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# Operational Sequencing: The Tension Between Simultaneous And Sequential Operations

A Monograph  
by  
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Infantry



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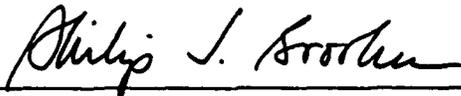
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## Introduction

The nature of modern weapons and modern battle is such that it is an impossible matter to destroy the enemy's manpower by one blow in a one day battle. Battle in a modern operation stretches out into a series of battles...<sup>1</sup>

As armies expanded in size and capability, their durability as operational formations increased, making the task of destroying these units difficult. This durability continued to expand with the progression of the industrial revolution during the 1800's. The industrial revolution provided armies a base from which to continuously draw materials, equipment, and manpower as they clashed with other formations. This base support structure enabled armies to absorb the blows from a battle and continue functioning. No longer could the planner rely on the Napoleonic concept of an extended approach march supported by foraging, followed by concentration at a single point, and then achieve the decision for both the campaign and the war with a single battle.<sup>2</sup> The possibility of destroying a formation in one decisive battle, the Napoleonic paradigm, had vanished.

Even as formations became more resilient, the effectiveness of weapons continued to improve. Technological advances in weaponry significantly enhanced the volume, accuracy, and lethality of both small arms and artillery.<sup>3</sup> These advances forced the operationally durable, but now tactically vulnerable formations to conduct distributed movements and distributed operations. The "expansion of the battlefield" reflected the need to disperse for survival. This in turn created the need for an intermediate, or "operational" level to bridge strategy with tactics.<sup>4</sup> This connection of battles in time and space with an overriding aim became known as operational art.<sup>5</sup>

Planners at the operational level today are faced with the

challenge of building a structure which links several battles into one coherent whole to reach a final decision. In doing so, the operational planner has to find a reasonable sequence of actions to bring about the objective of a campaign.

A planner's choice for sequencing resides somewhere on a scale between successive and simultaneous actions.<sup>6</sup> An inherent tension exists between the two ends of this scale which requires careful, reasoned consideration in order to balance means to ends.<sup>7</sup> This tension originates from the interaction of resources available (forces, time, space), ends (objectives, effects), and the enemy. An intellectually rigorous process to keep these dynamic, mutually interacting elements in balance should assist planners in determining the best choice; a choice which represents the "heart of operational art."<sup>8</sup>

This study examines operational sequencing to determine if FM 100-5, Operations, which elaborates the U.S. Army's operational level doctrine, provides sufficient description of the considerations planners should use in designing a campaign. How does doctrine fit into this design? As an "authoritative statement," doctrine should be "definitive enough to guide specific operations, yet remain adaptable" for unique circumstances.<sup>9</sup> Doctrine should provide the planner a structure for how to think about the sequencing problem. This structure should assist planners in developing "a careful understanding of the relationship of means to ends."<sup>10</sup>

To determine if the doctrine adequately describes the considerations involved in deciding how to sequence an operation, this study is structured into four main parts and a conclusion. The main sections include: a theoretical examination of sequencing, a critical analysis of sequencing issues using two case studies, the implications for sequencing derived from the previous two sections,

and an analysis of doctrine in light of the implications. The first section examines theoretical ideas related to operational sequencing. This monograph uses four criteria in weighing the merits of the arguments presented and operations studied: unifying aim, the correlation of means to actions, strength versus vulnerability, and momentum.

The criterion, **unifying aim**, examines the suitability between the ways [concept of operation, scheme of maneuver, etc.] and ends of a plan. The end reflects the objective of a plan, essentially articulating the action's purpose. Planners can consider a way or action suitable if the effects generated by the sequence of actions accomplishes the objective. Throughout the planning and execution of a campaign, planners must stay focused on the objective. A proper aim should help planners keep the objective in sight.

**Correlation of means to actions** examines the requirement in resources necessary to conduct an action. The purpose is to determine whether the means available are sufficient for the required action. If the means are sufficient, the action is feasible.

The remaining criteria, **strength against vulnerability** and **momentum**, assess whether the action obtained or will obtain the objective at an acceptable cost. Planners should strive to accomplish the most favorable result at the least expense in limited and precious resources. Ultimately, planners must determine whether the cost of the actions is in proportion to the desired effect.<sup>11</sup>

A critical analysis of two offensive, conventional operations will bridge the gap between theory and reality, and constitutes part two. The case studies included are: the Pusan Perimeter breakout during the Korean War in 1950, Operation Chromite; and the invasion of Panama in 1989, Operation Just Cause. This section does not

provide a detailed description of each case study. Instead, this study applies the evaluative criteria previously developed in the theoretical section to events in the case studies to illustrate the basis for either supporting or refuting theory.

The third section describes the implications for sequencing based on the theory and case study analysis. These implications highlight those considerations planners need to account for when determining the sequencing structure.

The fourth section examines U.S. Army operational doctrine, as articulated in FM 100-5 in light of the preceding sections. This portion of the paper determines if in fact doctrine bridges the gap between theory and experience. If doctrine adequately bridges the gap, operational planners will have sufficient framework for thinking about how to sequence actions.

The paper concludes with insights, drawn from the analysis, on how well doctrine describes sequencing considerations. Based on those findings, the study recommends adjustments to doctrine.

### I. Theoretical Foundations

Theory will have fulfilled its main task when it is used to analyze the constituent elements of war, to distinguish precisely what at first sight seems fused, to explain in full the properties of the means employed and to show their probable effects, to define clearly the nature of the ends in view, and to illuminate all phases of warfare...<sup>12</sup>

#### The Unifying Aim

A campaign's aim establishes the connection from the political object to the means employed. Clausewitz identified the political object as the imposition of the will of one element onto

another.<sup>13</sup> In contemporary terms, the political object establishes the strategic goal a campaign seeks to obtain. The planner uses the strategic goal as the start point and from there defines "an aim for the entire operational side of the war that will be in accordance with its purpose."<sup>14</sup> Throughout a well-conducted campaign, the aim serves to harmonize actions at the tactical level with the strategic goal. The aim links actions to the strategic goal.

Since strategic goals should guide everything else, planners must ensure the aim remains subordinate and in agreement with that same goal. If this does not happen, as Clausewitz cautioned, the war may turn into something neither the planner nor the political decision maker wanted. Therefore, the strategic goal determines the effort expended by the military in order to achieve the object of any given campaign. This ensures military actions remain compatible with the original purpose.<sup>15</sup>

In essence, the aim provides the focus for military efforts by identifying the final outcome of whatever sequence of actions is finally determined. Clausewitz stated that the aim "would have always and solely to be to overcome the enemy and disarm him."<sup>16</sup> Military forces which render an enemy "powerless" to resist usually secure the strategic goal. However, as discussed previously, this focus on the enemy must not be in isolation from the strategic goal. Understanding the linkage between the aim and the strategic goal forms a necessary foundation so planners can develop a suitable sequence of actions. The aim establishes the guide post for the actions military forces undertake. The actions themselves, however,

are important not for the sake of simply doing something, but for the effects generated.<sup>17</sup>

Clausewitz's concept for "action," which he would have called a battle, carefully developed the thought that the initial outcome transpired in the physical domain--destruction of an enemy force. This was the first order effect. But this only served to establish the beginning of a complementary result--a second order effect in the moral domain. Although Clausewitz viewed the interaction between the two as inseparable, he understood that the physical effects represented an antecedent requirement for the generation of moral effects. In fact, Clausewitz considered the second order effect, that which occurred in the moral domain, as decisive.<sup>18</sup>

That insight, that an action's relevance depends solely on the effect transferred to an opposing force, is crucial. Clausewitz stressed throughout his book, *On War*, that the actual effect of an action on the enemy "...is the most singular factor among all the particulars of action."<sup>19</sup> The first order effect, within the physical domain, took place in order to create the conditions for the second order effect. Therefore, second order effects within the moral domain represented the purpose for any action. The purpose behind the action itself is central to Clausewitz's writings.<sup>20</sup>

Several other theorists recognized that desired effects were the crucial element in determining actions. Foremost among them were Tukhachevskiy, Triandafillov, and Simpkin. The following discussion elaborates on Tukhachevskiy's writings, although the other theorists postulated many of the same considerations of

effects in their works.<sup>21</sup>

Tukhachevskiy's writings reflected the requirement to consider effect through his concept of "operational containment." Operational containment answered the dilemma engendered by the onset of broad fronts composed of resilient formations, supported by a communications network. This broad front structure enabled the enemy force to either move reserves or reinforcements to a threatened area, or withdraw forces prior to defeat. As horrifically demonstrated during World War I, this capability to restore the continuity of the defense faster than the attack could reach operational depth led to theater-wide stalemate, "meat-grinder" attritional warfare, and indecisive operations.<sup>22</sup>

As a counter to the enemy's ability to stabilize an endangered front, Tukhachevskiy suggested that an offensive occur along the entire width of a front and throughout the depth of the main attack's corridor.<sup>23</sup> Such actions, he argued, would produce multiple effects and lead eventually to penetration by the main attack. The first effect, initiated by the attacks along the front's entire width, occurred within the physical domain through destruction of enemy forces. Perhaps more important than the physical effect, however, was the imposition of a block, or paralysis, in the opposing commander's cybernetic domain. With multiple attacks occurring along the entire front, the decision of where or when to send reserves became extremely uncertain and difficult.<sup>24</sup>

Along the main attack's corridor, in Tukhachevskiy's vision, special attacks created an effect in the moral domain which

dislodged forces in that vicinity necessary to expedite the main attack's subsequent penetration. Finally, as the main attack penetrated to operational depth, a cascading deterioration of the enemy's will to resist resulted. Thus, the penetration itself first generated an effect in the physical domain within the vicinity of the attack, but most importantly, once in the operational depth of an enemy defense, the moral effect became ascendent, resulting in the "operational harvest."<sup>25</sup>

Thus we see that the aim, that focus and direction for the military forces, guides sequencing decisions and enables a planner to harmonize actions--ensuring all orient on the object. Actions of and by themselves are secondary in importance. Theory indicates a planner's primary concern is to determine the effects needed to bring about the desired aim. The constancy of purpose which the aim provides functions as a thread of continuity between the strategic goal, action, and effect.

Considering the dynamic nature of war, achieving constancy of purpose is difficult. The "collision of two living forces," as Clausewitz described war, produces a perplexing environment characterized by "fog and friction," which makes maintaining a focus on the end point hard.<sup>26</sup> But, a clear aim provides an "idea of the goal on which all lines are to converge," thus steadying actions and efforts.<sup>27</sup> This ensures that during a changing, complex situation the planner "is not thrown off course by thousands of diversions."<sup>28</sup>

#### Correlation of Means to Actions

Although this criterion requires the least explanation, the

correlation of means to actions is as important as the aim for developing a sound sequence of actions. Resources establish the bounds for the possible. Simply put, an action is feasible if available means exist to support the accomplishment of an action.

This correlation must weigh friendly means against enemy means, with a built-in margin to allow for the dissipating effect of friction. By definition, "means" encompasses the total combat power available for employment, including resources such as logistic capability, time, space, etc.<sup>29</sup> Clausewitz stated the ideal situation concerning means was to "always to be very strong..." yet this seldom occurs.<sup>30</sup>

Often the means available do not equal the demand, placing the planner in a dilemma. Tukhachevskiy described the crux of the problem as the requirement to construct actions which created a favorable correlation. In essence, he described using forces in a sequential manner so first one action took place, then the second, and so forth until an adequate correlation developed.<sup>31</sup>

Tukhachevskiy also recognized another option, to economize effort in all but the main attack's direction. Again, the aim provides a basis for determining the relevance of actions. Only those operations contributing to swift attainment of the object are generously resourced. Any required secondary actions receive only the minimum of resources. To effectively economize, a planner must "harmonize the scale of actions with resources."<sup>32</sup>

Unfortunately, as the disparity between means available and actions required increases, so too does risk. Risk includes the

potential danger that an enemy will find and exploit a weakness created by the need to mass elsewhere for essential actions. Taking risk, however, allows the commander to concentrate on the selected objectives--thus rapidly creating the desired effects."<sup>3</sup>

#### Strength versus Vulnerability

In order to maximize scarce resources, a planner must have a rational method for determining where and when to concentrate effects. This method should seek to preserve limited resources while simultaneously getting the most return from available means. Clausewitz's concept of the center of gravity provides a start point for planners to think about how to focus the effects of actions against a vital, tangible component of the opposing force. Careful consideration of center of gravity leads one to an understanding of "...a dominant characteristic...the point against which all our energies should be directed."<sup>34</sup> Since this characteristic directly or indirectly determines whether an enemy will maintain the will to resist, planners should structure actions so the outcome affects the center of gravity. Clausewitz defined the center of gravity as "the hub of all power and movement, on which everything depends."<sup>35</sup> He further implied a physical nature to the center of gravity when he said it was "always found where the mass is concentrated the most densely."<sup>36</sup> Since concentration is conditional on cohesion and unity, he went on to stress the importance of the moral domain in maintaining the strength of the center of gravity.<sup>37</sup>

Armies evolved from a unitary mass which moved and fought as a single block, into formations using distributed maneuver and battle.

While the center of gravity was discernable in Napoleonic war, it is far less obvious today. Modern theorists argue that the "greatest concentration of combat force" represents the center of gravity.<sup>38</sup> Although more sophisticated, this description is still compatible with Clausewitz's depiction. Whereas Clausewitz's concept meant the actual massing of men and units, this modern interpretation relates to a potential or actual concentration of combat power, irrespective of battlefield density. A common thread between the two is the principle of concentration. The modern idea, however, gets to the importance of effects.

Although the center of gravity represents the "most effective target for a blow," it also contains the power from which the "heaviest blow" originates.<sup>39</sup> Any plan requiring a direct confrontation between strengths is probably unacceptable and ill-advised. Although actions should affect the center of gravity, this does not mean that friendly forces have to be directed head-on against the source of strength. An indirect approach of attacking vulnerabilities which then influences the enemy center of gravity may be the most acceptable method. Using this indirect method, friendly forces seek to move through a weakness, and then attempt to fragment or disintegrate the enemy concentration of force by attacking selected vulnerabilities.<sup>40</sup> Indirect or not, if the attacks do not affect the enemy's center of gravity, then the action risks becoming an expenditure of combat power for no purpose.

What have theorists written about vulnerabilities? Baron Antoine-Henri Jomini called them "decisive points." He described

decisive points as "...capable of exercising a marked influence either upon the result of the campaign or upon a single enterprise."<sup>41</sup> Seizure or control of these points would decide the outcome of actions and impose a decision upon the contending sides.<sup>42</sup> Jomini linked decisive points to the concentration of mass against selected enemy elements or locations, thus achieving a relative superiority over the enemy.<sup>43</sup> Planners today seek to attack decisive points in order to unhinge an enemy center of gravity. Moving through a weakness to the decisive point further enhances an action's acceptability.

Jomini classified decisive points as either geographic or maneuver. Fortifications and key terrain features represented the geographic type. Decisive points of maneuver rested on an enemy's flank which, if controlled, allowed the opposing side to threaten the enemy's lines of communication to their base. These latter points generate a moral effect from this positional relationship. Today, a planner considers the aim, the terrain, and finally force disposition to determine the importance of a decisive point. In any given situation there may be more than one decisive point.<sup>44</sup>

A third type of decisive point--cybernetic--evolved with the industrial age and the evolution of communications networks. Cybernetic decisive points represent the complex command and control structures which enable modern armies to function. These points may be in the form of a command post, a communications center, a staff, etc. An attack on these points has the effect of paralyzing an enemy force and degrading their ability to effectively or effi-

ciently react to the attacker's moves. This paralysis enables the attacker to concentrate on selected portions of the enemy, rather than the whole, achieving relative superiority even with an unfavorable overall correlation of forces.<sup>45</sup>

At some point in time, a planner selects specific decisive points for attack. Those chosen should have the potential to unhinge, destroy, shatter or disperse the 'concentration of force' which represents the enemy's center of gravity.<sup>46</sup> Once picked for seizure or attack, a decisive point becomes an objective for which a commander is willing to expend combat power. Selecting the physical, cybernetic, or moral vulnerabilities against which to concentrate combat power, and achieving the desired effect while avoiding a head-to-head clash with the enemy's strength, embodies operational art.<sup>47</sup>

#### **Momentum**

As actions orient at an enemy center of gravity through the attack or seizure of decisive points, the cadence of actions must be such that the effect translates rapidly through the physical domain and to the moral domain. This is the goal of momentum. In his book Race to the Swift, Richard Simpkin, using a simple physics analogy, described momentum as the product of mass and velocity. A high velocity theoretically enables a smaller force to generate greater effects in a shorter time frame, comparable to the effects generated by a large force with less velocity.<sup>48</sup> Momentum enhances the acceptability of actions since the effects are generated at a reduced cost in resources. This enables a planner to stretch and

conserve limited means.

According to Simpkin, the purpose of momentum is to generate "leverage" against the enemy.<sup>49</sup> Leverage acts as a pressure which disrupts enemy forces and conveys the effect of the actions from the physical domain to the moral domain rapidly. Simpkin described leverage as the pressure a nutcracker builds to crack the shell of a nut. He called the cracking of the shell as the "turning moment" of an action.<sup>50</sup> As with a turning movement, the payoff is in the moral effect on an enemy.

In Clausewitz's era, a grouping of soldiers in a compact formation epitomized the 'mass' component of momentum. In contemporary terms mass consists of the combat power or usable physical fighting power a force possesses at a particular time. Simpkin described usable physical fighting power as the difference between the mass of a unit deployed for action versus that of a unit in the process of deploying. Although both units have identical composition, the disparity in effects immediately generated by the prepared unit versus the moving unit differ enormously. Considering the temporal and spacial context of deliverable effects serves to define mass in contemporary terms.<sup>51</sup>

Regarding momentum, planners must recognize two things. First, the planner has limited influence on the actual forces allocated. The higher headquarter allocates the forces, thus establishing the available mass. Planners must work with the available forces when building momentum. By adjusting velocity the potential exists to avoid the costly mass-on-mass confrontations by

going through areas before resistance develops. Once through the weakness, the available forces can attack a decisive point while it remains vulnerable. Thus, manipulation of velocity provides planners a sound method of increasing momentum.<sup>52</sup>

Other than simply being the second component of momentum, just what is velocity? In military terms, "tempo" most nearly encompasses the meaning of velocity. But tempo combines the physical speed of a unit and the rate of actions or combinations of actions focused on achieving the aim. Again, the aim supplies a directional focus and implies a purpose or reason for performing actions.<sup>53</sup> But this is only a partial understanding of tempo. Tempo strikes at the heart of time-competitive decision cycles. The organization which has the ability to move through decision cycles more rapidly and with a qualitative edge over an opponent gains a immense edge. This advantage increases over time since an opponent's actions and reactions continually address a situation which is no longer valid. The opponent's situation progressively deteriorates to the point that they simply cannot react, or their reactions are irrelevant.<sup>54</sup> With this deterioration, the potential for finding the opposing side unprepared increases. Simpkin described surprise as a significant payoff from increased momentum. Surprise dramatically increases the acceptability of actions as resistance and cost in resources declines.<sup>55</sup>

This analysis of theory provides several planning considerations relevant to the sequencing decision. First, the aim conveys the conditions which the military actions should

establish. The actions themselves must be compatible with the strategic goal. Most importantly, the action's relevance depends primarily on the effect transferred to the enemy. However, the means available for the actions determine what is or is not feasible. As the difference between the scale of actions and the available resources increases, a plan's risk also grows.

Whether a plan entails a high degree of risk or not, a planner must seek to maximize resources available by accomplishing the most favorable result at the lowest cost. Planners can do this by concentrating actions against those decisive points which most affect an enemy center of gravity. Finally, planners can further enhance the outcome from limited resources by generating and increasing momentum. Since planners must work with the allocated means, the best method for manipulating momentum comes through the control of tempo. These considerations allow planners to improve their comprehension of the relationship of means to ends.

## II. Case Study Analysis

Each case study has two main components. The first part contains a brief overview of the specified operation. The second section is a critical analysis of the operation using the theoretically based criteria previously developed. This analysis provides a basis for determining the criteria's relevance to sequencing actions. If relevant, doctrine should reflect the ideas encapsulated in these criteria thus providing planners a sufficient description of sequencing considerations.

## OPERATION CHROMITE

### OVERVIEW

On June 25th, 1950 the North Korean People's Army (NKPA) initiated an all-out invasion of South Korea with the purpose of quickly defeating the Republic of Korea's (ROK) armed forces and unifying the Korean peninsula under a communist government. The NKPA attacked with 135,000 troops in nine divisions along a broad front from coast to coast.<sup>56</sup> By 29 June, the ROK Army was in full retreat and the NKPA had reached Seoul.<sup>57</sup> As the NKPA attacked south, the first confrontation with U.S. forces took place near the village of Osan on 5 July. From then until 2 August, the forces comprising the Eighth Army continually withdrew south, eventually forming the Pusan Perimeter.

From August until mid-September, the NKPA and Eighth Army were locked in close combat. The NKPA conducted numerous attacks to breakthrough the perimeter, but to no avail. As the assaults continued, LTG Walker's Eighth Army grew in strength. By mid-August, a combined Eighth Army force of 6 ROK divisions, 4 U.S. divisions, and several regimental combat teams (RCT's) opposed 10 NKPA divisions.<sup>58</sup> This clash of the concentrated forces of both armies at the Pusan Perimeter was indecisive and resulted in high casualties. Eighth Army casualties were estimated at over 12,000, while the NKPA suffered anywhere from 20-30,000 casualties.<sup>59</sup> Continued operations in this manner merely promised more of the same.

General Douglas MacArthur, Far East Army Forces (FEAF) Commander, had something else in mind. While the battles raged

around the Pusan Perimeter, a naval amphibious flotilla containing the X Corps sailed around the western coast of Korea to execute Operation Chromite. X Corps, composed of the 1st Marine Division, 7th Infantry Division, and a regiment of ROK Marines, executed an amphibious assault at Inchon on 15 September. Surprise was complete. Within two days X Corps captured Inchon and pressed on to Seoul. By 20 September, elements of X Corps were on the southwestern outskirts of Seoul.<sup>60</sup>

On 16 September, as X Corps fought to secure Inchon, the Eighth Army began an offensive to breakout of the perimeter. Four frustrating days later, Eighth Army had not made any substantial progress. Even so, beginning on 19 September, the NKPA at Pusan faltered. Sensing the presence of X Corps far to the north, and repeatedly attacked by Eighth Army to their front, the NKPA disintegrated. Eighth Army pursued remnants of the NKPA north. Only 30,000 of an estimated 70,000 NKPA soldiers escaped death or capture by fleeing through mountainous eastern Korea to reach the safety of the 38th parallel.<sup>61</sup> The defeat of the NKPA enabled the government of South Korea to reestablish control in Seoul on 29 September. Considering the results, the 13,000 total casualties for both X Corps and Eighth Army in this operation sharply contrast with those suffered during the positional fighting around the Pusan Perimeter.<sup>62</sup>

## UNIFYING AIM

"Inchon will succeed and it will save 100,000 lives.  
...We shall land at Inchon and I shall crush them  
[NKPA]." MacArthur<sup>65</sup>

Two days after the NKPA launched their invasion, the United Nations (UN) passed a resolution not only condemning the invasion, but also establishing the strategic objective. The resolution called on member nations to assist South Korea in repelling "the armed attack and to restore international peace and security in the area."<sup>66</sup> From this objective, MacArthur derived the military aim of destroying the NKPA in South Korea.<sup>65</sup> This aim became the focus for actions he intended to execute.

MacArthur later claimed to have conceived the actions to bring forth the aim as he stood on the south bank of the Han River, just southwest of Seoul, on 29 June. From his vantage point, observing the routed ROK Army, MacArthur realized several things. First, the exhausted ROK Army would require U.S. assistance to defeat the invasion. Second, U.S. leaders had seriously misjudged the power and capability of the NKPA. MacArthur believed the only suitable action to reverse the situation would be in the form of an "amphibious envelopment at Inchon, or some such site on Korea's west coast."<sup>66</sup>

The primary reason MacArthur wanted to conduct this envelopment related to the effect the action would produce on the NKPA. He expected the action to produce a "knockout psychological blow."<sup>67</sup> By achieving a crushing moral victory, MacArthur intended to quickly resolve the conflict. Both he and the Truman Administration believed

that without a speedy military victory, the chances increased for Chinese or Soviet intervention. Involvement of the Chinese and Russians would extend the campaign into the winter months and lead to an uncertain conclusion, if not global holocaust.<sup>68</sup>

Between June and the landing in September, there were many developments which could have altered the intended actions. Foremost among these were enemy operations. On two separate occasions, enemy success forced MacArthur to postpone the envelopment.<sup>69</sup> After each diversion of force, however, MacArthur held fast to his original concept. He laid new plans to carry it out with other forces, still believing the Inchon landing was key to creating the necessary effect for an early victory.<sup>70</sup>

The other distraction came from the Joint Chiefs of Staff (JCS) who expressed doubt about the outcome of the sea-borne envelopment. During the visit of General J. Lawton Collins, the Army Chief of Staff, and Admiral Forrest Sherman, the Naval Chief of Staff, to MacArthur's General Headquarters (GHQ) in Japan on 23 August, both senior officers argued that better options existed for using the forces earmarked for the landing. The Army and Navy Chiefs of Staff argued for the following options: continued reinforcement of Walker's Eighth Army to enable Walker to breakout using shallow envelopments and incrementally destroy the NKPA; or to conduct an amphibious assault at Kunsan, much closer to the Pusan Perimeter, to attack the NKPA at the perimeter from behind and facilitate a quick link-up with Eighth Army.<sup>71</sup>

General Collins believed these options were more practicable

than MacArthur's concept for several reasons. First, in his estimate sufficient forces did not exist to conduct both the landing and the perimeter breakout. Most of the units in the perimeter were understrength, exhausted from weeks of tough fighting, and contained numerous 'green' replacements. Because of Eighth Army's state of combat readiness, Collins worried that the Inchon landing force might be isolated and then destroyed prior to a link up with Walker's force. Most importantly though, Collins feared that MacArthur's plan would not destroy the NKPA at all; therefore failing to accomplish the aim. Collins thought the NKPA might slip away from the envelopment into the hills of Korea, reorganize, and fight another day.<sup>72</sup>

MacArthur answered with a forty-five minute soliloquy on why Collins' options would not work, but his would. He rejected the first option as no option at all. The effect of a frontal assault would not quickly resolve the conflict. It would simply result in exorbitant casualties and a possible stalemate. MacArthur postulated that the second choice, the Kunsan landing, also would not achieve the desired effect. He had the following to say about the Kunsan site:

It would be an attempted envelopment which would not envelop. It did not sever or destroy the enemy's supply lines or distribution center, and would therefore serve little purpose.<sup>73</sup>

Clearly, MacArthur focused on the effect the action would generate. He continually reiterated the psychological reasons for conducting Operation Chromite in the manner he envisioned. Although

the fortunes of war repeatedly dealt setbacks and his higher headquarters doubted the potential for success of the action. MacArthur did not waver. The aim served always to bring him back to conducting a landing at Inchon in order to achieve the desired effect.

#### CORRELATION of MEANS to ACTIONS

The initial plans to deal with the invasion demonstrated a lack of a sound correlation of the necessary resources to accomplish the requirement. Operation Blueheart, the plan developed to counter the invasion after the rout of ROK forces, reflected this point. Operation Blueheart called for two divisions to deploy through Pusan and establish a defense south of the NKPA onslaught. This defense was to contain the NKPA while a third division landed at Seoul's seaport, Inchon."

During the first stages of the invasion, American leaders exuded great optimism that U.S. forces would easily defeat the NKPA. However, after the NKPA pummeling of the 24th Infantry Division (ID), it became apparent that there was no basis for this confidence. U.S. means had been greatly exaggerated while those of the NKPA had been seriously underestimated. As events were to prove, the forces expected to carry out these difficult, complex maneuvers were nowhere near the level of preparedness required.

After battlefield actions and realities squashed any misconceptions about unit combat abilities and the number of units required for the mission, FEAF sent the Pentagon a request for reinforcements. Basically, MacArthur wanted two field armies composed of eight full divisions. This required four more divisions

in addition to the four already in theater.<sup>75</sup>

For numerous reasons, the JCS could only send the 2d ID, a Marine Division in the process of forming, an assortment of RCT's, and numerous separate battalions to bring employed units up to strength.<sup>76</sup> With the allocated means well short of that requested, MacArthur had to take risk in order to constitute an amphibious landing force. He planned to use the 2d ID, one Marine RCT taken from the USMC division, and an airborne RCT as the landing force. MacArthur expected Walker to stop any further advances of the NKPA with the 24th ID, 25th ID, and the 1st Cavalry Division. But the NKPA continued to advance relentlessly east of the Kum River to Taejon. In the process, the 24th ID was rendered practically combat ineffective. When the 1st Cav failed to backstop the 24th, and the 25th was committed to the north, Walker needed assistance. Once again, the means allocated to the defense did not correlate to the resources necessary to stem the NKPA advance. This forced MacArthur to send both the 2d ID and the 5th Marine RCT hurriedly into the Pusan Perimeter and delay the Inchon landing again for lack of resources.

By the second week in August, the 2d ID and other forces began arriving at Pusan. MacArthur told Walker he must now hold so the "larger scheme could unfold."<sup>77</sup> In order to constitute the landing force, the majority of replacements were directed into the 7th ID to bring that unit up to strength. Additionally, MacArthur planned on eventually withdrawing the 5th Marine RCT out of Walker's perimeter.

Both measures entailed taking risk. One area of risk

concerned Japan. When the 7th ID embarked for Inchon, Japan would be left without any remaining combat forces. The JCS considered this extremely risky in the event of a theater wide communist attack.<sup>78</sup> The second area of risk was the Pusan Perimeter. The withdrawal of the 5th Marine RCT bothered Walker immensely. This unit's actions had stabilized the Pusan Perimeter on numerous occasions. Walker was concerned that its withdrawal would leave the Eighth Army both vulnerable to an NKPA penetration and unable to shift from the defense to the offense.<sup>79</sup> In early September, when the NKPA did in fact split the 2d ID with a penetration, Walker told GHQ, "If I lose the 5th Marine Regiment I will not be responsible for the safety of the front."<sup>80</sup> MacArthur personally sent Walker a message telling him to release the RCT so the 1st Mar Div could make way for Inchon.

MacArthur continuously balanced available resources between two competing demands. On one hand, Walker's situation had to be stabilized. But continued reinforcement in that area promised only a prolonged and costly battle. On the other hand, the potential of Inchon was great. Unfortunately, the 'winds of war' seemed to govern the employment of forces. Eventually, MacArthur economized in the Pusan Perimeter area in order to concentrate a force for the amphibious envelopment. He understood the degree of risk involved, but also believed in the potential payoff.<sup>81</sup>

### **STRENGTH versus VULNERABILITIES**

Operation Chromite's concept reflects an understanding of using strength against vulnerabilities. The NKPA forces

concentrated around the Pusan Perimeter represented their center of gravity. Likewise, as Eighth Army's forces concentrated in this area during the first part of August, its own center of gravity formed. The battles around the perimeter during this month demonstrate the indecisive and costly nature of direct center of gravity confrontations.

Two offensive actions, one from each side, are indicative of the inconclusive results when directly attacking an enemy's strength. Beginning on 7 August, the 25th ID conducted an attack in the southwestern portion of the perimeter with 16,000 men formed into an Army and Marine RCT. The purpose of the attack was to destroy one NKPA division and envelop a second. However, by 13 August, stiff enemy resistance stalled the attack and the 25th fell far short of its objectives, with heavy casualties.<sup>92</sup>

On the enemy side, starting on the 1st of September, the NKPA leadership decided to make one last effort to push the defenders of the Pusan Perimeter into the sea. Rather than concentrating at any particular portion of the perimeter, eleven divisions attacked everywhere at once. Although this achieved several limited penetrations which generated Walker's concern about losing the Marine 5th RCT, the NKPA had no forces remaining to exploit success. By the time this offensive ground to a halt during the second week of September, the NKPA lost six divisions.<sup>93</sup> As the NKPA probed for an opening in the Pusan defense, their forces shifted more and more to the southwestern end of the US/ROK defense. In fact, this played into MacArthur's hand by stretching the NKPA's lines of communica-

tion the furthest distance possible from their base of operation in Northern Korea."

In contrast to these indecisive operations, Operation Chromite moved through enemy weaknesses to seize a decisive point, which in turn caused the unity and cohesion of the NKPA center of gravity to fragment. By exploiting U.S. strengths, sea-control and the capability to move large forces by sea, Chromite brought the X Corps to an exposed NKPA flank."

Inchon itself represented a geographic decisive point for X Corps. Seoul was a maneuver decisive point for the theater. Seizure of both points was necessary to give MacArthur's forces an operational advantage over the NKPA. Seoul's capture isolated the NKPA's center of gravity from its base of operation." But it was the psychological and moral effect generated by the threat to NKPA lines of communication which engendered the collapse of the communists.

By avoiding a frontal clash of strengths, Chromite's acceptability was high. This scheme had the potential to accomplish the most at the least expense in limited and precious resources. The selection of Inchon and Seoul as decisive points against which combat power would be concentrated in order to achieve the desired effect, while simultaneously avoiding a head-to-head clash of strengths, embodied operational art.

#### MOMENTUM

When considering momentum, on the other hand, results during Operation Chromite were more mixed. Unarguably, this plan

effectively employed a relatively small force, in comparison to the Eighth Army, to generate enormous leverage against the enemy. X Corps' actions, during both the Inchon landing and subsequent attack of Seoul, rapidly achieved an effect in the enemy's moral domain. The actions of two divisions essentially shattered the NKPA center of gravity around the Pusan Perimeter.

However, the tempo of the actions between the landing at Inchon and Eighth Army's breakout may have been too rapid. Interestingly, MacArthur initially planned for Eighth Army to attack from the perimeter simultaneously with the X Corps amphibious landing at Inchon.<sup>67</sup> But, after Walker reviewed the plan he recommended a one day delay. Walker understood that the purpose of the Inchon assault was to disrupt the cohesion of the forces in the south to facilitate his breakout. He realized that a delay was needed to allow the psychological effect to take hold on the forces he faced.<sup>68</sup>

In retrospect, we can say that the delay was not enough. Contrary to the assumptions for the plan, the moral and physical effect did not take place immediately with the landing at Inchon. Only as US forces threatened to sever the lines of communication at Seoul did the effect fragment the unity and cohesion of the NKPA's center of gravity. Eighth Army encountered unexpectedly stiff resistance during the attempted breakout on 16 September. Not until 19 September, as X Corps cut lines of communication in and around Seoul, did the stout NKPA defense begin to crumble. Unfortunately, the combat power expended during those four days of unsuccessful attack further weakened Eighth Army. This weakening probably

contributed to that Army's subsequent inability to complete the destruction of the NKPA south of the 38th parallel."<sup>9</sup>

## OPERATION JUST CAUSE

### OVERVIEW

Beginning in June of 1987, relations between the U.S. and Panama deteriorated until both sides assumed a confrontational stance. On 15 December, 1989, the watershed event for this crisis occurred when Manuel Noriega, the leader of the Panamanian Defense Forces (PDF), annulled country wide elections, declared himself the "maximum leader," and asserted that a state of war existed with the United States. The very next day, PDF soldiers harassed a group of U.S. officers at a roadblock, killing one as he attempted to flee the scene. At that same roadblock, the PDF arrested a naval officer and his wife who witnessed the shooting. Before being released, both were beaten and interrogated. Convinced that more of the same or possibly worse incidents would follow, President Bush felt the time had come for action and ordered the JCS to execute Operation Just Cause.<sup>90</sup>

At 0045 on 20 December, the "biggest U.S. military operation since Vietnam" began.<sup>91</sup> In a violent, massive assault, joint U.S. forces attacked 27 objectives throughout the night in the heavily populated central portion of the country. By noon the following day, the PDF was leaderless and had ceased to exist as a cohesive organization. The previously elected Panamanian government had an opportunity to take shape.<sup>92</sup> As the operation continued, U.S. soldiers restored law and order and shifted operations to the remainder of Panama. By 31 January, 1990, peace had returned to Panama and the JCS declared Operation Just Cause over.<sup>93</sup>

### UNIFYING AIM

The strategic goals for Operation Just Cause were clear and unambiguous. The Bush administration established four goals: protect American lives, restore the democratic process in Panama, preserve the integrity of the Panama Canal treaty, and capture Manuel Noriega.<sup>94</sup> To accomplish these strategic goals, the military planners decided to neutralize the entire PDF.<sup>95</sup> This aim served to focus the subsequent actions of Operation Just Cause.

The planners assumed neutralization of the PDF would accomplish all four of the strategic goals in the most suitable manner. Essentially, neutralization would keep the PDF from striking; therefore protecting American citizens and the Panama Canal.<sup>96</sup> Additionally, an aim focused on neutralization rather than destruction complied with the end state of restoring the democratically elected government. Neutralization emphasized minimizing destruction. This was important since the Panamanian people were not the enemy and members of the PDF controlled most of the government's bureaucracy. A future democratic Panamanian government would depend on using members of the former PDF to keep the country functioning. Finally, the planners considered Noriega's capture as an inherent element of neutralizing the PDF.<sup>97</sup>

Operation Just Cause oriented on the cybernetic domain of the PDF. The leadership of the PDF was highly centralized, and rapid destruction of the PDF command and control would critically impair Panamanian ability to coordinate actions of the dispersed units. General Maxwell Thurman, Commander in Chief-South (CINCSOUTH), clearly recognized this with his desire "to 'decapitate' the PDF by eliminating its leadership and severing its command structure..."<sup>98</sup> Focusing the effort on achieving this paralyzing effect allowed Joint Task Force-South(JTF-SO) to deal with each unit individually.

By disrupting the cybernetic domain of the PDF each of their units were isolated, physically and psychologically. The planners counted on this isolation to lessen the will of the subordinate commanders to resist. In so doing, they expected the effect to strongly influence the morale of those units and further lessen any potential reactions counter to the U.S. actions. Ultimately, the effect generated prevented the PDF from acting in a cohesive, unified manner.<sup>99</sup>

#### CORRELATION of MEANS to ACTIONS

JTF-SO did not have a feasibility problem, given the means available for planned actions. The JCS resourced JTF-SO with overwhelming combat power in order to counter any possible PDF reaction. The JCS thus gave LTG Stiner, the commander of JTF-SO, the necessary forces which enabled him to met Clausewitz's dictum of "being strong everywhere." Stiner admitted that his superiors placed no constraints on the forces he could employ for this operation.<sup>100</sup> Stiner enjoyed this ideal situation for two main reasons. First, during this time the U.S. faced no major military threats. Second, the Bush Administration considered the situation in Panama a top priority and wanted quick resolution.<sup>101</sup>

Additionally, the forces under LTG Stiner's control were highly capable units. JTF-SO controlled forces from the 82d, 7th ID (LT), Marines, Air Force, Special Operations Forces from each of the services, and United States Army South units.<sup>102</sup> These units were trained, well led, and equipped, to conduct operations of this type. In terms of numbers, JTF-SO deployed a force of more than 26,000 soldiers within 48 hours of the initial assault. In contrast, the PDF had no more than 6,000 personnel in the active force and did not have the capability to conduct combined arms operations. The PDF existed principally as an internal police force.<sup>103</sup> This mismatch

allowed U.S. planners to achieve an asymmetrical confrontation in which the PDF really had no chance of surviving.

Although the JCS had not constrained the forces available for this operation, there were limitations. Airfield availability restricted the flow of forces into the theater.<sup>104</sup> Two actions were taken to mitigate this situation. The first took place during the pre-invasion period. Numerous units deployed under guise of both exercise and routine rotations. This not only provided forces, but also special equipment such as Apache attack helicopters and Sheridan tanks. The second action was the seizure of Tocumen Airfield by Ranger forces and a brigade from the 82d Airborne Division. The capture of this airfield provided a second airfield.<sup>105</sup> This gave LTG Stiner greater flexibility and capacity to bring forces into theater by air. In the final analysis, the correlation of means to actions was more than sufficient for almost any rational course of action.

#### **STRENGTH versus VULNERABILITIES**

Even though the confrontation with the PDF constituted an asymmetrical fight, with the U.S. dominating in every area, the idea of enhancing acceptability of the plan still applied. In fact, it appears the Just Cause planners considered acceptability to be a central factor. The desired effect of the planned actions focused specifically on isolating the constituent elements of the PDF. This in turn allowed US forces to deal with each PDF element as a demoralized fragment of the whole.

In light of the PDF's structure as an internal police force and the dispersal of its units, discerning a specific PDF center of gravity was difficult. The theoretical section of this paper demonstrated that a center of gravity represents a concentration from which potential or actual combat power develops. This

concentration was missing in the PDF. Nonetheless, three possible enemy actions worried the Just Cause planners. They were: revenge and terrorism inflicted on American dependents on American installations because of the fighting, attacks against the Panama Canal, and resort to guerrilla operations. General Thurman called the first two "non-war winners," no matter the degree of success of other actions.<sup>106</sup> The third action, an actual PDF contingency plan, troubled planners because such action would dramatically prolong the operation and lead to significant casualties.<sup>107</sup> The effect of paralyzing the PDF through severing its command and control would, it was hoped, prevent these actions from happening.

In order to neutralize the PDF, LTG Stiner directed his planners to focus combat power on three main components. Hence, these became the decisive points which prevented the PDF from acting as a unified, cohesive organization when attacked. The first element was the PDF command and control center located in central Panama City. The second consisted of striking PDF units Stiner believed capable and willing to interfere with the operation. A failed coup attempt against Noriega provided Stiner and his planners valuable intelligence about the units most loyal to Noriega and how these units responded in a crisis. Noriega himself was the remaining component.<sup>108</sup>

In practice, the effect generated by the simultaneous attack on these components prevented the PDF from forming a center of gravity. Additionally, US forces gained an immediate and insurmountable advantage over the PDF since the attack against these points left units of the PDF with no leadership, guidance, or connection to other units. Thus, the planned actions enhanced the operation's acceptability as the potential for a quick, decisive victory with minimal casualties substantially increased.

## MOMENTUM

Momentum proved an essential element in structuring the sequence of actions to accomplish the aim and further improve the acceptability of the actions. Simply put, the PDF could not handle the leverage which JTF-SO's high tempo generated. JTF-SO developed this momentum by controlling both the amount of force used and the tempo applied. As previously mentioned, the JCS did not constrain LTG Stiner on the forces available. In effect, he could add or decrease the number of units performing actions based on his estimate of necessary forces. Therefore, LTG Stiner was able to manipulate momentum by increasing the mass available.

Second, LTG Stiner structured JTF-SO into six subordinate task forces: four ground, one special operations, and one aviation.<sup>109</sup> This structure enabled LTG Stiner to achieve an extremely high tempo of actions by having each task force conduct separate actions simultaneously. The simultaneous attack of 27 targets gave the PDF no chance to react or regroup.<sup>110</sup> With each of those actions oriented on the aim of neutralizing the PDF, a synergistic effect took place. One field grade PDF officer indicated the degree of leverage this momentum generated when he said, "The whole infrastructure of our forces was destroyed in the first hour."<sup>111</sup>

The final point about momentum concerns JTF-SO's method of securing the western provinces of Panama. After the initial H-Hour assaults to secure the canal and neutralize the PDF command and control, many PDF units were left scattered and isolated throughout the country. This allowed each to be carefully and methodically eliminated by actions which capitalized on the psychological effect from the initial H-hour assaults. The elimination of these isolated PDF units was by necessity sequential to the initial assaults. The tempo for these actions slowed in order to capitalize on the effects

of those earlier actions. The standard procedure involved a special forces team leader calling the local PDF leader on the phone. After explaining the situation to the PDF leader, the special forces team leader asked for his unit's surrender. The units in the western provinces eventually surrendered unit by unit in this manner.<sup>112</sup>

### III. Sequencing Implications

An analysis of theory and the two case studies demonstrate that many factors affect operational sequencing. The chosen sequence must balance the relationships between ends and means. Understanding this relationship should help planners judge when to choose between successive and simultaneous actions. The following discussion highlights the critical points from the previous analysis of theory and history.

The **unifying aim** criterion indicates several factors which influence the suitability between the ways and ends of a plan. First, the planner derives the focus for military efforts from the strategic goal. As in Just Cause, the aim must be subordinate to the strategic goal. Hence, the planner must keep the level of violence and effort commensurate with the policy maker's expectations. Additionally, in both Chromite and Just Cause, the aim provided a reference point for determining if actions contributed to the goal. The planner must discard those planned actions which serve no useful purpose, thus avoiding the commitment of valuable resources to irrelevant requirements.

Most importantly, earlier analysis provides the insight that an action's relevance comes from the effect generated on the enemy. The desired effect must be the driving force when determining the actions to accomplish the aim. In essence, the effect provides the purpose for an action. Furthermore, both theory and history

illustrate the payoff related to directing the effect at the enemy's moral domain. In Korea the purpose of the action was to affect the NKPA's moral domain by a psychological blow. In Panama the initial effect paralyzed the cybernetic domain of the PDF, but the resulting perception of isolation influenced the moral domain of the PDF. Once isolated, the will to resist of both forces crumbled. By deriving the aim from the strategic goals, keeping the aim in accordance with the goal, and using the desired effect to guide selection of actions, planners improve the suitability of actions relative to the goal.

Correlation of means to actions shows the influence of this criterion on the sequencing decision. If the means available match the means required, the action is feasible. This was clearly the case in Just Cause. JTF-SO had an ideal situation in which they could get highly capable forces in whatever amount they deemed necessary. An asymmetrical confrontation existed because of the limited enemy capability. This gave JTF-SO numerous feasible sequencing options to choose from in order to accomplish the aim. MacArthur faced a diametrically different situation. At this stage of the Korean War a symmetrical ground situation existed. Whatever asymmetrical correlation existed was found at sea and in the air. Additionally, available means were insufficient and US planners had grossly exaggerated the capability of the ROK and US forces. Only when the defense stabilized around the Pusan Perimeter could MacArthur actually set the sea-borne envelopment in motion. A planner draws from a limited menu of feasible sequencing options when available means do not match requirements.

Strength versus vulnerability and momentum examined whether the ends were achieved at a reasonable cost in resources. Regardless of the means available, planners must take steps to

achieve the aim at the lowest cost in resources, thus improving an action's acceptability. When and where possible, planners accomplish this by focusing actions against vulnerabilities with the effect directed at the enemy's source of power. Chromite sought to accomplish the aim by avoiding the costly and prolonged symmetrical mass-on-mass clashes around the perimeter. Chromite did this by seizing a geographic decisive point in order to attack a maneuver decisive point. The attack on Seoul generated a psychological effect which shattered the NKPA's center of gravity at the Pusan Perimeter.

The initial actions of Just Cause focused on attacking the PDF's cybernetic decisive points. The effect of these actions paralyzed the PDF and prevented them from developing the necessary unity or cohesion to disrupt JTF-SO activities. Since Just Cause was an asymmetrical fight in favor of JTF-SO, overwhelming combat power enabled it to meet forces directly. In this set of circumstances, casualties and damage to infrastructure were reduced and enemy paralysis maximized in both direct and indirect confrontations with PDF forces. But, as demonstrated in the western regions, the direct clash occurred only if resistance continued.

The final criterion's analysis demonstrated the intricacies involved in attempting to develop momentum. As the criterion for correlation of means indicated, sometimes a planner will be able to adjust momentum with forces but other times not. More often, though, the most readily available way to manipulate momentum is through an adjustment of tempo. One point each case study shows is that goodness and a high tempo are not necessarily synonymous. The effect desired must receive prominent consideration when determining the tempo of actions. As Chromite illustrated, the effect required time to take hold; therefore, the need to make the Eighth Army's

breakout a sequential action. Just Cause provides an example of the desired effect initially demanding simultaneous actions. However, once the critical Thurman "non-war winners" were dealt with and the PDF isolated, operations could and did proceed at a measured, deliberate pace.

#### IV. Analysis of Doctrine FM 100-5, Operations

One thing becomes readily apparent when analyzing FM 100-5; the section titled 'Planning Considerations' in chapter 6, 'Planning and Executing Operations' does not provide a sufficient description of sequencing considerations. The factors applicable to this issue are spread through many different chapters. Chapter 2, 'Fundamentals of Army Operations', contains an initial grouping of concepts. The purpose of this chapter is to cover areas applicable to all operations. Specific points on sequencing operations are found under the following areas: principles of war, the tenets of Army operations, and combat power. In the next chapter, 'Force Projection', several more points on sequencing turn up. Finally, the two chapters on offensive operations, chapters 7 and 8, highlight additional factors which affect the sequencing decision. It is left up to the prospective planner to assimilate and structure these thoughts into a coherent, useful form.

Another point worth noting is the strong bias for simultaneous operations in the Chapter 6 sub-section titled 'Planning Considerations'. Not only is the first major section titled 'Simultaneous Operations', but the section is replete with frequent references to simultaneity. For instance, in the very first paragraph of this sub-section, doctrine characterizes "an appreciation of the simultaneous nature of operations..." as a necessary factor for successful planning.<sup>113</sup>

This proclivity for simultaneous operations is also evident in many other portions of this manual. To list all the references calling for simultaneous actions, at both the tactical and operational levels, would take several pages.<sup>114</sup> A few references, however, serve to illustrate this point. In the chapter on force projection, FM 100-5 states that "commanders normally seek to engage enemy forces simultaneously throughout the depth and space of the operational arena."<sup>115</sup> Chapter 6, 'Planning and Executing Operations', asserts that "Commanders set favorable terms for battle by synchronizing...capabilities to strike the enemy simultaneously throughout his tactical and operational depths."<sup>116</sup> Lastly, Chapter 8, 'Planning and Conducting the Offense', describes offensive operations as "characterized by...the deepest, most rapid, and simultaneous destruction of enemy defenses possible."<sup>117</sup> Generally, the purpose for this type of sequence is to stun and defeat the enemy decisively.

This bias for simultaneous operations aside, in order to provide a valid assessment on whether doctrine sufficiently addresses the sequencing considerations, this analysis must cover those other areas and what the section on 'Planning Considerations' brings out about sequencing. The following discussion provides that analysis.

#### **The Unifying Aim**

FM 100-5 clearly describes the necessary linkage of the strategic objective and the aim. The manual calls these the strategic end state and the military end state respectively. Identifying these end states is categorized as the critical first step which determines how war will achieve the national goals. From this point the commander with the planners develops the military end state. This military end state should articulate the necessary

conditions to attain the strategic end state. As the review of theory brought out, doctrine also reflects the need for the military end state to conform to the policy makers' desire. If planners fail to consider this, FM 100-5 cautions that military victory could nevertheless result in failure to achieve the strategic end state.<sup>118</sup>

Following the discussion on the two end states, the manual indirectly brings out the salient point that the military end state enables the planner to focus the efforts of military forces. The military end state begins the formation of a "common understanding ...of the conditions that constitute success."<sup>119</sup> In the second chapter however, the manual comments explicitly on the concept of producing a constancy of purpose under the two principles of war: 1) objective; and 2) unity of command.

The discussion on the principle of objective orients on ensuring that all actions contribute to accomplishing the military end state. It warns planners to avoid actions which do not aid in the accomplishment of that purpose. The principle of unity of command applies, according to doctrine, since this principle encompasses unity of effort. The essential factor behind unity of effort is purpose. By focusing the actions on the purpose, the military end state, the efforts of both higher and subordinate elements "nest" with one another. In essence, this ensures all actions orient on the appropriate goal. During both force projection and combined operations, doctrine establishes unity of effort as an essential element for future success.<sup>120</sup>

FM 100-5 delivers a mixed understanding of the "singular" factor for an action--the effect. Theory and history indicate that the effect should orient on the enemy's moral domain and further serves as the focal point for aligning actions. FM 100-5 echoes this, in that "Ultimately, the focus of all combat operations must

be the enemy's will."<sup>121</sup> A succinct discussion follows which elaborates on an enemy's defeat occurring when he no longer has the will to fight. However, the current FM 100-5 obscures the idea of the effect serving as a basis for arranging actions.

This confusion stems from the manual's treatment of synchronization. FM 100-5 defines synchronization as the arrangement of "activities in time and space to mass at the decisive point."<sup>122</sup> But, as the analysis indicated, the effect is the purpose of the action. Planners must strive to synchronize actions based on the anticipated effects. Interestingly, the previous edition of FM 100-5 did contain 'purpose' in defining synchronization.<sup>123</sup> For some reason, the current manual moved 'purpose' to the definition of depth. The reason for the move is unclear since the follow-on discussion about depth mentions nothing about purpose.<sup>124</sup> One can only speculate that the reason must be linked to nesting the purposes from top to bottom in order to attain unity of effort.

The problem with FM 100-5's current treatment of synchronization stems primarily from the disconnect between the definition and the subsequent explanation. The explanation clearly identifies that the expected effects should determine the alignment of actions. As explained, planners must use judgement when deciding between simultaneous or sequential actions. The judgement must consider whether "the effects of one activity are a precondition for subsequent action."<sup>125</sup> The linkage to the effect is further clarified when doctrine states that this judgement requires a "mastery of time-space-purpose relationships."<sup>126</sup>

#### Correlation of Means to Actions

FM 100-5 adequately addresses the point that the amount of forces, the type of units, and their capabilities affect the feasible options available.<sup>127</sup> Chapter 3, 'Force Projection',

distinctly articulates the importance of recognizing the correct size and composition of forces for planned actions under the caption of force tailoring.<sup>128</sup> For the most part, the manual emphasizes creating overwhelming combat power--which the manual defines as "sufficient force to ensure success..."<sup>129</sup> However, the manual also recognizes that the commander must fight with the available means. When a shortage of resources exists, commanders must focus resources by establishing a main effort and supporting efforts. With this prioritization, staffs can properly allocate resources and take risk through an economy of force.<sup>130</sup> Ultimately, the planner must ensure the action commits the proper units in the right time and place, but also with the "right combinations."<sup>131</sup>

#### Strength versus Vulnerability

Although FM 100-5 addresses the terms center of gravity and decisive point, certain portions of the explanation are obscure. This ambiguity makes discerning the relationship between the two terms difficult; thus, they become somewhat non-functional. This obscurity results from an imprecise definition of center of gravity and mixing decisive points together with center of gravity. In doctrine, the center of gravity represents "that characteristic, capability, or location from which...forces derive their freedom of action, physical strength, or will to fight."<sup>132</sup> The discussion provides examples which include the mass of units, command and control nodes, national will, public opinion, logistic areas, and lines of communications.<sup>133</sup> This lacks precision, since a strength could represent the center of gravity in one situation while in a second it could be a vulnerability. If that is not confusing, it can also be either physical or abstract.

The manual uses many center of gravity examples to describe decisive points, even though the discussion specifically states that

decisive points "are not centers of gravity; they are the keys to getting at centers of gravity."<sup>134</sup> Ambiguity in meaning aside, this last quote suggests that a direct confrontation of the center of gravity may not be appropriate. Doctrine specifically states that the essence of operational art "...lies in being able to mass effects against the enemy's main source of power."<sup>135</sup> Although the definitions need refinement, FM 100-5 suggests actions which may enhance acceptability by stressing the need to place an effect against the enemy's source of strength by attacking, if possible, those decisive points which most affect the source of strength.<sup>136</sup>

#### **Momentum**

Although not specifically defined in FM 100-5, doctrine captures the essence of momentum with its description of tempo. Doctrine defines tempo as the "rate of speed of military action."<sup>137</sup> Tempo itself is described as the combination of both speed and mass which creates a pressure on the enemy.<sup>138</sup> That pressure is momentum. This pressure, as noted in Chapter 3, 'Force Projection', can enhance the results obtained from a smaller force. Properly controlled, tempo will enhance surprise and therefore success in offensive actions. But, to develop and maintain the momentum which tempo generates requires an understanding of time-space relationships, as well as force capabilities.<sup>139</sup> A planner can grasp the importance of momentum to sequencing of actions from the explanation in FM 100-5.

As previously mentioned, an area of concern related to tempo is the emphasis this doctrine places on simultaneous operations--the most rapid tempo possible. Doctrine does identify that tempo can be fast or slow. The reasons listed for adjusting tempo focus on locating key enemy targets or preparing for future operations through arrangement of forces and resupply requirements.<sup>140</sup> The

missing element in the discussion seems to be determining the purpose behind the desired tempo for any particular plan. As in both Chromite and Just Cause demonstrate, tempo must be governed by the desired effect. By falling blindly into the need to execute everything at once or simply very rapidly, the sought after effect may be lost.

### CONCLUSION

Doctrine establishes a particular way of thinking about war and a way of fighting...doctrine provides the basis for harmonizing actions and mutual understanding.<sup>141</sup>

Planners must account for numerous complex factors when determining a plan's sequence of actions. The dynamic, interactive environment within which the sequence must operate, combined with the nature of the interrelationship between one factor to another engenders this complexity. A sound understanding of the relationships between means to ends will improve a planner's ability to deal with this complexity. As this study indicates, the planner must account for numerous considerations which the following criteria identified as relevant: unifying aim, correlation of means to actions, strength versus vulnerability, and momentum. Doctrine should assist a planner in recognizing those points.

U.S. Army operational doctrine, as embodied in the 1993 edition of FM 100-5, Operations, captures the essence of these factors. But, this study also indicates that areas exist within the doctrine requiring refinement to enhance understanding and reduce confusion related to those considerations. The areas needing attention primarily focus on three issues: 1) The need to achieve a balanced approach between simultaneous and sequential actions; 2) The need to adjust the definition of synchronization to account for

the effect; 3) The need to incorporate a concise synopsis of the various factors now scattered in the manual.

Two dangers exist if these measures are not adopted. First, given the bias for simultaneous actions, doctrine may become prescriptive in nature instead of descriptive. This trend is already developing in the Army. Consider the following statement by General Gordon Sullivan, Chief of Staff of the Army:

Success on the next battlefield is seen as resulting from an ability to execute full-dimensional operations; that is, to strike simultaneously throughout the entire depth and width of the battlefield...to overwhelm and destroy an enemy quickly and with few casualties.<sup>142</sup>

A second statement provides another indicator that this trend is developing, "The new paradigm suggests that simultaneity or what some theorists call simultaneous or parallel warfare is key to future operations."<sup>143</sup> However, this preference obscures the factors which ultimately must govern the sequence of actions: the aim, the desired effect, and means available. Without considering these, the plan may not be suitable for the strategic goal nor feasible.

This brings out the other danger. The three issues noted above combine to obscure the relationship between the ends to means. As this study demonstrates, planners must account for the aim, the means available to the actions, and ways to maximize and preserve resources in order to address the suitability, feasibility, and acceptability of actions. Doctrine should enhance the planners's judgment to make a clear, reasoned decision when choosing between simultaneous or sequential actions in designing a plan. Ultimately, the goal for doctrine is not to be "to badly wrong."<sup>144</sup>

## ENDNOTES

1. David M. Glantz, "The Nature of Soviet Operational Art," Parameters, (Spring): 5.
2. James J. Schneider, "Theoretical Paper No. 3: The Theory of Operational Art," (Ft. Leavenworth: Command and General Staff College, 1 March 1988), 8-11.
3. Jonathan House, Toward Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine, and Organization, Research Paper No. 2, (Ft. Leavenworth KS: U.S. Command and General Staff College, Combat Studies Institute, August 1984), 12-18.
4. James J. Schneider, "Theoretical Paper No. 4: Vulcan's Anvil: The American Civil War and the Emergence of Operational Art," (Ft. Leavenworth: Command and General Staff College, 16 June 1991), 32.
5. Ibid., 30.
6. U.S. Army, FM 100-5, Operations (Washington, D.C.: Department of the Army, 1993), 6-3.
7. Arthur F. Lykke, JR., "Toward an Understanding of Military Strategy," Military Strategy: Theory and Application, (Carlisle Barracks, PA: U.S. Army War College, 1989), 4. This article discusses the inherent components of all plans ends, ways, and means. Note 11 addresses the relationship between each of the points using the feasibility, acceptability, suitability (FAS) test.
8. James J. Schneider, "The Loose Marble and the Origins of Operational Art," Parameters, (March 1989): 87.
9. U.S. Army, FM 100-5, Operations, 1-1.
10. Ibid., 6-2.
11. "Strategic Analysis." In C510 Syllabus/Joint and Combined Environments. (Department of Joint and Combined Operations: Command and General Staff College, 1 August 1992), 47. This reference provides an initial discussion on the use of the FAS test. However, the following monograph addresses the relationship between the components extremely well: Leonard, Robert R. "Dialectic Strategy," (Student Monograph, Fort Leavenworth, KS: SAMS, 17 December 1993), 1-15.

12. Carl Von Clausewitz, On War, ed. and trans. by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 141.

13. Ibid., 75. Regardless of the specific point being contested, Clausewitz stressed that the entire matter concerned "an act of force to compel our enemy to do our will." Clausewitz's definition of war explains the object. The political object provides the goal for the act of war.

14. Ibid., 177.

15. Ibid., 80-81. In the hierarchical relationship which Clausewitz established (government, army, and people) the controlling entity which gave meaning to the act of force was the government. This recognition, plus other factors such as the uncertainty for the outcome would all tend to keep war from going to what Clausewitz called in theory the 'absolute.' Since the political object was the original motive for war, it determined both the military object and the effort required for its attainment. Thus, a commander required judgment in the choice of his aim and effort to establish the conditions necessary for the object. Clausewitz further articulates on pages 92-94 and the need to match effort to goal.

16. Ibid., 90, throughout Chapter 2 of Book 1, Clausewitz addresses the aim and its relative aspect to an enemy. During the period Clausewitz wrote about, once an opposing force was subdued, the aggressor could dictate his demands and generally have them fulfilled, p90-99. More importantly though, he stressed the importance of the aim as a guide for maintaining a link between actions which the military forces will perform and the desired outcome.

17. Ibid., 153-158, 177, 254. Clausewitz clearly felt a need to emphasize that first the "aim determines the series of actions intended to achieve it" and that the actions themselves were not initiated for the sake of movement or because routine at higher levels turns out ready made plans. Furthermore, he emphasized not the action itself but more importantly the effect created by the interaction of the two colliding forces.

18. Ibid., 71-79, 86, 96-99, 127-137, 231-234. The effect of the action as the main impetus behind the event is a consistent theme throughout these pages. Although Clausewitz does not describe the effects as occurring within domains, he specifically details the physical act of destruction with the consequences felt by the moral element. The moral element became decisive because this is the area in which the resisting forces' will to continue fighting as a whole disintegrates leading to a loss of unit cohesion. Once the moral strength of a unit dissipated, a rout

ensued with the pursuit accounting for the greatest number of either casualties or prisoners. Clausewitz viewed the pursuit as the ultimate expression of victory and it only came to fruition when the moral element of one side was destroyed.

19. Ibid., 139.

20. Ibid., 182, 225.

21. V. K. Triandavillov, Nature of the Operations of Modern Armies trans. by William Burhaus, (Moscow, 1929: School of Advanced Military Studies reprint, Command and General Staff College, Ft. Leavenworth, KS, 1990) 135-143, 150-157, 168.

Triandavillov wrote about the same factors which Tukhachevskiy described. He notes that "given today's elongation of the fronts...and stability of the defense, it is impossible to break open these fronts by means of breakthroughs on a narrow sector." This resulted from weapons lethality, range, rate of fire and the lack of the attacker's capability to prevent reserves from repositioning. (138) He then elaborates that a breakthrough can count on success only when a significant portion of the defense is engaged, direction selected for breakthrough achieves an advantageous operational position, and the attacking forces branch out on routes to develop blows against both the flanks and rear of enemy forces not directly in the offensive. (139) Further, a series of successive operations to significant depth so damage is done to the provide the attacker freedom of action. This requires the attacker to use a combination of blows directed from sides, on intersecting axes. This gives the attacker necessary leverage to dislocate the defense so the front is destroyed versus merely bent. Ultimately, the turning movements and envelopments must reach a sufficient depth that the requisite amount of pressure develops to ensure opposing force destruction. Throughout these pages the reader gains an impression that the physical actions themselves inflict first heavy destruction, followed by a cybernetic effect in which so many attacks and penetrations take place that the defender can not anticipate the main attack's location until too late. Thus, the action in the physical domain creates a cybernetic effect of paralyzing force movement which facilitates main attack mission. Once the main attack chews through the front lines and attacks to the rear and flank, a moral effect results with the enemy losing will power and cohesion. As this transpires, the forward forces collapse and an overall pursuit takes place. (140-143, 150-157, 168)

In his book Race to the Swift, Richard Simpkin also describes similar requirements under the guise of a holding force and mobile force with their actions being complementary with each other in the overall development of leverage. (92-114) The holding force acts as the containment element enabling the mobile force, or lever, to achieve a relatively higher velocity than the enemy can either in a withdrawal or reinforcement. To achieve the

necessary effect, the mobile force must reach a depth which exerts the proper amount of pressure to collapse the stability and cohesion of the defense. The effect of this building pressure results in dislocation. Dislocation is the term Simpkin uses to describe how to achieve victory after hostilities take place. There are three requirements for dislocation: the attritional action of the holding force which opens the way for the mobile force, mobile force engagements to gain freedom of action, and semi-clandestine operations to cause confusion and disruption of the resisting sides' cybernetic system. (140-141) The dislocation itself, however, results from the collapse of the defenders' will thus being an effect in the moral domain. Simpkin is formally cited later for footnote purposes.

22. M.N. Tukhachevskiy, New Problems in Warfare, ( Moscow, 1931, School of Advanced Military Studies reprint, Command and General Staff College, Ft Leavenworth KS, 1990) 1-5, 42-43, 111.

23. Ibid., 7, 16-17.

24. Ibid., 7. Tukhachevskiy used a particularly colorful description when he described this as "nailing him down...along the entire front line and in depth..."

25. Ibid., 23, 46-47. The paragraph synthesizes those pages from Tukhachevskiy, although the actual phrase of "reaping an operational harvest" comes from Triandifillov's writing pages 140-142.

26. Clausewitz, 77, 113-122.

27. Ibid., 583.

28. Ibid., 178.

29. Schneider, "Theoretical Paper No. 3," 16-18.

30. Clausewitz, 204.

31. Tukhachevskiy, 55-56.

32. Ibid., 19.

33. Leonhard, 121-122.

34. Ibid., 595-596.

35. Ibid., 595-596.

36. Ibid., 485.

37. Ibid. , 485-6.
38. James J. Schneider and Lawrence L. Izzo, "Clausewitz's Elusive Center of Gravity," Parameters, (September 1987): 56.
39. Clausewitz, 485.
40. Schneider and Izzo, 54-57.
41. Ibid. , 467.
42. James J. Schneider, "Theoretical Paper No. 3," 28.
43. Anotine Henri Jomini, Summary to the Art of War, ed. by J.D. Hittle in Roots of Strategy, Book 2, (Harrisburg, PA: Stackpole Books, 1987), 461-462.
44. Ibid. , 467-468.
45. James J. Schneider, "Theoretical Paper No. 3," 28.
46. Schneider and Izzo, 56.
47. Ibid. , 57.
48. Robert R. Leonhard, The Art of Maneuver, (Novato, CA: Presidio Press, 1991), 89.
49. Richard Simpkin, Race to the Swift, (London: Brassey's Defense Publishers, 1985), 22.
50. Simpkin, 95.
51. Simpkin, 92, 79-92.
52. Leonhard, 57-58.
53. Simpkin, 22.
54. William Lind, Maneuver Warfare Handbook, (Boulder, CO: Westview Press, 1985), 4-5.
55. Simpkin, 111-114.
56. Larry Addington. The Patterns of War Since the Eighteenth Century, (Bloomington: Indiana University Press, 1984), 253.
57. Robert Bebs Heinl, Jr., Victory at High Tide: The Inchon-Seoul Campaign, (Baltimore, MD: Nautical and Aviation Publishing Company of America, 1979), 14.

58. Clay Blair, The Forgotten War: America in Korea 1950-1953, (New York: Doubleday, 1987), 281.

59. Ibid., casualty figures extrapolated for this period taken from the number inflicted up to 1 Aug of 6,000 (p172) subtracted against the number by 15 September of 18,165 (p262). The NKPA numbers are provided on 221.

60. Ibid., 267-277.

61. Addington, 256.

62. Blair, 295-319.

63. Blair, 232.

64. Roy K. Flint, "Task Force Smith and the 24th Division: Delay and Withdrawal, 5-19 July 1950," America's First Battles: 1776-1965, ed. by Charles Heller and William A. Stofft (Lawrence, KS: University Press of Kansas, 1986), 267.

65. Blair, 286.

66. Ibid., 77.

67. Ibid., 231.

68. Ibid., 187.

69. Ibid., 142-146, The initial landing date was scheduled for 2 July. The first delay happened when the 24th Infantry Division was mauled from Osan back to Taejon. This required diverting the original landing force, the 1st Cavalry Division, to Fusan in order to help stabilize the situation. A subsequent NKPA victory at Taejon, in which U.S. forces suffered heavy casualties, compelled MacArthur to postpone the Inchon operation a second time. In this instance, the 2d Infantry Division and the 1st Marine RCT were diverted to reinforce Walker's Eighth Army.

70. Ibid., 142.

71. Ibid., 226.

72. Ibid., 224.

73. Ibid., 231.

74. Ibid., 187.

75. Ibid., 124.

76. Ibid., 119-124. Several reasons influenced the JCS to only partially fill the request. First, the common viewpoint regarded Korea as a potential 'communist bloc' feint to draw forces away from the primary theater in Europe. Of the six available divisions to draw from, two were committed to a confrontation with the 'communist bloc' in Europe. The status of the remaining four divisions provided a second reason. Two of those divisions, the 3d ID and the 11th Airborne, were pitifully understrength and not considered deployable. That left the 82d Airborne and the 2d ID. Since the 82d was held for potential contingencies requiring rapid response, only the 2d ID remained.

77. Ibid., 167.

78. Ibid., 122-123, 267.

79. Ibid., 224.

80. Ibid., 251.

81. Ibid., 232.

82. Blair, 190-197.

83. Roy Appleman, South to the Naktong, North to the Yalu U.S. Army in the Korean War, (Washington D.C.: Office of the Chief of Military History, 1961), 454-487, also in Blair's The Forgotten War. 262.

84. Blair, 210, 239.

85. Appleman, 488, 493.

86. Ibid., 492-495.

87. Ibid., 489.

88. Blair, 278.

89. Ibid., 295-297, 318-321.

90. Thomas M. Donnelly, et. al., Operation Just Cause: The Storming of Panama, (New York: Lexington Books, 1991), 13, 93-94, 96-99.

91. Lawrence A Yates, "Planning: Operation Just Cause, December 1989," Combined Arms in Battle Since 1939, ed. Roger J. Spiller (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1992), 203.

92. Donnelly, forward by Maxwell Thurman.

93. Donnelly, 350-379.
94. Vogel, "An Explosion of Violence Marks End of Year Long Fuze," Army Times, (1 January, 1990), R4.
95. Yates, 202.
96. Donnelly, 58.
97. Lawrence A. Yates, "Political Factors: The U.S.-Panama Crises, 1987-1990," Combined Arms in Battle Since 1939, ed. Roger J. Spiller (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1992), 210.
98. Donnelly, 71.
99. Ibid., 398.
100. Ibid., 56, 59-62, 75-86.
101. Ibid., 97-99, 102.
102. Ibid., 77-84.
103. Ibid., 6-8, 58-59, 75, 401.
104. Donnelly, 79-80.
105. Ibid., 75-77.
106. Ibid., 74.
107. Bloechl, MAJ Timothy D. "Operation Just Cause: An Application of Operational Art?" (Monograph, School of Advanced Military Studies, US Army Command and General Staff College, 1992), 24.
108. Donnelly, 58, 72, 108-109, 189-190.
109. U.S. Army, Operation Just Cause Lessons Learned. Volume I. Soldiers and Leadership (Fort Leavenworth, KS: Center for Army Lessons Learned, 1990), 1-2. Also in Donnelly's book p.77.
110. Donnelly, 72-77, cover inside flap provides specific number of targets.
111. Ed Magnusson, "Passing the Manhood Test," Time, (8 January, 1990), 43.
112. Leonard, 213, 218-219.

113. FM 100-5, 6-3

114. FM 100-5, This emphasis begins at the beginning of the manual with the idea that the Army's ideas about warfigting have evolved "...from set piece battle to simultaneous operations throughout the depth of the battlefield." (vi) Being able to attack the enemy simultaneously is also linked to thinking in depth. (2-7) Other references have linked the ability to conduct simultaneous actions with having vision and the ability to establish proper battlefield relationships. (6-12,6-3) An implied message comes across to the reader that if the plan is not simultaneous then you do not think in depth nor have vision, and you are not able to set the necessary relationships.

115. Ibid., 3-11.

116. Ibid., 6-15.

117. Ibid., 8-1.

118. Ibid., 6-1.

119. Ibid., 6-1.

120. Ibid., 2-4/5, 3-6, 5-2/3.

121. Ibid., 6-7.

122. Ibid., 2-8.

123. U.S. Army, FM 100-5, Operations, (Washington, D.C.: Department of the Army, 1986), 17.

124. Fm 100-5, (1993), 2-7/8.

125. Ibid., 2-9.

126. Ibid., 2-9.

127. Ibid., 8-3, 3-10.

128. Ibid., 3-4/5.

129. Ibid., 2-9.

130. Ibid., 2-10, 6-6, 2-5.

131. Ibid., 8-1.

132. Ibid., 6-7.

133. Ibid., 6-7.
134. Ibid., 6-7/8.
135. Ibid., 6-7.
136. Ibid., 6-8.
137. Ibid., 7-2.
138. Ibid., 7-3.
139. Ibid., 6-14.
140. Ibid., 7-3.
141. United States Marine Corps, Warfighting, Fleet Marine Force Manual No. 1 (FMFM 1) (Washington, D.C.: Headquarters United States Marine Corps, 1989), 43.
142. Gordon R. Sullivan, comments in "From the Editor," Military Review, LXXIII, #12 (June 1993): 1.
143. Frederick Strain, "The New Joint Warfare," Joint Forces Quarterly, 2 (Autumn 1993): 20.
144. Michael Howard, "Military Science in an Age of Peace," RUSI Journal of the Royal United Services Institute for Defense Studies, 119 (March 1974): 7.

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