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FOG and FRICTION
Challenges to Command and Control

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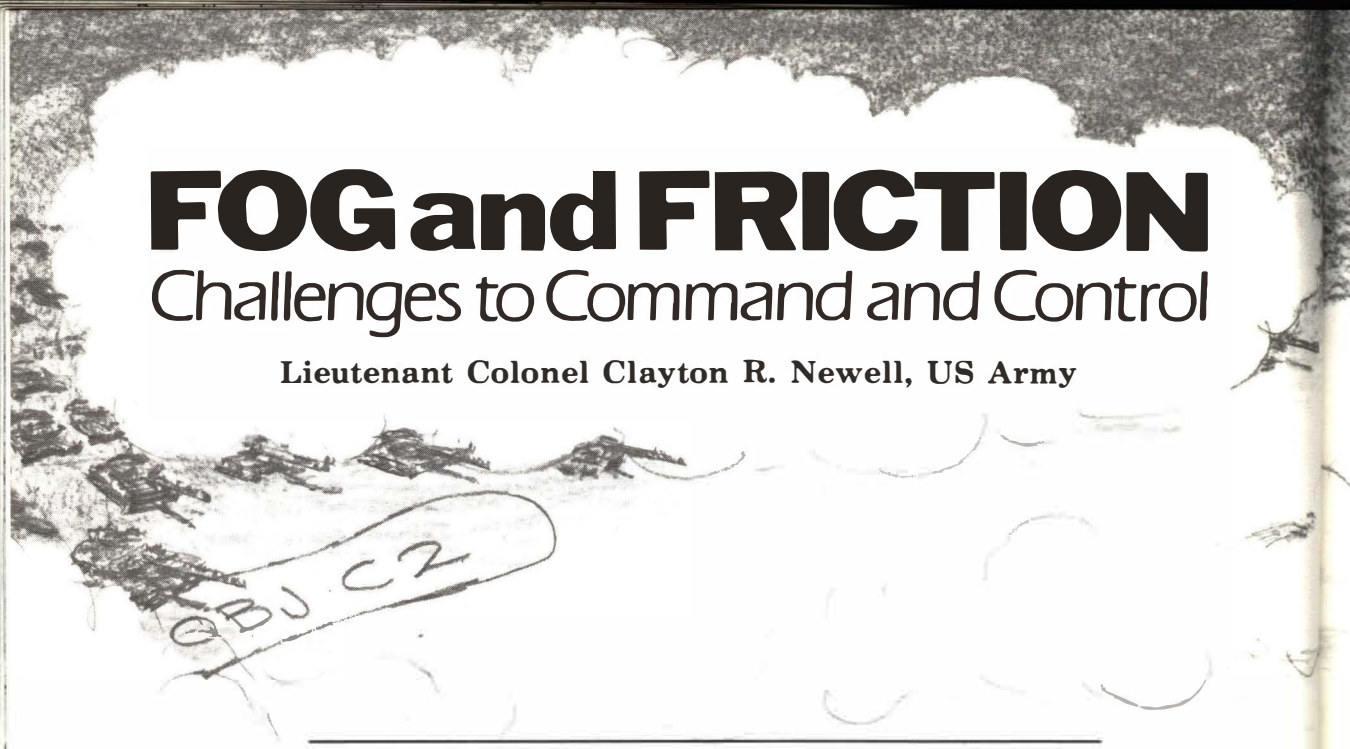

Command and control, or C², is one of the premier concepts in today's US Army. Effectively directing friendly forces against an enemy, imposing the commander's will on the opposing command structure and winning are the ultimate aims of a C² system. But many factors work against C² systems, and the commander must recognize and deal with these challenges before C² can assure success on the battlefield.

ARMIES strive to be orderly. In many military minds, the picture of a truly professional unit is tidy ranks and files of men and equipment on parade. While there is some truth in this picture, too much emphasis on order may actually be detrimental to success on the battlefield. This theory is especially true as technology becomes more involved in the conduct of war. Technological jargon, with its apparently precise meanings, creates a false sense of orderliness when used to describe broad, intangible concepts.

In the lexicon of the US Army, for example, the widespread use of the expression C² to represent command and control implies an order to war that simply does not exist on the battlefield. C² is a pseudo-mathematical expression that, when used as Army jargon, suggests that command and control is somehow above the chaos of battle. Chaos, the antithesis of order, actually predominates in war and makes the battlefield a place where uncertainty prevails. Commanders may see the expression C² as a means to provide certainty when making battlefield decisions. But there is no certainty in the chaos of battle. This search for certainty produces a dynamic tension between what commanders would like to do and what actually happens on the battlefield.

Two fictional vignettes from World War I illustrate this dynamic tension. In *The Soldier: His Daily Life Through the Ages*, Lance Corporal Verrall finds himself caught in the chaos of battle between British and German lines where "there was now so much smoke drifting over the ground that

it was impossible to know where the enemy was or where his own lines were. In the middle of that storm of death he stood there, wondering in which direction he should move."[1]

In contrast to Verrall's confusion, a newly appointed corps commander in the *The General*, one Lieutenant General Curzon, assures himself that "there was going to be no muddling in *his* corps. Everything was going to be exact, systematic, perfect—to Curzon the adjective 'systematic' implied a supremely desirable quality."[2]

While Verrall existed in the chaotic reality of "a storm of death," Curzon sought the comfort of certainty by being "systematic." In World War I, the misguided systematic, even scientific, search for certainty by commanders and staffs on both sides needlessly killed thousands of soldiers. Apparently, those searching for the perfect system did not understand or consider that ambiguity, not certainty, is the norm in war.

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Since World War I, technology has intensified both Verrall's "storm of death"

and Curzon's desire to be "systematic." Modern weapons systems, detection devices and electronic deception, to name but a few advances, make today's battlefield many times more lethal than the one Verrall knew. Concurrent developments in communications and computers also make Curzon's goal to be systematic seem more attainable.

In spite of the potential confusion surrounding the introduction of yet another new term, the Army's lexicon needs a way to convey the ambiguity of the battlefield. The expression F^2, for fog and friction, provides a useful contrast to the well-established C^2.

The dynamic tension between certainty and ambiguity is as real today as it was in World War I. Success in battle and in war will go, as it has always gone, to the side that can best cope with the omnipresent ambiguity of the battlefield. By its very nature, and in spite of technology, the battlefield will remain chaotic. It is simply unrealistic to expect order in an activity in which the whole point is for armed opponents to destroy one another.

In spite of the potential confusion surrounding the introduction of yet another new term, the Army's lexicon needs a way to convey the ambiguity of the battlefield. The expression F^2, for fog and friction, provides a useful contrast to the well-established C^2. Fog and friction, two intangibles of war, have always been present on the battlefield. They are, however, relatively new ideas in the literature of war, considering the three thousand and more years man has spent trying to eliminate himself from the face of the earth.

According to one source, the earliest reference to the fog of war was in 1724, when Chevalier Folard observed that "the *coup d'oeuil* [sic] is a gift of God and cannot be acquired; but if professional knowledge does not perfect it, one only sees things imperfectly and in a fog."[3] Of course, the concept goes beyond the literal reference to fog. It refers to the fact that commanders simply cannot determine enemy intentions before they happen. The fog of war prevents commanders from being certain of exactly what is happening to their own units on the battlefield, much less the enemy's. The *coup d'oeil* translates literally from the French as a glance or glimpse. As Folard used it, it refers to the battle-experienced commander's ability to quickly and intuitively understand complex situations in the absence of certainty. Even today, perfection of the *coup d'oeil* by constant professional study remains virtually the only way a commander can hope to penetrate the fog of war.

Friction, the second factor in F^2, is a Clausewitzian concept. "Friction," Karl von Clausewitz wrote in the early nineteenth century, "is the force that makes the apparently easy so difficult."[4] He elaborated on this theme by expressing the idea that while war is indeed very simple, even the simplest task is difficult. No matter how systematic the preparation for war, this friction will eventually reduce the effectiveness of the best plans of the best armies unless commanders can deal with the ambiguity of F^2 on the battlefield.

The expressions F^2 and C^2 neatly describe the perspectives of the fictional soldiers Verrall and Curzon. F^2 presents the ambiguity of Verrall's battlefield, and C^2 represents the systematic method that Curzon, or any other commander, uses to search for certainty. The US Joint Chiefs of Staff (JCS) convey this idea of searching for certainty when they define a C^2 system as "the facilities, equipment, communications, procedures,

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and personnel essential to a commander for planning, directing, and controlling operations of assigned forces pursuant to the missions assigned."[5]

The JCS definition, however, does not mention that the C^2 system has to function in an unsystematic, ambiguous environment. Even in peacetime, simply moving men and equipment across the ground produces an ambiguous situation. It is impossible to know exactly where every person or piece of equipment will be at any one time, even if all the elements of a complex C^2 system function perfectly. Add an opponent who will try very hard to disrupt an already ambiguous situation, and F^2 can very quickly overpower the best C^2 system. Success in war demands that the commander's C^2 system be greater than F^2. The US Army's keystone war-fighting manual, Field Manual (FM) 100—5, *Operations*, specifies that "*The ultimate measure of command and control (C^2) effectiveness is whether the force functions more effectively and more quickly than the enemy.*"[6]

In simple terms, a commander's C^2 system must overcome F^2 to be effective. A C^2 system, no matter how effective, cannot elimi-

Remembering that the Army's doctrinal measurement of C^2 effectiveness is the ability of the friendly force to function more quickly than the enemy, commanders must be able to react rapidly to unexpected situations by deciding what to do based on available information. Commanders simply cannot afford to wait for certainty.

nate F^2, nor does the experienced commander expect it to. The experienced commander does, however, expect his C^2 system to be effective enough to allow him to cope with the F^2, a realistic expectation when C^2 expands to become C^3 with the addition of communications. Modern communication systems help commanders lubricate the friction areas and see through the foggy ones. In fact, this C^3 system "is central to the conduct of battle," according to a senior NATO commander.[7]

Returning to the JCS for a definition of communications, we learn that it is "a method or means of conveying information of any kind from one person or place to another."[8] This definition is satisfactory as far as it goes, but it fails to cope with the F^2 of battle. While information per se is important, the idea behind the information actually provides the lubricant and vision to overcome F^2. This distinction between ideas and information is crucial when commanders are trying to overcome F^2 and impose their will on the enemy. Simply having a great deal of information about the enemy does not guarantee success. In the view of one authority, *"the mind thinks with ideas, not with information."*[9]

Communications must, therefore, include the concept of conveying ideas, as well as information, if commanders are to have any hope of thinking of ways to defeat their enemy. Some years ago, the US Army's Infantry School defined communications as "the process by which *ideas* and information are transmitted from one place to another or from one person to another."[10]

This definition provides a more complete picture of what must happen in an effective C^3 system. Remembering that the Army's doctrinal measurement of C^2 effectiveness is the ability of the friendly force to function more quickly than the enemy, commanders must be able to react rapidly to unexpected

situations by deciding what to do based on available information. Commanders simply cannot afford to wait for certainty. They must be able to act even when they have less information than they would like. Incomplete information, like F^2, is an omnipresent challenge of war. One key to ensure that C^2 is greater than F^2 on the battlefield is an adequate supply of the lubricant and the vision inherent in good communications to convey information and ideas rapidly.

Ideas, however, *must* accompany the information that passes through the C^3 system. Simply showing a briefing chart, for example, that merely records the number of bridges across a river may not be very helpful to the commander unless it can also convey the idea of why the bridges are important to the commander's plan. Without communicating the idea along with the information, the effort spent moving data through a C^3 system may be an exercise in futility. An experienced division commander has cautioned that "an inordinate amount of staff time is consumed in gathering and filtering the data that must fill in the blanks on the charts."[11]

Communicating the data or information just to fill in the blanks is not enough; the idea is the essential thing. Unfortunately, increasing advances in communications and automatic data processing have encouraged a tendency to dwell on how much information or data the C^3 system can transmit. In the confusion of battle, one can derive great comfort from the systematic organization, collection, collation and display of data. Once displayed for the commander, this information creates the impression of an orderliness that is simply not present on the battlefield. Some technicians even think the C^3 system actually "*requires* a steady stream of accurate and reliable operational/logistical reports."[12]

For a C^3 system to *require* a steady stream of information implies that the system has become an end in itself. The structure must exist to exchange information and, more importantly, ideas. Along with staff time wasted in gathering and filtering data, staffs can become wrapped up in maintaining and feeding the C^3 system, rather than using available information to generate ideas needed to conduct the battle. Certainly, the more information a commander has about an impending battle or campaign, the better.

Information cannot, however, be allowed to become an end in itself. Commanders will virtually never have all the information

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they would like to have. They must be prepared to act with decisiveness in an uncertain environment. General George S. Patton Jr. writes of demanding an attack to be conducted without delay over the objections of "all the generals concerned" because his

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"sixth sense told [him] it was vital."[13] Patton was proven correct. Attacking without delay resulted in breaking up an enemy attack before it started.

With advances in communications and data processing, the amount of information available to today's commander is rapidly increasing. Although we may be approaching the time when enough information is available to present a certain picture of the battlefield, the commander may not have the time to wait for the system to analyze the data before he must act. Too much information can paralyze a force as quickly as too little data if the commander is hesitant to act in ambiguous situations. Because the commander's *coup d'oeil* remains a key ingredient to success in battle, the commander must control his C^3 system, not be a slave to it.

In his classic study of command, historian Martin Van Creveld notes that an organization, when "confronted with a task, and having less information available than is needed to perform that task," has two options. "One is to increase its information-processing capacity, the other to design the organization, and indeed the task itself, in such a way as to enable it to operate on the basis of less information."[14]

The Army's current fascination with technology tends to focus on the first option, while Patton might have advocated the second. To be successful, commanders must develop the ability to strike a balance between their "sixth sense" and the necessity for a "steady stream" of information. They must organize their C^3 systems, both people and equipment, so that they can function on less than certain information.

Planning is a key factor in the ability of a C^3 system to overcome F^2. Detailed planning before a battle, a campaign or a war can anticipate many of the problems presented by F^2 and provide a better opportunity for the C^3 system to function effectively. No matter how detailed the plan, however, F^2 will certainly cause it to change once battle begins. The Prussian Field Marshal Helmuth von Moltke, a successful commander in the 1870 Franco-Prussian War, cautioned that no plan survives contact with the enemy.[15]

Von Moltke's message should remind planners, especially prewar or peacetime planners, that their plans must accommodate changes once the battlefield situation differs, as it certainly will, from what they thought would happen. Although planning can greatly assist the C^3 system's ability to cope with F^2, commanders must guard against the danger of becoming so enamored with their plan that they resist changes to it regardless of the situation, for according to Patton, "successful generals make plans to fit circumstances, but do not try to create circumstances to fit plans."[16]

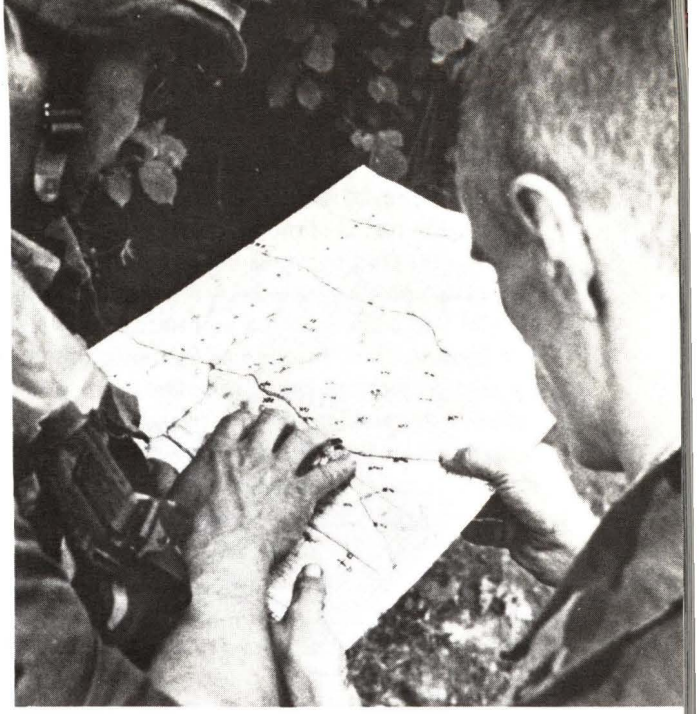
Commanders at all levels, once committed to battle, naturally want to believe their plan is working and are reluctant to accept information contrary to that supposition. Objective analysis of available information,

though essential, is frequently difficult. Simply assuming that things are going well because of no news to the contrary does not always work. The old adage that no news is good news does not necessarily apply to information in war.

On the contrary, wrote German Field Marshal Erich von Manstein, a successful commander in World War II, "whenever things are going well, news usually finds its way back quickly enough. If, on the other hand, the attack gets stuck, a blanket of silence descends on the front, either because communications have been cut or those concerned prefer to hang on till they have something encouraging to report."[17] Another reason that it may take longer for reverses on the battlefield to become known to higher headquarters, a more modern writer notes, is the human failing that "no one wants to pass bad news upward, especially if it reflects unkindly on him."[18]

In light of this expected reluctance among subordinates to pass on bad news, commanders must actively seek out the situation on the battlefield to find out whether their plan needs changing. The commander, through his C^3 system, must be able to receive and transmit both ideas and information to evaluate progress or the lack thereof. How he does it is a combination of personal desires and equipment available, but he must have some method that allows him to monitor the battle without imposing impossible requirements for information on his subordinate commanders. Unrealistic reporting requirements themselves contribute to the F^2 with which subordinate commanders must also contend.

Flexibility is the word for the ability of a commander to adapt his plan to what the situation will allow. Flexibility, like communications, provides a sort of lubricant and vision that helps overcome F^2. Combining F^2 and flexibility produces the expression F^3. F^3 represents a combination of the fog and friction of war and the flexible attitude that the successful commander must develop to deal with these intangibles. No matter how sophisticated the C^3 system, at times the F^2 may so overwhelm the combat forces that operations bog down for no apparent reason. The experienced commander who understands the intangibles of war must then be able to develop new ideas based on limited information to achieve his objective. This flexibility is Patton's "sixth sense" or Folard's *"coup d'oeuil."*



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Although successful commanders cannot hope to eliminate F^2, they can reduce its detrimental influence. Technology continues to develop equipment and techniques that provide commanders access to an ever-increasing pool of information to plan and conduct their operations. This increase can

be, however, a mixed blessing, for along with the benefits of more information comes the danger that commanders or their staffs, in a misguided or even an unguided effort to please the boss, become so enamored with the system that, instead of focusing on the ideas it transmits, they make the accumulation of information an end in itself.

Armies and their commanders exist not simply to accumulate information, but to fight wars. Clausewitz reminds us that "the end for which a soldier is recruited, clothed, armed, and trained, the whole object of his sleeping, eating, drinking, and marching *is simply that he should fight at the right place and the right time.*"[19]

Determining the right place and the right time is the commander's job. Although planning can establish when and where the fight should be, once the fight begins, the commander must be able to contend with F^2. The planning process includes designing a C^3 system that will provide the commander the information and ideas necessary to conduct the fight. C^3, however, can only assist the commander. He must prepare himself, before the fight, to deal with the intangibles of F^2.

Designing C^3 systems is relatively simple compared to understanding F^2. A lifetime of study may not be enough for some aspiring commanders to be successful in battle, but ignoring the intangibles of war in the belief that technology alone will somehow bring order to the chaos of battle will certainly guarantee failure. MR

NOTES

1. Philip Warner, *The Soldier: His Daily Life Through the Ages* (New York: Taplinger Publishing Company, 1975), 140–41.
2. C. S. Forester, *The General* (Annapolis: The Nautical & Aviation Publishing Company of America, 1982), 207 (emphasis original).
3. Chevalier Folard, *Nouvelles Decouvertes sur la Guerre, 1724*, quoted in Robert Debs Heinl Jr., *Dictionary of Military and Naval Quotations* (Annapolis: United States Naval Institute, 1966), 121.
4. Karl von Clausewitz, *On War*, ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 121.
5. US Joint Chiefs of Staff (JCS) Publication 1, *Dictionary of Military and Associated Terms* (Washington, DC: 1 January 1986), 77.
6. US Department of the Army, Field Manual 100—5, *Operations* (Washington, DC: May 1986), 22 (emphasis original).
7. General Glenn K. Otis and Maj. Robert F. Driscoll, "Making the C^3 Pieces Fit in Central Europe," *Signal* (November 1986): 19.
8. JCS Pub 1, 80.
9. Theodore Roszak, *The Cult of Information: The Folklore of Computers and the True Art of Thinking* (New York: Pantheon Books, 1986), 88 (emphasis original).
10. Joseph A. Olmstead, "Processes of Command Influence: Communication," in *Selected Readings in Modern Leadership* (Fort Benning, GA: US Army Infantry School, 1971), 220 (emphasis added).
11. Maj. Gen. Richard L. Prillaman, "Command and Control in the 2d Armored Division," *Military Review* (July 1982): 41.
12. Michael A. Platz, "Technological Advances for Enhanced Battlefield Leadership," *Signal* (November 1986): 67 (emphasis added).
13. George S. Patton Jr., *War As I Knew It* (Boston, MA: Houghton Mifflin Co., 1947). Patton mentions this incident in his narrative on page 207 and again as an example of how he earned his pay on page 387.
14. Martin Van Creveld, *Command in War* (Cambridge, MA: Harvard University Press, 1985), 269.
15. Lt. Col. Jack D. Hoschouer, "Von Moltke and the General Staff," *Military Review* (March 1987): 72.
16. Patton, 248. A slightly different version of the idea is on page 116.
17. Erich von Manstein, *Lost Victories* (Chicago: Henry Regnery Co., 1958), 48.
18. Olmstead, 227.
19. Clausewitz, 95 (emphasis original).

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