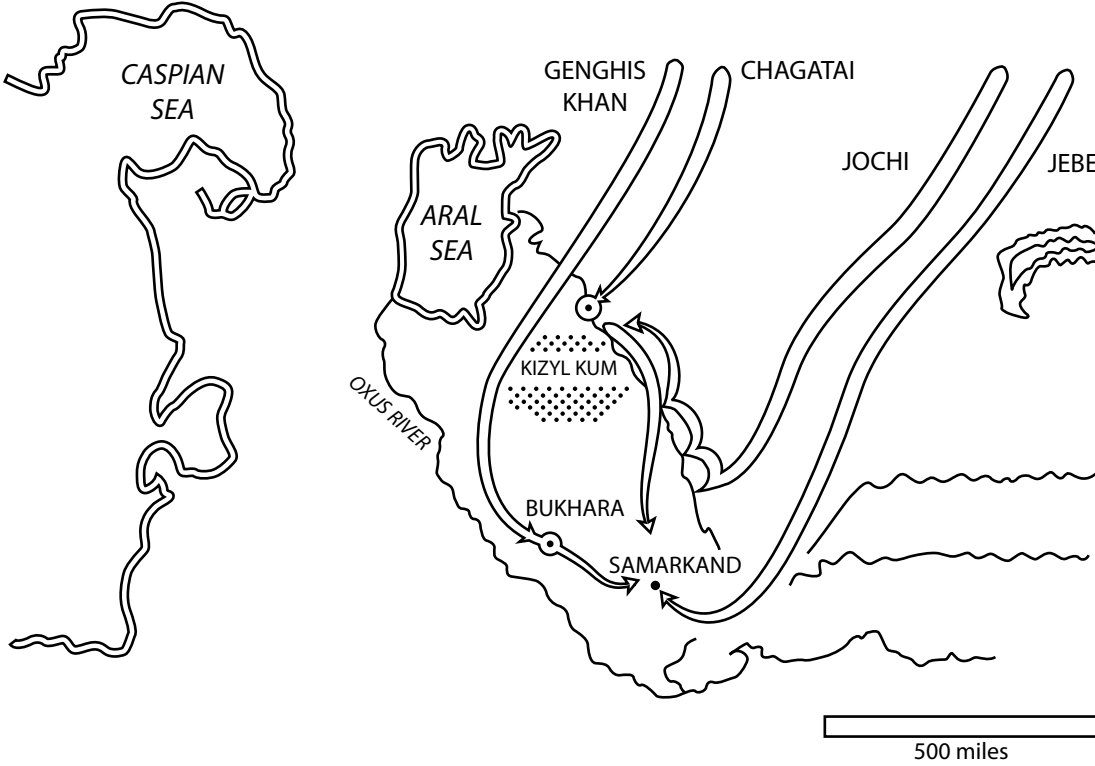
? – RAISES NAGGING QUESTION – ?

Even though outnumbered, why were Mongols able to maneuver in widely scattered arrays without being defeated separately or in detail?

HISTORICAL PATTERN
CHINGIS KHAN AND THE MONGOLS

Message

- By exploiting superior leadership, intelligence, communications, and mobility as well as by playing upon adversaries' fears and doubts via propaganda and terror, Mongols operated inside adversary observation–orientation–decision–action loops.

Result

- Outnumbered Mongols created impressions of terrifying strength—by seeming to come out of nowhere yet be everywhere.

hence,

- Subversive propaganda, clever stratagems, fast breaking maneuvers, and calculated terror not only created vulnerabilities and weaknesses but also played upon moral factors that drain-away resolve, produce panic, and bring about collapse.

Battle of Leuthen
December 5, 1757
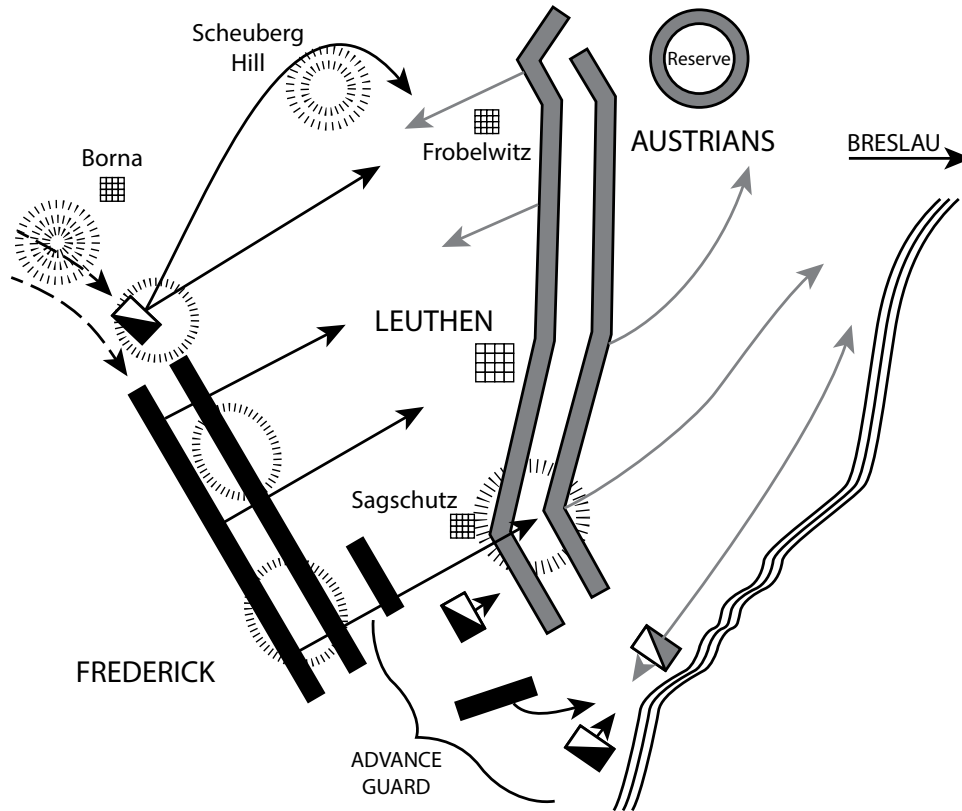
Scheuberg
Hill

Borna

Frobelwitz

Reserve

AUSTRIANS

BRESLAU

LEUTHEN

Sagschutz

FREDERICK

ADVANCE
GUARD

HISTORICAL PATTERN

<u>18th Century Theoreticians</u>

- Saxe
- Bourcet
- Guibert
- Du Teil

<u>Theme</u>

- Plan with several branches
- Mobility/fluidity of force
- Cohesion
- Dispersion and concentration
- Operate on a line to threaten alternative objectives
- Concentrate <u>direct</u> artillery fire on key points to be forced
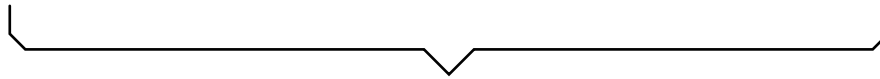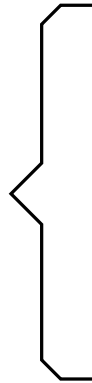
Action

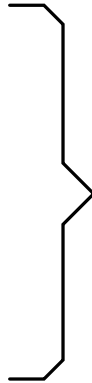- Napoleon was deeply influenced by the ideas of the above men. In early campaigns (as a general) he applied these ideas of <u>ambiguity</u>, <u>deception</u>, and <u>rapid/easy</u> movement to <u>surprise</u> and successively defeat fractions of superior forces. In later campaigns (as emperor) he relied increasingly on massed direct artillery fire, dense infantry columns, and heavy cavalry going <u>against regions of strong resistance</u>—at an eventually crippling cost in casualties.

- American colonists, Spanish and Russian Guerrillas, <u>in unexpected ways</u>, used <u>environmental background</u> (terrain, weather, darkness, etc.) and <u>mobility/fluidity</u> as basis for <u>dispersion</u> and <u>concentration</u> to harass, confuse, and contribute toward the defeat of the British and French under Napoleon.

HISTORICAL PATTERN

18th Century Theoreticians

- Saxe
- Bourcet
- Guibert
- Du Teil

Theme

- Plan with several branches
- Mobility/fluidity of force
- Cohesion
- Dispersion and concentration
- Operate on a line to threaten alternative objectives
- Concentrate <u>direct</u> artillery fire on key points to be forced

Action

- Napoleon was deeply influenced by the ideas of the above men. In early campaigns (as a general) he exploied these ideas of <u>variety</u> and <u>rapidity</u> with <u>harmony</u> for <u>ambiguity</u>, <u>deception</u>, and <u>rapid/easy</u> movement in order to surprise and succesiely defeat fractions of superior forces. In later campaigns (as emperor) he exchanged <u>variety</u> and <u>harmony</u> for <u>rigid uniformity</u> via massed directed artillery fire, dense infantry columns, and heavy cavalry going against regions of strong resistance—that resulted in an evern higher and cripping cost in casualties.

- American colonists, Spanish and Russian guerrillas exploited variety and <u>rapidity</u> associated with environmental background (terrain, weather, darkness, etc.) and mobility/fluidity of small bands with harmony of common cause against tyranny/injustice as basis to harass, confuse, and contribute toward the defeat of the British and French under Napoleon.

IMPRESSION

The ideas of Sun Tzu, Saxe, Bourcet, and Guibert seem to be at home with either

<u>Regular</u> or <u>Guerrilla</u> warfare.

HISTORICAL PATTERN
NAPOLEON'S ART OF WAR

Revolutionary Army Gifts to Napoleon

- Moral and physical energy of citizen–soldiers and new leaders generated by the revolution and magnified by successes against invading allied armies

- Subdivision of army into smaller self-contained but mutually supporting units (divisions)

- Ability to travel light and live-off countryside without extensive baggage, many supply wagons, and slow-moving resupply efforts

- Rapid march associated with "120" instead of the standard "70" steps per minute

- Discontinued adherence to 1791 Drill Regulations pertaining to the well-regulated and stereotype use of column and line formations for movement and fighting

Beneficial Asymmetry

- Mobility/fluidity of force dramatically better than that possessed by potential adversaries.

? – Raises Question – ?

How did Napoleon exploit this superior mobility/fluidity of force?

HISTORICAL PATTERN
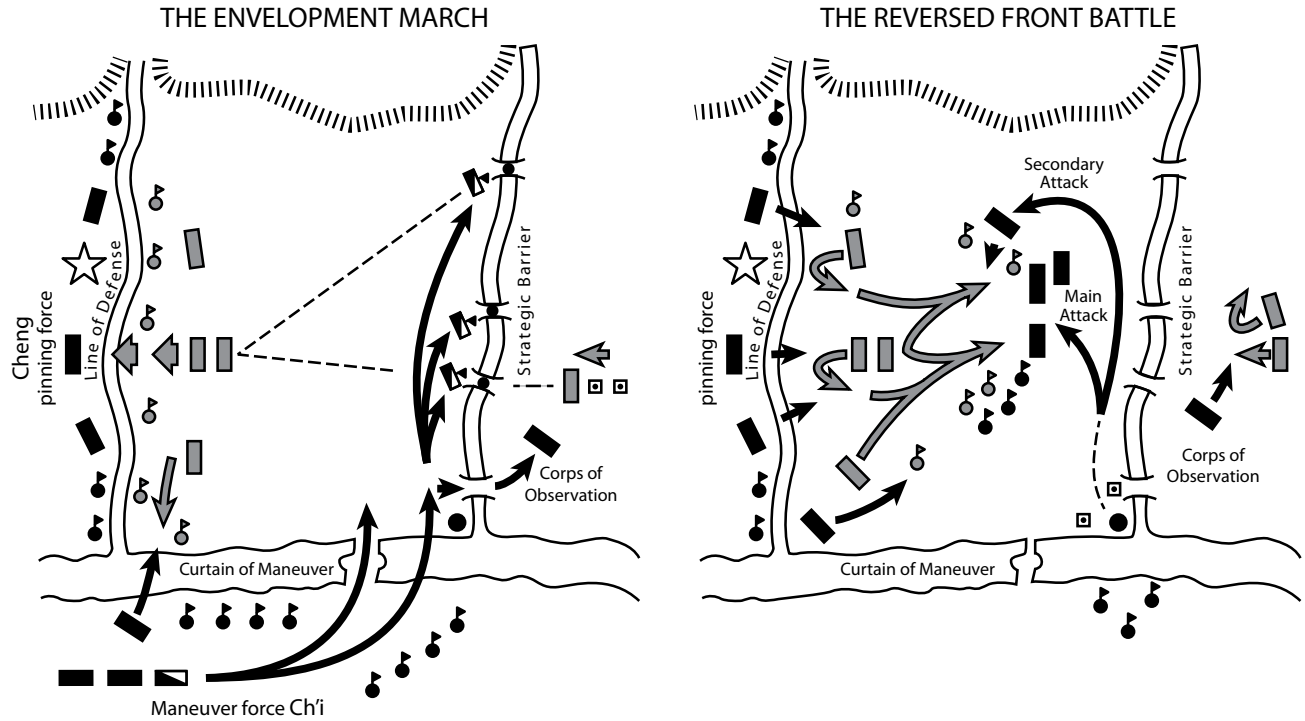# NAPOLEON'S ART OF WAR

General Features

- Plan and Resolution

  Evolve plan with appropriate variations each of which correspond to probable or possible actions. Employ Intelligence/recce units (spies, agents, cavalry, etc.) in predetermined directions to eliminate or confirm hypotheses concerning enemy actions thereby reduce uncertainty and simplify own plans as well as uncover adversary plans and intentions.

- Security

  Generate misinformation, devise stratagems, and alter composition of major formations to confuse and baffle enemy agents, spies, etc. Employ screens of cavalry, infantry, or both and make rise of natural features such as terrain, weather, and darkness to mask dispositions and cloak movements against enemy observation.

- Strategic Dispersion and Tactical Concentration

  Expand then contract intervals between force components in an irregular and rapid fashion to cloud/distort strategic penetration maneuvers yet quickly focus tactical effort for a convergent blow at the decisive joint.

- Vigorous Offensive Action

  Seize initiative at the outset by attacking enemy with an ever-shifting kaleidoscope of (strategic) moves and diversions in order to upset his actions and unsettle his plans thereby psychologically unbalance him and keep initiative throughout.

Strategic Theme

- Use unified (or single) line of operations as basis for mutual support between separated adjacent and follow-on units.

- Menace (and try to seize) adversary communications to isolate his forces from outside support or reinforcement and force him to fight under unfavorable circumstances by the following actions:

  — Employ fraction of force to hold or divert adversary attention—by feints, demonstrations, pinning maneuvers, etc.

  — Exploit "exterior maneuvers" against exposed flanks or "interior maneuvers" thru a weak front to place (bulk of) forces in adversary's flank and rear.

- Set-up supporting "centers (bases) of operation" and alternative lines of communication and keep (at least some) safe and open as basis to maintain freedom of maneuver.

Aim
Destroy enemy army

Strategy of Envelope
(Idealized Schematic)

THE ENVELOPMENT MARCH

THE REVERSED FRONT BATTLE

Cheng
pinning force

Line of Defense

Strategic Barrier

Corps of
Observation

Curtain of Maneuver

Maneuver force Ch'i

pinning force

Line of Defense

Secondary
Attack

Main
Attack

Strategic Barrier

Corps of
Observation

Curtain of Maneuver
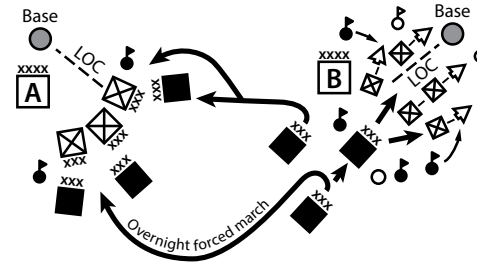
The Strategy of Central Position
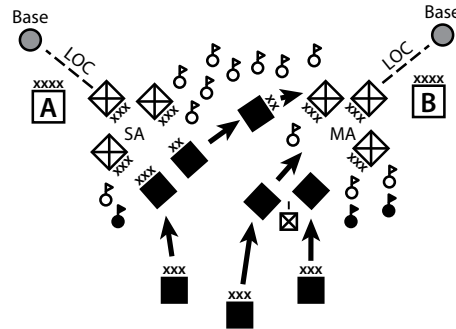## (Idealized Schematic)

Advance to Contact
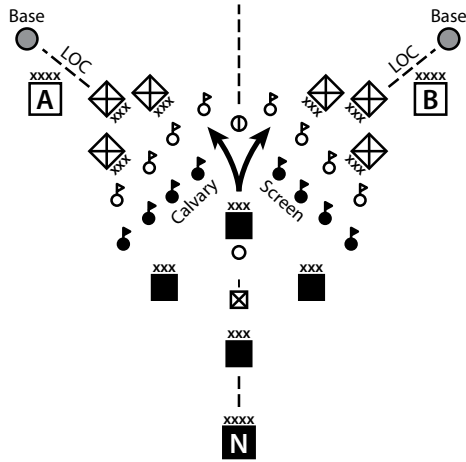
The Coup de Grace

The Double Battle

HISTORICAL PATTERN
NAPOLEON'S ART OF WAR

Early Tactics

"The action was opened by a cloud of sharpshooters, some mounted, some on foot, who were sent forward to carry out a general rather than a minutely-regulated mission; they proceeded to harass the enemy, escaping from his superior numbers by their mobility, from the effect of his cannon by their dispersal. They were constantly relieved to ensure that the fire did not slacken, and they also received considerable reinforcement to increase their overall effect . . . Once the chink in foe's armour had been revealed . . . the horse artillery would gallop up and open fire with canister at close range. The attacking force would meantime be moving up in the indicated direction, the infantry advancing in column, the cavalry in regiments or squadrons, ready to make its presence felt anywhere or everywhere as required. Then, when the hail of enemy bullets or cannon balls began to slacken . . . The soldiers would begin to run forward, those in the front ranks crossing their bayonets, as the drums beat the charge; the sky would ring a thousand battle-cries constantly repeated: 'En avant. En avant. Vive la Republique.'"

Later Tactics

"At the outset, a heavy bombardment would be loosed against the enemy formations, causing fearful losses if they failed to seek shelter, and generally lowering their power of resistance. Under cover of this fire, swarms of voltigeurs would advance to within musketry range and add a disconcerting 'nuisance' element by sniping at officers and the like. This preliminary phase would be followed by a series of heavy cavalry and infantry attacks. The secret of these was careful timing and coordination. The first cavalry charges were designed to defeat the hostile cavalry and compel the enemy infantry to form squares," thereby reduce fire in any one direction and enable the columns to get to close grips before the enemy could resume his linear formation. The infantry (deployed or not) and accompanying horse artillery would then blaze a gap in the enemy formation and finally the cavalry would sweep forward, again, to exploit the breakthrough.

Essential Point

Early tactics, without apparent design, operate in a fluid, adaptable manner to uncover, expand and exploit adversary vulnerabilities and weaknesses while later tactics emphasize massed firepower and stereotyped formations working formally together to smash adversary strength.

HISTORICAL PATTERN
NAPOLEON'S ART OF WAR

Critique

- Napoleon exploited ambiguity, deception, and mobility at the strategic level,

whereas,

- He increasingly emphasized formal battering ram methods and de-emphasized loose, irregular methods (e.g. skirmishers) at the tactics level—via a return to, and increasingly heavy-handed application of, the 1791 Drill Regulations.

Why?

- Napoleon emphasized the conduct of war from the top down. He created and exploited strategic success to procure grand tactical and tactical success.

- To support his concept, he set up a highly centralized command and control system which, when coupled with essentially unvarying tactical recipes, resulted in strength smashing into strength by increasingly unimaginative, formalized, and predictable actions at lower and lower levels.

Result

- Strategic maneuvers ambiguous and deceiving prior to tactical concentration; after concentration, "maneuvers" stereotyped and obvious.

hence

- Tactical "maneuvers" could not easily procure the victory because of their obvious, predictable nature.

<u>WHICH UNVEILS</u>

<u>The Napoleonic Spirit</u>

Strategic "fog" followed by stereotyped and ruinous tactical assaults.

HISTORICAL PATTERN
CARL VON CLAUSEWITZ—"ON WAR"—1832

Historical Pattern

Character/Nature of War

- An act of policy to use violence to impose one's will upon another.

- Duel or act of human interaction directed against an animate object that reacts.

- Uncertainty of information acts as an impediment to vigorous activity.

- Psychological/moral forces and effects (danger, intelligence, emotional factors, . . .) either impede or stimulate activity.

- Friction (interaction of many factors, including those above) impedes activity.

- Genius (harmonious balance of mind/temperament that permits one to overcome friction and excel at the complex activity of war) changes the nature and magnifies the scope of operations.

Strategy

- Exhaust enemy by influencing him to increase his expenditure of effort.

- Seek out those centers of gravity upon which all power/movement depend and, if possible, trace them back to a single one.

- Compress all effort, against those centers, into the fewest possible actions.

- Subordinate all minor, or secondary, actions as much as possible.

- Move with the utmost speed.

- Seek the major battle (with superiority of number and conditions that will promise a decisive victory).

Aim

"Render enemy powerless"—with emphasis on "the destruction of his armed forces."

HISTORICAL PATTERN
CARL VON CLAUSEWITZ—"ON WAR"—1832

Why?

- Clausewitz was concerned with trying to overcome, or reduce, friction/uncertainty. He failed to address the idea of magnifying adversary's friction/uncertainty.

- Clausewitz was concerned with trying to exhaust adversary by influencing him to increase his expenditure of effort. He failed to address, or develop, the idea of trying to paralyze adversary by denying him the opportunity of expend effort.

- Clausewitz incorrectly stated: "A center of gravity is always found where the mass is concentrated most densely"—then argued that this is the place where the blows must be aimed and where the decision should be reached. He failed to develop idea of generating many non-cooperative centers of gravity by striking at those vulnerable, yet critical, tendons, connections, and activities that permit a larger system to exist.

Critique

- Clausewitz overemphasized decisive battle and underemphasized strategic maneuver.

- Clausewitz emphasized method and routine at the tactical level.

? – Raises question – ?

What does all this mean?

HISTORICAL PATTERN
CARL VON CLAUSEWITZ—"ON WAR"—1832

Message

Clausewitz did not see that many non-cooperative, or conflicting, centers of gravity paralyze adversary by denying him the opportunity to operate in a directed fashion, hence they impede vigorous activity and magnify friction.

Likely Result

Operations end in a "bloodbath"—via the well-regulated stereotyped tactics and unimaginative battles of attrition suggested by Clausewitz.

HISTORICAL PATTERN
Jomini — 1861

Secret of Success

". . . the narratives of Frederick the Great: commenced to initiate me in the secret which had caused him to gain the miraculous victory of Leuthen. I perceived that this secret consisted in the very simple maneuver of carrying the bulk of his forces upon a single wing of the hostile army. . . . I found again, afterwards, the same cause in the first successes of Napoleon in Italy, which gave me the idea that by applying, through strategy, to the whole chess-table of a war this same principle which Frederick had applied to battles, we should have the key to all the science of war."

HISTORICAL PATTERN
JOMINI — THE ART OF WAR — 1836Aim

Key Idea and Supporting Mechanism

- Generalize oblique order associated with Battles at Leuctra and Leuthen.

- Divide theater and its subordinate components (zones, fronts, positions, etc.) into three-subdivisions—a center and two wings—as basis to apply the Leuctra/Leuthen concept in strategic and grand tactical maneuvers.

- Set-up base(s) of operations and (alternative) lines of communication for freedom to shape and shift flow/direction of operations as basis to apply Leuctra/Leuthen strategic and grand tactical maneuvers.

Strategy/Grand Tactics

- By free and rapid movements carry bulk of the forces (successively) against fractions of the enemy.

- Strike in the most decisive direction—that is to say against the center or one wing or the center and one wing simultaneously.

- If possible, seize adversary's communications (without losing one's own) and force him to fight on a reverse front, by using bulk of forces to hit his flank and take him in the rear—while using detachments, as needed, to block the arrival of reinforcements as well as draw his attention elsewhere.

- If the enemy's forces are too much extended, pierce his center to divide and crush his fractions separately.

- To outflank and turn (envelop) a wing, hit enemy in the flank and also contain him at the front.

- An attack may be made simultaneously upon both extremities but not when the attacking force is equal or inferior (numerically) to the enemy.

Aim
To make evident a "secret" for success in war.

<u>HISTORICAL PATTERN</u>
<u>JOMINI — "THE ART OF WAR" — 1836</u>

<u>Critique</u>

- Preoccupation with form of operations, spatial arrangement of bases, formal orders of battle, and tactical formations.
- Lack of appreciation for the use of loose, irregular swarms of guerrillas and skirmishers to mask own dispositions, activities, and intentions as well as confuse and disorder enemy operations.

<u>Likely Result</u>

- Operations become stereotyped—<u>unless</u> one can appreciate Jomini's ideas outside their formal underpinnings.

HISTORICAL PATTERN
NAPOLEON — CLAUSEWITZ — JOMINI

Key Point

Napoleon, Clausewitz, and Jomini <u>did not</u> appreciate importance of loose, irregular <u>tactical</u> arrangements and activities to mask or distort own presence and intentions as well as confuse and disorder adversary operations.

<u>? — Why — ?</u>

Major Flaw

Napoleon, Clausewitz, and Jomini viewed the Conduct of War and related operations in essentially one direction—from the top down—emphasizing adaptability at the top and regularity at the bottom.

EMIL SCHALK — "SUMMARY OF THE ART OF WAR" — 1862

"There are three great maxims common to the whole science of war; they are:

1st — Concentrate your force, and act with the whole of it on one part only of the enemy's force.

2nd — Act against the weakest part of your enemy—his center, if he is dispersed; his flank or rear, if concentrated. Act against his communications without endangering your own.

3rd — Whatever you do, as soon as you have made your plan, and taken the decision to act upon it, act with the utmost speed, so that you may obtain your object before the enemy suspects what you are about."

CAUTION

While these maxims by Schalk portray, in a general way, physical maneuvers that can be used to realize one's purpose in war at the strategic level, they do not address the non-adaptability and predictability (via the drill regulation mind-set) that permeated 19th century "maneuvers" at the tactical level.

IMPACT OF 19TH CENTURY TECHNOLOGY ON WAR

Key Ingredients

- Railroad/telegraph
- Quick fire artillery
- Machine gun
- Repeating rifle
- Barbed wire
- Trenches

Early Trends

- Emphasis toward massed firepower and large armies supported by rail logistics
- Increased emphasis on a holding defense and flanking or wide turning maneuvers into adversary rear to gain a decision
- Continued use of frontal assaults by large stereo-typed infantry formations (e.g. regiments, battalions), supported by artillery barrages, against regions of strong resistance

Result

Huge armies, and massed firepower and other vast needs supported through a narrow fixed logistics network, together with tactical assaults by large stereotyped formations, suppressed ambiguity, deception, and mobility hence surprise of any operation.

TECHNOLOGY AND THE ART OF WAR

- The legacy of Napoleon, Clausewitz, and Jomini's tactical regularity and the continued use of large stereotyped formations for tactical assault, together with the mobilization of large armies and massing of enormous supplies through a narrow logistics network, "telegraphed" any punch hence minimized the possibility of exploiting <u>ambiguity</u>, <u>deception</u>, and <u>mobility</u> to generate <u>surprise</u> for a decisive edge.

- In this sense, technology was being used as a crude club that generated frightful and debilitating casualties on all sides during the:

— American Civil War	(1861–65)
— Austro–Prussian War	(1866)
— Franco–Prussian War	(1870)
— Boer War	(1899–1902)
— Russo–Japanese War	(1904–05)
— World War I	(1914–18)

POINT

- Evolution of tactics did not keep pace with increased weapons lethality developed and produced by 19th century technology.

? — RAISES QUESTION — ?

- Why were the 19th century and early 20th century commanders unable to evolve better tactics to avoid over a half century of debilitating casualties?

IMPACT OF 19TH CENTURY CAPITALISM ON INSURRECTION/REVOLUTION
(with a Marxian flavor)

Comment

- A look back reveals that we have been speaking of conflict <u>between</u> social systems, rather than <u>within</u> social systems. With the explosive expansion of capitalism in the 19th century we begin to see the rise of much turmoil and attendant conflict due to opposing tendencies contained within capitalism itself.

Trend

- Without going into explicit detail we find (according to many investigators, including Karl Marx): that the interaction of competition, technology, specialization (division of labor), concentration of production in large scale enterprises, and the taking and plowing back of profits into this interaction produce opposing tendencies and periodic <u>crises</u> that leave in their wake more and more workers competing for jobs in fewer and fewer, but larger, firms that increasingly emphasize (percentage-wise) the use of more machines and less labor.

Result

- Low paid wage earners exhibit discontent and hatred for a system that permits others to live in comfort or luxury while they must live a life of toil, subject to strict and frequently harsh factory discipline.

- Witnessing these unfolding circumstances disillusioned intellectuals, bankrupt owners, and others take the side of the workers, as an <u>enlightened vanguard</u>, to mold them into a powerful opposition.

Raises Question

- How should such an unpleasant situation be corrected?

IMPACT OF 19TH CENTURY CAPITALISM ON INSURRECTION/REVOLUTION
(with a Marxian flavor)

Message

- According to Marx/Engels and their followers, the <u>only</u> way out is via revolution and dictatorship of the proletariat (workers) to smash the capitalistic system and replace it with one that does not exploit and oppress masses for the benefit of a ruling elite or class.

Necessary Conditions for Success

- <u>Crisis</u> generated by discontent/misery of masses and vacillation by authorities who indicate unwillingness or inability to come to grips with existing instability.

- <u>Vanguard</u>, or disciplined hard core, that offers leadership, provides a way out, and has support of masses.

Why

- <u>Crises</u> represent height of confusion/disorder due to many opposing tendencies (centers of gravity) that magnify friction, hence paralyze efforts by authorities to dominate such surges of turmoil. In this sense, crises are periods of vulnerability/weakness that beg to be exploited.

- <u>Vanguards</u> represent disciplined moral/mental/physical bodies focused to shape and guide masses as well as participate in action to exploit and expand confusion/disorder of crises that shake adversary's will to respond in a directed way.

Key Insight

- <u>Crises</u> and <u>Vanguards</u> are the golden keys that permit us to penetrate to the core of insurrection/revolution and, as we shall see later, modern guerrilla warfare.

CAPITALISM, TECHNOLOGY AND THE CONDUCT OF WAR

- The creation of crises and vanguards, via 19th century capitalism, make evident the foundations upon which to conduct insurrection/revolution in order to destroy a society from <u>within</u>.

On the other hand

- It is not yet clear how these notions change or fit into the way we exploit technology and conduct war against societies from <u>within</u> as well as from <u>without</u>. To gain such an appreciation we must look at the period containing World War I, World War II, and their aftermath.
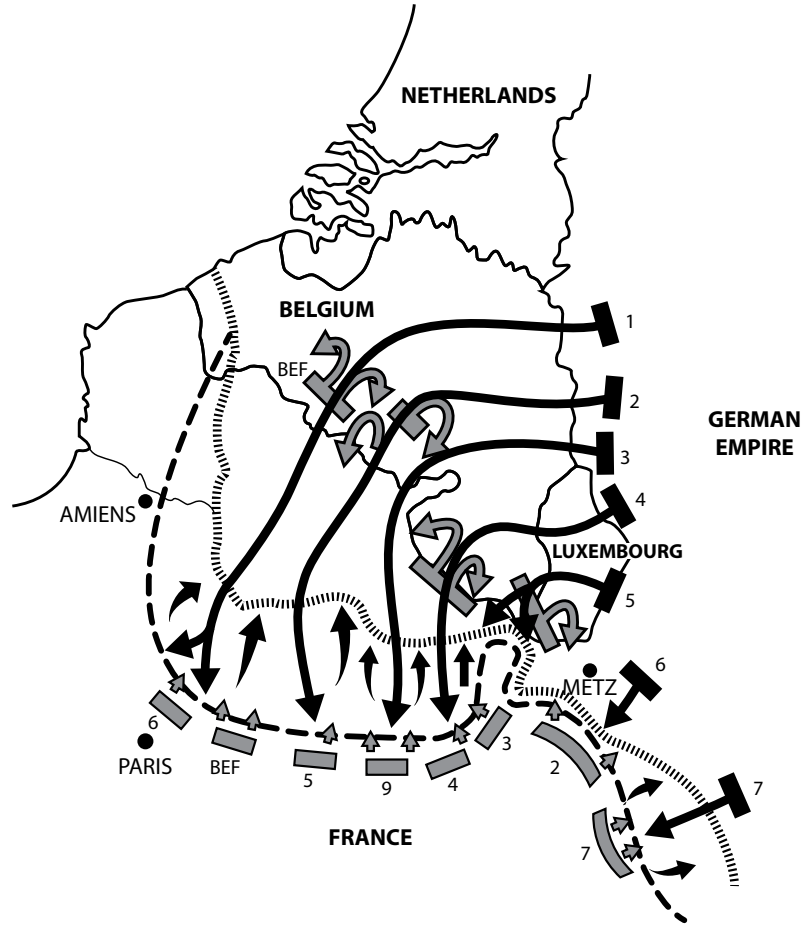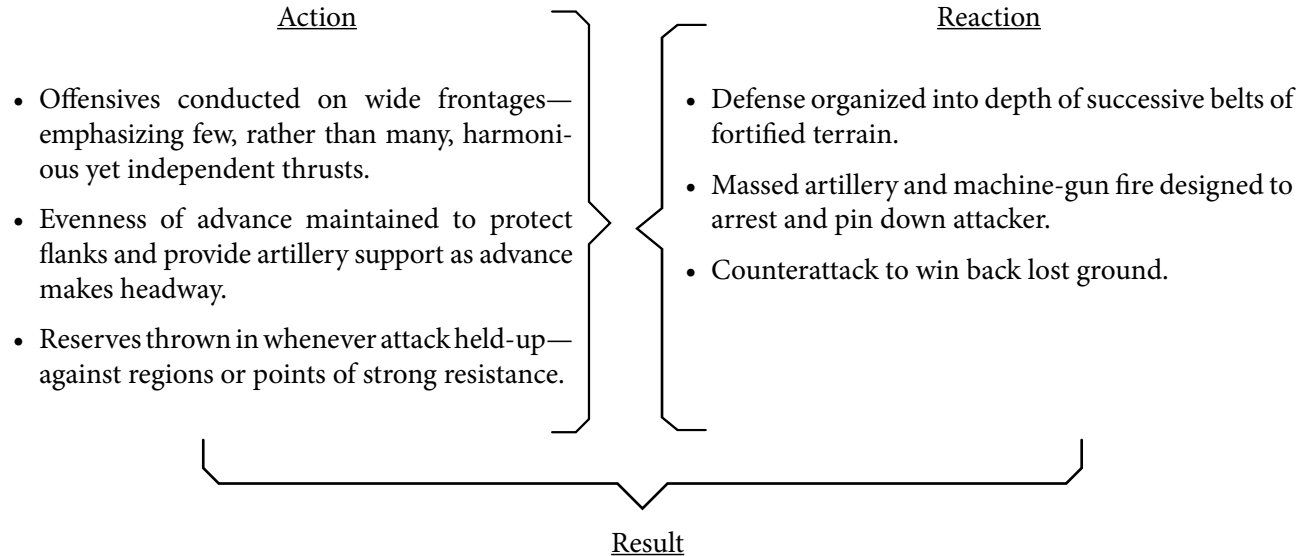
World War I

WORLD WAR I

- Plans and Execution
- Stagnation
- Finale

Schlieffen Strategic Maneuver
(1914)

NETHERLANDS

BELGIUM

BEF

GERMAN
EMPIRE

AMIENS

LUXEMBOURG

METZ

PARIS

BEF

FRANCE

WORLD WAR I

<u>Action</u>

- Offensives conducted on wide frontages—emphasizing few, rather than many, harmonious yet independent thrusts.
- Evenness of advance maintained to protect flanks and provide artillery support as advance makes headway.
- Reserves thrown in whenever attack held-up—against regions or points of strong resistance.

<u>Reaction</u>

- Defense organized into depth of successive belts of fortified terrain.
- Massed artillery and machine-gun fire designed to arrest and pin down attacker.
- Counterattack to win back lost ground.

<u>Result</u>

<u>Stagnation</u> and <u>enormous attrition</u> since advances made <u>generally as expected along paths of hardened resistance</u> because of dependence upon railroads and choice of tactics of trying to reduce strong points by massed firepower and infantry.

WORLD WAR I
A Way Out

Idea	Authors
• Infiltration Tactics	• Capt. Andre Laffargue
	• Gen. von Hutier
• Guerrilla Tactics	• Gen. Ludendorff
	• T.E. Lawrence
	• Paul von Lettow–Vorbeck

WORLD WAR I
INFILTRATION TACTICS

Action

- Brief but intense artillery bombardment that includes gas and smoke shell to disrupt/suppress defenses and obscure the assault.

- *Stosstruppen* (small teams or squads of thrust troops equipped with light machine-guns, flame-throwers, etc.) thrust forward close behind rolling artillery barrage, without any "effort to maintain a uniform rate of advance or align formations". Instead, as many tiny, irregular swarms spaced in breadth and echeloned in depth, they seep or flow into any gaps or weaknesses they can find in order to drive deep into adversary rear.

- *Kampfgruppen* (small battle groups consisting of infantry, machine-gunners, mortar teams, artillery observers and field engineers) follow-up to cave-in exposed flanks and mop-up isolated centers of resistance from flank and rear.

- Reserves and stronger follow-on echelons move through newly created breaches to maintain momentum and exploit success, as well as attack flanks and rear to widen penetration and consolidate gains against counter-attack.

Idea

- Hurl strength (echeloned in great depth), via an eruption of many thrusts, thru weaknesses along (many) paths of least resistance to gain the opportunity for breakthrough and envelopment.

WORLD WAR I
INFILTRATION TACTICS

Note

- Such classic descriptions, often repeated, create in listeners or readers minds vivid images of the infiltration technique.

Critique

- Unfortunately this depiction does not address how and why infiltration fire and movement schemes work.

WORLD WAR I
INFILTRATION TACTICS

Key Points

- Fire at all levels by artillery, mortars, and machine-guns is exploited to hold adversary attention and pin him down hence—

- Fire together with gas and smoke (as well as fog and mist) represent an immediate and ominous threat to capture adversary attention, force heads down and dramatically obscure view, thereby cloak infiltrators movements.

- Dispersed and irregular character of moving swarms (as opposed to well defined line abreast formations) permit infiltrators to blend against irregular and changing terrain features as they push forward.

- Taken together, the captured attention, the obscured view, and the indistinct character of moving dispersed/irregular swarms deny adversary the opportunity to picture what is taking place.

Result

- Infiltration teams appear to suddenly loom-up out of nowhere to blow thru, around, and behind disoriented defenders.

WORLD WAR I
INFILTRATION TACTICS

Essence

- Cloud/distort signature and improve mobility to avoid fire yet focus effort to penetrate, shatter, envelop, and mop-up disconnected or isolated debris of adversary system.

Intent

- Exploit tactical dispersion in a focused way to gain tactical success and expand it into a grand tactical success.

Implication

- Small units exploiting tactical dispersion in a focused way—rather than large formations abiding by the "Principle of Concentration"—penetrate adversary to generate many non-cooperative (or isolated) centers of gravity as basis to magnify friction, paralyze effort, and bring about adversary collapse.

? — NATURAL QUESTION — ?

Are infiltration tactics a rejection of the Napoleonic methods—
or are they application of these methods under a different guise?

RESPONSE

Infiltration fire and movement schemes can be viewed as Napoleon's multi-thrust strategic penetration maneuvers being transformed into multi-thrust tactical penetration maneuvers down to the lowest operational/organizational level—the squad.

POINT

Until the rise of the <u>infiltration</u> tactics (and the use of tanks by the allies) in the latter part of WWI, neither the 19th century nor the 20th century commanders were able to evolve effective tactical <u>penetration</u> maneuvers that could offset the massive increase in weapons lethality developed during this same period.

WHY

The aristocratic tradition, the top-down command and control system, the slavish addiction to the "Principle of Concentration," and the drill regulation mind-set, all taken together, reveal an "obsession for control" by high-level superiors over low-level subordinates that restrict any imagination, initiative, and adaptability needed by a system to evolve the indistinct-irregular-mobile tactics that could counter the increase in weapons lethality.

WORLD WAR I
INFILTRATION TACTICS

Result

- Immediate success at platoon/company/battalion level coupled with ultimate failure at corps/army level.

Why

- Ludendorff violated his own concept by his tendency to use strategic reserves to reinforce against <u>hardened resistance</u>—hence, at the strategic level; he seduced himself into <u>supporting failure not success</u>.

- Exhaustion of combat teams leading the assault.

- Logistics too inflexible to support rapid/fluid penetration and deeper exploitation of breakthrough.

- Communications too immobile to allow command to quickly identify and reinforce successful advances.

- Elastic zone defense, when used, (as developed by the Germans and practiced by <u>Pétain</u>) that emphasizes artillery and flank attacks against penetrations when they stretch beyond their own artillery support.

WORLD WAR I
GUERRILLA WARFARE
(á la T. E. Lawrence)

Action

- Gain support of population. Must "arrange the minds" of friend, foe and neutral alike. Must "get inside their minds".

- Must "be an idea or thing invulnerable, without front or back, drifting about like a gas" (inconspicuousness and fluidity-of action). Must be an "attack-in-depth".

- Tactics "should be tip-and-run, not pushes but strokes" with "use of the smallest force in the quickest time at the farthest place".

- Should be a war of detachment (avoiding contact and presenting a threat everywhere) using mobility/fluidity-of-action and environmental background (vast unknown desert) as basis for "never affording a target" and "never on the defensive except by accident and in error".

Idea
Disintegrate existing regime's ability to govern.

<u>IMPRESSION</u>

- Infiltration tactics á la Ludendorff seem to be similar in nature to irregular or guerrilla tactics á la Lawrence.

- Why? Both stress clouded/distorted signatures, mobility and cohesion of small units as basis to insert an amorphous yet focused effort into or thru adversary weaknesses.

MAJOR ADVANCES
BETWEEN WORLD WAR I AND II

Major Advances

<u>Soviet Revolutionary Strategy</u>

- Lenin, and after him Stalin, exploited the idea of <u>crises</u> and <u>vanguards</u>—that arise out of Marxian contradictions within capitalism—to lay-out Soviet revolutionary strategy.

- Result:

  — A scheme that emphasizes moral/psychological factors as basis to destroy a regime from within.

<u>Lightning War (Blitzkrieg)</u>

- Infiltration tactics of 1918 were mated with:

  — Tank
  — Motorized Artillery
  — Tactical Aircraft   by   J.F.C. Fuller
  — Motor Transport
  — Better Communications   Heinz Guderian

- Result:

  — <u>Blitzkrieg</u> to generate a breakthrough by piercing a region with multiple narrow thrusts using armor, motorized infantry, and follow-up infantry divisions supported by tactical aircraft.

<u>Guerrilla War</u>

- Mao Tse–Tung synthesized Sun Tzu's ideas, classic guerrilla strategy and tactics, and Napoleonic style mobile operations under an umbrella of Soviet revolutionary ideas to create a powerful way for waging modern (guerrilla) war.

- Result:

  — Modern guerrilla warfare has become an overall political, economic, social and military framework for "total war".

SOVIET REVOLUTIONARY STRATEGY
(á la Lenin/Stalin)

<u>Tasks</u>

- Employ agitation and propaganda in order to exploit opposing tendencies, internal tensions, etc. Object is to bring about <u>crises, to make revolution ripe</u> as well as convince masses that there is a way out. This is accomplished when the vanguard is able to:

  — Fan discontent/misery of working class and masses and focus it as hatred toward existing system.

  — Cause vacillation/indecision among authorities so that they cannot come to grips with existing instability.

  — "Confuse other elements in society so that they don't know exactly what is happening or where the movement is going."

  — Convince "proletariat class they have a function—the function of promoting revolution in order to secure the promised ideal society."

- Concentrate "the main forces of the revolution at the enemy's most vulnerable spot at the decisive moment, <u>when the revolution has already become ripe</u>, when the offensive is going full-steam ahead, when insurrection is knocking at the door, and when bringing the reserves up to the <u>vanguard</u> is the decisive condition of success." To quote Lenin on paraphrasing Marx and Engels:

  — "Never play with insurrection, but, when beginning it, firmly realize that you must go to the end."

  — "Concentrate a great superiority of forces at the decisive point, at the decisive moment, otherwise the enemy, who has the advantage of better preparation and organization, will destroy the insurgents."

  — "Once the insurrection has begun, you must act with the greatest determination, and by all means, without fail, take the offensive. 'The defensive is the death of an armed rising.' "

  — "You must try to take the enemy by surprise and seize the moment when his forces are scattered."

  — "You must strive for daily successes, even if small (one might say hourly, if it is the case of one town), and at all costs retain the 'moral ascendancy.'"

SOVIET REVOLUTIONARY STRATEGY
(á la Lenin/Stalin)

Tasks

- Select "the moment for the decisive blow, the moment for starting the insurrection, so timed as to coincide with the moment when the <u>crisis</u> has reached its climax, when the <u>vanguard</u> is prepared to fight to the end, the reserves are prepared to support the <u>vanguard</u>, and maximum consternation reigns in the ranks of the enemy." According to Lenin the decisive moment has arrived when:

  – "All the class forces hostile to us have become sufficiently entangled, are sufficiently at loggerheads, have sufficiently weakened themselves in a struggle which is beyond their strength;"

  – "All the vacillating, wavering, unstable, intermediate elements—the petty bourgeoisie, the petty-bourgeois democrats as distinct from the bourgeoisie—have sufficiently exposed themselves in the eyes of the people, have sufficiently disgraced themselves through their practical bankruptcy;"

  – "Among the proletariat a mass sentiment in favor of supporting the most determined, supremely bold, revolutionary action against the bourgeoisie has arisen and has begun to grow vigorously. Then revolution is indeed ripe. Then, indeed, if we have correctly gauged all the conditions indicated above . . . and if we have chosen the moment rightly, our victory is assured."

- Pursue "the course adopted, no matter what difficulties and complications are encountered on the road towards the goal. This is necessary in order that the <u>vanguard</u> not lose sight of the main goal of the struggle and the masses not stray from the road while marching towards that goal and striving to rally around the <u>vanguard</u>."

- Maneuver "the reserves with a view to effecting (sic.) a proper retreat when the enemy is strong . . . when, with the given relation of forces, retreat becomes the only way to escape a blow against the <u>vanguard</u> and retain the <u>vanguard's</u> reserves. The object of this strategy is to gain time, to disrupt the enemy, and to accumulate forces in order later to assume the offensive."

Goal

- Destroy capitalism as well as its offspring imperialism and replace it with a dictatorship of the proletariat.

BLITZKRIEG AND GUERRILLA STRATEGY

Infiltration and Isolation

- Blitz and guerrillas infiltrate a nation or regime at all levels to soften and shatter the moral fiber of the political, economic and social structure. Simultaneously, via diplomatic, psychological, and various sub-rosa or other activities, they strip-away potential allies thereby isolate intended victim(s) for forth-coming blows. To carry out this program, a la Sun Tzu, blitz, and guerrillas:

  — Probe and test adversary, and any allies that may rally to his side, in order to unmask strengths, weaknesses, maneuvers, and intentions.

  — Exploit critical differences of opinion, internal contradictions, frictions, obsessions, etc., in order to foment mistrust, sow discord and shape both adversary's and allies' perception of the world thereby:

  — Create atmosphere of "mental confusion, contradiction of feeling, indecisiveness, panic," . . .

  — Manipulate or undermine adversary's plans and actions.

  — Make it difficult, if not impossible, for allies to aid adversary during his time of trial.

Purpose

- Force capitulation when combined with external political, economic, and military pressures

or

- Weaken foe to minimize his resistance against military blows that will follow.

BLITZKRIEG

Action

- Intelligence (signal, photo, agent . . .), reconnaissance (air and ground), and patrol actions probe and test adversary before and during combat operations to uncover as well as shape changing patterns of strengths, weaknesses, moves, and intentions.

- Adversary patterns, and associated changes, are weighed against friendly situation to expose attractive, or appropriate, alternatives that exploit adversary vulnerabilities and weaknesses, hence help shape mission commitment and influence command intent.

- Mission assigned. Schwerpunkt (focus of main effort) established before and shifted during combat operations to bypass adversary strength and strike at weakness. Nebenpunkte (other related or supporting efforts) employed to tie-up, focus, or drain-away adversary attention and strength (elsewhere).

- Special seizure/disruption teams infiltrate (by air or other means) enemy rear areas where, with agents already in place, they: seize bridges and road crossings, sever communications, incapacitate or blow up power stations, seize or blow up fuel dumps, . . . as well as sow confusion/disorder via "false messages and fake orders."

- Indirect and direct air firepower efforts together with (any needed) sudden/brief preliminary artillery fires are focused in appropriate areas to impede (or channel) adversary movement, disrupt communications, suppress forward defensive fires, obscure the advance, and divert attention.

- Armored reconnaissance or storm trooper teams, leading armored columns, advance rapidly from least expected regions and infiltrate adversary front to find paths of least resistance.

- Armored assault teams of tanks, infantry, antitank guns, and combat engineers as well as other specialists, together with close artillery and air support, quickly open breaches (via frontal/flank fire and movement combinations) into adversary rear along paths of least resistance uncovered by armored reconnaissance or storm troopers.

- When breakthrough occurs, relatively independent mobile/armored teams led by armored recce with air support (recce, fire, and airlift when necessary), blow-through to penetrate at high speed deep into

adversary interior. Object is to cut lines of communication, disrupt movement, paralyze command and envelop adversary forces and resources.

- Motorized or foot infantry further back supported by artillery and armor pour-in to collapse isolated pockets of resistance, widen the breaches and secure the encirclement or captured terrain against possible counterattack.

Idea

- Conquer an entire region in the quickest possible time by gaining <u>initial surprise</u> and exploiting the <u>fast tempo/fluidity-of-action</u> of armored teams, with air support, as basis to repeatedly penetrate, splinter, envelop, and roll-up/wipe-out disconnected remnants of adversary organism in order to confuse, disorder, and finally shatter his will or capacity to resist.

IMPRESSION

Reflection upon discussion, so far, reveals that Blitzkrieg generates many non-cooperative centers of gravity, as well as undermines or seizes those that adversary depends upon, in order to impede vigorous activity and magnify friction, thereby paralyze adversary by denying him the opportunity to operate in a directed way.

? — RAISES NAGGING QUESTION — ?

How do blitzers simultaneously sustain rapid pace and abruptly adapt to changing circumstances without losing cohesion or coherency of their overall effort?

BLITZ OPERATING PHILOSOPHY

<u>Key Point</u>

- Each level from simple to complex (platoon to theater) has their own observation–orientation–decision–action time cycle that increases as we try to control more levels and details of command at the higher levels. Put simply, as the number of events we must consider increase, the longer it takes to observe–orient–decide–act.

<u>Idea</u>

- This brings out the idea that faster tempo, or rhythm, at lower levels should work within the slower rhythm but larger pattern at higher levels so that overall system does not lose its cohesion or coherency.

<u>Raises question</u>

- How do blitzers harmonize these differing tempos/rhythms so that they can exploit the faster rhythm/smaller pattern (of the lower-level units) yet maintain the coherency of the rhythm/pattern for the larger effort?

<u>Response</u>

- Give lower-level commanders wide freedom, <u>within an overall mind-time-space scheme</u>, to shape/direct their own activities so that they can exploit faster tempo/rhythm at tactical levels yet be in harmony with the larger pattern/slower rhythm associated with the more general aim and larger effort at the strategic level.

<u>Shaping Agents</u>

- Shape overall scheme by using mission concept or sense of mission to fix responsibility and shape commitment at all levels and through all parts of the organism. Likewise, use <u>Schwerpunkt</u> concept through all levels to link differing rhythms/patterns so that each part or level of the organic whole can operate at its own natural rhythm—without pulling organism apart—instead of the slower pace associated with a rigid centralized control.

? — RAISES QUESTIONS — ?

- What does an overall mind-time-space scheme imply or presuppose?

- How do mission and Schwerpunkt concepts give shape to this overall scheme?

OVERALL MIND–TIME–SPACE SCHEME

Message

- According to General Gunther Blumentritt, such a scheme presupposes a common outlook based upon "a body of professional officers who have received exactly the same training during the <u>long</u> years of peace and with the same tactical education, the same way of thinking, identical speech, hence a body of officers to whom all tactical conceptions were fully clear."

- Furthermore, a la General Blumentritt, it presupposes "an officers training institution which allows the subordinate a <u>very great</u> measure of freedom of action and freedom in the <u>manner</u> of executing orders and which primarily calls for independent daring, initiative and sense of responsibility."

Point

- Without a common outlook, superiors cannot give subordinates freedom-of-action and maintain co-herency of ongoing action.

Implication

- A common outlook possessed by "a body of officers" represents a unifying theme that can be used to simultaneously encourage subordinate initiative yet realize superior intent.

? — RAISES QUESTION — ?

Very nice, but how do the German concepts of mission and Schwerpunkt give shape to this scheme?

MISSION

<u>Message</u>

- The German concept of mission can be thought of as a contract, hence an agreement, between superior and subordinate. The subordinate agrees to make his actions serve his superior's intent in terms of what is to be accomplished, while the superior agrees to give his subordinate wide freedom to exercise his imagination and initiative in terms of how intent is to be realized.

- As part of this concept, the subordinate is given the right to challenge or question the feasibility of mission if he feels his superior's ideas on what can be achieved are not in accord with the existing situation or if he feels his superior has not given him adequate resources to carry it out. Likewise, the superior has every right to expect his subordinate to carry-out the mission contract when agreement is reached on what can be achieved consistent with the existing situation and resources provided.

<u>Limitation</u>

- While this concept of mission gives form and expression to what is expected between an individual superior and subordinate, it does not suggest ways to coordinate or harmonize activities among many superiors and subordinates as a collective group.

? — RAISES QUESTION — ?

With this limitation in mind how does Schwerpunkt play into or add to this concept?

SCHWERPUNKT (FOCUS OF MAIN EFFORT)

<u>Message</u>

- Schwerpunkt acts as a center or axis or harmonizing agent that is used to help shape commitment and convey or carry-out intent, at all levels from theater to platoon, hence an image around which:

  — Maneuver of all arms and supporting elements are focused to exploit opportunities and maintain tempo of operations,

    and

  — Initiative of many subordinates is harmonized with superior intent.

- In this sense Schwerpunkt can be thought of as:

  — A focusing agent that naturally produces an unequal distribution of effort as a basis to generate superiority in some sectors by thinning-out others,

    as well as

  — A medium to realize superior intent without impeding initiative of many subordinates, hence a medium through which subordinate initiative is implicitly connected to superior intent.

<u>Implication</u>

- Schwerpunkt represents a <u>unifying concept</u> that provides a way to rapidly shape focus and direction of effort as well as harmonize support activities with combat operations, thereby permit a true decentralization of tactical command within centralized strategic guidance—without losing cohesion of overall effort.

    or put another way

- Schwerpunkt represents a <u>unifying medium</u> that provides a directed way to tie initiative of many subordinate actions with superior intent as a basis to diminish friction and compress time in order to generate a favorable mismatch in time/ability to shape and adapt to unfolding circumstances.

GERMAN OPERATIONAL PHILOSOPHY

Impression

- The German operational philosophy based upon a common outlook and freedom-of-action, and realized through their concepts of mission and Schwerpunkt, emphasized <u>implicit over explicit</u> communication.

which suggests

- The secret of the German command and control system lies in what's <u>unstated or not communicated to one another</u>—to exploit lower-level initiative yet realize higher-level intent, thereby diminish friction and reduce time, hence gain both quickness and security.

Result

- The Germans were able to repeatedly operate inside their adversary's observation–orientation–decision–action loops.

or as stated by General Blumentritt,

- "The entire operational and tactical leadership method hinged upon . . . <u>rapid</u>, concise assessment of situations . . . <u>quick</u> decision and <u>quick</u> execution, on the principle: 'each minute ahead of the enemy is an advantage.'"

Impression of the Blitzkrieg Penetration
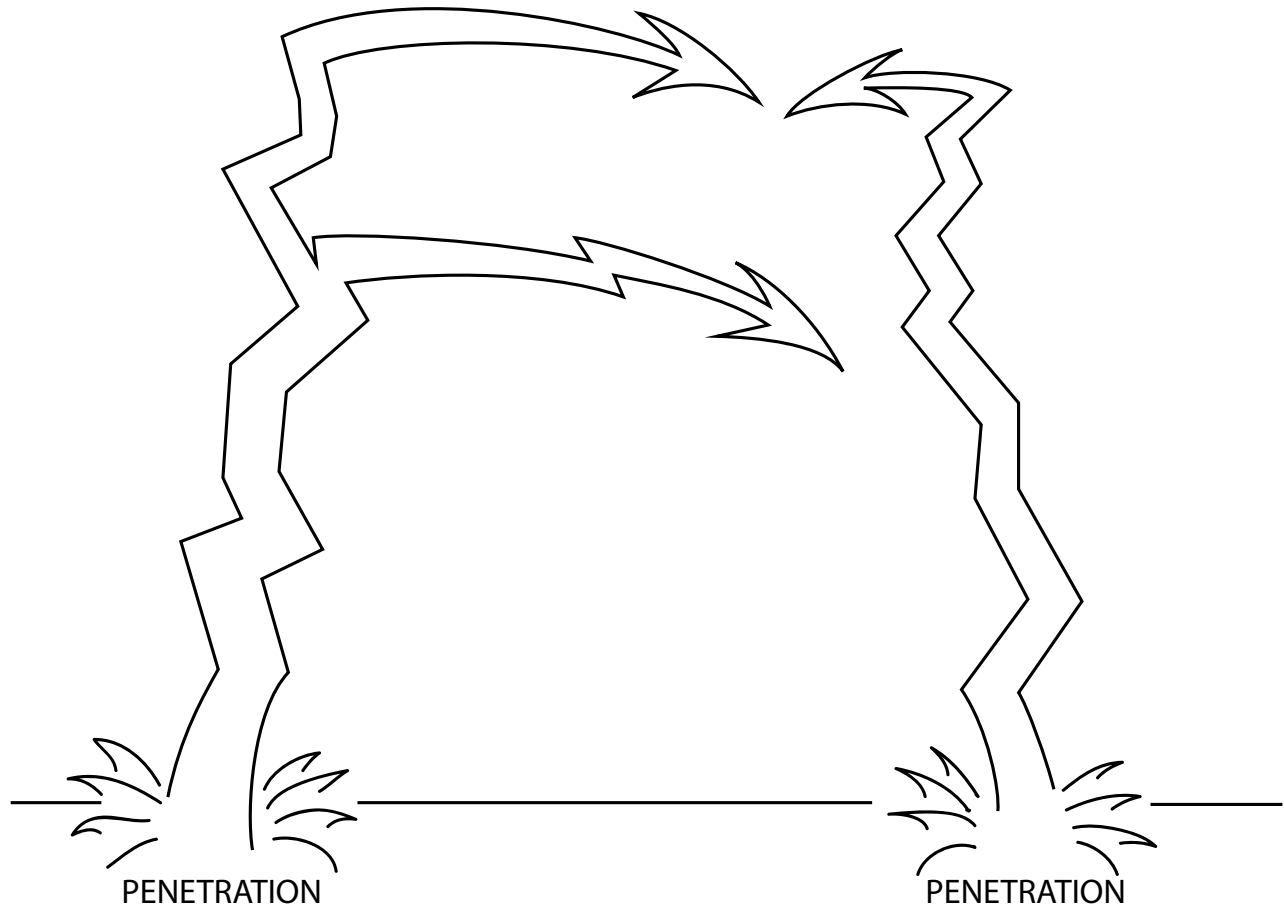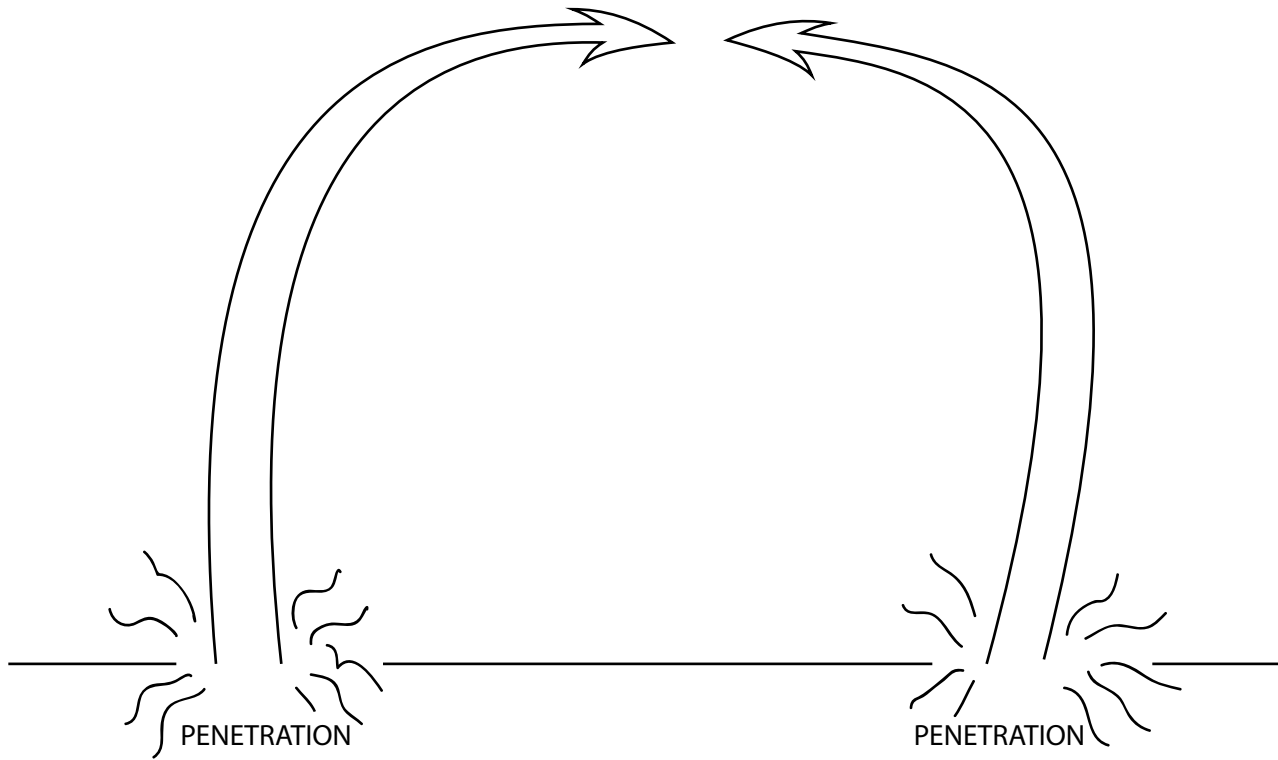Thrust and Roll-out/Roll-up Tactics
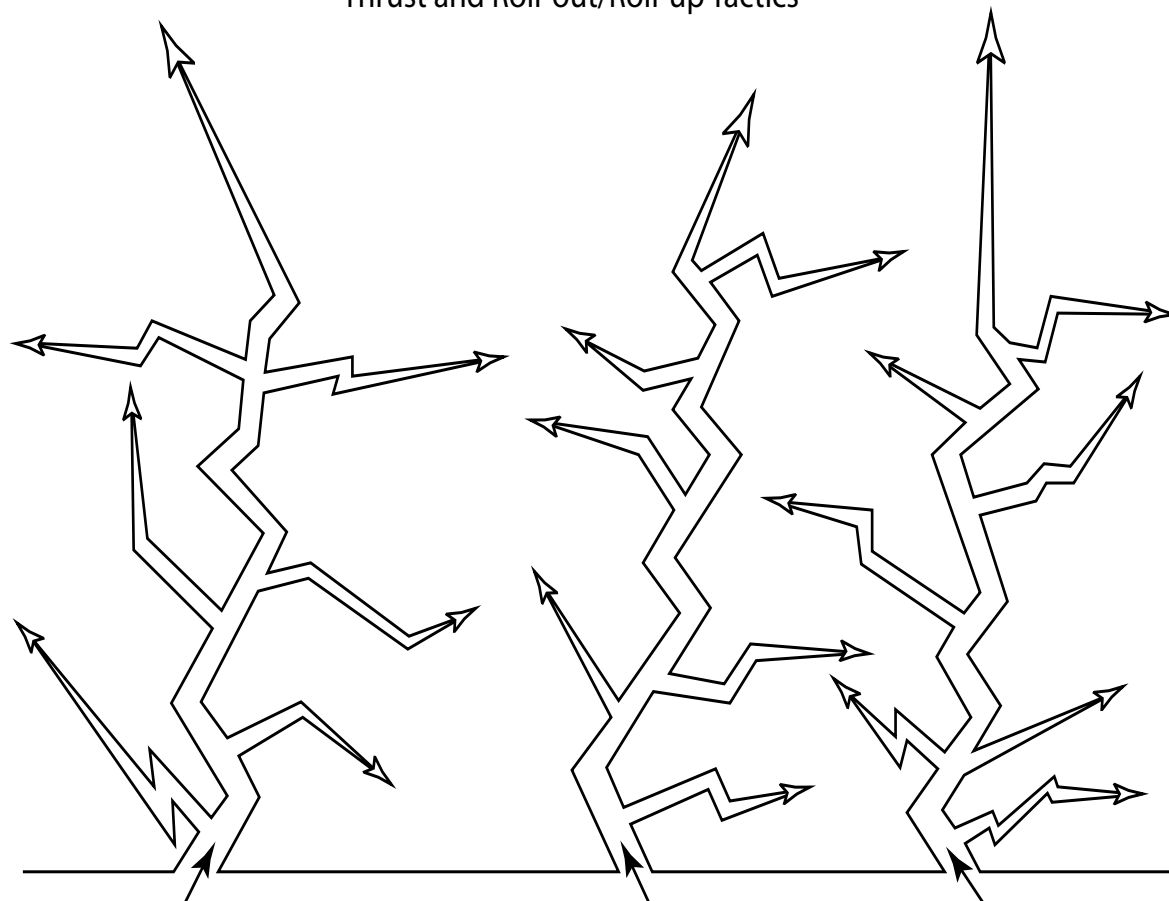
Impression of the Pincer
(Envelopment)

PENETRATION

PENETRATION
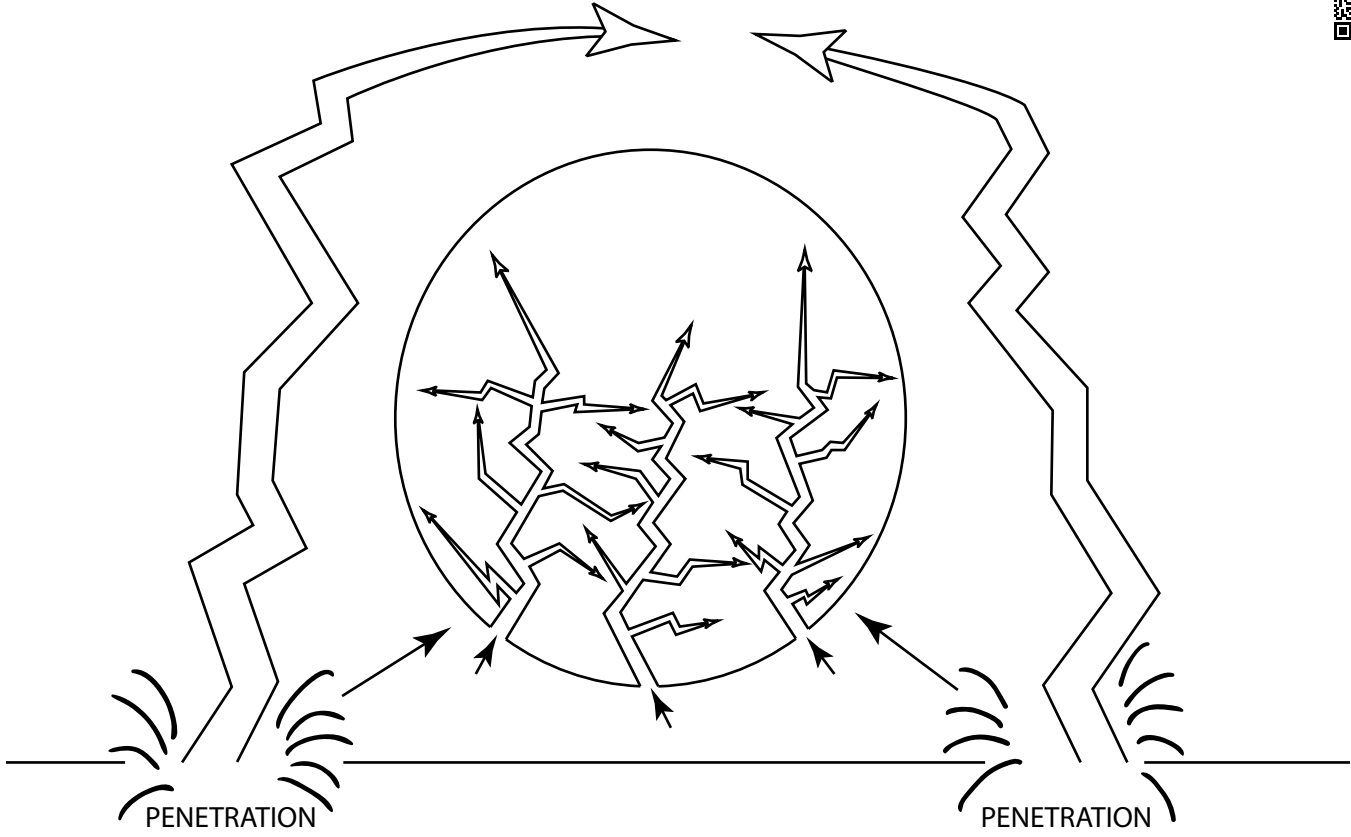
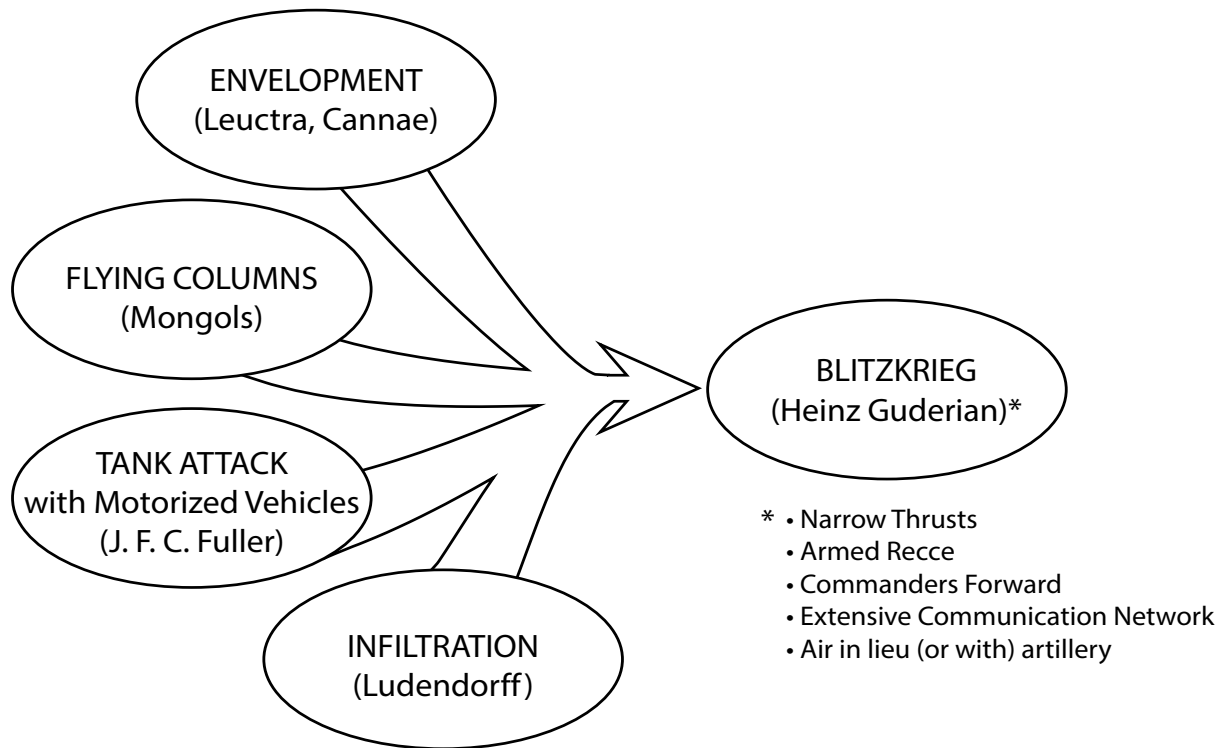## Impression of the Envelopment

PENETRATION

PENETRATION

Typical Impression of Blitzkrieg Envelopment

PENETRATION

PENETRATION

Creation of the Blitzkrieg

ENVELOPMENT
(Leuctra, Cannae)

FLYING COLUMNS
(Mongols)

TANK ATTACK
with Motorized Vehicles
(J. F. C. Fuller)

INFILTRATION
(Ludendorff)

BLITZKRIEG
(Heinz Guderian)*

* • Narrow Thrusts
• Armed Recce
• Commanders Forward
• Extensive Communication Network
• Air in lieu (or with) artillery

? — NATURAL QUESTION — ?

Why employ multiple thrusts, bundles of multiple thrusts, or bundles of thrusts inside bundles of thrusts?

<u>RESPONSE</u>

- Present <u>many</u> (fast breaking) <u>simultaneous</u> and <u>sequential</u> happenings to generate confusion and disorder—thereby stretch-out time for adversary to respond in a directed fashion.

- <u>Multiply opportunities</u>, to <u>uncover</u>, <u>create</u>, and <u>penetrate</u> gaps, exposed flanks, and vulnerable rears.

- <u>Create</u> and <u>multiply opportunities</u> to splinter organism and envelop disconnected remnants thereby dismember adversary thru the tactical, grand tactical, and strategic levels.

WHICH LEAD TO:

<u>Essence of Blitzkrieg</u>

Employ a Nebenpunkte/Schwerpunkt maneuver philosophy to <u>generate ambiguity</u>, realize <u>deception</u>, <u>exploit</u> <u>superior mobility</u>, and <u>focus violence</u> as basis to <u>quickly</u>:

- <u>Create many opportunities</u> to <u>penetrate</u> weaknesses in the form of any moral or mental inadequacies as well as any gaps or exposed flanks that open into adversary's vulnerable rear and interior, hence-

- <u>Create</u> and <u>exploit opportunities</u> to repeatedly <u>penetrate</u> adversary organism, at all levels (tactical, grand tactical, and strategic) and in many ways, in order to splinter, envelop, and roll-up/wipe-out isolated remnants, thereby generate confusion and disorder, hence-

- <u>Create</u> and <u>exploit opportunities</u> to disrupt his system for communication, command, and support, as well as undermine or seize those connections or centers that he depends upon, thus shake his will or capacity to decisively commit his back-up echelons, operational reserves, and/or strategic reserves, thereby magnify adversary's confusion and disorder and convince him to give up.

<u>Intent</u>

- Create grand tactical success then exploit and expand it into strategic success for a decisive victory.

<u>Implication</u>

- Blitzers, by being able to <u>infiltrate</u> or <u>penetrate</u> or <u>get inside</u> adversary's system, generate many moral–mental–physical noncooperative (or isolated) centers of gravity, as well as undermine or seize those centers of gravity adversary depends upon, in order to magnify friction, produce paralysis, and bring about adversary collapse.

WORLD WAR II
BLITZKRIEG

Keys to Success

- Emphasis on a common outlook and freedom-of-action that are exploited by mission and Schwerpunkt concepts to fix responsibilities as well as to rapidly shape, focus, and shift operations and support at all levels.

- Flexible command—based on a common outlook and freedom-of-action that are exploited by mission and Schwerpunkt—that encourages lower-level combat leaders (forward) to exploit opportunities generated by rapid action within a broad loosely woven scheme laid down from central command.

- Intelligence, reconnaissance (air and ground) and stratagem emphasized before and during combat operations to unmask and shape patterns of adversary strengths, weaknesses, moves, and intentions.

- Broad use of Schwerpunkt concept coupled with fast tempo/fluidity-of-action of armored teams and air support permit blitzers to repeatedly reshape strength and rapidly shift it against, or through, weaknesses thereby generate doubt and uncertainty which magnify into panic and chaos.

- Superior mobile communications to maintain cohesion of overall effort and to enable higher command levels to allocate reserves and support and to reshape as well as shift focus of main effort.

- Essential and only essential logistics tail (using airlift when appropriate and necessary) to support high-speed movement and rapid shift among routes of advance.

BLITZ RESULTS

Successful		Unsuccessful	
Poland	1939	Russia	Winter 1941–42
France	1940	Russia	Fall, Winter 1942–43
Balkans	1941	North Africa	1942
Russia	1941	Russia	Summer 1943
North Africa	1941–42	Ardennes	Winter 1944–45
Russia	Summer 1942		
Russia	Feb–March 1943		
Advance thru France	1944		
Manchuria	1945		
Middle East	1967		
Czechoslovakia	1968		
Middle East	1973		

MODERN GUERRILLA CAMPAIGN

Action

- Capitalize on discontent and mistrust generated by corruption (real or imagined), exploitation, oppression, incompetence, and unwanted presence of existing regime to evolve a common cause or unifying theme as basis to organize and maintain mass popular support through a militant political program.

- Set-up administrative and military organization, sanctuary, and communications network under the control of the guerrilla political leadership without arousing regime's intelligence and security apparatus. Build-up a shadow government, with "parallel hierarchies", in localities and regions that can be made ripe for insurrection/revolution by infiltrating cadres (vanguards) who can not only subvert existing authority but also convert leaders and people to guerrilla cause and organizational way.

- Exploit subversion of government and conversion of people to guerrilla cause to create an alien atmosphere of security and intelligence in order to "blind" regime to guerrilla plans, operations, and organization yet make "visible" regime's strengths, weaknesses, moves, and intentions.

- Shape propaganda, foment civil disorders (such as rallies, demonstrations, strikes, and riots), use selected terrorism, perform sabotage, and exploit resulting misinformation to expand mistrust and sow discord thereby magnify the appearance of corruption, incompetence, etc., and the inability of regime to govern.

- Employ tiny cohesive bands for surprise hit-and-run raids against lines of communications to gain arms and supplies as well as disrupt government communication, coordination, and movement. Retreat and melt into environment when faced by superior police and armed forces.

- Disperse or scatter tiny guerrilla bands to arouse the people (and gain recruits) as well as harass, wear-out, and spread-out government forces while larger bands, or mobile formations, concentrate to wipe-out his dispersed, isolated, and relatively weak fractions by sudden ambush or sneak attack.

- Play upon the grievances and obsessions of people (via propaganda, re-education, and selected successes) as well as encourage government to indiscriminately take harsh reprisal measures against them in order to connect the government with expanding climate of mistrust, discord, and moral disintegration. Simultaneously, show (by contrast) that guerrillas exhibit moral authority, offer competence, and provide

desired benefits in order to further erode government influence, gain more recruits, multiply base areas, and increase political infrastructure hence expand guerrilla influence/control over population and countryside.

- Demonstrate disintegration of regime by striking cheng/ch'i fashion, with small fluid bands and ever larger mobile formations, to split-up, envelop, and annihilate fractions of major enemy forces.

Idea

- Defeat existing regime politically by showing they have <u>neither the moral right nor demonstrated ability</u> to govern and militarily by continuously using <u>stealth/fast-tempo/fluidity-of-action and cohesion</u> of small bands and larger units in cooperation with political "agitprop" (agitation/propaganda) teams as basis to harass, confuse and ultimately destroy the will or capacity to resist.

MODERN GUERRILLA CAMPAIGN

Essence

- Capitalize on corruption, injustice, incompetence, etc., (or their appearances) as basis to generate atmosphere of mistrust and discord in order to sever moral bonds that bind people to existing regime.

Simultaneously,

- Share existing burdens with people and work with them to root out and punish corruption, remove injustice, eliminate grievances, etc., as basis to form moral bonds between people and guerrillas in order to bind people to guerrilla philosophy and ideals.

Intent

- Shape and exploit crises environment that permits guerrilla vanguards or cadres to pump-up guerrilla resolve, attract the uncommitted, and drain-away adversary resolve as foundation to replace existing regime with guerrilla regime.

Implication

- Guerrillas, by being able to penetrate the very essence of their adversary's moral–mental–physical being, generate many moral–mental–physical non-cooperative (or isolated) centers of gravity, as well as subvert or seize those centers of gravity that adversary regime must depend upon, in order to magnify friction, produce paralysis, and bring about collapse.

Yet,

- Guerrillas shape or influence moral–mental–physical atmosphere so that potential adversaries, as well as the uncommitted, are drawn toward guerrilla philosophy and are empathetic toward guerrilla success.

<u>LOOKING BACK</u>

Now, if we look at the ingredients that make up <u>modern guerrilla campaigns</u> as well as refer back to our discussion about <u>Soviet revolutionary strategy</u> and the <u>impact of 19th century capitalism on insurrection/revolution,</u> we gain some insight into the strategic philosophy that underlies today's guerrilla efforts.

MODERN GUERRILLA CAMPAIGN

Underlying Strategic Philosophy

- Guerrilla <u>vanguards</u> employ a variety of means to play-upon regime's internal frictions, obsessions, etc., as well as stimulate discontent/mistrust of people. In this way, vanguards sow discord that in turn magnifies regime's internal frictions, obsessions, etc., thereby paralyze its ability to come to grips with crises that further fan atmosphere of mistrust and discord that feed crises—hence push them out-of-control.

Simultaneously,

- Guerrilla vanguards share burden as well as help people cope with turmoil—that vanguards keep fanning and enmesh people into—in order to demonstrate ability to deal with surging crises as well as shape image that only guerrillas offer a way out of existing unpleasant circumstances.

INSIGHT

Insurrection/revolution becomes ripe when many perceive an <u>illegitimate inequality</u>—that is, when the people see themselves as being exploited and oppressed for the undeserved enrichment and betterment of an elite few. This means that the guerrillas not only need an illegitimate inequality but they also need support of the people; otherwise, insurrection/revolution is impossible.

? — RAISES QUESTION — ?

In the deepest possible sense what does it mean to have support of the people?

MESSAGE

- Guerrillas must establish implicit connections or bonds with people and countryside.

In other words

- Guerrillas must be able to blend into the emotional–cultural–intellectual environment of people until they become one with the people.

In this sense

- People feelings and thoughts must be guerrilla feeling and thoughts while guerrilla feelings and thoughts become people feelings and thoughts; people aspirations must be guerrilla aspirations while guerrilla aspirations become people aspirations; people goals must be guerrilla goals while guerrilla goals become people goals.

RESULT

- Guerrillas become indistinguishable from people while government is isolated from people.

MODERN GUERRILLA CAMPAIGN

<u>Keys to Success</u>

- Ability to continuously demonstrate government weakness, erode government influence, and cause government to alienate itself from people.

- Support of people (both psychological and physical) for intelligence, recruits, shelter, transportation, refuge, food, money, and medical aid.

- Access to (more or less permanent) safe sanctuaries or base areas and/or fluid bases that can be shifted from place to place, away from enemy forces—in order to rest, recuperate, repair materiel, etc., as well as indoctrinate, train, and equip recruits.

- Use of stealth/fast-tempo/fluidity-of-action coupled with cohesion of guerrilla bands as basis for:

  — <u>dispersion</u>, to arouse people, to avoid adversary strength, and to force government to thin-out, or disperse, its strength;

  — <u>concentration</u>, to hit and wipe-out isolated fractions;

  — <u>shifting of effort</u> (in these as well as other activities), in order to gain and keep initiative.

GUERRILLA RESULTS

Successful			Unsuccessful	
------------------------------------	----------		---	----------
• American Colonies	1775–81		Philippines	1899–1902
• Spain	1808–14		South Africa	1900–02
• Russia	1812		Greece	1944–49
• German East Africa	1914–18		Philippines*	1946–54
• Arabia	1916–18		Malaya*	1948–60
• China	1927–49			
• Russia	1941–45			
• Yugoslavia	1941–45		*Regime exercised particular care not to inflict casualties and to protect population.	
• Indochina	1945–54			
• Algeria	1954–62			
• Cuba	1956–59			
• South Vietnam	1958–75			

BLITZ/GUERRILLA THEME

<u>Essence</u>

- <u>Avoid battles</u>—instead penetrate adversary to <u>subvert</u>, <u>disrupt</u>, or <u>seize</u> those connections, centers, and activities that provide <u>cohesion</u> (e.g., psychological/moral bonds, communications, lines of communication, command and supply centers . . .)

- Exploit ambiguity, deception, superior mobility, and sudden violence to generate initial <u>surprise</u> and <u>shock</u> followed by <u>surprise</u> and <u>shock</u> again, again, again . . .

- Roll-up/wipe-out the isolated units or remnants created by the subversion, surprise, shock, disruption, and seizure.

<u>Intent</u>

- Exploit subversion, surprise, shock, disruption, and seizure to generate <u>confusion</u>, <u>disorder</u>, <u>panic</u>, etc., thereby <u>shatter cohesion</u>, <u>paralyze effort</u>, and <u>bring about adversary collapse</u>.

DISRUPT THE CONNECTIONS AND CENTERS THAT PROVIDE COHESION

<u>Israeli example (á la Gen Y. Yadin – 1949)</u>

"To exploit the principles of war for our purpose and base ourselves upon (the) strategic indirect approach, so as to determine the issue of the fighting even before fighting has begun, it is necessary to achieve the three following aims:

(a) to cut the enemy's lines of communications, thus paralyzing his physical build-up;

(b) to seal him off from his lines of retreat, thus undermining the enemy's will and destroying his morale;

(c) to hit his centers of administration and disrupt his communications, thus severing the link between his brain and limbs."

? — KEY QUESTION — ?

Why have blitz and guerrilla tactics been so extraordinarily successful?

MESSAGE

Message

- Blitz and guerrillas, by being able to operate in a <u>directed</u>, yet <u>more indistinct</u>, <u>more irregular</u>, and <u>quicker manner</u> than their adversaries, can:

  — Repeatedly concentrate or disperse more inconspicuously and/or more quickly from or to lower levels of distinction (organizational, operational, and environmental) without losing internal harmony, as well as,

  — Repeatedly and unexpectedly <u>infiltrate</u> or <u>penetrate</u> adversaries' vulnerabilities and weaknesses in order to splinter, isolate or envelop, and overwhelm disconnected remnants of adversary organism.

or put another way

- Blitz and guerrillas, by operating in a directed, yet more indistinct, more irregular, and quicker manner, <u>operate inside</u> their adversaries' observation–orientation–decision–action loops or <u>get inside</u> their mind–time–space as basis to <u>penetrate</u> the moral–mental–physical being of their adversaries in order to pull them apart, and bring about their collapse.

UNDERLYING IDEA

- Such amorphous, lethal, and unpredictable activity by blitz and guerrillas make them appear awesome and unstoppable which altogether produce uncertainty, doubt, mistrust, confusion, disorder, fear, panic . . . and ultimately collapse—a notion implied by Sun Tzu around 400 B.C. and more recently by J.F.C. Fuller after observing the impact of Ludendorff's infiltration tactics in 1918.

? — NATURAL QUESTIONS — ?

- How can we defend against or counter the blitz?
- How can we defend against or counter the guerrilla movement?

Where are the weaknesses
of the Blitzkrieg?

PENETRATION

PENETRATION
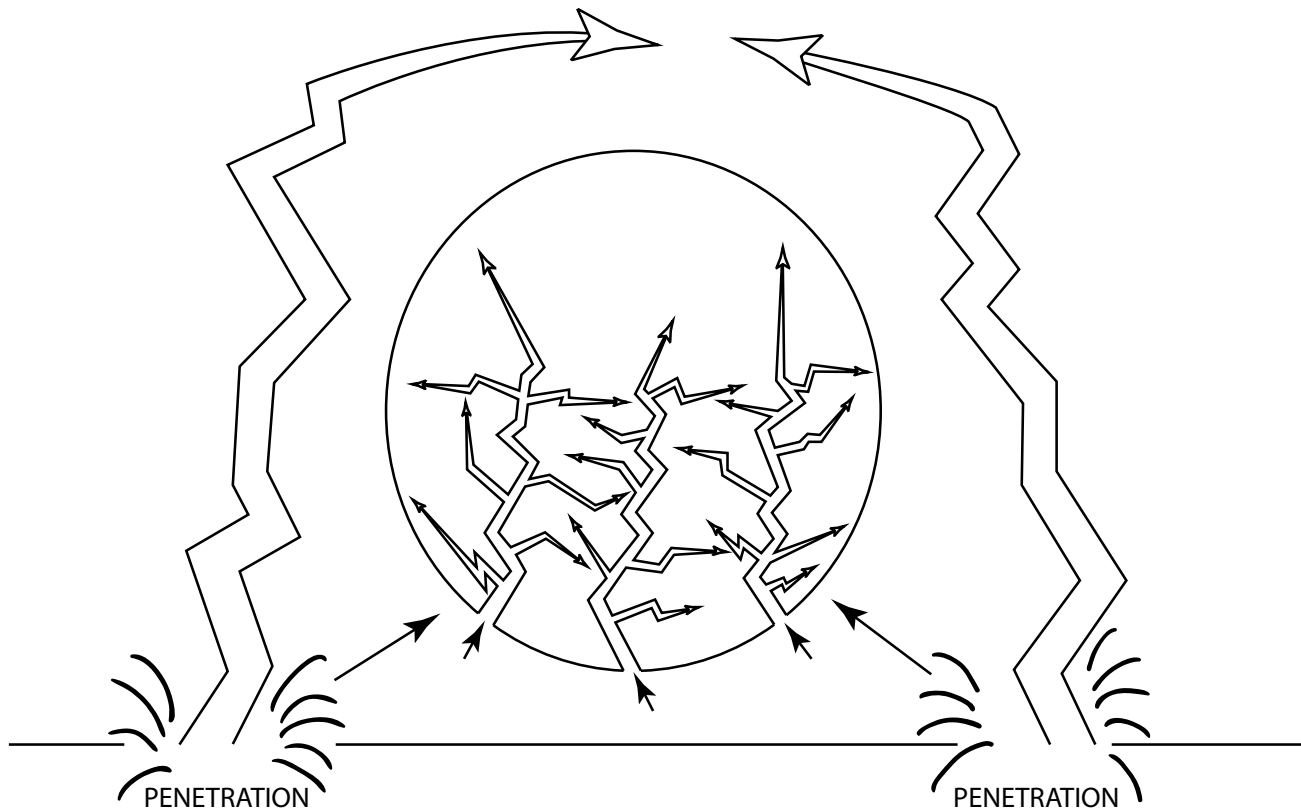
KEY POINT

Difficult to sustain fast-tempo <u>and</u> maintain cohesion of blitz effort when forced to repeatedly and rapidly shift concentration of strength against weakness.

<u>COUNTERBLITZ</u>
(Variation of German Experiences during WWII)

<u>Posture</u>

- Emphasize intelligence, reconnaissance (air and ground) and set-up screen of forward outposts and patrols to report on adversary activity and warn of any impending or actual incursions.

- Deploy, disperse, and frequently redeploy/redisperse reconnaissance and mobile antitank/infantry/armored teams together with artillery in region behind screen, so that they can mask dispositions, as well as move inconspicuously/quickly to focus and shift local main efforts against adversary thrusts.

- Place armored teams, as mobile reserve, in echelon behind recce, antitank/infantry/armor and artillery so that they can easily focus effort, and quickly move-in to decapitate any local breakthrough—or push-off for a blitz counterstroke.

<u>Action</u>

- Employ air and fast moving mobile/armored reconnaissance teams to determine direction/strength of thrusts and to continuously harass by repeated delaying actions and hit-and-run attacks in order to slow momentum and erode cohesion of blitz attack.

- Inconspicuously move-in with high-speed mobile antitank/infantry/armored teams, together with air and artillery support, to strengthen favorable sectors. Hit adversary thrusts and resupply efforts with ambuscades and with repeated sudden/sharp flank and rear counterthrusts to channel as well as drain-away momentum and break-up cohesion of blitz thrusts.

- Concentrate swift armored combat forces (held in reserve) and use with air to rapidly drive a shallow and/or deep flank counterstroke in order to swing in behind and roll-up blitz offensive in detail (counter-stroke launched while adversary is moving forward).

<u>Idea</u>

- Smash blitz offensive by <u>inconspicuously</u> using <u>fast-tempo/fluidity-of-action and cohesion</u> of counter-blitz combat teams as basis for <u>shifting of forces</u> and <u>quick focus of air and ground effort</u> to throttle momentum, shatter cohesion, and envelop blitz in order to destroy adversary's capacity to resist.

BLITZ AND COUNTERBLITZ

<u>Main Features and Emphasis</u>

- Intelligence and recce action

- Infiltration/penetration and isolation

- Ambiguity, deception, speed, and violence to generate surprise and shock

- Mission/Schwerpunkt philosophy

- Acceptance of "gaps" and (related) "risks" in support of mission/Schwerpunkt philosophy

- Echelon-in-depth (offense and defense)

- Reserves reconstituted and accumulated (at all levels) to support or generate success

- Posture of positions, alternative positions, dummy positions and roving positions to mask maneuvers and intentions

GUERRILLA/COUNTERGUERRILLA CAMPAIGNS

Key Points

- Guerrilla <u>vanguards</u> need cause and support of people that is dependent upon regime's unwillingness/inability to come to grips with <u>crises</u> of its' own making.

or more simply

- Crises and vanguards represent the marriage of instability and initiative that create and expand guerrilla effort.

hence

- The thought occurs that in order to dry-up a guerrilla upsurge one should strike at those root causes or illegitimate inequalities that generate and exacerbate crises as well as provide a favorable climate for vanguards to form or operate in.

COUNTERGUERRILLA CAMPAIGN

<u>Action</u>

- Undermine guerrilla cause and destroy their cohesion by demonstrating integrity and competence of government to represent and serve needs of people—rather than exploit and impoverish them for the benefit of a greedy elite.*

- Take political initiative to root out and visibly punish corruption. Select new leaders with recognized competence as well as popular appeal. Ensure that they deliver justice, eliminate grievances and connect government with grass roots.*

- Infiltrate guerrilla movement as well as employ population for intelligence about guerrilla plans, operations, and organization.

- Seal-off guerrilla regions from outside world by diplomatic, psychological, and various other activities that strip-away potential allies as well as by disrupting or straddling communications that connect these regions with outside world.

- Deploy administrative talent, police, and counterguerrilla teams into affected localities and regions to: inhibit guerrilla communication, coordination and movement; minimize guerrilla contact with local inhabitants; isolate their ruling cadres; and destroy their infrastructure.

- Exploit presence of above teams to build-up local government as well as recruit militia for local and regional security in order to protect people from the persuasion and coercion efforts of the guerrilla cadres and their fighting units.

- Use special teams in a complementary effort to penetrate guerrilla controlled regions. Employ (guerrillas' own) tactics of reconnaissance, infiltration, surprise hit-and-run, and sudden ambush to: keep roving bands off-balance, make base areas untenable, and disrupt communication with outside world.

- Expand these complementary security/penetration efforts into affected region after affected region in order to undermine, collapse, and replace guerrilla influence with government influence and control.

- Visibly link these efforts with local political/economic/social reform in order to connect central government with hopes and needs of people, thereby gain their support and confirm government legitimacy.

Idea

- Break guerrillas' moral–mental–physical hold over the population, destroy their cohesion, and bring about their collapse via political initiative that demonstrates <u>moral legitimacy</u> and <u>vitality</u> of government and by relentless military operations that emphasize <u>stealth/fast-tempo/fluidity-of-action</u> and <u>cohesion</u> of overall effort.

_____

* If you cannot realize such a political program, you might consider changing sides!

NOTE

We have indicated again and again the importance of popular support for guerrilla or counterguerrilla success. Why?

INSIGHT

Without support of people the guerrillas (or counterguerrillas) have neither a vast hidden intelligence network nor an invisible security apparatus that permits them to "see" into adversary operations yet "blinds" adversary to their own operations.

CATEGORIES OF CONFLICT

CATEGORIES OF CONFLICT

- Now looking back and reflecting upon the panorama of military history we can imagine three kinds of human conflict:

  — <u>Attrition warfare</u>—as practiced by the Emperor Napoleon, by all sides during the 19th century and during World War I, by the Allies during World War II, and by present-day nuclear planners.

  — <u>Maneuver conflict</u>—as practiced by the Mongols, General Bonaparte, Confederate General Stonewall Jackson, Union General Ulysses S. Grant, Hitler's Generals (in particular Manstein, Guderian, Balck, Rommel) and the Americans under Generals Patton and MacArthur.

  — <u>Moral conflict</u>—as practiced by the Mongols, most guerrilla leaders, a very few counterguerrillas (such as Magsaysay) and certain others from Sun Tzu to the present.

- With these comments in mind let's look into the essentials of each.

ATTRITION OBSERVATIONS

- Firepower, as a destructive force, is king.

- Protection (trenches, armor, dispersion, etc.) is used to weaken or dilute effects of enemy firepower.

- Mobility is used to bring firepower to bear or to evade enemy fire.

- Measures of success are (now) "body count" and targets destroyed.

- Seize and hold terrain objectives replaces Napoleon's dictum: Destroy enemy army.

ESSENCE OF ATTRITION WARFARE

Create and Exploit

- Destructive Force:

  Weapons (mechanical, chemical, biological, nuclear, etc.) that kill, maim, and/or otherwise generate widespread destruction.

- Protection:

  Ability to minimize the concentrated and explosive expression of destructive force by taking cover behind natural or manmade obstacles, by dispersion of people and resources, and by being obscure using camouflage, smoke, etc., together with cover and dispersion.

- Mobility:

  Speed or rapidity to focus destructive force or move away from adversary's destructive focus.

Payoff

- Frightful and debilitating attrition via widespread destruction as basis to:
  — Break enemy's will to resist
  — Seize and hold terrain objectives

Aim

Compel enemy to surrender and sue for peace.

OBSERVATIONS REGARDING MANEUVER

- Ambiguity, deception, novelty, mobility, and violence (or threat thereof) are used to generate surprise and shock.

- Fire and movement are used in combination, like Cheng/Ch'i or Nebenpunkte/Schwerpunkt, to tie-up, divert, or drain-away adversary attention and strength in order to expose as well as menace and exploit vulnerabilities or weaknesses elsewhere.

- Indications of success tend to be qualitative and are related to the widespread onset of confusion and disorder, frequent envelopments, high prisoner counts, or <u>any</u> other <u>phenomena that suggests inability to adapt to change</u>.

ESSENCE OF MANEUVER CONFLICT

Essence of Maneuver Conflict

<u>Create, Exploit, and Magnify</u>

- <u>Ambiguity:</u>

  Alternative or competing impressions of events as they may or may not be.

- <u>Deception:</u>

  An impression of events as they are not.

- <u>Novelty:</u>

  Impressions associated with events/ideas that are unfamiliar or have not been experienced before.

- <u>Fast Transient Maneuvers:</u>

  Irregular and rapid/abrupt shift from one maneuver event/state to another.

- <u>Effort (Cheng/Ch'i or Nebenpunkte/Schwerpunkt):</u>

  An expenditure of energy or an eruption of violence—focused into, or thru, features that permit an organic whole to exist.

<u>Payoff</u>

- <u>Disorientation</u>

  Mismatch between events one (seemingly) observes or anticipates and events (or efforts) he must react or adapt to.

- <u>Surprise</u>

  Disorientation generated by <u>perceiving</u> extreme change (of events or efforts) over a short period of time.

- <u>Shock</u>

  Paralyzing state of disorientation generated by extreme or violent change (of events or efforts) over a short period of time.

- <u>Disruption</u>

  State of being split-apart, broken-up, or torn asunder.

<u>Aim</u>
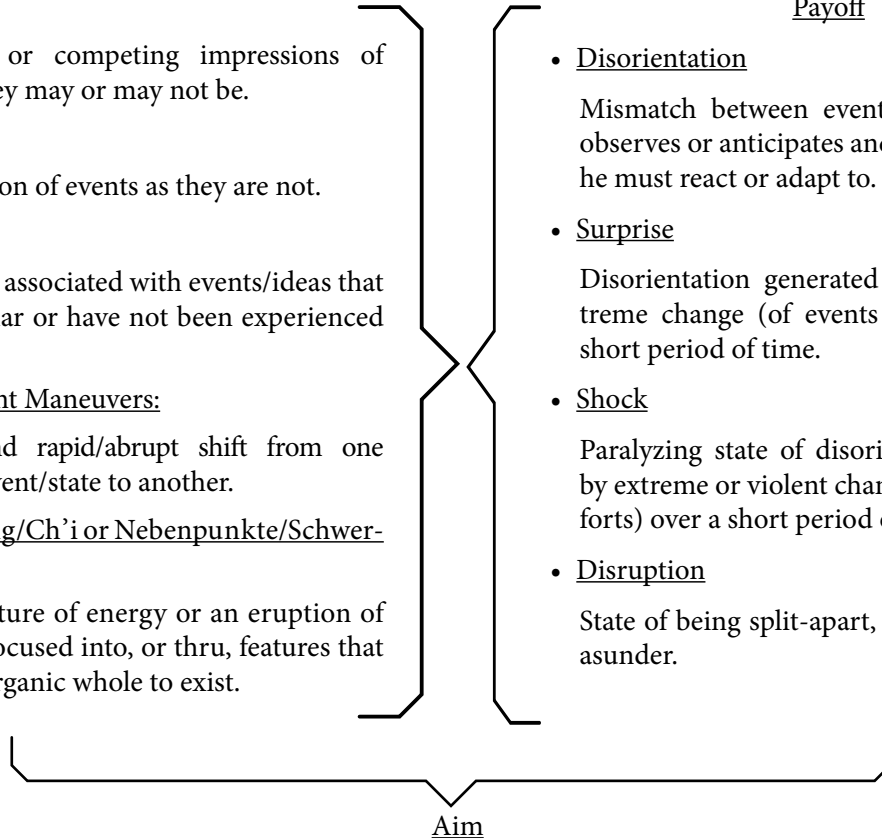
Generate many non-cooperative centers of gravity, as well as disorient or disrupt those that adversary depends upon, in order to magnify friction, shatter cohesion, produce paralysis, and bring about his collapse.

NOTE

Surprise and shock can also be represented as an overload beyond one's immediate ability to respond or adapt. In this context, we may view the "Essence of Maneuver Conflict" a bit differently—

Create, Exploit, and Magnify

- Ambiguity

  A lternative or competing impressions of events as they may or may not be.

- Deception

  An impression of events as they are not.

- Novelty

  Impressions associated with events/ideas that are unfamiliar or have not been experienced before.

- Fast transient maneuvers

  Irregular and rapid/abrupt shift from one maneuver event/state to another.

- Effort (Cheng/Ch'i or Nebenpunkte/Schwerpunkt)

  An expenditure of energy or an eruption of violence—focused into, or thru, features that permit an organic whole to exist.

Payoff

- Disorientation:

  Mismatch between events one observes or imagines and events (or efforts) he must react or adapt to.

- Disruption:

  State of being split-apart, broken-up, or torn asunder.

- Overload:

  A welter of threatening events/efforts beyond one's mental or physical capacity to adapt or endure.

Aim

- Generate many non-cooperative centers of gravity, as well as disorient, disrupt, or overload those that adversary depends upon, in order to magnify friction, shatter cohesion, produce paralysis, and bring about his collapse;

  or equivalently,

- Uncover, create, and exploit many vulnerabilities and weaknesses, hence many opportunities, to pull adversary apart and isolate remnants for mop-up or absorption.

OBSERVATIONS RELATED TO MORAL CONFLICT
GEN. HERMANN BALCK

Theme

- No fixed recipes for organization, communications, tactics, leadership, etc.
- Wide freedom for subordinates to exercise imagination and initiative—yet harmonize within intent of superior commanders.
- Heavy reliance upon <u>moral</u> (human values) instead of material superiority as basis for cohesion and ultimate success.
- Commanders must create a bond and breadth of experience based upon <u>trust</u>—<u>not mistrust</u>—for cohesion.

How is this Atmosphere Achieved?

- By example leaders (at all levels) must demonstrate requisite <u>physical energy</u>, <u>mental agility</u>, and <u>moral authority</u>, to inspire subordinates to enthusiastically cooperate and take initiative within superior's intent.

What is the Price?

- Courage to share danger and discomfort at the front.
- Willingness to support and promote (unconventional or difficult) subordinates that accept danger, demonstrate initiative, take risks, and come-up with new ways toward mission accomplishment.
- Dedication and resolve to face-up to and master uncomfortable circumstances that fly in the face of the traditional solution.

Benefit

- Internal simplicity that permits rapid adaptability.

OBSERVATIONS RELATED TO MORAL CONFLICT
CYRIL FALLS—*THE ART OF WAR FROM THE AGE OF NAPOLEON TO THE PRESENT DAY*—1961

Page 124

"In the First World War 'cellar life' had been a feature of the adversities of Paris, which actually came under the fire of specially built long-range guns in 1918, as well as aircraft bombing. In the East End of London air raids cause a tendency to panic in the latter part of 1917, and, whether there was a raid or not, some 300,000 people crowded each night into the underground railway stations and slept on the platforms. . . . There was little organized civil defence beyond the reduction of lights."

Page 161

"The Germans, who were far ahead of any rival in the science of lighter-than-air construction, refused to accept the general belief that the future lay entirely with the heavier-than-air. Their Zeppelins. . . . were employed chiefly in night attacks on England. On one occasion a single airship did a million pounds worth of damage in a raid, but on the whole their success was mainly moral and measured in terms of absenteeism in factories and sensational drops in production of warlike material."

Page 165

"Early in the war the German Armies owed much in their victories in Poland, Belgium, and France to their dive-bombers. These aircraft acted in close support to the armour and infantry . . . . . They often put hostile artillery out of action, but generally by driving the detachments from their guns. The successes were won for the most part by moral rather than material effect. To troops unused to them, especially the French division of low categories, they proved extremely unsettling."

OBSERVATIONS RELATED TO MORAL CONFLICT

Insights Regarding Falls' Statements and Balck's Ideas

- From Falls' comments we note (with slight alteration) the following words and phrases: panic . . . moral . . . absenteeism . . . sensational drops in production . . . dive bombers success were for the most part moral– to troops unused to them . . . they proved extremely unsettling. A quick glance shows that all these words and phrases are directly related to one another.

- Going even further we can say: Falls' comments on pages 124, 161, and 165 suggest that <u>moral effects</u> are related to the <u>menace</u> posed by the Zeppelins and dive bombers, and the <u>uncertainty</u> associated with not knowing what to expect or how to deal with this menace. Put simply: <u>Moral effects</u> are related to <u>menace</u> and <u>uncertainty</u>.

- For a first cut this suggests that <u>moral strength</u> represents mental capacity to overcome <u>menace</u> and <u>uncertainty</u>.

- On the other hand, this first cut seems to leave out something that humans either need or must overcame for <u>collective moral strength</u>. Fortunately, we have some clues:

  — First: Remember that guerrilla commanders (see Modern Guerrilla Campaign) stress use of propaganda, civil disorders, selected terrorism, etc., as basis to generate <u>mistrust</u> and discord.

  — Second: Balck emphasizes the importance of <u>trust</u>—<u>not mistrust</u>—for cohesion.

- Now, recognizing that both Balck and guerrilla commanders work in a hostile environment (of menace and uncertainty) that naturally breeds mistrust, it is clear that moral effects must include this factor.

- This suggest <u>moral strength</u> represents mental capacity to overcome <u>menace</u>, <u>uncertainty</u>, and <u>mistrust</u>.

OBSERVATIONS RELATED TO MORAL CONFLICT

- Now by using moral strength as a point of departure—and by feeding in those unsettling or threatening experiences (á la Clausewitz) that either bring out fear, anxiety, and alienation, or their more noble counter-weights: courage, confidence, and esprit—we can evolve the following related notions: <u>Moral strength</u>: Mental capacity to overcome menace, uncertainty, and mistrust.

  — <u>Moral victory</u>: Triumph of courage, confidence, and esprit (de corps) over fear, anxiety, and alienation when confronted by menace, uncertainty, and mistrust.

  — <u>Moral defeat</u>: Triumph of fear, anxiety, and alienation over courage, confidence, and esprit when confronted by menace, uncertainty, and mistrust.

  — <u>Moral values</u>: Human values that permit one to carry on in the face of menace, uncertainty, and mistrust.

  — <u>Moral authority</u>: Person or body that can give one the courage, confidence, and esprit to overcome menace, uncertainty, and mistrust.

- Finally, by stripping away and recombining essentials—from these notions as well as from the ideas and experiences of Clausewitz, Balck, and Falls—we can evolve the Essence of Moral Conflict.

ESSENCE OF MORAL CONFLICT

<u>Create, Exploit, and Magnify</u>

- <u>Menace:</u>

  Impressions of danger to one's well-being and survival.

- <u>Uncertainty:</u>

  Impressions, or atmosphere, generated by events that appear ambiguous, erratic, contradictory, unfamiliar, chaotic, etc.

- <u>Mistrust:</u>

  Atmosphere of doubt and suspicion that loosens human bonds among members of an organic whole or between organic wholes.

<u>Idea</u>

- Surface, <u>fear</u>, <u>anxiety</u>, and <u>alienation</u> in order to generate many non-cooperative centers of gravity, as well as subvert those that adversary depends upon, thereby magnify internal friction.

<u>Aim</u>

Destroy moral bonds that permit an organic whole to exist.

SUSPICION

The essence of moral conflict, as presented, seems to be one-sided and emphasizes the negative or dark side of one's moral make-up.

? — RAISES QUESTION — ?

How do we bring out the positive side? In other words—if courage, confidence, and esprit represent the positive counterweights to fear, anxiety, and alienation—what are the positive counterweights to menace, uncertainty, and mistrust?

<u>INSIGHT</u>

- In addressing this question we find that the counterweights to menace and uncertainty are not at all obvious unless we start with mistrust and work in reverse order. Proceeding in this way we note that:

  — The presence of mistrust implies that there is a rupture or loosening of the human bonds or connections that permit individuals to work as an organic whole <u>harmony</u> with one another. This suggests that harmony itself represents an appropriate counterweight to mistrust.

  — In dealing with uncertainty, <u>adaptability</u> seems to be the right counterweight. Otherwise, how can one adjust to the unforeseen or unpredictable nature of uncertainty?

  — Finally, with respect to menace one cannot be passive. Instead, <u>initiative</u> is needed otherwise menace may obliterate the benefits associated with harmony and adaptability. Intuitively, this suggests that initiative is the right counterweight here.

- Using these ideas, together with the previous ideas already uncovered, we can modify and enrich the essence of moral conflict as follows:

ESSENCE OF MORAL CONFLICT

<u>Negative Factors</u>

<u>Counterweights</u>

- <u>Menace</u>:

  Impressions of danger to one's well-being and survival

- <u>Uncertainty</u>:

  Impressions, or atmosphere, generated by events that appear ambiguous, erratic, contra-dictory, unfamiliar, chaotic, etc.

- <u>Mistrust</u>:

  Atmosphere of doubt and suspicion that loos-ens human bonds among members of an or-ganic whole or between organic wholes.

- <u>Initiative</u>:

  Internal drive to think and take action without being urged

- <u>Adaptability</u>:

  Power to adjust or change in order to cope with new or unforeseen circumstances

- <u>Harmony</u>:

  Interaction of apparently disconnected events or entities in a connected way
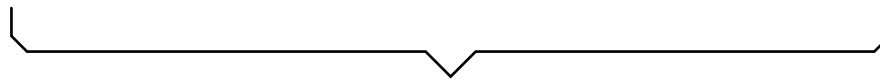
<u>Aim</u>

- Pump-up friction via negative factors to breed fear, anxiety, and alienation in order to generate many non-co-operative centers of gravity, as well as subvert those that adversary depends upon, thereby sever moral bonds that permit adversary to exist as an organic whole.

<u>Simultaneously,</u>

- Build-up and play counterweights against negative factors to diminish internal friction, as well as surface courage, confidence, and esprit, thereby make possible the human interactions needed to create moral bonds that permit us, as an organic whole, to shape and adapt to change.

SYNTHESIS

PATTERN FOR SUCCESSFUL OPERATIONS

- Goal

- Plan

- Action

- Support

- Command

PATTERNS FOR SUCCESSFUL OPERATIONS

<u>Goal</u>

- Diminish adversary's freedom-of-action while improving our freedom-of-action, so that our adversary cannot cope—while we can cope—with events/efforts as they unfold.

<u>Plan</u>

- Probe and test adversary to unmask strengths, weaknesses, maneuvers, and intentions.

- Employ a variety of measures that interweave menace–uncertainty–mistrust with tangles of ambiguity–deception–novelty as basis to sever adversary's moral ties and disorient or twist his mental images, hence mask–distort–magnify our presence and activities.

- Select initiative (or response) that is least expected.

- Establish focus of main effort together with other (related) effort and pursue directions that permit many happenings, offer many branches, and threaten alternative objectives.

- Move along paths of least resistance (to reinforce and exploit success).

- Exploit, rather than disrupt or destroy, those differences, frictions, obsessions, etc., of adversary organism that interfere with his ability to cope with unfolding circumstances.

- Subvert, disorient, disrupt, overload, or seize adversary's vulnerable, yet critical, connections, centers, and activities that provide cohesion and permit coherent observation–orientation–decision–action in order to dismember organism and isolate remnants for absorption or mop-up.

<u>Action</u>

- Observe-orient-decide-act more inconspicuously, more quickly, and with more irregularity as basis to keep or gain initiative as well as shape and shift main effort: to repeatedly and unexpectedly penetrate vulnerabilities and weaknesses exposed by that effort or other effort(s) that tie-up, divert, or drain-away adversary attention (and strength) elsewhere.

Support

- Superior mobile communications

- Only essential logistics
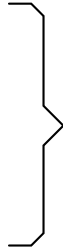
to maintain cohesion of overall effort and sustain appropriate pace of operations within available resources.

Command

- Decentralize, in a tactical sense, to encourage lower-level commanders to shape, direct, and take the sudden/sharp actions necessary to quickly exploit opportunities as they present themselves.

- Centralize, in a strategic sense, to establish aims, match ambitions with means/talent, sketch flexible plans, allocate resources, and shape focus of overall effort.

IMPRESSIONS

- <u>Plan</u> and <u>Action</u> statements suggest that we are trying to:

  — Penetrate adversary system and mask own system against his penetration;

  — Create a variety of impressions of what is occurring and what is about to occur;

  — Generate mismatches between what seems to be and what is;

  — Push adversary beyond his ability to adapt.

- Intentions that make up <u>Plan</u> cannot happen without application of transients that make up <u>Action</u>.

FIRST IMPRESSION

- Note how these strategic and tactical ideas, that we evolved from the <u>Plan</u> and <u>Action</u> statements, fit in nicely with the following comments by Napoleon:

  — "The art of land warfare is an art of genius, of inspiration. . . . A general never knows anything with certainty, never sees his enemy clearly, never knows positively where he is. When armies are face to face, the least accident in the ground, the smallest wood, may conceal part of the enemy army. The most experienced eye cannot be sure whether it sees the whole of the enemy's army or only three–fourths. It is by the mind's eye, by the integration of all reasoning, by a kind of inspiration that the general sees, knows, and judges."

  — "The first quality for a commander in chief is a cool head which receives a just impression of things; he should not allow himself to be confused by either good or bad news; the impressions which he receives successively or simultaneously in the course of a day should classify themselves in his mind in such a way as to occupy the place which they merit; because reason and judgment are the result of the comparison of various impressions taken into just consideration."

- Above comments, by Napoleon, reveal ever-present vulnerabilities and weaknesses that commanders and subordinates alike must accept.

<div align="center">hence</div>

- If we turn these comments around and connect them with the tactical and strategic ideas presented thus far, we surface a modern notion of grand tactics.

WHICH BECOMES:

<u>Grand Tactics</u>

> - Operate inside adversary's observation-orientation-decision-action loops, or get inside his mind- time-space, to create a tangle of threatening and/or non-threatening events/efforts as well as repeatedly generate mismatches between those events/efforts adversary observes, or anticipates, and those he must react to, to survive;
>
> thereby
>
> - Enmesh adversary in an amorphous, menacing, and unpredictable world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos . . . and/or fold adversary back inside himself;
>
> thereby
>
> - Maneuver adversary beyond his moral-mental-physical capacity to adapt or endure so that he can neither divine our intentions nor focus his efforts to cope with the unfolding strategic design or related decisive strokes as they penetrate, splinter, isolate or envelop, and over-whelm him.

SECOND IMPRESSION

Transients

- Observe, orient, decide, and act more inconspicuously, more quickly, and with more irregularity . . .

  or put another way

- Operate inside adversary's observation–orientation–decision–action loops or get inside his mind-time-space.

permits one to

Intentions

- Probe and test adversary to unmask strengths, weaknesses, maneuvers, and intentions.
- Employ a variety of measures that interweave menace–uncertainty–mistrust with tangles of ambiguity–deception–novelty as basis to <u>sever adversary's moral ties and disorient</u> . . .
- Select initiative (or response) that is least expected.
- Establish focus of main effort together with other effort and pursue directions that permit many happenings, offer many branches, and threaten alternative objectives.
- Move along paths of least resistance (to reinforce and exploit success).
- Exploit, rather than disrupt or destroy, those differences, frictions, and obsessions of adversary organism that interfere with his ability to cope . . .
- <u>Subvert</u>, <u>disorient</u>, <u>disrupt</u>, <u>overload</u>, or <u>seize</u> adversary's vulnerable, yet critical, connections, centers, and activities . . . in order to dismember organism and isolate remnants for wrap-up or absorption.
- Generate uncertainty, confusion, disorder, panic, chaos . . . to shatter cohesion, produce paralysis and bring about collapse.
- Become an extraordinary commander.

WHICH LEADS TO:

Strategy

Penetrate adversary's moral-mental-physical being to dissolve his moral fiber, disorient his mental images, disrupt his operations, and overload his system—as well as subvert, shatter, seize, or otherwise subdue those moral-mental-physical bastions, connections, or activities that he depends upon—in order to destroy internal harmony, produce paralysis, and collapse adversary's will to resist.

NOW ALTOGETHER

Tactics

- Observe–orient–decide–act more inconspicuously, more quickly, and with more irregularity as basis to keep or gain initiative as well as shape and shift main effort: to repeatedly and unexpectedly penetrate vulnerabilities and weaknesses exposed by that effort or other effort(s) that tie-up, divert, or drain-away adversary attention (and strength) elsewhere.

Grand Tactics

- Operate inside adversary's observation–orientation–decision–action loops, or get inside his mind–time–space, to create tangles of threatening and/or non-threatening events/efforts as well as repeatedly generate mismatches between those events/efforts adversary observes, or imagines, and those he must react to, to survive;

thereby

- Enmesh adversary in an amorphous, menacing, and unpredictable world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos . . . and/or fold adversary back inside himself;

thereby

- Maneuver adversary beyond his moral–mental–physical capacity to adapt or endure so that tie can neither divine our intentions nor focus his efforts to cope with the unfolding strategic design or related decisive strokes as they penetrate, splinter, isolate or envelop, and overwhelm him.

Strategy

- Penetrate adversary's moral–mental–physical being to dissolve his moral fiber, disorient his mental images, disrupt his operations, and overload his system, as well as subvert, shatter, seize, or otherwise subdue those moral–mental–physical bastions, connections, or activities that he depends upon, in order to destroy internal harmony, produce paralysis, and collapse adversary's will to resist.

Strategic Aim

- Diminish adversary's capacity while improving our capacity to adapt as an organic whole, so that our adversary cannot cope—while we can cope—with events/efforts as they unfold.

! — AN ALTERNATIVE PORTRAIT — !

Now, after some introspection, it is not difficult to see that these tactical and strategic statements are very definitely destructive in nature. Keeping these words in mind, while working backwards thru this presentation, one is left with the impression that the destructive attrition–maneuver–moral ideas played-out in the "Categories of Conflict" aren't much different than the tactical and strategic ideas that we have just discussed. As a consequence, by stripping-down and recombining the ideas associated with both these conceptual streams, we can evolve an alternative portrait of ruin as follows:

THEME FOR DISINTEGRATION AND COLLAPSE

Synthesize

- Lethal Effort:

  Tie-up, divert, or drain-away adversary attention and strength as well as (or thereby) overload critical vulnerabilities and generate weaknesses.

- Maneuver:

  Subvert, disorient, disrupt, overload, or seize those vulnerable yet critical connections, centers, and activities as basis to penetrate, splinter, and isolate remnants of adversary organism for mop-up or absorption.

- Moral:

  Create an atmosphere of fear, anxiety, and alienation to sever human bonds that permit an organic whole to exist.

Idea

- Destroy adversary's moral–mental–physical harmony, produce paralysis, and collapse his will to resist.

Aim

Render adversary powerless by denying him the opportunity to cope with unfolding circumstances.

<u>UNDERLYING INSIGHT</u>

Unless one can <u>penetrate</u> adversary's moral-mental-physical being, and sever those interacting bonds that permit him to exist as an organic whole, by being able to subvert, shatter, seize, or otherwise subdue those moral-mental-physical bastions, connections, or activities that he depends upon, one will find it exceedingly difficult, if not impossible, to collapse adversary's will to resist.

which leads to

<u>THE NAME-OF-THE-GAME</u>

Morally-mentally-physically <u>isolate</u> adversary from allies or any outside support as well as isolate elements of adversary or adversaries form on another and overwhelm them by being able to penetrate and splinter their moral-mental-physical being at any and all levels.

<u>? — RAISES QUESTION — ?</u>

How do we connect the tactical and strategic notions, or the theme for disintegration and collapse, with the national goal?

<u>—VIA A SENSIBLE GRAND STRATEGY THAT WILL:</u>

- Support national goal.

- Pump-up our resolve, drain-away adversary resolve, and attract the uncommitted.

- End conflict on favorable terms.

- Ensure that conflict and peace terms do not provide seeds for (unfavorable) future conflict.

<u>GRAND STRATEGY</u>

<u>Essence</u>

- Shape pursuit of national goal so that we not only amplify our spirit and strength (while undermining and isolating our adversaries) but also influence the uncommitted or potential adversaries so that they are drawn toward our philosophy and are empathetic toward our success.

<u>Basis</u>

- An appreciation for the underlying self-interests, critical differences of opinion, internal contradictions, frictions, obsessions, etc., that we as well as the uncommitted and any potential or real adversaries must contend with.

PATTERN

National Goal

- Improve our fitness, as an organic whole, to shape and cope with an ever-changing environment.

Grand Strategy

- Shape pursuit of national goal so that we not only amplify our spirit and strength (while undermining and isolating our adversaries) but also influence the uncommitted or potential adversaries so that they are drawn toward our philosophy and are empathetic toward our success.

Strategic Aim

- Diminish adversary's capacity while improving our capacity to adapt as an organic whole, so that our adversary cannot cope—while we can cope—with events/efforts as they unfold.

Strategy

- Penetrate adversary's moral–mental–physical being to dissolve his moral fiber, disorient his mental images, disrupt his operations, and overload his system, as well as subvert, shatter, seize, or otherwise subdue those moral–mental–physical bastions, connections, or activities that he depends upon, in order to destroy internal harmony, produce paralysis, and collapse adversary's will to resist.

Grand Tactics

- Operate inside adversary's observation–orientation–decision–action loops, or get inside his mind–time–space, to create tangles of threatening and/or non-threatening events/efforts as well as repeatedly generate mismatches between those events/efforts adversary observes, or imagines, and those he must react to, to survive;

<div align="center">thereby</div>

- Enmesh adversary in an amorphous, menacing, and unpredictable world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos . . . and/or fold adversary back inside himself;

<div align="center">thereby</div>

- Maneuver adversary beyond his moral–mental–physical capacity to adapt or endure so that he can neither divine our intentions nor focus his efforts to cope with the unfolding strategic design or related decisive strokes as they penetrate, splinter, isolate or envelop, and overwhelm him.

Tactics

- Observe–orient–decide–act more inconspicuously, more quickly, and with more irregularity as basis to keep or gain initiative as well as shape and shift main effort: to repeatedly and unexpectedly penetrate vulnerabilities and weaknesses exposed by that effort or other effort(s) that tie-up, divert, or drain-away adversary attention (and strength) elsewhere.

INSIGHT

On one hand, as shown on the previous chart, the national goal and grand strategy tend to be constructive in nature. On the other hand, the strategic aim, strategy, grand tactics, and tactics are destructive in nature and operate over a shorter time frame. In this sense, the upper two and the latter four notions, as expressed, appear to be in disharmony with one another. Yet, application of these latter four strategic and tactical notions permit real leadership to avoid high attrition, avoid widespread destruction, and gain a quick victory. This combined with shattered cohesion, paralysis, and rapid collapse demonstrated by the existing adversary regime, makes it appear corrupt, incompetent, and unfit to govern. Under these circumstances, leaders and statesmen offering generous terms can form the basis for a viable peace. In this sense, the first two and the latter four notions can be in harmony with one another.

FURTHER ELABORATION

Up to this point—by repeatedly adding, stripping-away, and recombining many different, yet similar, ideas and thoughts—we have examined the nature of conflict, survival, and conquest in many different ways. A review and further manipulation of the ideas and thoughts that make up these different ways suggests that, for success over the long haul and under the most difficult conditions, one needs some unifying vision that can be used to attract the uncommitted as well as pump-up friendly resolve and drive and drain-away or subvert adversary resolve and drive. In other words, what is needed is a vision rooted in human nature so noble, so attractive that it not only attracts the uncommitted and magnifies the spirit and strength of its adherents, but also undermines the dedication and determination of any competitors or adversaries. Moreover, such a unifying notion should be so compelling that it acts as a catalyst or beacon around which to evolve those qualities that permit a collective entity or organic whole to improve its stature in the scheme of things. Put another way, we are suggesting a need for a supra-orientation or center-of-gravity that permits leaders, and other authorities, to inspire their followers and members to enthusiastically take action toward confronting and conquering all obstacles that stand in the way. Such a scheme can be portrayed as follows:

THEME FOR VITALITY AND GROWTH

Ingredients Needed to Pursue Vision

- Insight

    Ability to peer into and discern the inner nature or workings of things.

- Initiative

    Internal drive to think and take action without being urged.

- Adaptability

    Power to adjust or change in order to cope with new or unforeseen circumstances.

- Harmony

    Power to perceive or create interaction of apparently disconnected events or entities in a connected way.

Unifying Vision

- A grand ideal, overarching theme, or noble philosophy that represents a coherent paradigm within which individuals as well as societies can shape and adapt to unfolding circumstances—yet offers a way to expose flaws of competing or adversary systems.

Aim

Improve fitness as an organic whole to shape and expand influence or power over the course of events in the world.

APPLICATION

COUNTERBLITZ
á la SUN TZU

COUNTERBLITZ
á la Sun Tzu

<u>Maneuver Scheme</u>

- Employ cheng/Nebenpunkte as basis to repeatedly and unexpectedly tie-up, divert, stretch-out, or drain-away adversary attention and strength in order to expose vulnerabilities and weaknesses for decisive stroke(s) by ch'i/Schwerpunkt.

<u>Aim</u>

- Blind-side adversary regardless of circumstances.

<u>COUNTERBLITZ</u>
á la Sun Tzu

<u>STRATEGY</u>

<u>Shape Adversary Impression</u>

Arrange elements of defense (in harmony with penchant for humans to generate mental patterns), as basis to guide adversaries to form or project patterns on the environment they are facing. In other words, emphasize certain features so that adversary intelligence, recce, patrols, and other observation activity generate mental pictures of what we seem to be doing. In this sense, we cause adversary to project tempo or rhythm as well as a sense of form or gestalt upon the environment. Naturally, this raises the question: How do we want our posture to appear to an adversary—or put another way, what kind of mental picture do we want him to generate in his mind?

COUNTERBLITZ
á la Sun Tzu

STRATEGY

How?

Set-up positions echeloned–in-depth (similar to German philosophy) with flexibility to quickly rotate or shift both front and flank maneuver schemes–yet convince adversary (with help from "shaping" and "disruption" agencies/activities—intelligence, electronic warfare, etc.) that he is facing, for example, an in-depth strong-point/checkerboard or multiple belts of an in depth linear or elastic defense. In this sense, we suggest three belts or bands behind the front as follows:

- Emphasize intelligence, reconnaissance (air and ground) and set-up screen of forward outposts and patrols to report on adversary activity and warn of any in pending or actual incursions.

- Deploy, disperse, and frequently redeploy/redisperse reconnaissance and mobile antitank/infantry/ armored teams together with artillery in region behind screen, so that they can mask dispositions, as well as move inconspicuously/quickly to focus and shift local main efforts against adversary thrusts.

- Place armored teams, as mobile reserve, in echelon behind recce, antitank/infantry/armor and artillery so that they can easily focus effort, and quickly move-in to decapitate any local breakthrough—or push-off for a blitz counterstroke.

COUNTERBLITZ
á la Sun Tzu

STRATEGY

Game

- Shift from such an ambiguous or misleading posture into a gauntlet defense with alternate channels, sectors, or zones by thinning-out some sectors or zones in order to strengthen others.

- Basic notion is to think in terms of channels, avenues and gauntlets (instead of just belts, bands and fronts) so that ambush gauntlets will naturally evolve or be set-up to deal with forward as well as lateral (roll-out) thrusts of adversary. In this way, ambush gauntlets can then be set-up at any level from platoon to theater.

COUNTERBLITZ
á la Sun Tzu

TACTICS

Basic Maneuver

- Use obstacles, delaying actions, hit-and-run attacks, and/or baited retreats in thinned-out sectors/zones together with "shaping" and "disruption" activities to disorient adversary as well as pile-up or stretch-out his maneuver. Combine this action with fire and movement into adversary flank and/or rear from strengthened adjacent sectors/zones to:

    — slow momentum and blow adversary away (during pile-up) or

    — channel momentum then decapitate and break-up cohesion of thrust (during stretch-out).

Mental Picture

- Think of obstacles, delay, hit-and-run, and baited retreats together with "shaping" and "disruption" activities as cheng or Nebenpunkte to create caps, exposed flanks, and vulnerable rears by the pile-up/congestion or stretch-out of adversary maneuver.

- Think of ch'i or Schwerpunkt maneuver (fire and movement) hitting unexpectedly thru gaps into adversary flank/rear, or blind-side, as a decisive stroke to pull enemy apart and roll-up his isolated remnants.

<u>COUNTERBLITZ</u>
á la Sun Tzu

<u>TACTICS</u>

<u>Action</u>

- Employ air and fast moving mobile/armored recce teams, with mobile antitank teams, artillery, and "shaping"/"disruption" activities in support, as Nebenpunkte to determine direction/strength of thrusts and (by local front/flank combinations) to continuously harass with repeated delaying actions and hit-and-run attacks. Object is to:

  — disorient adversary;

  — provide information to senior commanders to help them decide which sectors to thin-out and which to strengthen;

  — pile-up or stretch-out adversary maneuver to "shape" (or disrupt) tempo/rhythm and pattern of blitz attack as well as create gaps, exposed flanks, and vulnerable rears.

- Inconspicuously move-in with high-speed mobile antitank/infantry/armored teams together with air and artillery support as Schwerpunkt to strengthen appropriate sectors that flank adversary thrusts. From here, exploit gaps, or any other vulnerabilities and weaknesses, to ambush adversary with fire together with sudden/sharp flank and rear counterthrusts into his forward, roll-out, and resupply efforts moving through out thinned-out sectors. Object is to work Schwerpunkt in harmony with Nebenpunkte in order to break-up cohesion and roll-up isolated remnants of blitz thrusts.

COUNTERBLITZ
á la Sun Tzu

GRAND MANEUVER

Mental Picture

- Imagine the fluid cheng/ch'i or Nebenpunkte/Schwerpunkt counteroperations just discussed to be super Nebenpunkte operations that are used to tie—up or drain-away adversary strength. Idea is to set-up and launch a blitz counterstroke, or super Schwerpunkt, deep into adversary weakness while he (with his strength) is preoccupied in overcoming the challenge posed by the super Nebenpunkte operations.

Action

- Keep pressure on and continually force adversary to adapt to many abrupt and irregular changes generated by the ongoing super Nebenpunkte operations.

- When adversary is strung-out, or disconnected, and vulnerable: Unleash swift armored forces (held in reserve) together with air to hook-in behind and roll-up adversary blitz as well as push-off for a blitz counteroffensive. Shift forces, as appropriate, from local Nebenpunkte/Schwerpunkt operations (as well as from other sectors) into this super Schwerpunkt to both generate and exploit a decisive success.

<u>COUNTERBLITZ</u>
á la Sun Tzu

<u>CAUTION</u>

- Extensive use of many shallow, lower-level Nebenpunkte/Schwerpunkt actions across many sectors/zones drains-away resources needed for fewer but decisive large scale Nebenpunkte/Schwerpunkt operations.

- Furthermore, experience has shown, when under active pressure, it is difficult to disengage forces committed to these local efforts and shift them to the larger operation.

- In this sense, these many shallow lower-level actions or maneuvers across a broad front tend to take-on the character battle or <u>attrition</u> warfare while deep, large scale (up to theater level) Nebenpunkte/Schwerpunkt operations take-on the character of <u>strategic maneuver</u>.

COUNTERBLITZ
á la Sun Tzu

Underlying Idea

- Pull adversary apart and bring about his collapse by causing him to generate or project mental images that agree neither with the faster tempo/rhythm nor with the hidden form of the transient maneuver patterns to must compete against.

BLITZ/COUNTERBLITZ STRATEGIC DESIGN
OR
MANSTEIN DIVINED

OUTLINE

- BACKGROUND
- STRATEGIC DESIGN

<u>BACKGROUND</u>

- BATTLE OF LEUCTRA AND LEUTHEN
- BATTLE OF CANNAE
- SCHLIEFFEN STRATEGIC MANEUVER

OBSERVATION

Single envelopment schemes (á la Leuctra, Leuthen, or Schlieffen) take less force than double envelopment schemes (á la Marathon or Cannae) to achieve the same benefit.

STRATEGIC DESIGN

- POLAND
- FRANCE
- RUSSIA

POLAND 1–19 SEPTEMBER 1939
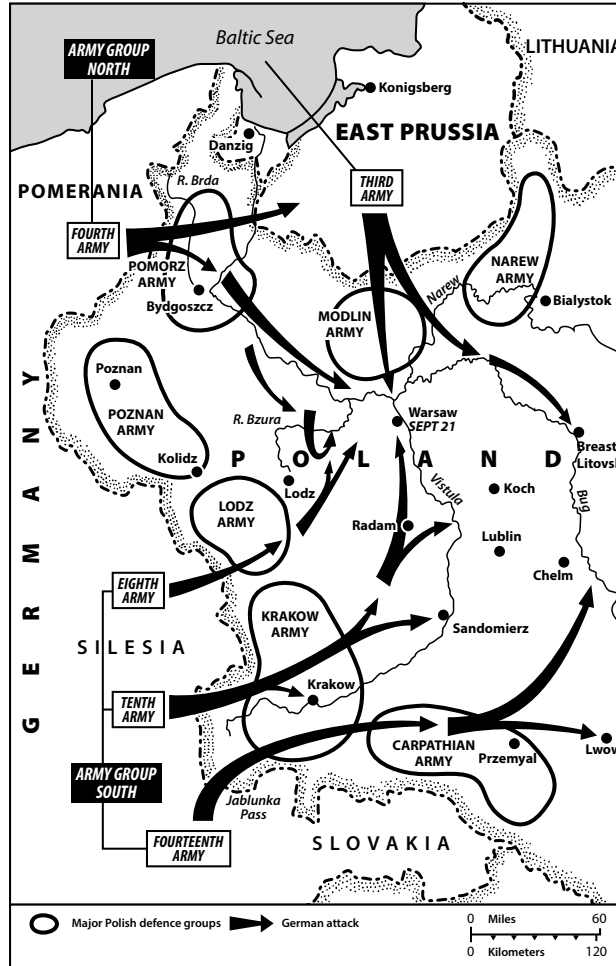
CONCENTRIC CANNAE WITH LEUCTRA/LEUTHEN UNDERTONE

POLAND (1939)

<u>KEY POINT</u>

GERMANS HAD MORE FORCES THAN POLES.

FRANCE (1940)

PHASE I

Phase II

Map (Phase I):

0 — 150 KM

HOLLAND
The Hague
Rotterdam
Dordrecht
Moerdijk
FR. 7th

ARMY GROUP B (back)

ENGLAND
Dover

MAY 26–JUNE 2 EVACUATED FROM DUNKIRK

GERMANY

Antwerp
Albert Canal

Dunkirk
Calais

BELG. ARMY

Brussels

St Omer
Boulogne
Aire
Lille
FR. 1st
Namur
FT. EBEN EMAEL

Maastricht

XXXIX PZ.CP. (Schmidt)
XVI PZ.CP. (Höppner)

XV PZ.CP. (Hoth)

ARMY GROUP A (Rundstedt)

B.E.F.

Abbeville
MAY 20
Arras
FR. 9th
Dinant
Givet

XLI PZ.CP. (Reinhardt)
XIX PZ.CP. (Guderian)

Amiens
Montherme
Charleville
St Menges
LUX

KLEIST'S PZ. GROUP

FRONT LINE JUNE 5

Aisne
Reims
FR. 2nd
MAGINOT LINE

FALL OF FRANCE 1940 (PHASE 1)

GERMAN INFANTRY & ARMORED ATTACKS
PANZER ATTACKS
GERMAN AIRBORNE LANDINGS MAY 10

ALLIED LINES AFTER FORWARD MOVEMENT OF LEFT SHOULDER
ARDENNES

Map (Phase II):

Brussels
BELGIUM
GERMANY

0 — 150 KM

ENGLISH CHANNEL
Abbeville

XV PZ.CP. (Hoth)
XIV & XVI PZ.CP. (Kleist)
2nd & 9th ARMIES
Péronne
XXXIX & XLI PZ.CP. (Guderian)
LUX

Cherborg
JUNE 19
Amiens
Laon

Compiégne
Creil
Reims
Châlons
MAGINOT LINE

Rennes
Alencon
Paris
June 14
Nancy

FRANCE

Orleans
Langres

Nantes
Tours
Dijon
JUNE 16

Limoges
Argenton
Vichy
SWITZERLAND

Geneva

BAY OF BISCAY
Royan
Limoges
Angoulême
Clermont Ferrand
Lyons
JUNE 20
Grenoble
ITALY

LINE OF GERMAN FORCES JUNE 25

FALL OF FRANCE 1940 (PHASE 2)

FRONT LINE JUNE 5
PANZER ATTACKS
FRENCH FORCES (SURROUNDED)

LEUCTRA/LEUTHEN

ECCENTRIC CANNAE WITH
LEUCTRA/LEUTHEN WINGS

FRANCE (1940)

KEY POINTS

- GERMANS HAD FEWER FORCES THAN ALLIES BEFORE PHASE I.
- GERMANS HAD MORE FORCES THAN ALLIES BEFORE PHASE II.

RUSSIA   JUNE 22–DECEMBER 5, 1941

SWEDEN

FINLAND

BALTIC SEA

Tallinn

Leningrad

ESTONIA

0 Miles 200

0 Kilometers 300

Riga

LATVIA

Rzhev

Klin

LITHUANIA

Dvinsk

Moscow

ARMY GROUP NORTH (Leeb)
inc. FOURTH PZ. GR, (Hoepner)

Vyasma

Kaunus

Vitebsk

Smolensk

Tula

EAST PRUSSIA

Orsha

GERMANY

Grodno

Minsk

Mogilev

Roslavl

ARMY GROUP CENTRE (Bock)
inc. THIRD PZ. GR, (Hoth)
SECOND PZ. GR. (Guderian)

Bialystok

Slonim

Rogachev

Briansk

Warsaw

Kobryn

Bobruisk

Gomel

Brest-Litovsk

Pripet Marshes

Novgorod Severski

POLAND

R   U   S   S   I   A

Luck

Korosten

Lwow

Brody

Kiev

Kharkov

ARMY GROUP SOUTH (Rundstedt)
inc. FIRST PZ. GR, (Kleist)

U   K   R   A   I   N   E

Dnepropetrovsk

HUNGARY

Rostov

Mariupol

Odessa

RUMANIA

BLACK SEA

CRIMEA

YUGOSLAVIA

Sevastopol

The Drive into Russia

➤ **Main German attacks**

— — **Front line September 1, 1941**

⬅ **Russian counterstrikes**

▪ **Main Russian pockets**

····· **Front line December 5, 1941**

<u>RUSSIA 1941</u>

<u>KEY POINT</u>

GERMANS HAD FEWER FORCES THAN RUSSIANS.

CAUCASUS/STALINGRAD
28 MAY–28 NOVEMBER 1942

N

Belgorod
Volchansk
Kharkov
8th ARMY
Krasnograd
Kupiansk
Izyum
May 26
May 12
Slavyansk

RUSSIAN DEFENSIVE MAY 12, 1942
GERMAN C/ OFFENSIVE MAY 17/26

2nd ARMY
Kursk
4th PANZER ARMY
Voronezh
ARMY GROUP B
Belgorad
8th ARMY
Kharkov
Izyum
ARMY GROUP SOUTH
Rossosh
Chertkovo
Don
8th Army
1st PANZER ARMY
Millerovo
Stalingrad
Kalach
ARMY GROUP A
Kamersk
ARMY GROUP B
17th ARMY
Taganrog
Rostov
Kotelnikovo
Volga
4th PANZER ARMY
Proletarskaya
Astrakhan
Manych
ARMY GROUP A
K A L M U K S T E P P E
SEA OF AZOV
Kerch
Kuban
Krasnodor
Stavropol
Budenovak
C A S P I A N S E A
Armavir
1st PANZER ARMY
MAY 8
11th ARMY
Novorossiysk
Maikop
Pyatigorsk
Mozdok
Taupse
Nalchik
Grozny
B L A C K   S E A
C A U C A S U S
Alagir
Ordzhenikidze
Mountains
ROSTOV-TBLISI HIGHWAY
Batumi
Tbilisi

T U R K E Y

0   100   200   300 KM

GERMAN ARMOURED ATTACKS ➡
GERMAN INFANTRY ATTACKS ⇨

GERMAN ADVANCE TO STALINGRAD

FRONT LINE MAY 28, 1942 ——
FRONT LINE JULY 22, 1942 ········
FRONT LINE NOV 18, 1942 — — —

BLITZ/COUNTERBLITZ STRATEGIC DESIGN

Leuctra/Leuthen/Schlieffen

- Manstein – France (Phase I) 1940

- ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?

- Manstein – Kerch Peninsula 1942

- OKW/OKH – Caucasus/Stalingrad counterstroke 1942

- Manstein – Donetz counterstroke 1943

- Manstein proposal – counterstroke from Kharkov to Sea of Azov 1943

- Rundstedt/Rommel proposal – Normandy 1944

- Ardennes – 1944–45

Cannae—with Leuctra/Leuthen/Schlieffen Undertone

- Poland – 1939

- France (Phase II) – 1940

- Russia – 1941

- Kursk – 1943

? — NATURAL QUESTION — ?

HOW COME GERMANS DID NOT ATTEMPT A LEUCTRA/LEUTHEN
STRATEGIC MANEUVER AGAINST RUSSIA IN 1941?

B. H. LIDDELL HART — *THE GERMAN GENERALS TALK* — 1948

Page 184

<u>Rundstedt</u>

"The 1941 operations in Russia should, in my opinion have had their main effort directed, not at first towards Moscow, but towards Leningrad. That would have linked up with the Finns. Then, in the next stage, should have come an attack on Moscow from the north, in cooperation with the advance of Field Marshal von Bock's Army Group from the west."

BLITZ/COUNTERBLITZ STRATEGIC DESIGN

Leuctra/Leuthen/Schlieffen

- Manstein – France (Phase I) 1940

- Rundstedt proposal – thrust to Leningrad followed by thrust (roll-up) to south and take Moscow – 1941

- Manstein – Kerch Peninsula 1942

- OKW/OKF – Caucasus/Stalingrad counterstroke 1942

- Manstein – Donetz counterstroke 1943

- Manstein proposal – counterstroke from Kharkov to Sea of Azov 1943

- Rundstedt/Rommel proposal – Normandy 1944

- Ardennes – 1944–45

Cannae—with Leuctra/Leuthen/Schlieffen Undertone

- Poland – 1939

- France (Phase II) – 1940

- Russia – 1941

- Kursk – 1943

MESSAGE

Only Manstein (and few others) knew how to synthesize and apply the experiences and ideas of <u>Napoleon</u>, <u>Clausewitz</u>, <u>Jomini</u>, <u>Moltke</u>, and <u>Schlieffen</u> in a strategic as well as a grand tactical sense.

WRAP-UP

WRAP-UP

Message

- He who is willing and able to take the <u>initiative</u> to exploit <u>variety</u>, <u>rapidity</u>, and <u>harmony</u>—as the basis to create as well as adapt to the more indistinct — more irregular — quicker changes of rhythm and pattern, yet shape the focus and direction of effort—survives and dominates.

or contrariwise

- He who is unwilling or unable to take the <u>initiative</u> to exploit <u>variety</u>, <u>rapidity</u>, and <u>harmony</u> . . . goes under or survives to be dominated.

WRAP-UP

<u>Game</u>

- Create tangles of threatening and/or non-threatening events/efforts as well as repeatedly generate mismatches between those events/efforts adversary observes or imagines (Cheng/Nebenpunkte) and those he must react to (Ch'i/Schwerpunkt)

as basis to

- Penetrate adversary organism to sever his moral bonds, disorient his mental images, disrupt his operations, and overload his system, as well as subvert, shatter, seize, or otherwise subdue those moral–mental–physical bastions, connections, or activities that he depends upon

thereby

- Pull adversary apart, produce paralysis, and collapse his will to resist.

<u>How</u>

- Get inside adversary observation–orientation–decision–action loops (at all levels) by being more subtle, more indistinct, more irregular, and quicker—yet appear to be otherwise.

WRAP-UP

<u>Implications</u>

- In a <u>tactical sense</u>, these multi-dimensional interactions suggest a <u>spontaneous</u>, <u>synthetic/creative</u>, and <u>flowing</u> action/counteraction operation, rather than a <u>step-by-step</u>, <u>analytical/logical</u>, and <u>discrete</u> move/countermove game.

  — In accepting this idea we must admit that increased unit complexity (with magnified mental and physical task loadings) does not enhance the spontaneous synthetic/creative operation. Rather, it constrains the opportunity for these timely actions/counteractions.

  or put another way

  — Complexity (technical, organizational, operational, etc.) causes commanders and subordinates alike to be captured by their own internal dynamics or interactions—hence they cannot adapt to rapidly changing external (or even internal) circumstances.

- In a <u>strategic sense</u>, these interactions suggest we need a <u>variety</u> of possibilities as well as the <u>rapidity</u> to implement and shift among them. Why?

  — Ability to <u>simultaneously</u> and <u>sequentially</u> generate <u>many different</u> possibilities as well as <u>rapidly</u> implement and shift among them permits one to repeatedly generate mismatches between events/ efforts adversary observes or imagines and those he must respond to (to survive).

  — Without a <u>variety</u> of possibilities, adversary is given the opportunity to read as well as adapt to events and efforts as they unfold.

WRAP-UP

- Alternatively—by stripping away and recombining some of the comments associated with "Clausewitz", "Grand Tactics", "Message", "Game", "How", and "Implications"—we can say:

  — <u>Variety/Rapidity</u> allow one to:

    Magnify adversary friction hence stretch-out his time to respond in a directed way.

  — <u>Harmony/Initiative</u> permit on to:

    Diminish own friction hence compress own time to exploit variety/rapidity in a directed way.

  — Altogether <u>Variety/Rapidity/Harmony/Initiative</u> enable one to:

    Operate inside adversary's observation–orientation–decision–action loops to enmesh adversary in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos, . . . and/or fold adversary back inside himself so that he cannot cope with events/efforts as they unfold.

- Simultaneously—by repeatedly rolling-thru OODA loops while appealing to and making use of the ideas embodied in "Grand Strategy" and "Theme for Vitality and Growth"—we can:

  — Evolve and exploit <u>Insight/Initiative/Adaptability/Harmony</u> as basis to:

    Shape or influence events so that we not only amplify our spirit and strength (while isolating our adversaries and undermining their resolve and drive) but also influence the uncommitted or potential adversaries so that they are drawn toward our philosophy and are empathetic toward our success.

WRAP-UP

—or summarizing in another, yet similar way—

We have in a nutshell:

The Art of Success

- Appear to be an unsolvable cryptogram while operating in a directed way to penetrate adversary vulnerabilities and weaknesses in order to isolate him from his allies, pull him apart, and collapse his will to resist.

yet

- Shape or influence events so that we not only magnify our spirit and strength but also influence potential adversaries as well as the uncommitted so that they are drawn toward our philosophy and are empathetic toward our success.

EPILOGUE

<u>COMMENT</u>

- Reflection upon the previous discussion and reflection upon the various principles of war that are bandied about leave one unsettled about the real value associated with these principles.

- To illustrate, let's take a look at some of the principles of war (or military art).

PRINCIPLES OF WAR

USA	United Kingdom	Soviet Union	France
• Objective	• Aim/goal	• Mobility/tempo	• Concentration of efforts
• Offensive	• Coordination	• Concentration of efforts	• Freedom of action
• Mass	• Offensive	• Surprise	• Economy of forces
• Economy of forces	• Freedom of action	• Combat activeness	
• Maneuver	• Concentration	• Preservation of combat effectiveness	
• Unity of command	• Economy of efforts	• Conformity of goal/plan to actual situation	
• Security	• Surprise	• Coordination/interworking	
• Surprise	• Security		
• Simplicity	• Morale		
	• Control of rear		

CRITIQUE

- A list of principles does not reveal how individual principles interact nor the mechanism for doing so.

- Scientific laws and principles are the same for all countries and tend to change little over time. On the other hand, we note that the principles of war are different for different countries and change more dramatically over time. Furthermore, they do not make evident the importance of variety/rapidity/harmony/initiative as basis to shape and adapt to circumstances—a necessary requirement for success in the uncertain and ever-changing environment of conflict or war.

- This would suggest that the principles are not principles. Instead, they seem to be some kind of a (shifting) static checklist or laundry list of what should be adhered to.

ALTERNATIVE POSSIBILITY

- With this critique in mind, if we still feel we need some guidance, why not evolve statements that reflect the essence of conflict dynamics in a connected sense?

<center>or put another way</center>

- Why not collect appropriate bits and pieces and assemble them in a coherent way to present a more satisfying picture?

APPROPRIATE BITS AND PIECES

- Compress own time and stretch-out adversary time.

- Generate unequal distributions as basis to focus moral–mental–physical effort for local superiority and decisive leverage.

- Diminish own friction (or entropy) and magnify adversary friction (or entropy).

- Operate inside adversary's observation—orientation–decision–action loops or get inside his mind–time–space.

- Penetrate adversary organism and bring about his collapse.

- Amplify our spirit and strength, drain-away adversaries' and attract the uncommitted.

CENTRAL THEME

Evolve and exploit insight/initiative/adaptability/harmony together with a unifying vision, via a grand ideal or an overarching theme or a noble philosophy, as basis to:

- Shape or influence events so that we not only amplify our spirit and strength but also influence the uncommitted or potential adversaries so that they are drawn toward our philosophy and are empathetic toward our success,

<div align="center">yet be able to</div>

- Operate inside adversary's observation–orientation–decision–action loops or get inside his mind–time–space as basis to:
- Penetrate adversary's moral–mental–physical being in order to isolate him from his allies, pull him apart, and collapse his will to resist.

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ORGANIC DESIGN
for
COMMAND AND CONTROL

May 1987

John R. Boyd

THE TITLE CHART PROVOKES A COUPLE OF QUESTIONS:

- Why the focus on command and control (C&C)?

- What do we mean by organic design?

FAILURES

The past few years have seen the fiascos associated with <u>Nifty Nugget</u> and <u>Proud Spirit</u> C&C exercises together with the real world fiascos epitomized by the evacuation of Saigon, Desert I, and others.

RESPONSE

The institutional response for overcoming these fiascos is: more and better sensors, more communications, more and better computers, more and better display devices, more satellites, more and better fusion centers, etc.—all tied into one giant, fully informed, fully capable C&C system. This way of thinking emphasizes hardware as the solution.

ANOTHER WAY

I think there is a different way—a way that emphasizes the implicit nature of human beings. In this sense, the following discussion will uncover what we mean by both implicit nature and organic design.

<u>IMPLICATIONS</u>

- Need <u>insight and vision</u>, to unveil adversary plans and actions as well as "foresee" own goals and appropriate plans and actions.

- Need <u>focus and direction</u>, to achieve some goal or aim.

- Need <u>adaptability</u>, to cope with uncertain and ever-changing circumstances.

- Need <u>security</u>, to remain unpredictable.

ELABORATION

- Why insight and vision? Without insight and vision there can be no <u>orientation</u> to deal with both <u>present</u> and <u>future</u>.

- Why focus and direction? Without focus and direction, implied or explicit, there can be neither <u>harmony</u> of effort nor <u>initiative</u> for vigorous effort.

- Why adaptability? Adaptability implies <u>variety</u> and <u>rapidity</u>. Without variety and rapidity one can neither be unpredictable nor cope with changing and unforeseen circumstances.

- Why security? Without security one becomes predictable, hence one loses the benefits of the above.

Comment

With these thoughts in mind let's take a look at some appropriate samples from the historical environment that will, as we shall see, prove useful before trying to evolve any operational philosophy or command and control concept.

SAMPLES FROM HISTORICAL ENVIRONMENT

- Sun Tzu (around 400 BC)

  Probe enemy to unmask his strengths, weaknesses, patterns of movement and intentions. Shape enemy's perception of world to manipulate/undermine his plans and actions. Employ Cheng/Ch'i maneuvers to quickly and unexpectedly hurl strength against weaknesses.

- Bourcet (1764–71)

  "A plan ought to have several branches. . . . One should . . . mislead the enemy and make him imagine that the main effort is coming at some other part. And . . . one must be ready to profit by a second or third branch of the plan without giving one's enemy time to consider it."

- Napoleon (early 1800s)

  "Strategy is the art of making use of time and space. I am less chary of the latter than the former. Space we can recover, time never. . . . I may lose a battle, but I shall never lose a minute. The whole art of war consists in a well-reasoned and circumspect defensive, followed by rapid and audacious attack."

- Clausewitz (1832)

  Friction (which includes the interaction of many factors, such as uncertainty, psychological/moral forces and effects, etc.) impedes activity. "Friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper." In this sense, friction represents the climate or atmosphere of war.

- Jomini (1836)

  By free and rapid movements carry bulk of the forces (successively) against fractions of the enemy.

SAMPLES FROM HISTORICAL ENVIRONMENT (continued)

- N. B. Forrest (1860s)

  "Git thar the fustest with the mostest."

- Blumentritt (1947)

  "The entire operational and tactical leadership method hinged upon . . . rapid, concise assessment of situations . . . quick decisions and quick execution, on the principle: 'each minute ahead of the enemy is an advantage.' "

- Balck (1980)

  Emphasis upon creation of implicit connections or bonds based upon trust, not mistrust, that permit wide freedom for subordinates to exercise imagination and initiative—yet, harmonize within intent of superior commanders. Benefit: internal simplicity that permits rapid adaptability.

- Yours Truly

  Operate inside adversary's observation, orientation, decision, action loops to enmesh adversary in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic chaos . . . and/or fold adversary back inside himself so that he cannot cope with events/efforts as they unfold.

KEY POINTS

- The atmosphere of war is friction.

- Friction is generated and magnified by menace, ambiguity, deception, rapidity, uncertainty, mistrust, etc.

- Friction is diminished by implicit understanding, trust, cooperation, simplicity, focus, etc.

- In this sense, variety and rapidity tend to magnify friction, while harmony and initiative tend to diminish friction.

IN OTHER WORDS

- Variety/rapidity without harmony/initiative lead to confusion, disorder, and ultimately to chaos.

<div align="center">on the other hand</div>

- Harmony/initiative without variety/rapidity lead to (rigid) uniformity, predictability, and ultimately to non-adaptability.

? — RAISES THE QUESTION — ?

- How do we generate harmony/initiative so that we can exploit variety/rapidity?

COMMENT

- We must uncover those <u>interactions</u> that foster harmony and initiative—yet do not destroy variety and rapidity.

INTERACTIONS

Positive

Activities	Linkages
• Radio transmission/reception	• Common frequencies
• Conversation/writing	• Common language
• Operational Intelligence Center	• Correlation among multiple sources
• Teamwork	• Harmony of different efforts
• Tradeoffs	• Inversely related characteristics
• Hans Rudel	• Image of activities and changes thereto

Negative

• Compartmentation	• Disconnected bits and pieces
• Noncooperative centers of gravity	• Islands of disconnected effort
• Alienation	• Disconnected from other humans
• Nonadaptation	• Disconnected from environment
• Fixed recipe	• Disconnected from environment, but connected to some formality

INSIGHT

Interactions, as shown, represent a <u>many-sided implicit cross-referencing process of projection</u>, <u>empathy</u>, <u>correlation</u>, <u>and rejection</u>.

SUSPICION

Seems as though this insight is related in some way to orientation, hence it . . .

? — RAISES THE QUESTION— ?

What do we mean by orientation?

MESSAGE

Orientation, <u>seen as a result</u>, represents images, views, or impressions of the world shaped by <u>genetic heritage</u>, <u>cultural tradition</u>, <u>previous experiences</u>, and <u>unfolding circumstances</u>.

? — RAISES ANOTHER QUESTION — ?

How are these images, views, or impressions created?

MESSAGE

Referring back to our previous discussion, we can say: orientation <u>is an interactive process of many-sided implicit cross-referencing projections, empathies, correlations, and rejections</u> that is <u>shaped by</u> and <u>shapes</u> the interplay <u>of genetic heritage, cultural tradition, previous experiences,</u> and <u>unfolding circumstances</u>.

ILLUMINATION

- Orientation is the Schwerpunkt (or focal point). It shapes the way we interact with the environment—hence <u>orientation</u> shapes the way we <u>observe</u>, the way we <u>decide</u>, the way we <u>act</u>. In this sense

- Orientation shapes the character of present observation, orientation, decision, action loops—while these <u>present</u> loops shape the character of <u>future</u> orientation.

IMPLICATION

- We need to create mental images, views, or impressions, hence patterns that match with activity of world.

- We need to deny adversary the possibility of uncovering or discerning patterns that match our activity, or other aspects of reality in the world.

ESSENTIAL IDEA

Patterns (hence, orientation), right or wrong or lack thereof, suggest ability or inability to conduct many-sided implicit cross-references.

? — RAISES QUESTION — ?

How do we set-up and take advantage of the many-sided implicit cross-referencing process of projection, empathy, and correlation, rejection that make appropriate orientation possible?

MESSAGE

Expose individuals, with different skills and abilities, against a variety of situations—whereby each individual can <u>observe</u> and <u>orient</u> himself simultaneously to the others and to the variety of changing situations.

? — WHY — ?

In such an environment, a harmony, or focus and direction, in operations is created by the bonds of <u>implicit communications</u> and <u>trust</u> that evolve as a consequence of the similar mental images or impressions each individual creates and commits to memory by repeatedly sharing the <u>same</u> variety of experiences in the <u>same</u> ways.

BENEFICIAL PAYOFF

A command and control system, whose secret lies in what's unstated or not communicated to one another (in an explicit sense)—in order to exploit lower-level initiative yet realize higher-level intent, thereby diminish friction and compress time, hence gain both quickness and security.

? — RAISES QUESTION — ?

What happens if we <u>cannot establish these implicit connections or bonds</u>—via similar mental images or impressions—as basis to cope with a many-sided uncertain and ever-changing environment?

ILLUMINATION

- The previous discussion assumes interaction with both the <u>external</u> and <u>internal</u> environment. Now, let us assume, for whatever reason or combination of circumstances, that we design a command and control system that hinders interaction with <u>external</u> environment. This implies a focus inward, rather than outward.

- Picking up on this idea, we observe from Darwin that:

    — The environment selects.

    — Ability or inability to interact and adapt to exigencies of environment select one <u>in</u> or <u>out</u>.

- Furthermore, according to the Gödel Proof, the Heisenberg Uncertainty Principle, and the Second Law of Thermodynamics:

    — One cannot determine the character or nature of a system within itself.

    — Moreover, attempts to do so lead to confusion and disorder. Why? Because in the "real world" the environment intrudes (my view).

- Now, by applying the ideas of Darwin, the Second Law, Heisenberg, and Gödel to Clausewitz one can see that:

    He who can generate many non-cooperative centers of gravity magnifies friction. Why? Many noncooperative centers of gravity within a system restrict interaction and adaptability of system with its surroundings, thereby leading to a focus inward (i.e., within itself), which in turn generates confusion and disorder, which impedes vigorous or directed activity, hence, by definition, magnifies friction or entropy.

<u>POINT</u>

- Any command and control system that forces adherents to look inward, leads to dissolution/disintegration (i.e., system comes unglued).

<u>IN A MUCH LARGER SENSE</u>

- <u>Without the implicit bonds or connections</u>, associated with similar images or impressions, there can be <u>neither harmony nor individual initiative</u> within a collective entity, therefore, <u>no way</u> that such an organic whole can stay together and cope with a many-sided uncertain and ever-changing environment. Or equivalently,

- <u>Without implicit bonds or connections</u>, we magnify friction, produce paralysis, and get system collapse.

INSIGHT

The key idea is to emphasize <u>implicit</u> over explicit in order to gain a favorable mismatch in <u>friction</u> and <u>time</u> (i.e., ours lower than any adversary) for superiority in shaping and adapting to circumstances.

? — RAISES QUESTION — ?

How do we do this?

MESSAGE

- Suppress tendency to build-up <u>explicit internal</u> arrangements that <u>hinder interaction</u> with <u>external</u> world.

Instead

- Arrange setting and circumstances so that leaders and subordinates alike are given opportunity to continuously <u>interact</u> with <u>external</u> world, and with each other, in order to <u>more quickly</u> make many-sided implicit cross-referencing projections, empathies, correlations, and rejections as well as create the similar images or impressions, hence a similar implicit orientation, needed to form an organic whole.

Why?

- A <u>similar implicit orientation</u> for commanders and subordinates alike will allow them to:
  — Diminish their friction and reduce time, thereby permit them to:
  — Exploit variety/rapidity while maintaining harmony/initiative, thereby permit them to:
  — Get inside adversary's OODA loops, thereby:
  — Magnify adversary's friction and stretch-out his time (for a favorable mismatch in friction and time), thereby:
  — Deny adversary the opportunity to cope with events/efforts as they unfold.

CIRCLING BACK TO THE BEGINNING

- We can see that <u>implicit orientation</u> shapes the character of:

  — Insight and vision

  — Focus and direction

  — Adaptability

  — Security

IMPLICATION

- Since a first rate command and control system should possess above qualities, any design or related operational methods should play to and expand, not play down and diminish, <u>implicit orientation</u>.

COMMENT

Up to this point we have shown <u>orientation</u> as being a critical element in command and control—implying that without orientation there is no command and control worthy of the name.

VERY NICE

But, simply stated, what does this comment and everything else we've discussed so far tell us about command and control?

ILLUMINATION

- The process of observation, orientation, decision, action represents what takes place during the command and control (C&C) process—which means that the OODA loop can be thought of as being the C&C loop.

- The second O, orientation—as the repository of our genetic heritage, cultural tradition, and previous experiences—is the <u>most important part</u> of the OODA loop since it shapes the way we observe, the way we decide, the way we act.

IMPLICATION

- Operating inside adversary's OODA loop means the same thing as operating inside adversary's C&C loop.

<u>WHICH</u>

<u>? — RAISES THE QUESTION — ?</u>

How can we get effective command and control?

SOME HISTORICAL SNAPSHOTS

In responding to this question let us take a look at some evidence (provided by Martin van Creveld as well as myself) that may help in this regard:

- Napoleon's use of staff officers for personal reconnaissance

- Moltke's message "directives" of few words

- British tight control at the Battle of the Somme in 1916

- British GHQ (general headquarters) "phantom" recce regiment in WW II

- Patton's "household cavalry"

- My use of "legal eagle" and comptroller at NKP.*

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*Nakohon Phanom Royal Thai Air Force Base, Thailand

A RICHER VIEW
(á la Martin Creveld—"Command"—1982)

In the June 1967 War, " . . . General Yeshayahu Gavish spent most of his time either 'accompanying' units down to brigade level—by which, according to his own definition, he meant staying at that unit's command post and observing developments at first hand—or else helicoptering from one unit to another; again, in his own words, 'there is no alternative to looking into a subordinate's eyes, listening to his tone of voice.' Other sources of information at his disposal included the usual reporting system; a radio network linking him with three divisional commanders, which also served to link those commanders with each other; a signals staff whose task it was to listen in to the divisional communications networks, working around the clock and reporting to Gavish in writing; messages passed from the rear, i.e., from General Headquarters in Tel Aviv, linked to Gavish by 'private' radiotelephone circuit; and the results of air reconnaissance forwarded by the Air Force and processed by Rear Headquarters. Gavish did not depend on these sources exclusively, however; not only did he spend some time personally listening in to the radio networks of subordinate units (on one occasion, Gavish says, he was thereby able to correct an 'entirely false' impression of the battle being formed at Brigadier Gonen's headquarters) but he also had a 'directed telescope' in the form of elements of his staff, mounted on half tracks, following in the wake of the two northern-most divisions and constantly reporting on developments."

POINT

The previous discussion once again reveals our old friend—the many-sided implicit cross-referencing process of projection, empathy, correlation, and rejection.

? — RAISES QUESTION — ?

Where does this lead us?

EPITOME OF "COMMAND AND CONTROL"

Nature

- Command and control must permit one to direct and shape what is to be done as well as permit one to modify that direction and shaping by assessing what is being done.

What does this mean?

- Command must give direction in terms of what is to be done in a clear unambiguous way. In this sense, command must interact with system to shape the character or nature of that system in order to realize what is to be done; whereas

- Control must provide assessment of what is being done also in a clear unambiguous way. In this sense, control must not interact nor interfere with system but must ascertain (not shape) the character/nature of what is being done.

Implication

- Direction and shaping, hence "command", should be evident while assessment and ascertainment, hence "control", should be invisible and should not interfere—otherwise "command and control" does not exist as an effective means to improve our fitness to shape and cope with unfolding circumstances.

ILLUMINATION

- Reflection upon the statements associated with the Epitome of "Command and Control" leave one unsettled as to the accuracy of these statements. Why? Command, by definition, means to direct, order, or compel while control means to regulate, restrain, or hold to a certain standard as well as to direct or command.

- Against these standards it seems that the command and control (C&C) we are speaking of is different than the kind that is being applied. In this sense, the C&C we are speaking of seems more closely aligned to <u>leadership</u> (rather than command) and to some kind of <u>monitoring</u> ability (rather than control) that permits leadership to be effective.

- In other words, leadership with monitoring, rather than C&C, seems to be a better way to cope with the multi-faceted aspects of uncertainty, change, and stress. On the other hand, monitoring, per se, does not appear to be an adequate substitute for control. Instead, after some sorting and reflection, the idea of <u>appreciation</u> seems better. Why? First of all, appreciation includes the recognition of worth or value and the idea of clear perception as well as the ability to monitor. Moreover, next, it is difficult to believe that leadership can even exist without appreciation.

- Pulling these threads together suggests that <u>appreciation and leadership</u> offer a more appropriate and richer means than C&C for shaping and adapting to circumstances.

? — RAISES QUESTION — ?

Where does this lead us?

APPRECIATION AND LEADERSHIP

Nature

- Appreciation and leadership permit one to discern, direct, and shape what is to be done as well as permit one to modify the direction and shaping by assessing what is being done or about to be done (by friendlies as well as adversaries).

What does this mean?

- Appreciation, as part of leadership, must provide assessment of what is being done in a clear unambiguous way. In this sense, appreciation must not interact nor interfere with system but must discern (not shape) the character/nature of what is being done or about to be done;

whereas

- Leadership must give direction in terms of what is to be done also in a clear unambiguous way. In this sense, leadership must interact with system to shape the character or nature of that system in order to realize what is to be done.

Implication

- Assessment and discernment should be invisible and should not interfere with operations while direction and shaping should be evident to system—otherwise appreciation and leadership do not exist as an effective means to improve our fitness to shape and cope with unfolding circumstances.

SUSPICION

The previous discussion suggests that the title "Organic Design for Command and Control" is not appropriate.

? — WHY — ?

C&C represents a top-down mentality applied in a rigid or mechanical (or electrical) way that ignores as well as stifles the <u>implicit</u> nature of human beings to deal with uncertainty, change, and stress. (Examples: The Battle of the Somme, Evacuation of Saigon, Mayaguez Affair, Desert I, Nifty-Nugget, and Proud Spirit C&C exercises, etc.).

RESOLUTION

With these thoughts in mind, I suggest that the following title more clearly reflects the spirit and content of this presentation.

<u>APPRECIATION AND LEADERSHIP</u>

<u>DEFINITIONS</u>

- Understanding — means to comprehend or apprehend the import or meaning of something.

- Command — refers to the ability to direct, order, compel with or without authority or power.

- Control — means to have power or authority to regulate, restrain, verify, (usually against some standard) direct or command. Comes from medieval Latin *contrarotulus*, a "counter roll" or checklist (*contra*, against plus *rotulus*, list).

- Monitoring — refers to the process that permits one to oversee, listen, observe, or keep track of as well as to advise, warn, or admonish.

- Appreciation — refers to the recognition of worth or value, clear perception, understanding, comprehension, discernment, etc.

- Leadership — implies the art of inspiring people to cooperate and enthusiastically take action toward the achievement of uncommon goals.

THE STRATEGIC GAME

OF

?   AND   ?

June 1987

John R. Boyd

? — RAISES QUESTION — ?

What lies hidden under the question marks?

Put Simply

That is what the aim or purpose of this presentation is all about—to find and make evident what lies hidden under the question marks!

<u>FOR OPENERS</u>

What is Strategy?

<u>Outline</u>

- What is strategy?

- What is the aim or purpose of strategy?

- What is the central theme and what are the key ideas that underlie strategy?

- How do we play to this theme and activate these ideas?

<u>APPROACH</u>

- Make a general survey

- Condense to essential elements

- Place in strategic perspective

- Implementation

? — RAISES QUESTION — ?

Why do we want to use this approach?

ILLUSTRATION

- Imagine that you are on a ski slope with other skiers—retain this image.

- Imagine that you are in Florida riding in an outboard motorboat—maybe even towing water-skiers—retain this image.

- Imagine that you are riding a bicycle on a nice spring day—retain this image.

- Imagine that you are a parent taking your son to a department store and that you notice he is fascinated by the tractors or tanks with rubber caterpillar treads—retain this image.

<u>NOW IMAGINE THAT YOU:</u>

- Pull skis off ski slope; discard and forget rest of image.

- Pull outboard motor out of motorboat; discard and forget rest of image.

- Pull handlebars off bicycle; discard and forget rest of image.

- Pull rubber treads off toy tractors or tanks; discard and forget rest of image.

THIS LEAVES US WITH

Skis, outboard motor, handlebars, rubber treads

PULLING ALL THIS TOGETHER

What do we have?

SNOWMOBILE

? — WHAT DOES THIS EXAMPLE SUGGEST — ?

To discern what is going on we must interact in a variety of ways with our environment.

IN OTHER WORDS

We must be able to examine the world from a number of perspectives so that we can generate mental images or impressions that correspond to that world.

MORE TO THE POINT

We will use this scheme of pulling things apart (analysis) and putting them back together (synthesis) in new combinations to find how apparently unrelated ideas and actions can be related to one another.

GENERAL SURVEY

DISCIPLINES OR ACTIVITIES TO BE EXAMINED

- Mathematical Logic
- Physics
- Thermodynamics
- Biology
- Psychology
- Anthropology
- Conflict

VERY NICE

BUT

? — WHERE DO WE BEGIN — ?

HUMAN NATURE

<u>Goal</u>

- Survive, survive on our own terms, or improve our capacity as independent action.

<div align="center">

The competition for limited

resources to satisfy these

desires may force one to:

</div>

- Diminish adversary's capacity for independent action, deny him the opportunity to survive on his terms, or make it impossible for him to survive at all.

<u>? — RAISES THE QUESTION — ?</u>

In a most fundamental way how do we realize this goal or make it difficult for others to realize this goal?

SELECTIONS FROM NEWSPAPERS

The Washington Post

"Nerve Cells Redo Wiring . . . ," by Boyce Rensberger

Dale Purvis and Robert D. Hadley . . . have discovered that a neuron's fibers can change significantly in a few days or weeks, presumably in response to changing demands on the nervous system. . . . Research has shown neurons continually rewire their own circuitry, sprouting new fibers that reach out to make contact with new groups of other neurons and withdrawing old fibers from previous contacts. . . . This rewiring process may account for how the brain improves one's abilities such as becoming proficient in a sport or learning to play a musical instrument. Some scientists have suggested that the brain may use this method to store facts. . . . The research was on adult mice, but since all mammalian nervous systems appear to behave in similar ways, the researchers assume that the findings also apply to human beings.

The Washington Post Book World

"The Soul of the Machine," by Richard M. Restak,
(Review of "Neuronal Man," by Jean-Pierre Changeux)

Changeux suggests that the complexity of the human brain is dependent upon the vast number of synapses (connections) between brain cells . . . these synaptic connections are established or fall by the wayside according to how frequent they're used. Those synapses which are in frequent use tend to endure ('are stabilized') while others are eliminated. . . . In other words, . . . interactions with the environment . . . [exert] . . . tremendous influence on the way the human brain works and how it has evolved.

SELECTIONS FROM NEWSPAPER (continued)

The Washington Post

"Brain Cells Try To Battle Alzheimer's . . ." by Jan Ziegler

A post mortem study of brains of Alzheimer's victims, (reported on by Dr. Carl Cotman and colleagues) showed that cells tried to repair connections destroyed by the disease by sprouting new branches. . . . A progressive, degenerative disease, it can cause memory loss, confusion, difficulty in speech and movement, inability to recognize even family members. . . . A characteristic of the disease is the death of neurons, or nerve cells, that connect to each other by long fibers, which forces the brain to live with fewer and fewer connections. Analyzing cells from the hippocampus of six deceased Alzheimer's patients, Cotman and colleagues, found that axons—the output fibers of nerve cells, responsible for transmitting signals through the nervous system—start to sprout, reforming the connections between remaining cells. . . . Ultimately however, the sprouting process cannot keep up with destruction. Either, the sprouting stops, or too many nerve cells die.

Erie Daily Times

"Rats Lost Muscle, Bone Strength in Space Flight," by Paul Recer

Space rats that spent seven days in orbit suffered massive losses of muscle and bone strength, suggesting that astronauts on long voyages must be protected from debilitating effects of zero gravity. . . . The young space rats experienced a bone strength loss of up to 45 percent and a muscle tissue loss of up to 40 percent . . . older rats . . . suffered bone and muscle strength losses of about 15 percent. . . . Soviet space scientists reported a similar amount of muscle and bone loss in rats that were in space for more than 20 days.

SELECTIONS FROM BOOKS

"Order Out of Chaos," by Ilya Prigogine and Isabelle Stengers

"Equilibrium thermodynamics provides a satisfactory explanation for a vast number of physicochemical phenomena. Yet it may be asked whether the concept of equilibrium structures encompasses the different structures we encounter in nature. Obviously the answer is no."

"Equilibrium structures can be seen as the results of statistical compensation for the activity of microscopic elements (molecules, atoms). By definition they are inert at the global level. . . . Once they have been formed they may be isolated and maintained indefinitely without further interaction with their environment. When we examine a biological cell or a city, however, the situation is quite different: not only are these systems open, but also they exist only because they are open. They feed on the flux of matter and energy coming to them from the outside world. We can isolate a crystal, but cities and cells die when cut off from their environment. They form an integral part of the world from which they can draw sustenance, and they cannot be separated from the fluxes that they incessantly transform."

<u>SELECTIONS FROM BOOKS (continued)</u>

<u>"Looking Glass Universe, by Jon P. Briggs and F. David Peat"</u>

"Prigogine called far-from-equilibrium forms like the vortex, 'dissipative structures.' The name comes from the fact that to keep their shape these structures must constantly dissipate entropy so it won't build up inside the entity and 'kill' it with equilibrium. . . . [These dissipative structures] can survive only by remaining open to a flowing matter and energy exchange with the environment. . . . The structure is stabilized by its flowing. It is stable but only relatively stable—relative to the constant energy flow required to maintain its shape. Its very stability is also paradoxically an instability because of its total dependence on its environment. The dissipative structure is autonomous (separate) but only relatively separate. It is a flow within a flow."

SELECTIONS FROM BOOKS (continued)

"The War of the Flea," by Robert Taber

"Almost all modern governments are highly conscious of what journalism calls 'world opinion.' For sound reasons, mostly of an economic nature, they cannot afford to be condemned in the United Nations, they do not like to be visited by Human Rights Commissions or Freedom of the Press Committees; their need of foreign investment, foreign loans, foreign markets, satisfactory trade relationships, and so on, requires that they be members in more or less good standing of a larger community of interests. Often, too, they are members of military alliances. Consequently, they must maintain some appearance of stability, in order to assure the other members of the community or of the alliance that contracts will continue to be honored, that treaties will be upheld, that loans will be repaid with interest, that investments will continue to produce profits and be safe."

"Protracted internal war threatens all of this . . . no ally wishes to treat with a government that is on the point of eviction."

"It follows, that it must be the business of the guerrilla, and of his clandestine political organization in the cities, to destroy the stable image of the government, and so to deny its credits, to dry up its source of revenue, and to create dissension within the frightened owning classes, within the government bureaucracy (whose payrolls will be pinched), and within the military itself."

"Isolation, military and political, is the great enemy of guerrilla movements. It is the task of the urban organization to prevent this isolation, to provide diversions and provocations when needed, to maintain contact, to keep the world aware of a revolution in progress even when there is no progress to report."

SELECTIONS FROM BOOKS (continued)

<u>Social Order and the Theory of Strategy, by Alexander Atkinson</u>

"Moral fiber is "the great dam that denies the flood of social relations their natural route of decline towards violence and anarchy.". . . In this sense, "moral order at the center of social life literally saves society from itself."

"Strategists must grasp this fact that social order is, at once, a moral order. . . . If the moral order on which rests a fabric of social and power relation is compromised, then the fabric (of social order) it upholds goes with it."

"In other words, "the one great hurdle in the strategic combination (moral and social order) is the moral order. If this remains untouched the formation of new social relations and social ranking in status and power either never gets off the ground or faces the perennial specter of backsliding towards the moral attraction of established social and power relations."

"The strategic imperative, then, becomes one of trying "to achieve relative security of social resources by subverting and reweaving those of the opponent into the fabric of one's own social order."

SELECTIONS FROM BOOKS (continued)

Beyond Culture, by Edward T. Hall

"Everything man is and does is modified by learning and is therefore malleable. But once learned, these behavior patterns, these habitual responses, these ways of interacting gradually sink below the surface of the mind and, like the admiral of a submerged submarine fleet, control from the depths. The hidden controls are usually experienced as though they were innate simply because they are not only ubiquitous but habitual as well."

". . . the only time one is aware of the control system is when things don't follow the hidden program. This is most frequent in intercultural encounters. Therefore, the great gift that the members of the human race have for each other is not exotic experiences but an opportunity to achieve awareness of the structure of their own system, which can be accomplished only by interacting with others who do not share that system."

SELECTIONS FROM AN UNPUBLISHED ESSAY

<u>"Destruction and Creation," by Yours Truly</u>

According to Gödel's Incompleteness Theorems, Heisenberg's Uncertainty Principle, and the Second Law of Thermodynamics one cannot determine the character or nature of a system within itself. Moreover, attempts to do so lead to confusion and disorder.

SELECTION FROM A SPEECH

"A Model of Soviet Mentality," by Dmitry Mikheyev

"Interaction between the individual and his environment starts with his perception of himself as a separate entity and the environment as everything outside of self. He learns his physical limits and desires, and how to fulfill them through interaction with the physical and social environment. . . . I maintain that the way the individual perceives the environment is crucial for his orientation and interaction with it."

"Man's orientation will involve perceptions of self as both a physical and a psychological entity, as well as an understanding of the environment and of the possibilities for achieving his goals (FROMM, 1947). Society, meanwhile, has goals of its own—preservation of its physical integrity and spiritual identity. Pursuing these goals involves mobilizing and organizing its inner resources and interaction with the outside environment of other societies and nations. . . . An individual becomes a member of the society when he learns to act within its limits in a way that is beneficial to it."

SOME FAVORITE SELECTIONS

<u>Old Fable</u>

- "But sir, the emperor is naked, he has no clothes."

<u>Sun Tzu</u>

- "Know your enemy and know yourself; in one hundred battles you will never be in peril."

- "Seize that which your adversary holds dear or values most highly; then he will conform to your desires."

<u>Jomini</u>

- "The great art, then, of properly directing lines of operations, is so to establish them in reference to the bases and to the marches of the army as to seize the communications of the enemy without imperiling one's own, and is the most important and most difficult problem in strategy."

<u>Leadership</u>

- The art of inspiring people to cooperate and enthusiastically take action toward the achievement of uncommon goals.

<u>? — RAISES QUESTION — ?</u>

Remembering that we are trying to see how the preceding selections are related to one another, where do we go next?

CONDENSATION
TO
ESSENTIAL ELEMENTS

COMPRESSION

- Physical as well as electrical and chemical connections in the brain are shaped by interacting with the environment. Point: Without these interactions we do not have the mental wherewithal to deal or cope with that environment.

- Gödel's Incompleteness Theorems, Heisenberg's Uncertainty Principle, and the Second Law of Thermodynamics, all taken together, show that we cannot determine the character or nature of a system within itself. Moreover, attempts to do so lead to confusion and disorder—mental as well as physical. Point: We need an external environment, or outside world, to define ourselves and maintain organic integrity, otherwise we experience dissolution/disintegration—i.e., we come unglued.

- Moral fiber or moral order is the glue that holds society together and makes social direction and interaction possible. Point: Without this glue social order pulls apart towards anarchy and chaos leaving no possibility for social direction and interaction.

- Living systems are open systems; closed systems are non-living systems. Point: If we don't communicate with outside world—to gain information for knowledge and understanding as well as matter and energy for sustenance—we die out to become a non-discerning and uninteresting part of that world.

! — SIMPLY STATED — !

As human beings, we cannot exist without an external or surrounding environment from which we can draw sustenance, nourishment, or support.

IN OTHER WORDS

<u>Interaction</u> permits vitality and growth while <u>isolation</u> leads to decay and disintegration.

SUCH A SIMPLE STATEMENT REVEALS THAT:

The theme associated

with

D & C, P O C, C & C

is one of

Interaction and Isolation

- "Organic Design for Command and Control" (C&C) emphasizes interaction.
- "Patterns of Conflict" (POC) emphasize isolation.
- "Destruction and Creation" (D&C) is balanced between interaction and isolation.

<u>NOW WE CAN SEE BY</u>
<u>GOING BACK TO THE BEGINNING</u>

The Strategic Game

is one of

Interaction and Isolation

A game in which we must be able to diminish adversary's ability to communicate or interact with his environment while sustaining or improving ours.

KEEPING TRACK OF ALL THESE IDEAS

Let's move on and place them in a—

STRATEGIC PERSPECTIVE

<u>? — RAISES QUESTION — ?</u>

How do we do this?

<u>THREE WAYS COME TO MIND</u>

- Moral
- Mental
- Physical

? — WHY SHOULD WE USE THESE — ?

- <u>Physical</u>   represents the world of matter-energy-information all of us are a part of, live in, and feed upon.

- <u>Mental</u>   represents the emotional/intellectual activity we generate to adjust to, or cope with, that physical world.

- <u>Moral</u>   represents the cultural codes of conduct or standards of behavior that constrain, as well as sustain and focus, our emotional/intellectual responses.

UPON FOLDING THESE IDEAS INTO OUR
<u>INTERACTIONS/ISOLATION THEME WE CAN SAY:</u>

- <u>Physical Isolation</u>   occurs when we fail to discern, perceive, or make sense out of what's going on around ourselves.
- <u>Mental Isolation</u>   occurs when we fail to gain support in the form of matter-energy-information from others outside ourselves.
- <u>Moral Isolation</u>   occurs when we fail to abide by codes of conduct or standards of behavior in a manner deemed acceptable or essential by others outside ourselves.

WHILE IN OPPOSITE FASHION WE CAN SAY:

- <u>Physical Interaction</u>   occurs when we freely exchange matter-energy-information with others outside ourselves.

- <u>Mental Interaction</u>   occurs when we generate images or impressions that match-up with the events or happenings that unfold around ourselves.

- <u>Moral Interaction</u>   occurs when we live by the codes of conduct or standards of behavior that we profess, and others expect us, to uphold.

! — FINE — !

But how do we play to this theme and exploit these ideas?

HINTS

- Recall how we mentally constructed a snowmobile.

- Remember how we looked at ideas in mathematical logic, physics, thermodynamics, biology, psychology, anthropology, and conflict to surface a central theme.

- Remember our whole approach has been one of pulling things apart and putting them back together until something new and different is created.

ILLUMINATING EXAMPLE

? — What does the Second Law of Thermodynamics say — ?

All natural processes generate entropy.

? — What did Heisenberg say — ?

One cannot simultaneously fix or determine precisely the momentum and position of a particle.

? — What did Gödel say — ?

One cannot determine the consistency of a system within itself.

<u>ILLUMINATING EXAMPLE (Continued)</u>

<u>Point</u>

As they appear, these statements and the ideas they embody seem unrelated to one another.

<u>? — Raises Question — ?</u>

Can these statements be related to one another; and, if so, how?

in other words

Taken together, what do Gödel, Heisenberg, and the Second Law of Thermodynamics say?

ILLUMINATING EXAMPLE (Continued)

Message

One cannot determine the character or nature of a system within itself.
Moreover, attempts to do so lead to confusion and disorder.

Keeping this statement in mind,

? — Let's ask another question — ?

What do the tests of the YF-16 and YF-17 say?

ILLUMINATING EXAMPLE (continued)

Message

The ability to shift or transition from one maneuver to another more rapidly than an adversary enables one to
win in air-to-air combat.

Now
? — What do we have — ?

A statement drawn from the ideas of Gödel, Heisenberg, and the
Second Law of Thermodynamics (First Message).

as well as

A statement drawn from the tests of YF-16 and YF-17 (Second Message).

ILLUMINATING EXAMPLE (Continued)

<u>Point</u>

Once again, it appears that these two messages seem unrelated to one another.

<u>? — Raises Question — ?</u>

Can these statements be related to one another; and, if so, how?

in other words

Taken altogether, what do Gödel, Heisenberg, the Second Law of Thermodynamics, and the tests of the YF-16/YF-17 say?

ILLUMINATING EXAMPLE (Continued)

Overall Message

- The ability to operate at a faster tempo or rhythm than an adversary enables one to fold adversary back inside himself so that he can neither appreciate nor keep-up with what's going on. He will become disoriented or confused;

which suggests that

- Unless such menacing pressure is relieved, adversary will experience various combinations of uncertainty, doubt, confusion, self-deception, indecision, fear, panic, discouragement, despair, etc., which will further:

Disorient or twist his mental images/impressions of what's happening;

thereby

Disrupt his mental/physical maneuvers for dealing with such a menace;

thereby

Overload his mental/physical capacity to adapt or endure;

thereby

Collapse his ability to carry on.

? — WHAT'S THE POINT OF ALL THIS — ?

- We can't just look at our own personal experiences or use the same mental recipes over and over again; we've got to look at other disciplines and activities and relate or connect them to what we know from our experiences and the strategic world we live in.

if we can do this

- We will be able to surface new repertoires and (hopefully) develop a *Fingerspitzengefühl* for folding our adversaries back inside themselves, morally-mentally-physically—so that they can neither appreciate nor cope with what's happening—without suffering the same fate ourselves.

WHICH CARRIES US TO THE

? — QUESTION — ?

- How do we fold adversaries back inside themselves, morally-mentally-physically . . . without suffering the same fate ourselves?

or put another way

- How do we <u>physically isolate</u> our adversaries yet <u>interact</u> with others outside ourselves?

- How do we <u>mentally isolate</u> our adversaries yet keep in touch hence <u>interact</u>, with unfolding events?

- How do we <u>morally isolate</u> our adversaries yet maintain the trust/confidence of others and thereby <u>interact</u> with them?

<u>ILLUMINATION</u>

- <u>Physically</u> we can <u>isolate</u> adversaries by severing their communications with outside world as well as by severing their internal communications to one another. We can accomplish this by cutting them off from their allies and the uncommitted via diplomatic, psychological, and other efforts. To cut them off from one another we should penetrate their system by being unpredictable, otherwise they can counter our efforts.

- <u>Mentally</u> we can <u>isolate</u> our adversaries by presenting them with ambiguous, deceptive, or novel situations, as well as by operating at a tempo or rhythm they can neither make out nor keep up with. Operating inside their OODA loops will accomplish just this by disorienting or twisting their mental images so that they can neither appreciate nor cope with what's really going on.

- <u>Morally</u> adversaries <u>isolate</u> themselves when they visibly improve their well-being to the detriment of others (i.e. their allies, the uncommitted, etc.) by violating codes of conduct or behavior patterns that they profess to uphold or others expect them to uphold.

<u>EXPECTED PAYOFF</u>

Disintegration and collapse, unless adversaries change their behavior patterns to conform to what is deemed acceptable by others outside themselves.

<u>ILLUMINATION (continued)</u>

- <u>Physically</u> we <u>interact</u> by opening-up and maintaining many channels of communication with the outside world, hence with others out there, that we depend upon for sustenance, nourishment, or support.

- <u>Mentally</u> we <u>interact</u> by selecting information from a variety of sources or channels in order to generate mental images or impressions that match-up with the world of events or happenings that we are trying to understand and cope with.

- <u>Morally</u> we <u>interact</u> with others by avoiding mismatches between what we say we are, what we are, and the world we have to deal with, as well as by abiding by those other cultural codes or standards that we are expected to uphold.

EXPECTED PAYOFF

Vitality and growth, with the opportunity to shape and adapt to unfolding events thereby influence the ideas and actions of others.

PULLING ALL THIS TOGETHER
<u>WE HAVE IN A NUTSHELL</u>

<u>The Art of Success</u>

- Shape or influence the moral-mental-physical atmosphere that we are a part of, live in, and feed upon so that we not only magnify our inner spirit and strength, but also influence potential adversaries and current adversaries as well as the uncommitted so that they are drawn toward our philosophy and are empathetic toward our success; yet be able to.

- Morally-mentally-physically isolate our adversaries from their allies and outside support as well as isolate them from one another, in order to: magnify their internal friction, produce paralysis, bring about their collapse; and/or bring about a change in their political/economic/social philosophy so that they can no longer inhibit our vitality and growth.

IMPLEMENTATION
an
example

A

MORAL DESIGN

FOR

GRAND STRATEGY

NAME-OF-THE-GAME

- Use moral leverage to amplify our spirit and strength as well as expose the flaws of competing or adversary systems, all the while influencing the uncommitted, potential adversaries and current adversaries so that they are drawn toward our philosophy and empathetic toward our success;

or put another way

- Preserve or build-up our moral authority while compromising that of our adversaries' in order to pump up our resolve, drain away adversaries' resolve, and attract them as well as others to our cause and way of life.

? — RAISES QUESTION — ?

- How do we evolve this moral leverage to realize the benefits cited above?

MORAL LEVERAGE

<u>With respect to ourselves we must:</u>

- Surface as well as find ways to overcome or eliminate those blemishes, flaws, or contradictions that generate mistrust and discord so that these negative qualities neither alienate us from one another nor set us against one another, thereby destroy our internal harmony, paralyze us, and make it difficult to cope with an uncertain, ever-changing world at large.

In opposite fashion we must:

- Emphasize those cultural traditions, previous experiences, and unfolding events that build-up harmony and trust, thereby create those implicit bonds that permit us as individuals and as a society, or as an organic whole, to shape as well as adapt to the course of events in the world.

<u>MORAL LEVERAGE (Continued)</u>

<u>With respect to our adversaries we should:</u>

- Reveal those harsh statements that adversaries make about us—particularly those that denigrate our culture, our achievements, our fitness to exist, etc.—as basis to show that our survival and place in the scheme of things is not necessarily a birthright, but is always at risk.

<p align="center">Likewise, we should:</p>

- Reveal those mismatches in terms of what adversaries profess to be, what they are, and the world they have to deal with in order to surface to the world, to their citizens, and to ourselves the ineptness and corruption as well as the sub-rosa designs that they have upon their citizens, ourselves, and the world at large.

<p align="center">Moreover, we should:</p>

- Acquaint adversaries with our philosophy and way of life to show them that such destructive behavior works against, and is not in accord with, our (or any) social values based upon the dignity and needs of the individual as well as the security and well-being of society as a whole.

MORAL LEVERAGE (Continued)

<u>With respect to others (i.e., the uncommitted or potential adversaries) we should:</u>

- Respect their culture and achievements, show them we bear them no harm and help them adjust to an unfolding world, as well as provide additional benefits and more favorable treatment for those who support our philosophy and way of doing things;

yet

- Demonstrate that we neither tolerate nor support those ideas and interactions that undermine or work against our culture and our philosophy hence our interests and fitness to cope with a changing world.

NOW
GOING BACK TO THE BEGINNING

? — What is Strategy — ?

A mental tapestry of changing intentions for harmonizing and focusing our efforts as a basis for realizing some aim or purpose in an unfolding and often unforeseen world of many bewildering events and many contending interests.

? — What is the Aim or Purpose of Strategy — ?

To improve our ability to shape and adapt to unfolding circumstances, so that we (as individuals or as groups or as a culture or as a nation-state) can survive on our own terms.

? — What is the Central Theme and What Are the Key Ideas that Underlie Strategy — ?

The central theme is one of interaction/isolation while the key ideas are the moral-mental-physical means toward realizing this interaction/isolation.

? — How Do We Play to this Theme and Activate these Ideas — ?

By an instinctive see-saw of analysis and synthesis across a variety of domains, or across competing/independent channels of information, in order to spontaneously generate new mental images or impressions that match-up with an unfolding world of uncertainty and change.

<u>DEFINITIONS</u>

- <u>Evil</u>   Occurs when individuals or groups embrace codes of conduct or standards of behavior for their own personal well-being and social approval, yet violate those very same codes or standards to undermine the personal well-being and social approval of others.

- <u>Corruption</u>   Occurs when individuals or groups, for their own benefit, violate codes of conduct or standards of behavior that they profess or are expected to uphold.

DESTRUCTION AND CREATION

by

John R. Boyd

3 September 1976

DESTRUCTION AND CREATION

ABSTRACT

To comprehend and cope with our environment, we develop mental patterns or concepts of meaning. The purpose of this paper is to sketch out how we destroy and create these patterns to permit us to both shape and be shaped by a changing environment. In this sense, the discussion also literally shows why we cannot avoid this kind of activity if we intend to survive on our own terms.

The activity is dialectic in nature generating both disorder and order that emerges as a changing and expanding universe of mental concepts matched to a changing and expanding universe of observed reality.

GOAL

Studies of human behavior reveal that the actions we undertake as individuals are closely related to survival, more importantly, survival on our own terms. Naturally, such a notion implies that we should be able to act relatively free or independent of any debilitating external influences—otherwise that very survival might be in jeopardy. In viewing the instinct for survival in this manner we imply that a basic aim or goal, as individuals, is to improve our capacity for independent action. The degree to which we cooperate, or compete, with others is driven by the need to satisfy this basic goal. If we believe that it is not possible to satisfy it alone, without help from others, history shows us that we will agree to constraints upon our independent action—in order to collectively pool skills and talents in the form of nations, corporations, labor unions, mafias, etc.—so that obstacles standing in the way of the basic goal can either be removed or overcome. On the other hand, if the group cannot or does not attempt to overcome obstacles deemed important to many (or possibly any) of its individual members, the group must risk losing these alienated members. Under these circumstances, the alienated members may dissolve their relationship and remain independent, form a group of their own, or join another collective body in order to improve their capacity for independent action.

ENVIRONMENT

In a real world of limited resources and skills, individuals and groups form, dissolve and reform their cooperative or competitive postures in a continuous struggle to remove or overcome physical and social environmental obstacles.[11/13] In a cooperative sense, where skills and talents are pooled, the removal or overcoming of obstacles represents an improved capacity for independent action for all concerned. In a competitive sense, where individuals and groups compete for scarce resources and skills, an improved capacity for independent

action achieved by some individuals or groups constrains that capacity for other individuals or groups. Naturally, such a combination of real world scarcity and goal striving to overcome this scarcity intensifies the struggle of individuals and groups to cope with both their physical and social environments.

NEED FOR DECISIONS

Against such a background, <u>actions</u> and <u>decisions</u> become critically important. Actions must be taken over and over again and in many different ways. Decisions must be rendered to monitor and determine the precise nature of the actions needed that will be compatible with the goal. To make these timely decisions implies that we must be able to form mental concepts of observed reality, as we perceive it, and be able to change these concepts as reality itself appears to change. The concepts can then be used as decision-models for improving our capacity for independent action. Such a demand for decisions that literally impact our survival causes one to wonder: How do we generate or create the mental concepts to support this decision-making activity?

CREATING CONCEPTS

There are two ways in which we can develop and manipulate mental concepts to represent observed reality: We can start from a comprehensive whole and break it down to its particulars or we can start with the particulars and build towards a comprehensive whole.[29/25] Saying it another way, but in a related sense, we can go from the general-to-specific or from the specific-to-general. A little reflection here reveals that deduction is related to proceeding from the general-to-specific while induction is related to proceeding from the specific-to-general. In following this line of thought can we think of other activities that are related to these two opposing ideas? Is not analysis related to proceeding from the general-to-specific? Is not synthesis, the opposite of analysis related to proceeding from the specific-to-general? Putting all this together: Can we not say that general-to-specific is related to both deduction and analysis, while specific-to-general is related to induction and synthesis? Now, can we think of some examples to fit with these two opposing ideas? We need not look far. The differential calculus proceeds from the general-to-specific—from a function to its derivative. Hence is not the use or application of the differential Calculus related to deduction and analysis? The integral calculus, on the other hand, proceeds in the opposite direction—from a derivative to a general function. Hence, is not the use or application of the integral calculus related to induction and synthesis? Summing up, we can see that: <u>general-to-specific</u> is related to <u>deduction</u>, <u>analysis</u>, and <u>differentiation</u>, while, <u>specific-to-general</u> is related to <u>induction</u>, <u>synthesis</u>, and <u>integration</u>.

Now keeping these two opposing idea chains in mind let us move on a somewhat different tack. Imagine, if you will, a domain (a comprehensive whole) and its constituent elements or parts. Now, imagine another domain and its constituent parts. Once again, imagine even another domain and its constituent parts. Repeat-

ing this idea over and over again we can imagine any number of domains and the parts corresponding to each. Naturally, as we go through life we develop concepts of meaning (with included constituents) to represent observed reality. Can we not liken these concepts and their related constituents to the domains and constituents that we have formed in our imagination? Naturally, we can. Keeping this relationship in mind, suppose we shatter the correspondence of each domain or concept with its constituent elements. In other words, we imagine the existence of the parts but pretend that the domains or concepts they were previously associated with do not exist. Result: We have many constituents, or particulars, swimming around in a sea of anarchy. We have uncertainty and disorder in place of meaning and order. Further, we can see that such an <u>unstructuring</u> or <u>destruction</u> of many domains—to break the correspondence of each with its respective constituents—is related to <u>deduction</u>, <u>analysis</u>, and <u>differentiation</u>. We call this kind of unstructuring a <u>destructive deduction</u>.

Faced with such disorder or chaos, how can we reconstruct order and meaning? Going back to the idea chain of specific-to-general, induction, synthesis, and integration the thought occurs that a new domain or concept can be formed if we can find some common qualities, attributes, or operations among some or many of these constituents swimming in this sea of anarchy. Through such connecting threads (that produce meaning) we synthesize constituents from, hence across, the domains we have just shattered.[25] Linking particulars together in this manner we can form a new

domain or concept—providing, of course, we do not inadvertently use <u>only</u> those "bits and pieces" in the same arrangement that we associated with one of the domains purged from our imagination. Clearly, such a synthesis would indicate we have generated something new and different from what previously existed. Going back to our idea chain, it follows that <u>creativity</u> is related to <u>induction</u>, <u>synthesis</u>, and <u>integration</u> since we proceeded from unstructured bits and pieces to a new general pattern or concept. We call such action a <u>creative</u> or <u>constructive induction</u>. It is important to note that the crucial or key step that permits this creative induction is the separation of the particulars from their previous domains by the destructive deduction. Without this unstructuring the creation of a new structure cannot proceed—since the bits and pieces are still tied together as meaning within unchallenged domains or concepts.

Recalling that we use concepts or mental patterns to represent reality, it follows that the unstructuring and restructuring just shown reveals a way of changing our perception of reality.[29] Naturally, such a notion implies that the emerging pattern of ideas and interactions must be internally consistent and match-up with reality.[14/26] To check or verify internal consistency we try to see if we can trace our way back to the original constituents that were used in the creative or constructive induction. If we cannot reverse directions, the ideas and interactions do not go together in this way without contradiction. Hence, they are not internally consistent. However, this does not necessarily mean we reject and throw away the entire structure. Instead, we should

attempt to identify those ideas (particulars) and interactions that seem to hold together in a coherent pattern of activity as distinguished from those ideas that do not seem to fit in. In performing this task we check for reversibility as well as check to see which ideas and interactions match-up with our observations of reality.[28/14/15] Using those ideas and interactions that pass this test together with any new ideas (from new destructive deductions) or other promising ideas that popped out of the original destructive deduction we again attempt to find some common qualities, attributes or operations to recreate the concept—or create a new concept. Also, once again, we perform the check for reversibility and match-up with reality. Over and over again this cycle of Destruction and Creation is repeated until we demonstrate internal consistency and match-up with reality.[19/14/15]

SUSPICION

When this orderly (and pleasant) state is reached the concept becomes a coherent pattern of ideas and interactions that can be used to describe some aspect of observed reality. As a consequence, there is little, or no, further appeal to alternative ideas and interactions in an effort to either expand, complete, or modify the concept.[19] Instead, the effort is turned inward towards fine tuning the ideas and interactions in order to improve generality and produce a more precise match of the conceptual pattern with reality.[19] Toward this end, the concept—and its internal workings—is tested and compared against observed phenomena over and over

again in many different and subtle ways.[19] Such a repeated and inward-oriented effort to explain increasingly more subtle aspects of reality suggests the disturbing idea that perhaps, at some point, ambiguities, uncertainties, anomalies, or apparent inconsistencies may emerge to stifle a more general and precise match-up of concept with observed reality.[19] Why do we suspect this?

On one hand, we realize that facts, perceptions, ideas, impressions, interactions, etc. separated from previous observations and thought patterns have been linked together to create a new conceptual pattern. On the other hand, we suspect that refined observations now underway will eventually exhibit either more or a different kind of precision and subtlety than the previous observations and thought patterns. Clearly, any anticipated difference or differences, suggests we should expect a mismatch between the new observations and the anticipated concept description of these observations. To assume otherwise would be tantamount to admitting that previous constituents and interactions would produce the same synthesis as any newer constituents and interactions that exhibit either more or a different kind of precision and subtlety. This would be like admitting one equals two. To avoid such a discomforting position implies that we should anticipate a mismatch between phenomena observation and concept description of that observation. Such a notion is not new and is indicated by the discoveries of Kurt Gödel and Werner Heisenberg.

INCOMPLETENESS AND CONSISTENCY

In 1931 Kurt Gödel created a stir in the world of mathematics and logic when he revealed that it was impossible to embrace mathematics within a single system of logic.[12/24] He accomplished this by proving, first, that <u>any consistent system</u>—that includes the arithmetic of whole numbers—<u>is incomplete</u>. In other words, there are true statements or concepts within the system that cannot be deduced from the postulates that make up the system. Next, he proved <u>even though such a system is consistent, its consistency cannot be demonstrated within the system</u>.

Such a result does not imply that it is impossible to prove the consistency of a system. It only means that such a proof cannot be accomplished inside the system. As a matter of fact, since Gödel, Gerhard Gentzen and others have shown that a consistency proof of arithmetic can be found by appealing to systems outside that arithmetic. Thus, Gödel's Proof indirectly shows that in order to determine the consistency of any new system we must construct or uncover another system beyond it.[30/28] Over and over this cycle must be repeated to determine the consistency of more and more elaborate systems.[30/28]

Keeping this process in mind, let us see how Gödel's results impact the effort to improve the match-up of concept with observed reality. To do this we will consider two kinds of consistency: The consistency of the concept and the consistency of the match-up between observed reality and concept description of reality. In this sense, if we assume—as a result of previous destructive deduction and creative induction efforts—that we have a consistent concept and consistent match-up, we should see no differences between observation and concept description. Yet, as we have seen, on one hand, we use observations to shape or formulate a concept; while on the other hand, we use a concept to shape the nature of future inquiries or observations of reality. Back and forth, over and over again, we use observations to sharpen a concept and a concept to sharpen observations. Under these circumstances, a concept must be incomplete since we depend upon an ever-changing array of observations to shape or formulate it. Likewise, our observations of reality must be incomplete since we depend upon a changing concept to shape or formulate the nature of new inquiries and observations. Therefore, when we probe back and forth with more precision and subtlety, we must admit that we can have differences between observation and concept description; hence, we cannot determine the consistency of the system—in terms of its concept, and match-up with observed reality—within itself.

Furthermore, the consistency cannot be determined even when the precision and subtlety of observed phenomena approaches the precision and subtlety of the observer—who is employing the ideas and interactions that play together in the conceptual pattern. This aspect of consistency is accounted for not only by Gödel's Proof but also by the Heisenberg Uncertainty or Indeterminacy Principle.

INDETERMINACY AND UNCERTAINTY

The Indeterminacy Principle uncovered by Werner Heisenberg in 1927 showed that one could not simultaneously fix or determine precisely the velocity and position of a particle or body.[14/9] Specifically he showed, due to the presence and influence of an observer, that the product of the velocity and position uncertainties is equal to or greater than a small number (Planck's Constant) divided by the mass of the particle or body being investigated. In other words,

$$\Delta V^{*} \Delta Q \geq h/m$$

where ΔV is velocity uncertainty, ΔQ is position uncertainty, and h/m is Planck's constant (h) divided by observed mass (m).

Examination of Heisenberg's Principle reveals that as mass becomes exceedingly small the uncertainty or indeterminacy, becomes exceedingly large. Now—in accordance with this relation—when the precision or mass of phenomena being observed is little, or no different than the precision or mass of the observing phenomena, the uncertainty values become as large as, or larger than, the velocity and size frame-of-reference associated with the bodies being observed.[9] In other words, when the intended distinction between observer and observed begins to disappear,[3] the uncertainty values hide or mask phenomena behavior; or put another way, the observer perceives uncertain or erratic behavior that bounces all over in accordance with the indeterminacy relation. Under these circumstances, the uncertainty values represent the inability to determine the character or nature (consistency) of a system within itself. On the other hand, if the precision and subtlety of the observed phenomena is much less than the precision and subtlety of the observing phenomena, the uncertainty values become much smaller than the velocity and size values of the bodies being observed.[9] Under these circumstances, the character or nature of a system can be determined—although not exactly—since the uncertainty values do not hide or mask observed phenomena behavior nor indicate significant erratic behavior.

Keeping in mind that the Heisenberg Principle implicitly depends upon the indeterminate presence and influence of an observer,[14] we can now see—as revealed by the two examples just cited—that the magnitude of the uncertainty values represent the degree of intrusion by the observer upon the observed. When intrusion is total (that is, when the intended distinction between observer and observed essentially disappears[3]) the uncertainty values indicate erratic behavior. When intrusion is low, the uncertainty values do not hide or mask observed phenomena behavior, nor indicate significant erratic behavior. In other words, the uncertainty values not only represent the degree of intrusion by the observer upon the observed but also the degree of confusion and disorder perceived by that observer.

ENTROPY AND THE SECOND LAW OF THERMODYNAMICS

Confusion and disorder are also related to the notion of entropy and the Second Law of Thermodynamics.[11/20]

Entropy is a concept that represents the potential for doing work, the capacity for taking action, or the degree of confusion and disorder associated with any physical or information activity. High entropy implies a low potential for doing work, a low capacity for taking action or a high degree of confusion and disorder. Low entropy implies just the opposite. Viewed in this context, the Second Law of Thermodynamics states that all observed natural processes generate entropy.[20] From this law it follows that entropy must increase in any closed system—or, for that matter, in any system that cannot communicate in an ordered fashion with other systems or environments external to itself.[20] Accordingly, whenever we attempt to do work or take action inside such a system—a concept and its match-up with reality—we should anticipate an increase in entropy hence an increase in confusion and disorder. Naturally, this means we cannot determine the character or nature (consistency) of such a system within itself, since the system is moving irreversibly toward a higher, yet unknown, state of confusion and disorder.

DESTRUCTION AND CREATION

What an interesting outcome! According to Gödel we cannot—in general—determine the consistency, hence the character or nature, of an abstract system within itself. According to Heisenberg and the Second Law of Thermodynamics any attempt to do so in the real world will expose uncertainty and generate disorder. Taken together, these three notions support the idea that any inward-oriented and continued effort to improve the match-up of concept with observed reality will only increase the degree of mismatch. Naturally, in this environment, uncertainty and disorder will increase as previously indicated by the Heisenberg Indeterminacy Principle and the Second Law of Thermodynamics, respectively. Put another way, we can expect unexplained and disturbing ambiguities, uncertainties, anomalies, or apparent inconsistencies to emerge more and more often. Furthermore, unless some kind of relief is available, we can expect confusion to increase until disorder approaches chaos—death.

Fortunately, there is a way out. Remember, as previously shown, we can forge a new concept by applying the destructive deduction and creative induction mental operations. Also, remember, in order to perform these dialectic mental operations we must first shatter the rigid conceptual pattern, or patterns, firmly established in our mind. (This should not be too difficult since the rising confusion and disorder is already helping us to undermine any patterns). Next, we must find some common qualities, attributes, or operations to link isolated facts, perceptions, ideas, impressions, interactions, observations, etc. together as possible concepts to represent the real world. Finally, we must repeat this unstructuring and restructuring until we develop a concept that begins to match reality. By doing this—in accordance with Gödel, Heisenberg and the Second Law of Thermodynamics—we find that the uncertainty and disorder generated by an inward-oriented system talking to itself can be offset by going outside and creating

a new system. Simply stated, uncertainty and related disorder can be diminished by the direct artifice of creating a higher and broader more general concept to represent reality.

However, once again, when we begin to turn inward and use the new concept—within its own pattern of ideas and interactions—to produce a finer grain match with observed reality we note that the new concept and its match-up with observed reality begins to self-destruct just as before. Accordingly, the dialectic cycle of destruction and creation begins to repeat itself once again. In other words, as suggested by Gödel's Proof of Incompleteness, we imply that the process of Structure, Unstructure, Restructure, Unstructure, Restructure is repeated endlessly in moving to higher and broader levels of elaboration. In this unfolding drama, the alternating cycle of entropy increase toward more and more disorder and the entropy decrease toward more and more order appears to be one part of a control mechanism that literally seems to drive and regulate this alternating cycle of destruction and creation toward higher and broader levels of elaboration.

Now, in relating this deductive/inductive activity to the basic goal discussed in the beginning, I believe we have uncovered a Dialectic Engine that permits the construction of decision models needed by individuals and societies for determining and monitoring actions in an effort to improve their capacity for independent action. Furthermore, since this engine is directed toward satisfying this basic aim or goal, it follows that the goal seeking effort itself appears to be the other side of a control mechanism that seems also to drive and regulate the alternating cycle of destruction and creation toward higher and broader levels of elaboration. In this context, when acting within a rigid or essentially a closed system, the goal seeking effort of individuals and societies to improve their capacity for independent action tends to produce disorder towards randomness and death. On the other hand, as already shown, the increasing disorder generated by the increasing mismatch of the system concept with observed reality opens or unstructures the system. As the unstructuring or, as we call it, the destructive deduction unfolds it shifts toward a creative induction to stop the trend toward disorder and chaos to satisfy a goal-oriented need for increased order. Paradoxically, then, an entropy increase permits both the destruction or unstructuring of a closed system and the creation of a new system to nullify the march toward randomness and death.

Taken together, the entropy notion associated with the second law of thermodynamics and the basic goal of individuals and societies seem to work in dialectic harmony driving and regulating the destructive/creative or deductive/inductive action—that we have described herein as a dialectic engine. The result is a changing and expanding universe of mental concepts matched to a changing and expanding universe of observed reality.[29/28] As indicated earlier, these mental concepts are employed as decision models by individuals and societies for determining and monitoring actions needed to cope with their environment—or to improve their capacity for independent action.

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CONCEPTUAL SPIRAL

July/August 1992

John R. Boyd

<u>FOCUS</u>

To make evident how science, engineering, and technology influence our ability to interact and cope with an unfolding reality that we are a part of, live in, and feed upon.

FOR OPENERS

Let's reexamine our abstract

? — ? | What do we find? | ? — ?

KEY PASSAGE

. . . the theme that weaves its way through this "Discourse on Winning and Losing" is not so much contained within each of the seven sections, per se, that make up the "Discourse"; rather, it is the kind of thinking that both lies behind and makes up its very essence. For the interested, a careful examination will reveal that the increasingly abstract discussion surfaces a process of reaching across many perspectives, pulling each and every one apart (analyses), all the while intuitively looking for those parts of the disassembled perspectives which naturally inter-connect with one another to form a higher order, more general elaboration (synthesis) of what is taking place. As a result, the process not only creates the "Discourse" but it also represents the key to evolve the tactics, strategies, goals, unifying themes, etc., that permit us to actively shape and adapt to the unfolding world we are a part of, live in, and feed upon.

? — WHY IS THIS PASSAGE KEY — ?

- Because it suggests a general way by which we can deal with the world around us.

<div align="center">
More specifically, we
shall show that:
</div>

- By exploiting the theme contained within this passage and by examining the practice of science/engineering and the pursuit of technology, we can evolve a conceptual spiral for comprehending, shaping, and adapting to that world.

Why is This Passage Key

NOW

If the practice of science/engineering and the pursuit of technology are going to be a key for unveiling this "conceptual spiral,"

we should ask ourselves:

In speaking of science, engineering, and technology,

what do we mean?

SIMPLE-MINDED MESSAGE

- <u>Science</u> can be viewed as a self-correcting process of observation, hypothesis, and test.

whereas

- <u>Engineering</u> can be viewed as a self-correcting process of observation, design and test.

while

- <u>Technology</u> can be viewed as the wherewithal or state of the art produced by the practice of science and engineering.

? — RAISES QUESTION — ?

What has the practice of science, engineering and the pursuit of technology given us or done for us?

EXAMPLES FROM SCIENCE

Some Outstanding Contributors	Contributions
• Isaac Newton (1687)	• "Exactness"/predictability via laws of motion/gravitation
• Adam Smith (1776)	• Foundation for modern capitalism
• A.M. Ampere/C.P. Gauss (1820's/1830's)	• Exactness/predictability via electric/magnetic laws
• Carnot/Kelvin/Clausius/Boltzman (1824/1852/1865/1870s)	• Decay/disintegration via second law of thermo-dynamics
• Faraday/Maxwell/Hertz (1831/1865/1888)	• Union of electricity & magnetism via field theory
• Darwin & Wallace (1838/1858)	• Evolution via theory of natural selection
• Marx & Engels (1848–1895)	• Basis for modern "scientific socialism"
• Gregory Mendel (1866)	• Inherited traits via his laws of genetics
• Henri Poincare (1890s)	• Inexactness/unpredictability via gravitational influence of three bodies

Examples from Science	Some Outstanding Contributors	Contributions
	• Max Planck (1900)	• Discreteness/discontinuity via his quantum theory
	• Albert Einstein (1905/1915)	• Exactness/predictability via his special and general relativity theories
	• Bohr/de Broglie/Heisenberg/Schrodiger/ Dirac/et al (1913/1920's . . .)	• Uncertainty/indeterminism in quantum physics
	• L. Lowenheim & T. Skolem (1915–1933)	• Unconfinement (non-categoricalness) in mathematics & logic
	• Godel/Tarski/Church/Turing/et al (1930's . . .)	• Incompleteness/undecidability in mathematics & logic
	• Claude Shannon (1948)	• Information theory as basis for communication
	• Crick & Wilson (1953)	• DNA spiral helix as genetically coded information for life
	• Lorenz/Prigogine/Mandelbrot/ Feigenbaum/et al (1963/1970's . . .)	• Irregularity/unpredictability in nonlinear dynamics
	• G. Chaitin/C. Bennet (1960/1985)	• Incompleteness/incomprehensibility in information theory

EXAMPLES FROM ENGINEERING

Some Outstanding Contributors	Contributions
• Savery/Newcomen/Watt (1698/1705/1769)	• Steam engine
• George Stevenson (1825)	• Steam railway
• H. Pixii/M. H. von Jacobi (1832/1838)	• AC generator/AC motor
• Samuel Morse	• Telegraph
• J. N. Nieqce/J. M. Daguerre/Fox Talbot (1839)	• Photography
• Gaston Plante (1859)	• Rechargeable battery
• Z. Gramme/H. Fontaine (1869/1873)	• DC generato/DC motor
• Nicholas Otto (1876)	• Four-cycle gasoline engine
• Alexander G. Bell (1876)	• Telephone
• Thomas A. Edison (1877)	• Phonograph
• Thomas A. Edison (1879)	• Electric light bulb
• Werner von Siemens (1879	• Electric locomotive
• Germany (1881)	• Electric metropolitan railway
• Charles Parsons (1884)	• Steam turbine
• Benz/Daimler (1885/1886)	• Gasoline automobile
• T.A. Edison/J. LeRoy/T. Armat/et al (1890-1896)	• Motion picture camera/projector
• N. Tesla/G. Marconi (1893/1895)	• Wireless telegraph
• Rudolf Diesel (1897)	• Diesel locomotive
• Italy (1902)	• Electric railway

EXAMPLES FROM ENGINEERING

<u>Some Outstanding Contributors</u>   <u>Contributions</u>

- Wright Brothers (1903)
- Christian Hulmeyer (1904)
- V. Paulsen/R.A. Fessenden (1904/1906)
- John A. Fleming/Lee De Forest (1904/1907)
- Tri Ergon/Lee De Forest (1919/1923)
- USA—Pittsburgh (1920)
- American Car Locomotive (1925)
- J.L. Baird (1926)
- Warner Brothers (1927)
- Germany/USA (1932/1934)
- Britain/USA/Germany (1935/1936/1939)
- Germany/Britain/USA (1935/1936/1939)
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- Sony (1980)

- Gasoline powered airplane
- Radar
- Wireless telephone
- Vacuum tube
- Sound motion picture
- Public radio broadcasting
- Diesel-electric locomotive
- Television
- Sound motion picture, "The Jazz Singer"
- Diesel-electric railway
- Operational radar
- Television broadcasting
- Jet engine/jet airplane
- Electronic computer
- Transistor
- Video recorder
- Integrated electronic circuit
- Laser
- Video cassette recorder
- Video camcorder

<u>? — RAISES QUESTION — ?</u>

Looking at the <u>past</u> via the contributions these people have provided the world:

What can we say about our efforts for <u>now</u> and for the <u>future</u>?

Raises Question

<u>GRAND MESSAGE</u>

In a mathematical/logical sense we can say:

- Taken together, the theorems associated with Godel, Lowenheim & Skolem, Tarski, Church, Turing, Chaitin, and others reveal that: NOT only do the statements representing a theoretical system for explaining some aspect of reality explain that reality inadequately or incompletely but, like it or not, these statements spill out beyond any one system and do so in unpredictable ways;

or conversely,

- These theorems reveal that: WE can neither predict the future migration and evolution of these statements nor just confine them to any one system nor suggest that they fully embrace any such system.

Now if we extend these ideas and build upon them in a scientific/engineering sense, we can say:

- Any coherent intellectual or physical systems we evolve to represent or deal with large portions of reality will at best represent or deal with that reality incompletely or imperfectly.

- Moreover, we neither have nor can we create beforehand a supersystem that can forecast or predict the kind of systems we will evolve in the future to represent or deal with that reality more completely or more perfectly.

- Furthermore, such a supersystem can neither forecast nor predict the consequences that flow from those systems that we create later on.

- Going even further, we cannot determine or discern the character or nature of such systems (super or otherwise) within themselves.

Which altogether imply that:

- People using theories or systems evolved from a variety of information will find it increasingly difficult and ultimately impossible to interact with and comprehend phenomena or systems that move increasingly beyond and away from that variety—that is, they will become more and more isolated from that which they are trying to observe or deal with, unless they exploit the new variety to modify their theories/systems or create new theories/systems.

? — RAISES QUESTION — ?

Taken together, what do the many contributions and Grand Message suggest?

<u>IMPRESSION</u>

While we can comprehend and predict some portions of the everchanging world that unfolds before us, other portions seem forever indistinct and unpredictable.

? — RAISES QUESTION — ?

Very nice, but what does all this have to do with our ability to thrive and grow in such a world that is seemingly orderly and predictable yet disorderly and unpredictable?

COMMENT

- To get at this question let's take a closer and more general look at what science, engineering, and the pursuit of technology produce and how this is accomplished.

- Furthermore, suspecting that these practices and pursuit are not wholly accidental nor obvious and that they seem to change us in some ways, let's also examine what keeps the whole enterprise going and how this enterprise affects us personally.

In other words, In order to gain a richer image of science, engineering, and technology we will address the following questions:

- What do science, engineering and technology produce?

- How is this accomplished?

- What is the driving mechanism that keeps the process alive and ongoing; or put another way, what phenomena sustain or nourish the whole enterprise?

- Finally, how does this enterprise of science, engineering, and technology affect us personally as individuals, as groups, or as societies?

FIRST OF ALL

? — ?

> What do science, engineering, and technology produce?

? — ?

If we examine the contributions from the practice of science and engineering and generalize from these individual contributions, what do we see? We see <u>new</u> ideas, <u>new</u> systems, <u>new</u> processes, <u>new</u> materials, <u>new</u> etc.

In other words,

Science, engineering, and technology produce change via <u>novelty</u>.

? — ┌─────────────────────────────────┐ — ?
      │   How is This Novelty Produced?   │
      └─────────────────────────────────┘

- To examine novelty, we speak of it in terms of those features that seem to be part of that novelty. In other words, we reduce a novel pattern down to some features that make up that pattern. Different people in examining such a pattern may see differing features that make it up. In other words, there are different ways by which a pattern can be reduced hence the possibility for differing features or parts. Regardless of how it comes out, we call this process of reduction, <u>analysis</u>.

- Pushing this process even further, we can reduce many different patterns (analyses) to parts that make up each pattern and use these parts, or variations thereof, to make a new pattern. This is done by finding some common features that interconnect some or many of these parts so that a new pattern—whether it be a new concept, new system, new process, new etc.—can be created. We call this process of connection, <u>synthesis</u>.

- Now if we test the results of this process with the world we're dealing with, we have an <u>analytical/synthetic</u> feedback loop for comprehending, shaping, and adapting to that world.

Pulling all this together, we can say that:

Novelty is produced by a mental/physical feedback process of <u>analyses</u> and <u>synthesis</u> that permits us to interact with the world so that we can comprehend, cope with, and shape that world as well as be shaped by it.

which carries us to the question

? —

> What is the driving mechanism that keeps the process alive and ongoing; or put another way, what phenomena sustain or nourish the whole enterprise.

— ?

- One thing is clear: If our ideas and thoughts matched perfectly with what goes on in the world; and if the systems or processes we designed performed perfectly and matched with whatever we wanted them to do, what would be the basis for evolving or creating new ideas, new systems, new processes, new etc.? The answer: There wouldn't be any!

In other words,

- The presence and production of <u>mismatches</u> are what sustain and nourish the enterprise of science, engineering, and technology, hence keep it alive and ongoing—otherwise there would be no basis for it to continue.

<u>VERY NICE,</u>
BUT

? — | How does this enterprise of science, engineering, and technology affect us personally as individuals, as groups, or as societies? | — ?

- As already shown, the practice of science/engineering and the pursuit of technology not only change the physical world we interact with—via new systems, new processes, new etc.—but they also change the mental/physical ways by which we think about and act upon that world.

In this sense

- The practice of science/engineering and the pursuit of technology permit us to continually <u>rematch our mental/physical orientation</u> with that changing world so that we can continue to thrive and grow in it.

Put simply

- The enterprise of science, engineering, and technology affects us personally as individuals, as groups, or as societies by <u>changing our orientations to match</u> with a changing world that we, in fact, help change.

NOW

- If we reverse direction and reexamine where we have been, we can see that without the intuitive interplay of analyses and synthesis, we have no basic process for generating novelty, no basic process for addressing mismatches between our mental images/impressions and the reality it is supposed to represent; and no basic process for reshaping our orientation toward that reality as it undergoes change.

Put simply

- Without the interplay of analyses and synthesis, we have no basis for the practice of science/engineering and the pursuit of technology—because novelty, mismatches, and reorientation as the life blood ingredients that naturally arise out of such practice and pursuit can no longer do so.

VIEWED IN THIS LIGHT

The preceding statements seem to suggest that the "Simple-Minded Message" presented near the beginning whereby:

Science can be viewed as a self-correcting process of observation, hypothesis, and test

whereas

Engineering can be viewed as a self-correcting process of observation, design, and test
should be modified as follows:

Science can be viewed as a self-correcting process of observations, analyses/synthesis, hypothesis, and test

whereas

Engineering can be viewed as a self-correcting process of observations, analyses/synthesis, design, and test.

? — Why — ?

Without the interplay of analyses and synthesis, one can evolve neither the hypothesis or design and follow-on test, nor the original "Simple-Minded Message," nor this presentation itself.

<u>? — RAISES QUESTION — ?</u>

What bearing does all this have

on

Winning and Losing?

ILLUMINATION

Illumination

Novelty is not only produced by the practice of science/engineering and the pursuit of technology, it is also produced by the forces of nature, by our own thinking and doing as well as by others. Furthermore, novelty is produced continuously, if somewhat erratically or haphazardly. Now, in order to thrive and grow in such a world, we must match our thinking and doing, hence our orientation, with that emerging novelty. Yet, any orientation constrained by experiences before that novelty emerges (as well as by the Grand Message discussed earlier) introduces mismatches that confuse or disorient us. However, the analytical/synthetic process, previously described, permits us to address these mismatches so that we can rematch thereby reorient our thinking and action with that novelty. Over and over, this continuing whirl of reorientation, mismatches, analyses/synthesis enables us to comprehend, cope with, and shape as well as be shaped by the novelty that literally flows around and over us.

<u>MAYBE SO</u>

Yet, upon reflection, we still have a puzzle: Why does our world continue to unfold in an irregular, disorderly, unpredictable manner even though some of our best minds try to represent it as being more regular, orderly, and predictable?

MORE POINTEDLY

With so much effort over such a long period by so many people to comprehend, shape, and adapt to a world that we depend upon for vitality and growth, why does such a world, although richer and more robust, continue to remain uncertain, everchanging, and unpredictable?

<u>RESPONSE</u>

Very simply, review of "Destruction and Creation," this presentation, and our own experiences reveal that the various theories, systems, processes, etc. that we employ to make sense of that world contain features that generate mismatches that, in turn, keep such a world uncertain, everchanging, and unpredictable.

<u>THESE FEATURES INCLUDE</u>

- <u>Uncertainty</u> associated with the unconfinement, undecidability, and incompleteness theorems of mathematics and logic.

- <u>Numerical imprecision</u> associated with using the rational and irrational numbers in the calculation and measurement processes.

- <u>Quantum uncertainty</u> associated with Planck's Constant and Heisenberg's Uncertainty Principle.

- <u>Entropy increase</u> associated with the Second Law of Thermodynamics.

- <u>Irregular or erratic behavior</u> associated with far-from-equilibrium, open, nonlinear processes or systems with feedback.

- <u>Incomprehensibility</u> associated with the inability to completely screen, filter, or otherwise consider spaghetti-like influences from a plethora of everchanging, erratic, or unknown outside events.

- <u>Mutations</u> associated with environmental pressure, replication errors, or unknown influences in molecular and evolutionary biology.

- <u>Ambiguity</u> associated with natural languages as they are used and interact with one another.

- <u>Novelty</u> generated by the thinking and actions of unique individuals and their many-sided interactions with each other.

UNDERLYING MESSAGE

There is no way out, unless we can eliminate the features just cited. Since we don't know how to do this: we must continue the whirl of reorientation, mismatches, analyses/synthesis over and over again ad infinitum as a basis to comprehend, shape, and adapt to an unfolding, evolving reality that remains uncertain, ever-changing, unpredictable.

Underlying Message

posttext1

posttext2

posttext3

posttext4

<u>NOW</u>

If we connect this continuing whirl of <u>reorientation</u>, <u>mismatches</u>, <u>analyses/synthesis</u> and the <u>novelty</u> that arises out of it with the previous discussion we can see that we have:

A

Conceptual Spiral

for

• Exploration	— Discovery	— Innovation
• Thinking	— Doing	— Achieving
• Learning	— Unlearning	— Relearning
• Comprehending	— Shaping	— Adapting

hence a

Conceptual Spiral

for generating

• Insight	— Imagination	— Initiative

<u>WHICH</u>
<u>? — RAISES THE QUESTION — ?</u>

Can we survive and grow without these abilities?

! NO !

<u>Which Suggests</u>

The conceptual spiral also represents:

A
Paradigm
for
Survival and Growth

POINT

Since survival and growth are directly connected with the uncertain, everchanging, unpredictable world of winning and losing, we will exploit this whirling (conceptual) spiral of <u>orientation</u>, <u>mismatches</u>, <u>analyses/synthesis</u>, <u>reorientation</u>, <u>mismatches</u>, <u>analyses/synthesis</u> … so that we can comprehend, cope with, and shape, as well as be shaped by that world and the <u>novelty</u> that arises out or it.

REVELATION

METAPHORICAL MESSAGE

- A <u>loser</u> is someone is someone (individual or group) who <u>cannot</u> build snowmobiles when facing uncertainty and unpredictable change;

<div align="center">whereas,</div>

- A <u>winner</u> is someone (individual or group) who <u>can</u> build snowmobiles, and employ them in an appropriate fashion, when facing uncertainty and unpredictable change.

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Wilcox et al.

Afterword

When John Boyd died in March of 1997, he wondered if he had made any real difference. He worked on the designs of the A-10, F-15, and F-16 in his last years on active duty and which reinvented tactical air power—TACAIR—for the US Air Force. Then there were the large numbers of foreign military sales of both the Fighting Falcon and the Eagle in their various configurations. His work on energy-maneuverability theory changed the way in which military aircraft were designed and built. However, Boyd had a different standard. He wanted to know that his ideas about warfighting, strategy, deception and how to defeat guerilla warfare, had made a difference in how people thought about and prepared for war. He labored 22 years on "A Discourse on Winning and Losing," briefed it nearly fifteen hundred times across the country and in the Department of Defense (DOD). His ideas about maneuver warfare were adopted by the US Marine Corps and subsequently by the DOD in general. His work behind the scenes in the Military Reform Movement should also have been the source of some sense of accomplishment in contributing to the defense intellectual debates on the future of US security. However, it was not.

He felt he was an outcast, a would-be prophet without honor, largely shunned by his service, and neither he nor his ideas not very well known at home or abroad. All that changed over the next decade. Colin Gray bestowed an accolade in his *Modern Strategy* that Boyd "well merits the honourable mention as an outstanding general theorist of strategy." My first book on John—*The Mind of War: John Boyd and American Security*—was printed in 2001 and reprinted in 2004 and 2007. Robert Coram's book *BOYD: The Fighter Pilot Changed the Art of War* followed in 2002 to great acclaim and large sales, and Frans Osinga's more intellectually oriented *Science Strategy and War: The Strategic Theory of John Boyd* was published in 2007. It took fifteen years for the US Air Force to accept Boyd. This acceptance was not actualized until I was invited to give annual the Harmon Memorial Lecture at the US Air Force Academy in January 2012 entitled "On the Making of History: John Boyd and American National Security."

However, the real and lasting impact of John Boyd and his thought on the USAF and the US defense establishment is the broad acceptance and understanding of his ideas and their institutionalization in the Professional Military Education (PME) of the USAF. Boyd is taught and discussed in multiple schools and centers at Air University at Maxwell AFB, the home of Air Force PME. Not only that, but he and his ideas are well known in far corners of the globe, from Singapore to Romania, Denmark to the UAE. The influence is particularly profound at the Center for Strategy and Technology (CSAT), the home of the Air Force's Blue Horizons Program. A group majors and lieutenant colonels take a year-long study of strategy and technology culminating in a specialized degree in Airpower Strategy and Technology Integration. These officers conduct careful

research to produce prototypes—of strategies, concepts of operations or CONOPS, changes in organizational structures, or new technologies—for the USAF to test and implement to prepare for the future. Blue Horizons maintains an iconic lithograph of one very bad-ass looking black snowmobile, tail number BH 001, emblazoned "Col John R. Boyd" to honor of Boyd's encouragement of synthetic thinking of the kind that could take disparate things and create a snowmobile. Boyd's ideas—the OODA (observe, orient, decide, act) Loop, his emphases on time and timing, the strategy of isolation and interaction, on information, maneuver, deception, and so on, are all the key components of the course of study in Blue Horizons.

But, it is more than the ideas, the master's theses, and the prototypes that emerge from individual Blue Horizons fellows' research that matter. Rather it is the habit of mind and pattern of thought that owes so much to John Boyd and how he thought that makes the graduates of the program special. Each year some 16–17 majors, lieutenant colonels, and colonels pass through the only mixed-rank Intermediate Developmental Education and Senior Developmental Education courses in the DOD. These officers have been thoroughly schooled and have become individually adept at the practices of the habits of mind, patterns of thought, and the necessity of asking the right questions following the patterns set by John Boyd.

Loyal heretics all, they go forth and infect those with whom they work and lead over the rest of their careers with, at least some of, the insight, spirit, analytical, and synthetic capabilities of John Boyd.

That spirit of inquiry is a gift that keeps on giving, and one in which Boyd would be justly proud. The "Discourse on Winning and Losing" continues, and this volume published by Air University Press ensures that this is so. It makes his work available in multiple dimensions to a much larger audience. We owe Dr. Ernest Rockwell, director of the Air University Press, Mr. James Howard, the indefatigable creator of this work replete with QR code access to videos, and so much more, and the staff who assisted in bringing this volume to fruition, a debt of gratitude for their role in ensuring that the "Discourse" continues with easy access and low cost and as a volume unto itself. That the US Air Force helps spread his ideas and discusses them, adopts some of his insights in policy and tactics, and shares his ideas with new generations of Air Force officers routinely would please Boyd greatly. Fear not, John. The "Discourse on Winning and Losing" continues—and will for a long time to come.

Grant T. Hammond
Air University
Maxwell AFB, AL
August 2017

Appendix
The OODA Loop

Probably the most readily associated term with John Boyd is the concept of the OODA Loop (observation, orientation, decision, act), which does not appear in the "Discourse on Winning and Losing" in the August 1987 version that was so widely distributed. Instead, it was a part of the last update that John Boyd made to the Discourse on 28 June 1995 in a boiled down version of things entitled "The Essence of Winning and Losing." Boyd referred to this as "the big squeeze," the ultimate compression of his ideas. It is a synthesis of all that Boyd had learned from his early "Aerial Attack Study" to his later interests in coevolution, sociobiology, genetic engineering, chaos, and complexity. For Boyd, OODA Loops are a composite of how we think and learn, the source of who we are, and the potential we possess. It is a profoundly simple explanation of the nearly infinite variety that is possible. It is a shorthand for life itself, a model for how we think, and the means by which we both compete and collaborate.

In a portion of the "Essence of Winning and Losing," Boyd describes the centrality of the OODA Loop as follows:

> Without our genetic heritage, cultural traditions, and previous experiences, we do not possess an implicit repertoire of psycho-physical skills shaped by environments and changes that we have previously experienced.

> Without analysis and synthesis across a variety of domains or across a variety of competing independent channels of information, we cannot evolve a new repertoire to deal with unfamiliar phenomena or unforeseen change.

> Without a many-sided implicit cross referencing process of projection, empathy, correlation, and rejection (across many different domains or channels of information), we cannot even do analysis and synthesis.

> Without OODA Loops, we can neither sense, hence observe, thereby collect a variety of information for the above process, nor decide as well as implement actions in accord with these processes.

> Or, put another way, without OODA Loops embracing all the above and without the Ability to get inside other OODA Loops (or other environments), we will find it impossible to comprehend, shape, adapt to, and in turn be shaped by an unfolding, evolving reality that is uncertain, ever changing, and unpredictable.

The OODA Loop was originally known as the "Boyd cycle." OODA loops are descriptions of tactical air-to-air engagement, means of adjusting strategies in constant coevolution with one's strategic environment, and metaphors for life itself. The concept of an OODA loop is an extended biological metaphor of stimulus and response, but an organic model, not a mechanistic one. It

Boyd's OODA Loop
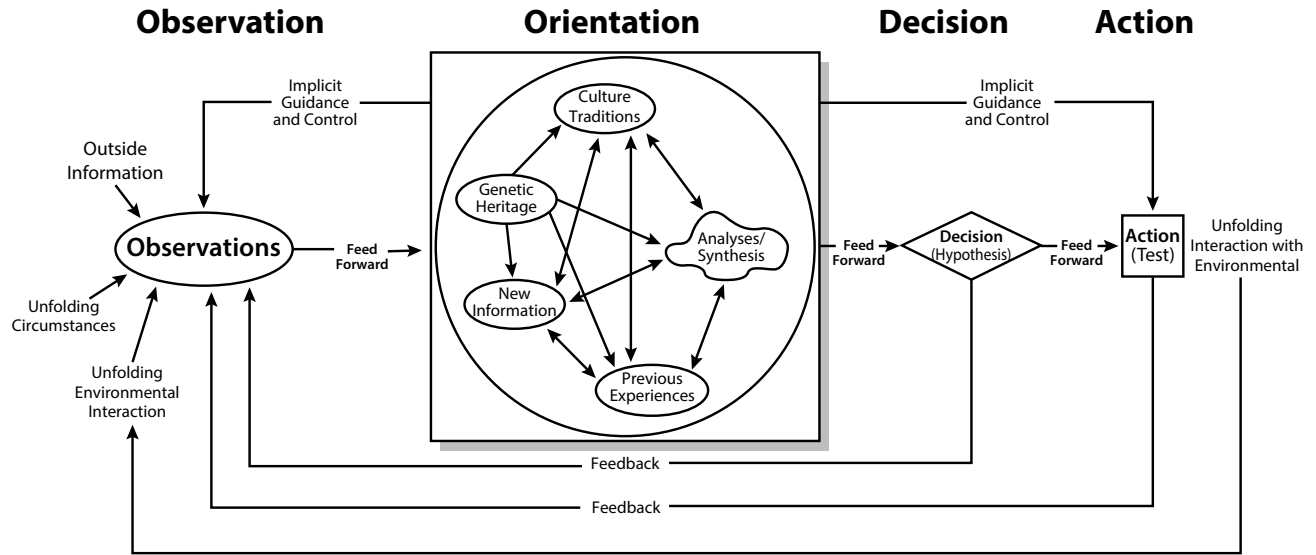
The OODA Loop. Boyd's final sketch of the OODA Loop, as presented in his summation of "A Discourse on Winning and Losing," which he referred to as "the big squeeze," 28 June 1995. Adapted from Hammond, *Mind of War, 190.*

is an integration of Boyd's "mind/time/space" and a key to successful adaptation.

When Boyd first developed the idea, "sensing" was used instead of "observation." But "SODA Loops" didn't pass the giggle test, as Boyd said. It all begins with *Observation*—assessing the environment, one's place

in it, and the interaction of the two. It is scanning for threats and opportunities and provides a base from which to proceed feeding forward into *Orientation*. What Boyd called "the big 'O.'" It is the amalgamation of genetic heritage, cultural traditions, previous experience, education, and new information and the analysis and

synthesis that follows. These are a complex set of filters that condition action and reaction to various stimuli. In processing all this information a menu of responses is developed.

These responses are then sorted, analyzed, and synthesized for a Decision on a preferred procedure—least harmful, quickest, most consequential, and so on. As Boyd described it: "A many sided implicit cross referencing process of projection, empathy, correlation, and selection." Decision is a choice of a course of action, a trade-off in a wider trade space about some future state of affairs and their consequences. It becomes a hypothesis to be tested by the Action that implements the made decision—a testing of our hypothesis about how best to shape and to be shaped by the environment.

The OODA Loop process was a nonlinear process with constant feedback and feed-forward channels of implicit guidance and control. For Boyd, it was "an evolving, open-ended, far from equilibrium process of self-organization, emergence, and natural selection." OODA Loops explain actions and reactions and explain how others—adversaries, allies, and bystanders—operate. Understanding other orientations and circumstances is critical for successful competition with others.

The OODA Loop provides an analytical tool as well as a model. It is not disciplinary dependent, provides context, emphasizes the temporal dimension, and provides insight into a decision calculus. As a theory, it is an effort to describe, explain, and predict a future course of events. Many ascribe the Gulf War of 1991 victory to getting "inside the adversary's decision cycle"—modulating operational tempo—slowing things down and speeding things up to sow confusion and disorder in the enemy.

An assessment of the OODA Loop concept was given by Colin Gray: "The OODA Loop may appear too humble to merit categorization as grand theory, but that is what it is. It has elegant simplicity, an extensive domain of applicability, and contains a high quality of insight about strategic essentials, such that its author well merits honourable mention as an outstanding general theorist of strategy."[1] Though it is the most well-known term associated with Boyd, it is also the least understood. It is often referenced with a diagram of four circular arrows which Boyd never created and which grossly oversimplifies the concept and its importance. It is hoped that this volume of Boyd's work will rectify the many misconceptions of what it is and why it is important.

*Colin S. Gray, Modern Strategy, (Oxford: Oxford University Press, 1999), 91.

Index

"The United States Air Force of today reflects the impact of many of Boyd's ideas."

Aerospace Power Journal

"He wore the Air Force uniform for twenty-four years. During that time he made more contributions to fighter tactics, aircraft design, and the theory of air combat than any man in Air Force history."

Robert Coram, *Boyd: The Fighter Pilot That Changed the Art of War*

"The significance of Boyd's theory is that these principles, based on the records of combat over more than two millennia, lead to a demand for a military establishment that is very different from the one the United States has created."

James Fallows, *National Defense*

"John Boyd was a remarkable patriot whose intense commitment to learning and teaching the lessons of history changed American military doctrine and made Desert Storm possible."

Newt Gingrich, former Speaker of the US House of Representatives

"The military services should welcome more people like Colonel John Boyd. He was something of a legend in the Pentagon—for his willingness to swim against the tide and to challenge service orthodoxy."

James Schlesinger, Former Secretary of Defense