ON THE ARMY STYLE IN ANALYSIS

Carl H. Builder

October 1986
The Rand Paper Series

Papers are issued by The Rand Corporation as a service to its professional staff. Their purpose is to facilitate the exchange of ideas among those who share the author's research interests; Papers are not reports prepared in fulfillment of Rand's contracts or grants. Views expressed in a Paper are the author's own and are not necessarily shared by Rand or its research sponsors.

The Rand Corporation, 1700 Main Street, P.O. Box 2138, Santa Monica, CA 90406-2138
ON THE ARMY STYLE IN ANALYSIS

Introduction

What I want to say tonight has some of the elements of a sermon: I will make reference to the Psalms, the Gospel, a parable, and, if you listen closely enough, you might even detect a message. But if you think I am here to save souls, forget it. Analysts are beyond redemption; and I intend not to convert you, but to incite you to greater mischief, if that is possible in a group like this.

At the meetings here today, the papers and discussions are centered--quite properly--on the techniques of operations research as applied to a variety of Army problems. Tonight, I would like to turn toward another aspect of operations research--one which we seldom talk about--the matter of style in our analyses. Webster defines style as a:

Mode of expressing thought in language; especially a manner of expression characteristic of an individual, period, school, or nation.

Analysis is certainly another language for expressing thoughts; and the manner by which the Army characteristically expresses its thoughts through analysis is a matter of style. That style is unique to the Army and derives in large measure from who the Army is and what it is about. And, I will argue, that style affects the quality and utility of analysis every bit as much as technique. Thus, I am going to try to convince you that the Army's style in analysis ought to be of some interest and concern to each of us.

---

1This is the text of a banquet talk given by the author at the Twenty-Fifth Annual U.S. Army Operations Research Symposium on 8 October 1986, at Ft. Lee, Virginia.
My interest in all this derives from my year as a visiting analyst with CAA. Van\(^3\) asked me to look into Army participation in the strategic planning process--particularly with respect to the formulation and application of strategy in the design of future forces. My research soon revealed that the three services had uniquely different approaches to strategic planning which were rooted in their distinctive personalities. I would like to tell you something about those differences so you can better appreciate the Army's style in analysis and its origins in the Army personality.

In my efforts to sketch their institutional personalities, I compared the three services on seven aspects, such as the ways they distinguish among their own branches or specialties and their confidence in their own institutional legitimacy or relevancy. Some of those aspects aren't pertinent to analytical style. But I want to touch upon a few of them because they will give you the flavor of the distinctive service personalities and how they influence analytical styles. Let me begin with the institutional altars at which the services worship.

**Altars Worshiped**

The Navy worships at the altar of tradition. Now tradition has always been an important part of military life; but the Navy, much more than any of the other services, has cherished and clung to tradition--and not just in pomp or display, but in the Navy's approach to almost every action from eating to fighting. In tradition, the Navy finds a secure anchor for the institution against the dangers it must face. If in doubt, or if confronted with a changing environment, the Navy will look for safety in its traditions.

If tradition is the altar at which the Navy worships, then one of the icons on the altar is the concept of independent command at sea, which, like the Holy Grail, is to be sought and honored by every true naval officer. By the way, this reference to religious concepts in describing the Navy is not new: Secretary of War Stimson once remarked that

\(^3\)E. B. Vandiver III, Director of the U.S. Army Concepts Analysis Agency in Bethesda, Maryland.
The admirals were wrapped up in a "peculiar psychology" in which "Neptune was God, Mahan his prophet, and the United States Navy the only true Church."4

For the Navy, independent command at sea is epitomized by Commodore Matthew Perry who, in the 1850s, went off to Japan and behaved as the President and the Secretaries of State, War, and Commerce—all under the guns of his ships.

The Air Force worships at the altar of technology. The airplane was the technological marvel that gave birth to independent air forces. For the Air Force, technology is an eternal fountain of gifts—of new machines that will fly ever faster and higher—giving their owners the freedom of flight and the justification for their institutional independence.

The altar at which the Army worships is less obvious; but you can find it when the Army talks about itself. The object of the Army's worship is the country; and the means of worship is service to the country. Listen to these words from Psalm FM-100-1:

Out of the Army's long and varied service to our nation, tested and tempered through 200 years of peace and war, have emerged certain fundamental roles, principles and precepts.5

...the Army ethic must strive to set the institution of the Army and its purpose in proper context—that of service to the...nation, and fully responsive to the needs of its people.6

---


Explicit examples of that service to the nation are to be found in the Gospel according to Samuel (Huntington, that is):

The Army participated in a diversity of tasks—Southern reconstruction, Indian fighting, labor disorders, the Spanish War, Cuban occupation, Philippine pacification, construction and operation of the [Panama] Canal, the Mexican punitive expedition. Accordingly, the Army developed an image of itself as the government's obedient handyman performing without question or hesitation the jobs assigned to it.7

It comes as no surprise, therefore, to find that while the other services have steadfastly resisted being drawn into the war on drug trafficking, the nation's obedient servant, the Army, recently went off to Bolivia, despite the obvious risks of ending up with more egg on its face than cocaine in its choppers.

**Self-Measurement**

Each of the military services measures itself against some institutional standard of health: 17 divisions, 27 tactical fighter wings, or 15 aircraft carriers. But the important aspect here is not how the services choose to measure themselves, but how important those measurements are to them: How concerned or preoccupied are they about making or meeting those measurements?

The Navy has been the most consistently concerned of the three services about its size, which it measures first in the number of its capital ships and then in the numbers of other ships, by category, and, more recently, in the aggregate.8 The Secretary of the Navy, John Lehman, has taken some pain to be sure that we all know about the need for a 600-ship Navy. That number, of course, is built around 15 aircraft carriers—the capital ships of the modern Navy.

---


But did you know that the Navy has always wanted 15 capital ships? The Navy's demand for 15 capital ships has remained constant since the turn of the century—from the time of Teddy Roosevelt—even though the capital ship has undergone repeated changes—from dreadnought to battleship to carrier to supercarrier—and the perceived enemy has changed as many times—from Britain to Germany to Japan to Russia. Empires may rise and fall, the world and the threat and the technology may change, but not the Navy's demand for 15 capital ships. Now that's tradition!

Moreover, the Navy's concern about meeting these measurements is acute: Being one capital ship short is to be "a quart low," with ominous consequences if not corrected quickly. The Navy is the hypochondriac of the services, constantly taking its own temperature or pulse, finding it inadequate, caught up in an anxiety largely of its own making.

The Air Force has always been more concerned about the quality of its aircraft than their numbers. For example, the Air Force doesn't lament the size of its bomber force so much as it does its age. Given a choice between quantity and quality, the Air Force has always opted for quality. The Air Force concern about self-measurement becomes acute only if its qualitative superiority is threatened: To be outnumbered may be tolerable; but to be out-flown isn't. The way to get the American flier's attention is to confront him with a superior machine.

The Army appears to be the most relaxed of the three services about measuring itself, probably because it has become accustomed to growing and shrinking with the nation's demands for its services. At least until recently, the Army has consisted mostly of people conscripted from the citizenry. Thus, where the Army does talk about its size, it tends to be in terms of people—end strength or divisions—and their state of readiness, not so much as the Air Force and Navy in terms of equipment.
Devotion to Toys

How do the services differ in their devotion, possessiveness, or pride toward their equipment? With what do people in military service tend to identify themselves?

The Air Force is, by far, the most attached of the services to toys. Air Force pilots often identify themselves with an airplane: "I'm a 141 driver." "I flew buffs." Sometimes this identification goes right down to a particular model of an airplane: "I fly F-4Cs." The pride of association is with a machine, even before the institution. One could speculate that if the machines were, somehow, moved en masse to another institution, the loyalty would be to the airplanes. The American experiences with the Lafayette Escadrille, Chennault's Flying Tigers, and the Eagle Squadron, support that speculation.

The Navy is far less toy oriented, even though there is a more diverse set of bigger and more expensive toys to play with. While the things that the Navy owns and operates are clearly a source of interest and pride for those who serve in them, Navy men are more likely to associate themselves with the Navy as an institution. This loyalty to institution appears to extend even to Navy fliers, who see themselves as naval officers first and aviators second (I haven't yet talked to Army aviators about their loyalties: Do they see themselves as soldiers first and fliers second?)

Army people have historically taken greater pride in their skills than in their equipment. If one engages, say, an Army artillery man in conversation about his business, it is soon apparent that his pride is in the art of laying a battery of guns for accurate fire. The kind of gun—whether it be a 155mm, 8-inch, or even a captured gun—is incidental; the power and satisfaction are in the knowledge and skills required to do something that is both important and general to warfare. Conversations with infantry and armored officers reveal a similar pride of skills: a thorough grounding in the basic arts of employing infantry or tanks effectively in battle.

Of late, however, the Army seems to be moving toward the other services in an attachment to machines. The Abrams tank and the Bradley fighting vehicle have some of the color of institutional toys. That shift may be in response to the technological challenges now confronting the Army; or it may be seen as a better way for the Army to compete for budget slices in a toy-oriented defense program. In any event, there are signs that the Army is getting "hooked" on toys too.

Service Personalities

After a while, these kinds of comparisons begin to reveal the unique personality within each of the services. This is what emerges for me:

The Navy, more than any of the other services and over anything else, is an institution. That institution is marked by two strong senses of itself: its independence and its stature. A past Chairman of the Joint Chiefs, General David Jones, has observed that:

The Department of the Navy is the most strategically independent of the services--it has its own army, navy and air force. It is least dependent on others. It would prefer to be given a mission, retain complete control over all the assets, and be left alone.10

So fierce had been the Navy's opposition to service unification, that even Truman was intrigued with one exasperated Army unification proposal which suggested that "the only way to overcome the Navy's resistance would be to do away with the War Department, transfer all of its elements to the Navy, and redesignate that organization as the Department of Defense."11

The Navy's stature as an independent institution is on a level with that of the U.S. Government (which the Navy reluctantly suffers).

11 Ibid., p. 70.
Who is the Navy? It is the supra-national institution that has inherited the British Navy's throne to naval supremacy. What is it about? It is about preserving a way of life associated with sea power. The means to that end are the institution and its traditions.

Who is the Air Force? It sees itself as the keeper and wielder of the decisive instruments of war. What is it about? It is about insuring the independence of those who fly these splendid machines to have the freedom and power that airplanes confer upon those with the skill and courage to take to the air. Without detracting at all from the bravery and sacrifice of the airmen who have fought in the sky, the Air Force is not about fighting so much as it is about flying.

Who is the Army? It is, first and foremost, the nation's obedient and loyal military servant. It is the keeper of the essential skills of war that must be infused into the citizenry when they are called upon to fight. What is it about? It is about serving the nation by being prepared to meet the varied demands which the American people have historically asked of its army. And, unlike the other services which continue to press for the independence of their institution and missions, the Army has long ago come to terms with its utter dependency upon combined arms, joint operations, and coalition warfare.

Sometime after characterizing the services this way, it occurred to me that the mottos for the three service academies might shed additional light on their distinctive personalities. I wondered if they would lend or undermine support for the distinctions I have made here. I will let you judge. They need no identification:

- Man's flight through life is sustained by the power of his knowledge.
- Ex scientia tridens. (If your Latin is rusty or nil, the translation is: "From knowledge, sea power." Isn't the use of Latin somehow fitting for an aristocratic institution?)
- Duty, honor, country.
The ultimate objects of affection or aspiration are obvious in each case: flight, sea power, country.

Of course, personalities can change. But the personalities of the services, like those of individuals, are difficult to change. They are the products of the culture and acculturation of hundreds of thousands of people, whose behavior is continuously reinforced by social and professional incentives. Thus, the unique service personalities (whether or not I have portrayed them correctly here) are likely to persist for a very long time. Indeed, the service identities or personalities are likely to be one of the most stable aspects of the nation's future prospects for security.

**Styles in Analysis**

And these personalities have marked and will continue to mark the individual style of each of the services in their approaches to analysis.

The Air Force, consistent with its reverence for technology, has always been the most comfortable of the three services with analysis. Air Force officers, even the most senior, as members of an institution whose faith rests on theory and technology, are accustomed to dealing with analysis on every aspect of flight and the application of air power. Supporting decisions with analysis is quite natural.

Analysis is more likely to be used by the Air Force to illuminate or clarify its decision and options rather than to predict conflict outcomes or force requirements. Consequently, Air Force analyses tend to be relatively sophisticated and elegant in their design, execution, and presentation: They prize the simple equation, the single graph, or the clever model that captures and illuminates the essence of a problem. Analytical models are likely to be fashioned ad hoc and to have a life no longer than the problem at hand. Large-scale simulations are rare; more common are graphic parametric analyses that illustrate the options or their sensitivity to the principal uncertainties.

---

The Navy's attitude toward analysis is true to its aristocratic institutional character. The Navy has been at the forefront of operational analysis—to improve the tactical or operational use of its existing platforms or forces. But it has little tolerance of analysis for planning or evaluating the Navy. Analysis of naval force requirements or effectiveness is a direct threat to the Navy's traditional institutional prerogatives. The Navy doesn't need analysis to define its requirements; it has always known what its requirements were. It knows that naval forces are effective when the Navy is left alone to use them as they see fit.

When the Navy had to take up "systems analysis" in order to survive in the planning, programming, and budgeting processes, it did so with a clear eye: If analysis was the coin of the McNamara realm, then the Navy would counterfeit as much of it as might be necessary. Navy decisions about the needed platforms or forces, still based upon its experience and traditions, could, after all, be wrapped in the language of "systems analysis." It would be unfair to say that the Navy was deliberately cynical in its regard for systems analysis because its actions were rooted in a much more fundamental perception and faith: Navy institutional judgments were (like those of the true Church) infallible. If an analysis gave results that were contrary to those judgments, then, very simply, the analysis must be wrong, either in the way it was formulated or in the way it was executed.

The Army's approach to analysis is, in many respects, opposite to both the Air Force and Navy. This may be partly due to the unique circumstances under which the Army must plan and fight, but it also derives from the Army's vision of itself as the nation's loyal and obedient servant. If the national leadership wants planning numbers from the services, the Army will dutifully calculate them.

13 Unlike its two sister services, the peacetime Army retains little control over the time and place where it must engage the enemy; and the resources which it will need (mainly people) are not forces in being, but remain to be conscripted from the citizenry.
Where the Navy casts a suspicious eye upon any analysis of its requirements, the Army seems quite willing to calculate any requirement. Indeed, Army analyses, much more than those for either the Navy or the Air Force, appear to be focused on dutifully feeding the best, the most precise possible, numbers into the planning, programming, and budgeting processes. Where the Air Force is more likely to use analyses to define the characteristics of the forces it needs (e.g., the optimum payload for a new bomber), the Army is more likely to use them to define the amount of forces it needs (e.g., the number of 155mm shells required).

The Army likes large-scale simulation models which necessarily entail long, evolutionary lives. Detail and scope are prized, too often, I fear, at the expense of clarity or understanding. There is an implicit faith in analysis and analysts: If enough factors are taken into account in enough detail, by competent mathematicians, the analytical results are deemed to carry weight. Much of Army analysis appears to be aimed at getting a single answer (often a number) rather than illuminating the alternatives in the face of recognized uncertainties. Hence, deterministic rather than stochastic methods predominate.

The sophistication of Army analysis is likely to be found in computer programming and data handling, as opposed to problem structuring or analytical design. Army analysts tend to associate themselves with models (or particular analytical techniques) rather than with the problems to which their models are applied. This is in some contrast with Air Force analysts who tend to associate themselves more with problems—which they may address with a variety of models or analytical techniques. At the risk of overstating the point, the Army uses professional analysts to get the numbers requested of them, while in the Air Force, anyone confronted with the need to understand a problem or advocate a solution is likely to turn into an analyst.

In sum, if descriptive words had to be affixed to each of the three services to describe their approaches to analysis, they might be sophisticated and elegant for the Air Force, haughty and arrogant for the Navy, and ingenuous and credulous\(^1\) for the Army.

\(^1\)Ingenuous: showing innocent or childlike simplicity and candidness. Credulous: proceeding from undue readiness of belief. Webster, op. cit.
A Parable

If the distinctions between the service styles aren't apparent yet, let me offer the following parable:

In 1988, the four-year election cycle coincided for the first time since 1960 with the seven-year cycle for shortages of toilet paper in Washington. The coincidence of the two cycles brought a crisis of memorable proportions. Even Congress took note: When a defense procurement bill came before the House, they attached a rider mandating that each of the services make an analysis of their wartime toilet paper needs to be sure that they were adequately stocked.

The Air Force immediately saw the advantages of being responsive to Congress with a high-quality analysis of their needs. Besides, they saw the analytical problem as being similar to their requirements for an advanced tactical fighter, so they put their very best people on it. Their top analyst, a three star, led a team of the Air Force's best and brightest into the statistical morass of uncertainty. The Air Force team, with elegant use of Poisson and Gaussian distributions, rigorously proved that wartime toilet paper requirements could not be estimated with a precision greater than plus or minus ten percent with a confidence of 80 percent. Accordingly, they provided Congress with both the mean and standard deviation of their needs--normally distributed, of course.

The Navy frothed with indignation at the mandated analysis. One crusty admiral (have you noticed that admirals are always crusty?) is reported to have said that Congress could go to Hell, the Navy knew its requirements for toilet paper, had always known its requirements for toilet paper since it was first introduced into the fleet (in 1847--on September the seventh--at three bells into the dog watch--on the quarterdeck of the frigate Assateague); and the Navy didn't need any analytical tom-foolery to tell them how much they needed.

When an aide respectfully noted that the analysis was mandated in the same bill that authorized the keel-laying for the next carrier, the admiral relented, but only a little. He instructed his staff to get the GS-14 PhD they kept locked up for just such contingencies and assign him the job of dressing up the current Navy estimates for toilet paper in
some suitable mathematical garb. But under no circumstance was this analysis to contradict the current numbers. And that is what Congress got, begrudgingly, from the Navy.

The Army took the mandated analysis seriously. After all, this was the year of Army hygiene (you remember the slogan: "Be as clean as you can be--in the Army!"). Taking toilet paper requirements seriously would demonstrate the commitment of the Army leadership to its programs. Since wartime toilet paper requirements were mainly a theater problem, DCSOPS assigned the analysis to CAA. CAA had just the right theater-level model for the problem--the new FORCEM model which included the effects of logistics. The FORCEM task force even developed a brand-new "TF Module" for the model which took into account the loss of toilet paper as units were overrun and increased usage of paper by the headquarters units during enemy breakthroughs. With this, CAA calculated the wartime toilet paper requirements for the Army to ten significant digits--down to the very last roll. (Some of the CAA analysts argued for an accounting by sheets since some of the paper was in the form of packets, not rolls.) The FORCEM modelers were pleased; the Army was pleased; and Congress was very pleased with the Army's precise and timely response to what had become a burning question.

**Implications**

The serious point to all this is that there is an Army style in analysis. It derives in large measure from who the Army is and how it sees itself. But it can probably also be shaped to some degree by Army analysts if they are aware of that style and want to modify it.

Tonight, I have tried to make you more conscious than you might have been about the Army style in analysis. Whether you want to modify that style is a prerogative and franchise for you as individuals to weigh and to act upon.

As you think about whether or not the Army style in analysis should be modified, let me suggest a few arguments:
1. Each of the services could learn something from the others' approaches to analysis:
   - The Air Force's service-wide use of analysis as an illuminative decision aid is to be admired even when its motives aren't completely altruistic.
   - The Army's support for, and reliance upon, analysis and its development of highly-skilled professional analysts is worthy of envy by the other services.
   - The Navy's skepticism about requirements analysis may be overdone; but it isn't completely unwarranted. The Navy knows, correctly I think, that results or outcomes in war are largely incalculable. But this may have caused them to throw the baby out with the bath water--to reject the benefits of analysis in illuminating important relationships between things and events in war. Walking the balance between the analysis of war outcomes and the analysis of relationships in war is tricky. The Navy has given up on both; but the Army may not yet be differentiating between the two.

2. The programming and budgeting system\textsuperscript{15} may create a demand for point-estimate planning numbers; but that shouldn't prevent or impede the Army from extending its analyses, perhaps with other tools, to illuminating and understanding problems rather than just calculating the answers. The real planning environment for the Army is more than the bureaucratic planning system; and analysis can help the Army to better understand and cope with that uncertain environment--one that has no school solution in the back of the book of truth.

3. The Army's admirable commitment to the development and use of professional analysts may be fostering an association of their analysts with tools and models rather than with problems. There is a dilemma here for you to consider: The

\textsuperscript{15}I deliberately omitted planning. As others have noted, the first P in PPBS is regrettably missing.
specialization of Army analysts provides you with the most sophisticated of tools and models. Those models have proven themselves in calculating the answers you need to feed the programming and budgeting system. But to illuminate, to understand, the Army's problems, you will also need general analysts who associate themselves with problems more than tools. And if such analysts emerge, will they discover that those very sophisticated models created by the specialists are inappropriate or even unnecessary?

In short, you may eventually have to confront the question of why the Army does analysis. Is it principally to feed numbers to the bureaucratic planning processes? Or is it, first and foremost, the means by which the Army tries to understand a murky and dangerous future where the only certainty is that the Army will be called upon again to serve the nation it so clearly loves?