Strategy and Airpower

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When a new technology appears in business or war, advantages in cost or efficiency—albeit initially marginal—may be clear almost from its appearance. Conversely, decades or even centuries may pass before we conclude that the new technology is not a substitute for the old but offers the opportunity to move into a new dimension previously not available or even conceived. Such myopia often leads otherwise competent observers to underestimate significantly the new technology's potential. Two business examples stand out: in 1876 Western Union observed that "this 'telephone' has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us"; and in 1977 Ken Olsen declared that "there is no reason for any individual to have a computer in his home."[1]

In the military sphere, airpower—anything guidable that moves through the air or space, manned or remotely piloted—has encountered the same problem, as evidenced by Marshal Ferdinand Foch's reported evaluation of the airplane when he was a professor of strategy at France's École supérieure de guerre (war college) before World War I: "Airplanes are interesting toys, but of no military value."[2] Certainly, few people today would go as far as Marshal Foch in dismissing airpower as just a toy, but perhaps equally few understand that airpower can and should fundamentally change the very nature of war.

The first known combat employment of the airplane took place over Libya during the Italo-Turkish war of 1911, just a century ago.[3] In the intervening years, range, speed, payload, and accuracy have improved substantially, and airpower has profoundly influenced the outcome of every conflict following its first major application in World War I. Despite its past successes, however, we still tend to see airpower as a means of improving or facilitating old ways of war rather than the path to revolutionary change of enormous value to the United States.

Regardless of airpower's potential, it can never realize its real capability so long as it remains bound to an anachronistic view of war with an anachronistic vocabulary. On the contrary, if airpower is truly to come of age, it must do so in the context of a modern concept of war that associates the use of force as directly as possible with end-game strategic objectives, not with the act of fighting. If this is to happen, the operators of airpower must understand, believe, and teach end-game strategy as the foundation of airpower. Failure to do so will condemn airpower to suboptimization and deprive its owners of using force in such a dramatically different way that will achieve national objectives quickly and at minimum cost. To succeed, airpower advocates must stop trying to use airpower as a substitute for its military predecessors, connect it directly to strategic end-games, adopt a new vocabulary to match airpower's promise, and become serious promoters not of machines but of ideas.

War seems part and parcel of the human condition although we have reasonable knowledge of details about wars only of the last several thousand years. Most of those occurred between opposing land forces, and the bulk of our thinking and writing has focused on the land aspect of conflict. Less has been written about sea power although it often played a crucial role in the outcome of conflicts dating back at least to the ancient Greeks. As evidence of what we might consider a fixation, consider Carl von Clausewitz's book *On War*, in which the role of sea power in the defeat of Napoleon is conspicuous by its absence.

Land operations have so dominated the study of war that war itself has come to be defined almost exclusively as the clash of armies. The clashes, the battles, became not only the measure of success but also something to be desired. As Clausewitz said,

> Combat is the only effective force in war; its aim is to destroy the enemy's forces as a means to a further end. . . . It follows that the destruction of the enemy's forces underlies all military actions; all plans are ultimately based on it, resting on it like an arch on its abutment. . . . The decision by arms is for all major and minor operations in war what cash payment is in commerce. . . .
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> Thus it is evident that destruction of the enemy forces is always the superior, more effective means, with which others cannot compete.[4]

Our purpose is not to critique Clausewitz (in many ways the *pontiff maximus* of Western armies for a century and a half) but to use him as a writer still much read and as an example of how most people, including heads of state and their senior officers, think about war. To them, war is inevitably the clash of arms—to repeat, "The destruction of the enemy's forces underlies all military actions. . . . That destruction of the enemy forces is always the superior, more effective means, with which others cannot compete." It is amazing how this idea has remained so embedded in our thinking and culture, especially in light of a number of historical examples of wars either won or significantly influenced by some other means. Readers need no reminder that one of the world's truly great empires grew largely on the back of a Royal Navy that frequently won "wars"—or prevented them—by its mere presence.

Exponents of *On War* largely overlook the fact that even Clausewitz said that the "aim is to destroy the enemy's forces as a means to a further end." Then, for a variety of reasons, he and his followers focused their thinking, writing, and fighting on fighting! And this is our problem: we only

give lip service to "the further end," remaining fixated on an infatuation with battle.

So here is a proposition: let us resolve to expunge the words *fighting*, *battle*, *shape the battlefield*, *battlespace*, and *the war fighter* from our vocabulary, to relegate the "means" of war to the last thing we think about, and to elevate the "end" to the pedestal of our consideration. In other words, let's bury thousands of years of bloody battle stories, as heroic as they were, and start looking at war—and eventually airpower—from its end point, which by definition means from a strategic perspective.

Strategy can be complex, but for our purposes we can simplify it considerably. At the most basic level, strategy addresses four words: Where, What, How, and Exit. These words serve as the foundation for the four strategic questions:

1. *Where* do we want to be in the future? In other words, what do we want ourselves and our opponent to look like at some specific point in the (postwar) future? For simplicity, we can call this a future picture.

2. *What* can we put our resources against that will create the conditions to allow us to realize the future we have just described? At the highest level of analysis, we start this process by identifying the systems that need to change so that we can realize our future picture; at the next level of analysis, we continue by identifying the centers of gravity (the control or leverage points) against which to apply real resources to force needed system change.[5]

3. *How* and in what time frame can we affect the things against which we are applying our resources? In this step, we will eventually make decisions about the tactics, but we will start with decisions about the time we can afford and the sequence of attacking centers of gravity within that time frame. We go out of our way not to choose our tactics—a bomb, bullet, or torpedo—until we well understand everything else.

4. *Exit*. How do we move on, following success—or failure? Occasionally, endeavors as complex and dangerous as war lead to success for one of the antagonists. Moving on from success, however, is not easy, and we must think through it at least as carefully as we considered the decision on the future picture and the decision to go to war. Even more dangerous is the much more likely event of making significant mistakes along the way. Failure to have a plan for failure leads to a high probability of disaster.

Assuming that we can create a future picture for ourselves and our opponents, the two questions of direct relevance to our topic of airpower and strategy are the second (What?) and the third (How?), although we can certainly make a case that withdrawal (Exit) from an airpower war gone well (or badly) is much easier than from one in which ground power dominated. Seemingly, if we want anything (a future picture) different from that which currently exists, something must change to make it happen. In the geopolitical world, if we have a future picture (strategic objective) for an opponent (which may be a nation-state, group such as al-Qaeda, or tribe), that adversary must change in some way to reflect our future picture. Since the opponent probably doesn't want to change, we need to do something to force it.

Opponents are complicated things with many moving and static parts, but we can simplify our analysis by seeing them as a system, which means that they function in some reasonably connected manner. Systems exist for a purpose—in this case, to do something (which may be little more than survive) that we don't want them to do. To do something, the nation-state or group uses its internal components to realize the "something."

If a state, for example, wanted to attack another state, it would go through steps similar to the following:

1. One or more individuals (*leaders* with or without portfolio) would espouse the idea, find other leaders to help them, or suppress those who opposed their idea.
2. It would develop or put into motion the *processes* necessary to garner support from more members of the state and to acquire resources such as arms and ammunition for the attack; put other processes into motion to recruit, train, and equip the forces needed for the attack; and nurture the processes necessary for survival of the state, such as communications, food production and distribution, financing, and manufacturing.
3. The state would ensure that the roads and other *infrastructure* were adequate for survival and for supporting attack operations.
4. It would take steps to ensure either adequate support from the *population* or to suppress opposition.
5. Finally, it would send some of its *fielded forces* (almost always a relatively small part of the population, at least since the days of the Mongols) to carry out the assigned attack.

Note that sending forces off to attack is the last step in the simplified process and that the state probably has the ability to send more forces if the initial batch runs into problems. A visual depiction of this organizational pattern helps us understand it (fig. 1).

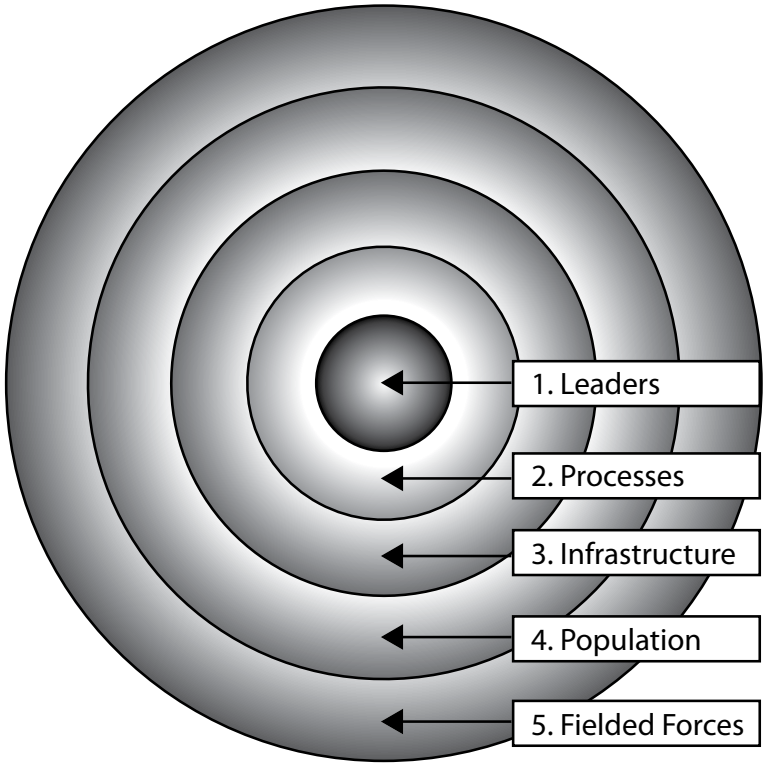

Figure 1. The enemy as a system—the five rings

Reversing the sequence just described (i.e., moving from the outside rings to those inside) reveals that the state could probably lose the entire force that it dispatched but, other things being equal, could nevertheless remain an entirely capable organization (recall the very rapid recoveries from British losses at Yorktown in 1781 and British and Commonwealth losses in Singapore in 1941).

Conversely, if the state's leaders were gone or had lost their interest in conflict, and if communication were limited, food production and distribution broken, and movement difficult to impossible, then the state (or group) could no longer function at its prior level—and, indeed, would be doomed over some period of time. Recall Germany and Japan in 1945. Despite suffering significant losses in their attack forces, quite large Japanese forces, in particular, were still fighting well at the time of surrender. This fact suggests that the opponent's armed forces (whether highly trained pilots or suicide-belt bombers) could hardly be the place to start thinking about attaining geopolitical objectives. In fact, it would seem the least appropriate place imaginable. Our thinking should always move from the inside rings to the outside ones, never from the outside to the inside.

If we see the enemy as a system, we first determine what the system needs to look like so that we can realize our future picture for it. At one extreme, Rome envisioned Carthage's disappearance at the end of the third Punic War, which necessitated the system's destruction. At the other end of the spectrum, during the first Gulf War, attaining the United States' major objective of regional stability meant that Iraq could not remain a strategic threat to its neighbors, which in turn meant weakening but not destroying Iraq as a system so that it could function and defend itself but not undertake new foreign adventures.

Once leaders choose the desired overall system effect, the next step is to find the centers of gravity whose alteration will create the desired system change as directly (strategically) as possible. We start with the center ring and work from the inside to the outside to find the right centers of gravity. Note the following simplified examples:

1. *Leaders* (ring one). If a strong leader such as Attila, Napoleon, Bismarck, Hitler, or bin Laden is taking an opponent in a particular direction, the removal of that leader (and perhaps his close associates) will normally result either in a reversal of direction or significant deceleration. If we wanted such a change, removal or conversion of a leader (through force, persuasion, or even bribery) would constitute a direct strategic action since change in the center of gravity is directly associated with a strategic objective.

2. *Processes* (ring two). If an opponent refuses to agree to desired terms, we can put it into a position that makes impossible any pursuit of objectives that conflict with our future picture. In World War I, the Allies imposed a blockade on Germany's food-distribution process that B. H. Liddell Hart considered "fundamental" to the outcome of the war; more directly, continuation of the blockade into 1919 forced the postwar German government to accept the harsh terms of the Treaty of Versailles.[6] Germany could not survive in the face of a blockade that produced a direct strategic effect.

3. *Infrastructure* (ring three). A nation-state or a group needs some amount of infrastructure to function. It may belong to someone else, but even in today's world we need to put our feet down someplace in order to conduct business. In the current Afghanistan war, we produced the important and early effect of depriving al-Qaeda of infrastructure that had served it well as a base of operations and for training and indoctrination camps. This loss did not destroy al-Qaeda, but it did severely complicate its ability to do business. This is an example of an-

other center of gravity closely linked to a needed strategic effect although, by itself, it did not reduce al-Qaeda to a manageable level.

4. *Population* (ring four). Nation-states and groups need elements of the population (demographic groups) to be sympathetic and helpful in a variety of ways. In the Malayan Emergency, the United Kingdom isolated the ethnic Chinese, who represented the heart of the problem, thus making the situation manageable.[7] Here, a focus on the population center of gravity helped lead to direct strategic results—the end of the emergency.

5. *Fielded Forces* (ring five). If we follow Clausewitz, we see enemy fielded forces (the enemy military) as the focus of our efforts—something to engage and defeat in battle. And that is how we have traditionally dealt with them. When a nation-state or a group loses some part of its fielded forces, it does one of three things in order of likelihood: organize and send more; negotiate to buy time to send more or hope for something good to happen; or agree to proffered peace terms when the terms look more attractive than continuing to fight. Note that the choice is up to the opponent and that the choice is unpredictable. In only a few circumstances does changing the fielded-force center of gravity produce direct strategic results. Affecting fielded forces is usually a difficult means to a murky and distant end.

A little thought will suggest that the centers of gravity in the five rings do not all have the same value in terms of their return on the investment needed to affect them. Normally we realize a far higher return on investments (whether bombs, bullets, or bullion) to affect the inner rings than on those to affect the outer rings (fig. 2). This does not mean that we can or should always ignore the outer rings; it does mean, however, that we can expect the cost of dealing with the outer rings to be quite high in comparison to the return on the operation.

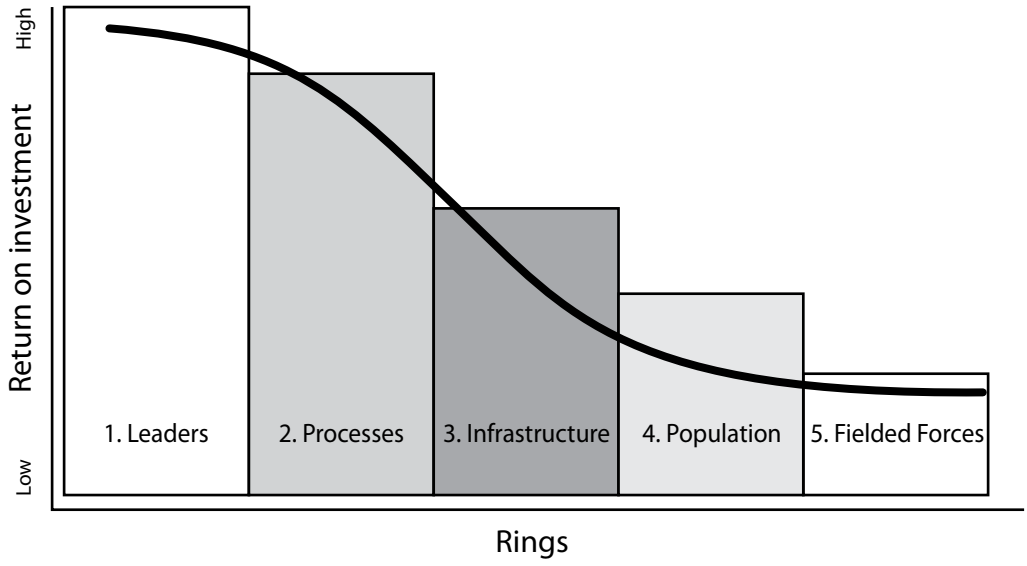

Figure 2. Return on investment for efforts to affect different rings

In the strategy methodology just discussed, we first identify our strategic objectives, our "where"—the future picture for the opponent. (We really need to do it first for ourselves, but that is another subject.) Then, looking at our opponent as a system, we find the centers of gravity that, when affected, will have the most direct effect on realizing our strategic objectives. In a few cases, we may find that just one or two will prove adequate, but in most instances we must affect several in a relatively compressed period of time. Notably, even in a large system such as the United States or China, the number of targets associated with strategic centers of gravity is rather small—considerably fewer than 1,000, more than likely.

If we need to address the opponent's fielded forces at all, we can and should use exactly the same methodology that we used at the strategic level. After identifying our objective, which could range from destruction through immobilization to recruitment, we analyze the fielded force as a system and find the relevant centers of gravity, starting from the center. The number of centers of gravity with which we have to deal in this case will normally translate into far fewer targets than if we took the traditional approach of a war of attrition against the force's personnel and equipment. The number of targets associated with operational-level centers of gravity for even a large fielded force is again surprisingly small—probably in the low thousands at most (e.g., the Iraqi army in Kuwait in 1991).

After identifying the centers of gravity, we decide what they must become (destroyed, isolated, converted, paralyzed, etc.) and how we will measure success. Only at the very end do we decide the methodology (the tactics) that we will employ to affect them. Note that if we start with the last step—choose a tactic such as a ground attack—we subvert the whole strategy process and will probably do nothing that makes sense, let alone do the best thing. The strategic approach gives us the freedom to consider and mix every conceivable way to change a center of gravity—a bribe, an aerial bomb, a hack, a proxy, a conference, an award, assistance funding, or a thousand other possibilities. Rather interestingly, a ground attack against an army would be one of the last things put on the list.

If we end up choosing to use force as a major or complementary way to achieve strategic objectives, the methodology just described (or something similar to it) is crucial to the effective exploitation of airpower. This methodology allows us to select the most appropriate centers of gravity and then apply airpower (if appropriate) to produce direct strategic results. It helps us avoid the siren lure of "battle" and prevents us from starting with the "means" à la Clausewitz, while giving only a nod to "other ends" and really having no clear idea exactly where the "means" will lead. To the extent that national leaders understand this methodology, they understand the value of airpower; to the extent that they don't, they will not understand and will become victims of thousands of years of tactical history that has lost much of its relevance. Another critical and generally ignored component of strategy, however, accentuates even more the importance of airpower—and that is time itself.

Leaders of any competitive enterprise, including leaders of a nation (or any other group), must understand the importance of time, for it is a critical yet normally mismanaged element. As Sun Tzu said two millennia ago, "Thus, though we have heard of stupid haste in war, cleverness has never been seen associated with long delays. . . . There is no instance of a country having benefited from prolonged warfare."[8] This statement is as true today as when he wrote it—except that *long* or *prolonged* may have meant many months in Sun Tzu's era, whereas today they could mean hours or days. Very simply, *short* is categorically good, and *long* is categorically dangerous and bad—because of something called the "time value of action," which in turn derives from the phenomenon of shock effects produced by compressed, parallel attacks on

centers of gravity. During serial attack, the opposite of parallel attack, forces attempt to affect one or a small number of strategic centers of gravity sequentially over time.

To realize the future picture, we must change the opponent system, which we do by affecting one or more of its centers of gravity. The resulting impact on the system will be a function of how quickly the centers are affected. If we do so too slowly (serially), the system will probably find ways to repair itself, protect itself against further attacks, and begin its own operations against its opponent's systems. Conversely, if we affect enough centers of gravity quickly enough (in parallel), the system will go into a state of paralysis, preventing it from repairing itself, protecting itself against future attacks, or making competent attacks against its opponent's systems. Over the last half century or so, we have actually seen several examples of both the serial and parallel approaches.

In World War II, the United States conducted serial aerial attacks on German targets in 1943.[9] The US Eighth Air Force, for example, hit only about 11 target areas that could be considered "centers of gravity"; six of these went directly or indirectly against fielded forces (aircraft and ships). Of the remaining five, only the attacks on marshalling yards, synthetic oil installations (three attacks total against two locations), and, to some extent, ball bearing factories approached the status of a second-ring (processes) center of gravity that could have had a general impact on Germany as a whole. Note that no attacks occurred on ring one (leadership) or on such key ring two (processes) targets as electricity, command and control communications, energy other than oil, transportation other than rail marshalling yards, food, finance, or radio broadcast, to name just a few. At the time, attacking some of these centers of gravity lay beyond the available technology. In addition, we followed a very measured rate of attack: none (involving more than 10 aircraft) took place during 21 weeks of the year, and the median number of attacks per week for the entire year was just *one*.[10] Although these strikes caused considerable damage and forced the Germans to reallocate resources for defense and repair, Germany as a system functioned well at the end of the year. Due to bad weather and bomber diversion to support the planned D-day invasion, attack intensity effectively moved operations from serial to parallel only at the end of 1944. By the conclusion of the war in May 1945, the changed use of airpower had become a key factor in creating a state of paralysis in Germany because too many things were broken to allow effective repair, defense, or competent counterattack.

A similar phenomenon took place in Operation Allied Force against Yugoslavia (Serbia) in 1999: serial attacks in the first month went largely against fielded forces. Serbian leader Slobodan Milošović's forces operated effectively under this attack methodology, even stepping up operations in Kosovo. After the attacks in the second month became parallel and included direct leadership and process centers of gravity, internal dissension at the highest levels of government appeared within a week; Yugoslavia claimed it was withdrawing forces from Kosovo two weeks thereafter; and in the eighth week following the change in attack methodology, Yugoslavia essentially offered to capitulate by saying it would accept the European Group of Eight's "principles for a peace deal."[11]

Movement from the parallel domain to the serial domain causes the probability of success to begin to fall dramatically.[12] Taking a very long time decreases the chances considerably. It isn't impossible to win a long war, but the odds are very low—and this applies to both sides, despite significant differences in their centers of gravity. Since good strategy depends heavily on understanding probabilities, deliberately embarking on a low-probability, long serial war does not make much sense.

Another phenomenon occurs as we move into the serial domain in war or business. In war the cost of operations goes up dramatically in terms of lives, money, and equipment for both sides. Conversely, and

somewhat paradoxically, a parallel attack is actually less costly for both sides although initial commitment and expenditures may be higher than for the serial strike. In business the costs include time to market, inefficient use of people and facilities, and lack of strategic information. The huge difference manifests itself when we look at the cost from inception to conclusion. In addition the cost associated with operating in the parallel domain is reasonably clear in part because predicting the short term is far easier than predicting the long term. Foreseeing the cost of serial operations is extraordinarily difficult, and actual expenses almost always far exceed the estimates. Examples abound, including estimates for government acquisition projects and those for the cost of wars. Figure 3 captures the concept of the time value of action, showing some of the many things that may go wrong as a protagonist moves into the serial domain. It also depicts an averaged line for the cost of operations.

Very simply, whether in war or business, our normal approach to the time element is exactly backward: we ask ourselves how long something will take rather than decide how long it should take in order to create parallel effects and succeed at an acceptable cost. So important is this concept that we can use it to help determine whether or not we want to go to war. If we cannot or will not operate in the parallel domain, then we should first look for ways to avoid war (in any event, probably a reasonable course in most instances).

We began by suggesting that our war concepts and vocabulary were outmoded and dysfunctional and that we still follow an ancient idea of war captured in Clausewitz's focus on battle. The old ideas had some practical value in the past when the military forces available to any state or organization were small and had limited speed and range. On the one hand, if an organization defeated the military of another organization, usually nothing stood between the victor and the real reason for war—seizing wealth, whether in the form of crops, land, gold, or slaves. On the other, failure to overcome the opponent's military lay one's own wealth open to seizure and destruction. Most of our thinking and operations, then, really flowed from the extraordinarily limited capability of the available forces, so we

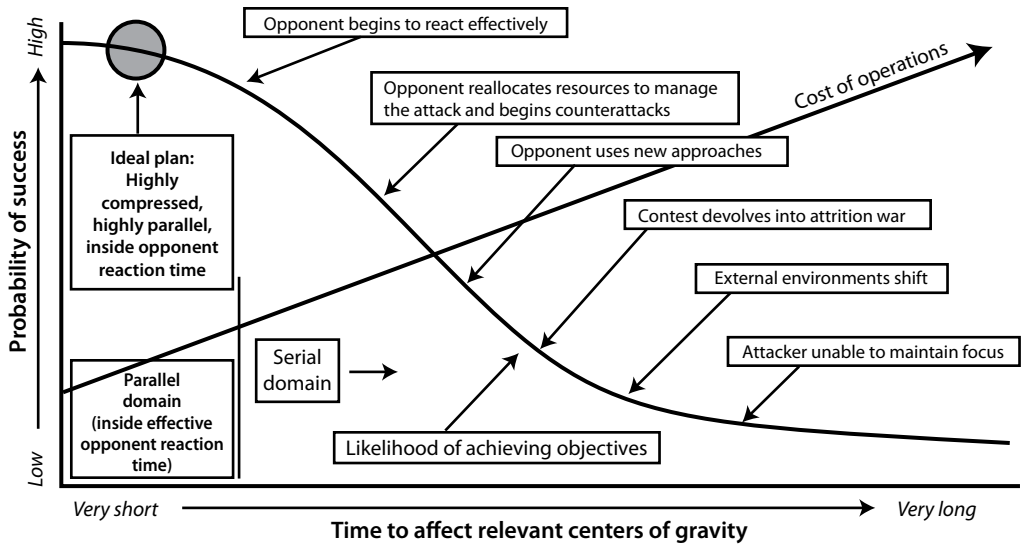

Figure 3. Time value of action

had no compelling reason to think beyond the battle. Imagine, however, that armies of old could have instantly transported themselves into the rich heartlands of their opponents where the plunder would have been theirs for the taking. Would not our whole concept of war have been much different? In addition, the military forces themselves could rarely attack more than one thing at a time, so they had to proceed serially. Only within the last 75 years has airpower made it possible to attack multiple centers of gravity in parallel. Can there be any question that we desperately need to rethink war?

Airpower enables us to think about conflict from a future-back, end-game-first perspective as opposed to one based on the battle obsession of Clausewitz and his followers. It also opens another very exciting possibility: conflict with little or no unplanned destruction or shedding of blood.

Traditionally we have thought about war as quintessentially battle, bloodshed, and destruction; indeed, the tools of war previously available left us little choice. If, however, presented with a way to conduct war without unplanned destruction or bloodshed, would we shun or welcome it? Some would choose the former very quickly while others would choose the latter.

Those who would shun relatively bloodless war argue that without bloodshed and destruction, war would not be war and that, in any event, it would prove too tempting for the politicians. Let's assume for the moment that bloodshed and destruction are the necessary components of war, by definition. We would then ask ourselves why we have wars. The answer is simple: we go to war to get something we otherwise would not have because another state or group will not voluntarily give it to us. War then is very clearly a means to an end—and thus not a strategic starting place. Obviously we will want things in the future that the possessor is not inclined to surrender, so the something becomes our strategic objective.

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Knowing the strategic objective, we start looking for the means to achieve it. Our choices would range from war defined as bloody and destructive to cajolery of some kind. In the middle of this spectrum, we might find something (currently nameless) that makes it physically impossible for a possessor of something we want to withhold it but involves little or no bloodshed and destruction. To make discussion easier, let's call this "bloodless force." If we had this option at a reasonable cost, we would probably choose it in those instances when cajolery failed and when we could not reasonably argue that we should take the bloody war path as a first choice. This brings us back to the other objection frequently raised to bloodless force—that politicians would resort to it too often.

We cannot know whether politicians would more frequently resort to bloodless force than they have to traditional war. In fact our ability to predict what politicians will do in any circumstance is rather close to zero. The argument might have validity if we had a long record of politicians avoiding

war, but such is not the case. The bloodiness and destruction of war seem to have had little dampening effect on politicians through the ages (perhaps just the opposite); thus, we have no reason to think that we would encounter many more instances of physical action against opponents than we have up to the present.

When we engage in conflict, we should always make our strategic objective the creation of a better peace. Normally, in a better peace the vanquished do not bear such hatred for the victors that another trial becomes inevitable. One way of reducing postconflict enmity involves lessening the suffering and recovery time of the defeated party. Traditional wars have perverse and long-lasting effects, but airpower may someday offer an alternative.

Some would agree that truly bloodless force would be great but that it is technologically impractical. And it might well be—today. Tomorrow, however, is a different story; we have already made great progress, as evidenced by the wars of the 1990s, in which high-tech powers represented one side of the conflict. Because airpower already has the ability to deliver energy with great accuracy (precision of impact), even now we can largely confine weapons to hitting their intended targets. The next step calls for making serious progress in achieving real precision of effect whereby the energy delivered does only what we want it to do. The new small-diameter bombs are a step in the right direction. With precision of effect combined with precision of impact, bloodless war becomes a reality.

To this point, we have tried to make the case that airpower can realize its potential of moving us into a new sphere of conflict only if it is tightly linked with a future-back, end-game strategy that rejects anachronistic ideas about war. Specifically,

- The best approach to strategy starts with a future picture, determines the systems and centers of gravity that must change to realize that picture, takes into account the impact of time, and preplans an exit.
- We should focus on direct, strategic centers of gravity to the maximum extent possible.
- Our conflict vocabulary flows from ancient times and traps us mentally and physically into concepts that no longer make sense, so our vocabulary must change.
- The objective of a conflict is to achieve a future picture, not to kill and destroy.

Our last task, perhaps the easiest one, has to do with seeing if we can employ airpower effectively in the service of system-centric rather than battle-centric strategy—and do so in such a way as to move to a more efficient, effective approach to conflict that does not emphasize death and destruction.

With regard to strategy and airpower,

- Strategy provides the framework for finding the best means to attain objectives.
- If we want to change our opponent as a system to conform to our objectives, then the most direct approach entails affecting opponent centers of gravity closely related to the objectives.
- Fast action and short conflicts are imperative and far less expensive than slow, long ones.
- As we consider conflict, we should explore bloodless-force options exhaustively before reverting to traditional war and battle.
- "Battle" is at best an expensive and risky means to a distant end, and we should almost always avoid it.

If we accept these points, we can begin to find the means to realize them.

Our options, in the broadest sense, include ground power, sea power, and airpower, but before we examine them, some amplification is worthwhile. In the world of real organizations, armies and navies have

airpower, while air forces normally have very little ground power beyond that needed for light security. To keep this simple, we will not talk about current service organizations. Thus, ground power is anything essentially tethered directly to the earth, including people, tanks, and artillery; sea power is anything that operates on or under water but does not include aircraft or missiles launched from ships; and airpower is anything guided that flies through the air and space, regardless of who owns it or its launch platform. If we want to avoid parochial arguments that confuse our assessment of the options, we need to stay with these definitions. After reaching conclusions, we can decide which organizations should own and operate the three types of power.

Ground power, the oldest and historically most prevalent tool of conflict, is slow and normally affects only an opponent's fielded forces—the outer, fifth ring that is only rarely directly connected to a strategic objective. Ground power has minimal ability to conduct parallel operations on its own or to operate without significant destruction and bloodshed.

Sea power can operate against centers of gravity directly or closely related to strategic objectives but only if those centers are accessible by water. Although much of the world fits into this category, much does not—and even the majority of states and organizations with coasts normally have a large number of their centers of gravity well removed from the sea. Sea power can move faster than ground power and can bring more centers of gravity under attack, but in most circumstances it cannot execute parallel operations. It can conduct operations with far less destruction and bloodshed than ground power.

Airpower can operate against virtually all of the centers of gravity directly related to strategic objectives, regardless of their location. Because it can bring many under attack in compressed periods of time, it is well suited for parallel operations. Finally, airpower can produce appropriate effects with little destruction and bloodshed, if desired.

The overwhelming, game-changing value of airpower should be clear—but such is not the case for the majority of government officials and military officers, including many who operate some facet of airpower. To see such a valuable resource properly used, however, we Airmen must stop thinking we can do so via the two methodologies most prominent in the last few years: trumpeting our spectacular technology and asking merely to be treated as equal members of a team composed of the three forms of power. The technology is spectacular, but we should take a page from business, which long ago learned that selling a product had to involve much more than touting its technical goodness. Products sell because customers see them as filling a real need in their lives; airpower advocates have not done well in this regard. If airpower is something different, we must highlight its differences and show convincingly that it fills a vital need.

This brings us back to strategy. Our sale of airpower—which, like it or not, has to precede its smart application—must start by connecting it uniquely to a new approach to success in conflict. If our approach to strategy finds acceptance, airpower becomes the obvious solution; if it fails, we are just another hawker of new gizmos. Marketing, then, becomes a number-one priority for airpower even though many airpower advocates are not very comfortable with or knowledgeable about it.

We must direct our marketing toward taxpayers and decision makers at large; indeed, we must think through the problem in the same way we would think through something like the Iraqi invasion of Kuwait in 1990. That is, we must have a future picture of airpower, understand the need to change our own system, apply our efforts against centers of gravity within our own system, and strive to operate in parallel so as to give ourselves maximum probabilities of success at the lowest possible cost. If we don't take this approach, we limit ourselves to trying to convince advocates of ground

power and sea power to agree to something they think is against their best interests.

Our successes with airpower over the last century have flowed primarily from connecting it uniquely to a new approach to success in conflict. When the public and senior civilians in government understood the value of airpower, including the cost of depending on other means, plans for novel application won acceptance—witness the British use of airpower in 1920s Mesopotamia, emphasis on airpower in the 1930s as another European war loomed, long-range aerial attacks on Germany and Japan as a major part of the World War II effort, the huge investment in airpower as a weapon and deterrent in the first half of the Cold War, and the use of airpower in the 1990s. None of these efforts could have happened had they depended on a vote by the "joint team." In other words, airpower has enjoyed success when it played what we might call the outside game and far less success when it tried to play the inside game.

Airpower exponents not only need to connect airpower directly to strategy and market their product well, but also need to start believing in it. Those who begin a discussion by noting that airpower "can't do everything" do themselves and their listeners a real disservice. They probably mean that military power cannot do everything or fulfill some objectives—a completely true statement. If, however, a problem is amenable to military solution, why disqualify airpower from any aspect of it? Why should we start out with "airpower has limits" in our mind instead of "airpower has no limits"? In other words, we should at least begin with the presumption that airpower can carry out any military task. If we fail to do so, we create a self-fulfilling prophecy and don't even examine the possibilities because "everyone knows" we have always used bayonets guided by human beings as the preferred tool and that will "never change." Offhand, I can think of only one thing that airpower cannot do and that some other form of military power can: physically take people into custody. But if it won't work today, what would we need to do to make it work tomorrow?

After careful consideration of a problem, we may decide that airpower will not work. That is an acceptable answer—for now.

Of course, espousing the unlimited concept of airpower exposes the advocate to charges of airpower zealotry, a lack of "jointness," or some other nasty label. But we need to become confident enough to shrug off these labels. At one time, Airmen refused to be marginalized by such attacks and pressed on to do the impossible, time after time. If we want a brighter airpower tomorrow and a brighter, more affordable, more effective, and lower-risk future for our nation, then we must reclaim the courage and confidence of our forebears. If we do, we can reforge airpower into an invaluable concept for our nation and civilization—one that will return huge dividends on the human and monetary investments needed to realize its extraordinary promise. ✪

Notes

1. The quotation from Western Union is widely attributed to a company internal memo dated 1876. See, for example, *All Great Quotes*, http://www.allgreatquotes.com/stupid_quotes124.shtml. For the Olsen quotation, see Jonathan Gatlin, *Bill Gates: The Path to the Future* (New York: Avon Books, 1999), 39.

2. See *Great-Quotes.com*, http://www.great-quotes.com/quote/861686.

3. *Encyclopedia Britannica*, academic ed., s.v. "Military Aircraft: Early History," accessed 23 November 2010, http://www.britannica.com/EBchecked/topic/382295/military-aircraft/57483/Early-history?anchor=ref521642.

4. Carl von Clausewitz, *On War*, rev. ed., ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984), 97.

5. Two or more people who are cooperating constitute a system.

6. Sir B. H. Liddell Hart, *Strategy* (New York: Meridian, 1991), 204.

7. A key part of the British Briggs Plan to defeat the insurgency called for isolating insurgents from their supporters among Malaya's ethnic Chinese population. The plan involved the forced relocation of about 500,000 rural Malayans, including 400,000 Chinese, from squatter communities into newly constructed guarded camps called New Villages designed to keep the inhabitants in and the guerrillas out. Many relocated people became content with the better living standards in the villages. See *Wikipedia: The Free Encyclopedia*, s.v. "Malayan Emergency," accessed 28 November 2010, http://en.wikipedia.org/wiki/Malayan_Emergency.

8. Sun Tzu, *Sun Tzu on the Art of War: The Oldest Military Treatise in the World*, trans. Lionel Giles (Toronto: Global Language Press, 2007), 11, 12.

9. RAF Bomber Command was quite active during 1943, but it directed virtually all of its attacks against cities at night, with a major objective of "lowering morale and de-housing workers." See Richard G. Davis, *Bombing the European Axis Powers: A Historical Digest of the Combined Bomber Offensive, 1939–1945* (Maxwell AFB, AL: Air University Press, April 2006). I extracted my data from the book's CD, which includes the files "1943.xls" and "I Sheet Key.pdf." The quotation above comes from p. 6 of the latter file in a section entitled "General Information."

10. Ibid. Data extracted from CD files "1943.xls" and "I Sheet Key.pdf." For this analysis, I counted as an "attack" only missions that started with 10 or more aircraft. Of the approximately 72 missions of fewer than 10 aircraft, 29 hit undefined industrial areas, and 30 ended up striking undefined targets of opportunity (in 1943 the latter generally meant any alternative target, selected when aircraft could not find assigned targets due to bad weather). The 11 target categories hit in 1943 are as follows (the number in parentheses indicates the ring in which I believe the target would have fit using the five-ring system): aircraft manufacturing (five); bearings (two); industrial areas (three or four); marshalling yards (two); synthetic oil plants (two); port areas (five); shipping (five); steel (two); rubber (two); tires (five); and U-boat shipyards (five). As an aside, if I were planning a similar attack against a similar opponent today, I would not hit steel, industrial areas, or rubber because they do not have a general impact on the enemy as a system and therefore are not really ring-two targets.

11. "Operation Allied Force," *GlobalSecurity.org*, accessed 28 November 2010, http://www.globalsecurity.org/military/ops/allied_force.htm.

12. I use the word *domain* in this context to illustrate the dramatic difference between the world of serial and parallel attacks. The US Air Force does not refer to serial and parallel domains, using the word *domain* in connection with air, space, and cyber.

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Colonel Warden (USAFA; MA, Texas Tech University) retired from the Air Force as commandant, US Air Force Air Command and Staff College, Maxwell AFB, Alabama, in June 1995. In his active duty career, he had extensive experience in flying, command, and staff positions. He has more than 3,000 flying hours in a variety of aircraft, including the F-4, OV-10, and F-15; flew over 250 combat missions in Vietnam as a forward air controller; and served as commander of the 36th Tactical Fighter Wing in Germany. His nonflying assignments included two tours on the Air Staff with the second as deputy director for war fighting, in which capacity he led the planning effort to develop the strategic air campaign (originally titled Instant Thunder) for the first Gulf War. After the war, he was a special assistant to the vice president of the United States, focusing on American-competitiveness issues. Following his retirement from the Air Force, Colonel Warden founded Venturist Incorporated, which has specialized in helping a wide variety of companies improve their results through strategic thinking and execution. He has appeared on a number of television programs and is the author of two books: *The Air Campaign* and *Winning in FastTime*. Colonel Warden is a graduate of Squadron Officer School (correspondence), Air Command and Staff College (seminar), and the National War College. His decorations include the Distinguished Service Medal, Defense Superior Service Medal, Legion of Merit, Distinguished Flying Cross, and Air Medal with 10 oak leaf clusters.

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