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Intelligence Preparation Of The THEATER

A Monograph
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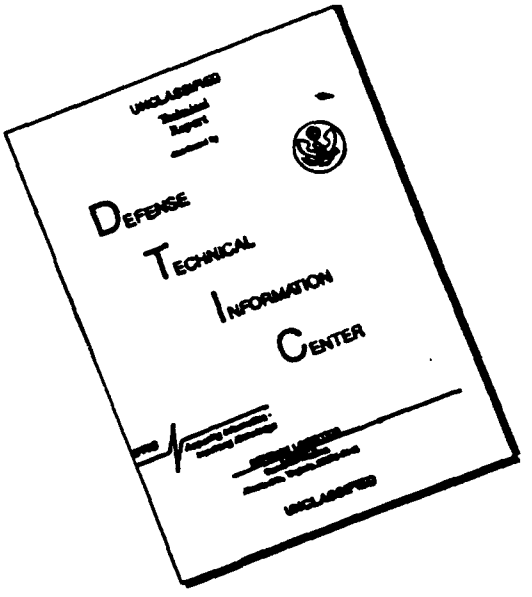

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ABSTRACT

"Operational IPB" describes U.S. Army doctrine for the pre-combat intelligence estimate process employed at the operational level of war. Its methodology is contained in an appendix to a tactical field manual, FM 34-130, Intelligence Preparation of the Battlefield. Commanders and staffs rely on "operational IPB" to locate enemy centers of gravity--a Clausewitzian theoretical concept heralded as the essence of operational art. Due to Army-wide acceptance of original IPB doctrine and growing interest in war fighting, "operational IPB" has emerged as a simple, familiar procedural solution to the search for a center of gravity.

This study seeks to determine whether the abstract concepts contained in "operational IPB" doctrine provide an adequate theoretical foundation for intelligence estimates in a theater of operations.

The monograph first assesses present doctrine regarding operational art, operational intelligence, and "operational IPB," with the goal of demonstrating center of gravity's central role in each. Next, the paper critiques "operational IPB." Third, the center of gravity and three other elements of military theory--decisive points, lines of operations, and lines of support--are reviewed from a classical and contemporary perspective, to determine how they may contribute to operational design. Finally, the paper uses the German Ardennes counteroffensive (December 1944-January 1945) as a case study to validate the utility of these four theoretical elements as planning tools in a theater of operations.

The paper concludes that, beginning with its name, "operational IPB" is inadequate doctrine and should be replaced with a broad, comprehensive theoretical model entitled Intelligence Preparation of the Theater of Operations (IPT). "Operational IPB" is a misnomer. It relies on a mechanistic, step-by-step templating approach typical of its tactical predecessor and is not grounded in the fundamentals of operational art. It is not sound doctrine for an Army that will fight in contingency theaters. It does not provide the conceptual framework or analytical tools necessary to meet the intelligence mandate of theater commanders. In contrast, IPT is a flexible, open-ended way of thinking about intelligence requirements in a theater of operations. It should be used to plan sequential operations to defeat enemy operational centers of gravity, and can be directed toward friendly forces to help prevent the enemy from defeating us.

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PART I: INTRODUCTION

In February 1991, United States and coalition armed forces completed one of the most remarkable major operations in military history--Desert Storm. Victory over Iraq underscores the importance of the study and practice of operational art. It may also foreshadow the nature of future conflict, if only from the standpoint that "the halcyon days" of a well-known threat, countered by U.S. forces forward-deployed in a theater of operations, are already over.1

The Army has tailored its development of operational art to the most clear and present danger--the Soviet Union. But today the Warsaw Pact is dead and the Soviet Union is mired in its own seemingly intractable domestic problems. Though the Soviet Union remains the only credible threat to the survival of the United States, the Mideast War suggests that elsewhere around the globe lurk dangers to our national interests which may require military responses. Some can be easily detected now; others may emerge rapidly and unexpectedly. Notwithstanding the dimensions of the American victory in the Mideast, we cannot assume that the future will afford us a global environment that is any less volatile than the present. The implications of "the new world order" are not all reassuring.

There will be many lessons drawn from Operation Desert Storm. Among them must be the conclusion that our armed forces no longer have the luxury to concentrate on the Soviet Union. Our doctrine must prepare us to confront less well-

known threats in various regions. Prospective defense budget reductions imply that this feat must be accomplished with a smaller force structure which is predominantly based in the United States rather than abroad.

This study addresses one aspect of evolving operational doctrine, commonly described as "operational intelligence preparation of the battlefield" or, more frequently but just as incorrectly, "operational IPB."2 Expressed in a brief appendix to FM 34-130, Intelligence Preparation of the Battlefield, "operational IPB" (as its name suggests) is based on the enormously popular graphic decision support techniques that drive Army tactical planning. FM 34-130 maintains that "the same intellectual process which reduces uncertainty for the tactical commander can be adapted to do the same for the operational level commander."3 Given the range of distinctions between the operational and tactical levels of war, such a claim sounds like a very large assumption indeed.

The core of "operational IPB" is a staff estimate process, inspired by Carl von Clausewitz, that leads to the identification and location of the enemy's theoretical center of gravity and culminating point.4 Whether it is possible to graphically locate and depict a center of gravity and culminating point is beyond the scope of this paper, as is Clausewitz's personal disdain of military intelligence.5 However, the fact that "operational IPB" has a theoretical base is very much to the point.

Recognizing that the scope of operational art requires doctrine which is broad, flexible and situationally-contingent, this paper accepts the presumption that some operational intelligence doctrine should be rooted in the theory of operational art.[6] It assumes that a conceptual rather than literal application of operational theory can be helpful to commanders and staffs, particularly when planning contingency operations. The paper seeks to determine whether the theoretical foundation of "operational IPB," as expressed in FM 34-130 and FM 100-5, Operations, is sufficient for the establishment of a staff intelligence estimate process at the operational level of war. It concludes that the theoretical foundation is weak, but that remedies for this can be found in the works of Sun Tzu, Clausewitz, Jomini, and a recent Training and Doctrine Command publication entitled Blueprint of the Battlefield (Blueprint).

The study includes an assessment of basic Army operational doctrine, operational intelligence, and "operational IPB." Next, the paper examines the theoretical underpinnings of doctrine, and additional concepts from Sun Tzu, Clausewitz and Jomini are explored to determine their contemporary utility. This is illustrated by a case study, the German Ardennes counteroffensive, December 1944--January 1945. Finally, the paper proposes a new name and expanded theoretical foundation for operational intelligence estimates: Intelligence Preparation of the Theater of Operations (IPT).[7]

PART II: DOCTRINE

> ...the need is for clear ideas and the ability to show their connection with each other. The human mind, moreover, has a universal thirst for clarity, and longs to feel itself part of an orderly scheme of things.
> Clausewitz, On War[1]

Unfortunately, the subject of operational art seems destined to defy Clausewitz's appeal for clarity. Paradoxically, it was the great theoritician himself who provided much of the grist for the mill of professional military debate that endures to this day. For the sake of precision and to limit the scope of the paper, this section introduces several definitions. Some are drawn from field manuals, others from Blueprint. This section then identifies the three main theoretical ingredients of AirLand Battle Doctrine: lines of operation, culminating point, and the center of gravity, and establishes the central importance of Clausewitz's "center of gravity," particularly with respect to operational intelligence doctrine.

Operational Art

The Army's primary source of operational doctrine, FM 100-5, defines operational art as "the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization and conduct of campaigns and major operations."[2] Some terms in this definition themselves require definition.

A theater of war is defined as "that area of land, sea and air which is, or may become, directly involved in the operations of war."[3] The physical domain of a modern theater

of war also includes exoatmospheric space and the electromagnetic spectrum enveloping the area, each of which have military utility. Historically, a theater of war has been associated with a level of war called grand strategy. The national command authority (NCA) designates theaters of war and places into the hands of a theater commander varying amounts of all five elements of national power--geography, economics, politics, military force and national will.[4] **Campaigns**, "a series of joint actions designed to achieve a strategic objective," are conducted in a theater of war and may or may not be decided by military force.[5]

A **theater of operations**, also established by the NCA, is "that portion of a theater of war necessary for military operations and for the administration of such operations," and if very small can also be entitled an **area of operations**.[6] The commander of a theater of operations must be cognizant of other elements of national power besides armed force, though he does not usually control those elements. His military forces, however, may impact on some or all elements of the enemy's national power. **Major operations**, which comprise "the coordinated actions of large forces in a single phase of a campaign or in a critical battle," are conducted within a theater of operations.[7]

Thus, a theater of operations is that part of a theater of war where the employment of military force--the subject of operational art--plays or is expected to play the dominant role in securing strategic objectives. This paper concerns

itself with the doctrine for intelligence estimates which are necessary for planning major operations in a theater of operations.

Appendix B of FM 100-5 rewards three elements of classical military theory with a place in operational doctrine: center of gravity, lines of operation, and culminating point. They are discussed separately and their potential interrelationships are not explored.8 Center of gravity is by far the most important of the three; doctrine stipulates that it is "the essence of operational art."9

To explain the center of gravity, FM 100-5 employs Clausewitz's analogy--the hub of all power--and defines it as "...that characteristic, capability or locality from which the force derives its freedom of action, physical strength, or will to fight."10 This explanation will serve our immediate purposes, and the concept will be discussed further in the next section. For now it is enough to assert that Army doctrine considers the center of gravity as the cornerstone of operational art. Whether or not operational intelligence can unearth this cornerstone and tell us what to do with it is our next subject.

Operational Intelligence

One author recently described operational intelligence doctrine as "the stepchild of the intelligence community."11 A doctrine review offers many examples to justify his exasperation. Considering the primacy of the center of

gravity in operational doctrine, it comes as no surprise that center of gravity also dominates operational intelligence doctrine. Of the other two theoretical elements of operational design, lines of operation are not mentioned at all in intelligence manuals, and culmination appears only as an afterthought in one short paragraph of FM 34-130.12 In spite of the prominence of center of gravity, operational intelligence doctrine does not embellish FM 100-5's explanation of it very much.13

There are several different definitions of operational intelligence on the books at the moment. They share a common theme: locating the enemy's center of gravity is recognized as the purpose of operational intelligence. The definitions differ in other respects. Joint doctrine simply says that "operational intelligence is required for the planning and conduct of campaigns and operations."14 Army field manuals claim that operational intelligence is required for campaign planning in a theater of war, while **Blueprint** says that it is used to plan major operations in a theater of operations.15 Of course, intelligence is critical to commanders in both kinds of theaters.

The **Blueprint** definition contains some helpful theoretical themes concerning the center of gravity, to be developed later, and will suffice for now:

> Operational intelligence is that intelligence which is required for the planning and conduct of campaigns and major operations within a theater (or area) of operations. ...the joint and combined intelligence system concentrates on the collection of information, and the analysis of that information, which will lead to

> the identification and location of the operational center(s) of gravity (or high payoff targets affecting the centers of gravity) that, if successfully attacked, achieve assigned strategic aims.16

Intelligence doctrine focuses more on organization of the operational intelligence effort than operational analysis requirements. The doctrine is at best a description of what product is required, not an explanation of how to go about it. For example, joint doctrine divides operational intelligence into six functions: indications and warning, current intelligence, intelligence production, target intelligence support, collection management, and intelligence integration.17

Similarly, Army doctrine recognizes five operational intelligence tasks: indications and warning, situation development, target development, security and deception, and electronic warfare. It vaguely recommends that "operational level intelligence extend to social, political, economic and personality matters which may affect enemy activity within a theater of operations," and identifies three analysis functions--information collection, information processing, and preparation of intelligence reports.18 There is little mention of how to perform intelligence analysis in anticipation of operations.

Blueprint provides the most detailed set of analysis requirements, though it does not establish their inter-relationships. First, operational intelligence must probe the mind and decision-making processes of the enemy commander. Next, because of its greater scope compared to

tactics, operational intelligence analysis must be broad and predictive if it is to be of value. While many tactical intelligence factors (such as order of battle) are important at the operational level, they must be evaluated from a broad perspective and balanced against other factors (such as economic and technological considerations). Finally, operational intelligence analysis is said to be a product of situation development.19 It is to this organizational function we now turn in search of a process leading to the center of gravity.

Operational IPB?

"Situation development is IPB at the operational level."20 With few reservations, the Army embraces the templates and techniques contained in FM 34-130. IPB is now so fundamental that a March 1991 Doonesbury comic strip lampooned it.21 But this success has a down side. Calling to mind Clausewitz's appeal for clarity, one observer wrote:

> IPB was a winner from the starting gate. It satisfies a warfighting need. It gives structure to the desperately complex...battlefield. Alas, it is too appealing...it is the country club of the decision brief.22

IPB seems to be contagious. At the risk of making too much of a good thing, doctrine writers are expanding IPB's scope to encompass operational art. One author claims that "if IPB is a precondition at the tactical level, it should be at the operational."23 "IPB at the Operational Level" and "Operational IPB" are expressions that, for lack of anything

better, have found their way into doctrinal descriptions of the operational intelligence estimate process.

During discussions at the Army's School of Advanced Military Studies, students and instructors sometimes explain past military failures in ways that hint at the Army's mystic faith in IPB: "Hitler failed to conduct a good `operational IPB' before the Battle of Britain, did not identify the British center of gravity, and consequently lost."24 In the midst of a fog that enshrouds so much of the complex world of operational art, many see the faint flickering of a familiar tactical torch, IPB, illuminating the path to simple and complete solutions. But what is behind the promising facade of "operational IPB?"

As was the case with original IPB, "operational IPB" techniques were developed by forward-deployed units before finding a place in doctrine. Two years before FM 34-130 was published, General William J. Livsey, former commander of U.S. forces in Korea remarked that,

> IPB can drive the entire combat planning process, from tactical planning...to campaign planning at field and theater army level. It is the planning template upon which [operational] synchronization can be built.25

Of course, General Livsey enjoyed the luxury of designing his operations to contend with a well-known opponent while actually garrisoning his forces within the theater of operations, a condition that it is not likely to last much longer. Regardless, "operational IPB" methods are now incorporated into Appendix D of FM 34-130. It is telling that a vital element of operational doctrine exists only as a

brief appendix to a tactical manual.

The appendix describes four steps that are essentially clones of tactical doctrine. **Theater area evaluation** covers the collection and analysis of demographic, economic and political aspects of the theater. **Analysis of the characteristics of the theater** includes analysis of terrain and weather (tactical considerations) and "topography, hydrography [and] seasonal climatic conditions [that often] dictate when to launch campaigns." This step requires an assessment of theater infrastructure, communications, types of social systems, etc. Step Three, **Threat Evaluation**, focuses on "all forces available to the enemy in a theater of war...and effectiveness of their reconstitution-sustainment system." During this step, analysts consider the enemy commander's personality. Finally, **Threat Integration** calls for a synthesis of preceding steps that somehow results in discerning the enemy's center of gravity and "the sequence of actions necessary to expose and defeat" it.26 This sounds, and is, all too easy and familiar.

Like the rest of FM 34-130, Appendix D features a mechanistic approach that concentrates on symbology and methodology for a war in Europe against the Soviets.27 In fact, FM 34-130 implies that a sort of doctrinal reverse engineering has occurred in the case of "operational IPB," with original IPB as both the start point and goal of the endeavor. Though Appendix D "may yield some minor insights," says one critic, "it is of little value as implementing

doctrine for operational intelligence."[28]

"Operational IPB" is simply a name for the detailed intelligence work that is accomplished wherever large forces are forward-deployed, but is of marginal utility under other circumstances. The name itself is a misleading oxymoron. A battlefield is a tactical environment; operational art is practiced in theaters.

"Operational IPB" steps are original IPB inflated to envelop greater expanses of time, space and mass, but provide no analytical tools to identify a center of gravity or a sequence of actions to defeat it. Though it fits nicely into "the orderly scheme of things" advocated by Clausewitz, "operational IPB" fails to serve as adequate doctrine.[29]

The last page of Appendix D to FM 34-130 admonishes intelligence staffs to predict when an enemy force will reach its culminating point, and to plan operations that will expedite this occurrence. The manual offers no method of accomplishing this, either, does not explain culmination or refer the reader to FM 100-5's treatment of the subject. Culmination is a valid theoretical proposition for both the attack and defense and it should be of interest to intelligence staffs. However, contemporary authors have affirmed what Clausewitz suspected: little predictive use can be made of culmination before operations commence. Hence, culmination has no place in "operational IPB."[30]

Of its many shortcomings, "operational IPB" suffers most from the lack of a conceptual framework analysts can use to

deal with a plethora of intangibles and "invisible linkages that can give an enemy force its synergistic power" in a theater of operations.31 It has no operational theme other than references to geography, climate and a tenuous theoretical linkage to the center of gravity. Our doctrine requires but lacks the conceptual foundation upon which to conduct **Intelligence Preparation of the Theater of Operations**. Fortunately, the ingredients for the foundation are available elsewhere.

PART III: THEORY

> ...the primary purpose of any theory is to clarify concepts and ideas that have become...confused and entangled.
>
> Clausewitz, On War

Since military theory is the source both of the essence of operational art and the purpose of operational intelligence, perhaps theory is also the proper reserve from which to select tools to assist operational intelligence analysts. After all, IPT is essentially a theoretical model. This section elaborates four classical concepts with potential for contemporary application: centers of gravity, decisive points, lines of operation, and lines of support. Their utility has not been realized, partly because we have inadvertently used them to create confusion when, in fact, their purpose is to alleviate it.

This section considers each concept from a classical and modern perspective, proposes new definitions, and highlights some of the relationships between the concepts. Grasping the abstract linkages between elements of operational theory is an important step in developing an ability to discern similarly complex relationships between opposing armed forces and the environment of a theater of operations. Together, these theoretical concepts establish a foundation for Intelligence Preparation of the Theater of Operations.

Centers of Gravity

Students of operational art have expended much academic energy in repeated attempts to dispel the confusion inherent

in any debate over Clausewitz's center of gravity analogy. It seems that in punishing ourselves trying to agree on what Clausewitz really meant, we have missed what the analogy can mean to us.

Clausewitz caused the controversy by offering conflicting definitions and examples to explain his concept. Of the many choices available in On War, the authors of FM 100-5 selected another analogy, "the hub of all power," to explain the original analogy. FM 100-5 perpetuates the confusion by citing several apparently unrelated examples: a unit, a boundary, or in the case of the Battle of the Bulge, the crossroads of St. Vith.2 One is left with the feeling that a center of gravity can be almost anything, and that there is no way of really knowing for sure. Another dose of clarity is required. Without breaking the concept into its constituent parts, it is too vague to be an analytical tool.

Clausewitz implied and FM 100-5 affirms that centers of gravity exist at each level of war.3 Ideally, there is only one enemy center of gravity at each level at one time. though there is no reason to dismiss the idea that more than one may exist simultaneously. In that case, selecting the one that is the most important and most vulnerable becomes the key planning task. Doctrine also recognizes that centers of gravity are not static; they can shift during the course of a war, operation or battle. A changed alliance, fresh reserve formation, or failed technology can rapidly shift the balance.4

At any level of war, centers of gravity are characterized by elements of national power. For example, under various conditions one may correctly claim that a country's strategic center of gravity is its national will, its economic power, or perhaps for a superpower, its strategic nuclear offensive forces.

Though Clausewitz addressed only the tactical and strategic levels of war, he provided an important insight concerning operational centers of gravity: "...no matter what the central feature of the enemy's power may be...the defeat and destruction of his fighting forces remains the best way to begin."[5] Since operational art is primarily a contest of armed force in a theater, we may excise the military element of national power from the other four, which remain as components of strategic centers of gravity, and assert that an operational center of gravity is almost always some expression of armed force present in a theater of operations or promptly available for employment there.

Throughout history, theater commanders have organized a subordinate formation that was larger, more mobile, more powerful than other formations, one that was commanded by the most capable or favored officer, or given the most critical mission to accomplish. Often, this formation had land, air and sea components, augmented in more recent times with capabilities in space and across the electro-magnetic spectrum. Though the relative strength of the operational center of gravity depended upon the assets and tasks given it

by the establishing authority, it was capable of seizing or protecting objectives with operational and strategic significance. Major reorganization of theater forces, whether caused by new missions, casualties, reinforcements, or changed alliances, often resulted in the creation of a new operational center of gravity.

Other elements of national power contribute to the strengths and weakness of armed forces, but an operational commander has little impact on them outside his theater. Armed force is the primary medium of the operational artist. If analysis shows that another element of power is dominant as the operational center of gravity, then we should take Sun Tzu's advice: "if one cannot succeed, do not use troops."6

The task now is to distinguish an operational center of gravity from the entirety of a theater commander's armed forces. Clausewitz said to assess "the dominant characteristics of both belligerents," because a commander will organize a center of gravity according to how he perceives strengths and weakness on both sides.7 More specifically, Clausewitz recommended that analysts "scrutinize closely the cohesiveness of the different masses and the character of their commanding general."8 In most cases, a cohesive force, well led, is formidable. Less complicated (and more quantifiable) factors also come into play. Size, location, composition, command and control dynamics and battle experience figure in the center of gravity calculus, as does the impact of characteristics of the theater.

This is not meant to imply that it is now easy to identify an operational center of gravity, given that it is part of the armed forces. Clausewitz described the task as "a major act of judgment,"[9] as did his contemporary, Tolstoy:

> ...they say that war is like a game of chess? Yes, only with this little difference, that in chess...a knight is always stronger than a pawn and two pawns always stronger than one, while in war a battalion is sometimes stronger than a division and sometimes weaker than a company. No one can ever be certain of the relative strength of armies.[10]

Identifying centers of gravity and keeping track of them during major operations is only the first of many operational intelligence challenges. Together with other staff members, the intelligence officer must recommend ways to defeat or destroy enemy centers of gravity. Clausewitz would propose whatever steps were necessary to rapidly bring the opposing centers of gravity into conflict in a decisive battle. Though a direct confrontation may sometimes be required or even preferred today, in most cases it will be unacceptable and American commanders will use an indirect approach to maximize the agility of their forces and minimize casualties.

Striking at one part of the enemy's center of gravity or against its lifelines has many advantages. Classical theory offers an important concept that can be used to design major operations and distinguish centers of gravity--decisive points.

Decisive Points

The concept of decisive points is ancient. Sun Tzu urged his clients to "seize something [the enemy] cherishes and he will conform to your desires."[11] The same theme occurred to Jomini, who devoted much of **The Art of War** to the planning steps required to choose and attack decisive points. Jomini's works have fallen into disfavor, however, and since World War II western analysts have often confused decisive points with centers of gravity. This trend is evident in FM 100-5 and FM 34-130, where examples of decisive points are characterized as centers of gravity.[12] The failure of FM 100-5 and FM 34-130 to distinguish decisive points from centers of gravity is a major doctrinal shortcoming. **Blueprint** alludes to the concept of decisive points by its inclusion of high payoff targets in the definition of operational intelligence, as does FM 34-130 in its treatment of "Named Areas of Interest," but by and large most of Jomini's ideas are either missing from our doctrine or confused with something else.[13]

Jomini based his principles of war on massing armed force against decisive points. These points were decisive only if they were capable of significantly affecting the course of a campaign.[14] Clausewitz recognized them also, though he did not regard them with the esteem characteristic of Jomini.[15] To Jomini, decisive points came in several varieties. For our purposes, two merit study: geographic decisive points and maneuver decisive points.

Geographic decisive points were features of permanent importance, such as fortresses, capitals, and heights.16 Maneuver decisive points, termed "accidental points of maneuver" by Jomini, resulted from the relative positioning of armed formations, and usually yielded an advantage to the formation arrayed against the enemy's flank.17 One often contributed to the importance of the other, as in the case where an opponent made use of a maneuver decisive point to cut off the enemy from its base, a geographic decisive point.

Modern theorists have updated Jomini's ideas. James Schneider of the Army's School of Advanced Military Studies defined a decisive point as a "physical object for which we are willing to expend combat power," and later broadened the concept by describing it as "any objective which will provide a force with a marked advantage over its opponent" and positing three kinds of modern decisive points: physical, cybernetic and moral.18

A physical decisive point, like Jomini's geographic decisive point, may be a permanent feature like a city or a river but also an animate object, such as a formation of troops. It is anything physically tangible: in the words of one officer, a "hard" decisive point. Cybernetic decisive points affect command, control and information processing. Examples include command posts and commanders themselves, and less visible things such as boundaries between formations. To this list we can add the portions of the electro-magnetic spectrum necessary for command and control. A moral decisive

point, also termed a "soft" decisive point, "...sustains the forces' morale--their magnitude of will." Examples are the commander's will and the commander himself.19 Though these three categories overlap somewhat, they extend the basic Jominian theme to new and vital areas of operational art.

Classical and modern theorists view decisive points as things to attack or protect. There is yet another aspect to consider, however. Some decisive points, such as a holy city or shrine, should be strictly avoided by a theater commander in spite of their value to an opponent, because use of or damage to such locations may infuriate inhabitants, make bad press, and abet the enemy.

There are several important relationships between decisive points and operational centers of gravity. Each of the various decisive points mentioned above pertain to a facet of armed force that may constitute an operational center of gravity. A measure of a center of gravity's strength is drawn from decisive points upon which the center of gravity depends.

To the extent that certain points directly and indirectly support a center of gravity, facilitate its freedom of action and sustain its effort, they appreciate in value. Some points will be more assailable than others. Military action directed toward objects not identified as decisive is wasteful. Conversely, action directed against carefully selected decisive points, by means of sequenced operations in a theater, can unhinge and eventually defeat

the enemy's center of gravity, or force him to organize another, without the risks of combating the center of gravity head-on.

Often, decisive points chart an indirect but desirable path toward an operational center of gravity, particularly during the early stages of war and when planning collateral measures such as deception, electronic warfare and psychological operations. Disruption of the enemy's command and control, for example, is an essential prelude to the destruction of his center of gravity which is best accomplished by attacking cybernetic decisive points.20 Psychological operations can be directed against cybernetic and moral decisive points.

Operational maneuver can also create a decisive point in relation to the enemy's center of gravity. Anticipating this sort of decisive point is more difficult, as it depends upon theater dynamics and relative mobility of forces. However, it can also yield the most dramatic operational victories, as was the case with American landings at Inchon during the Korean War.

To locate and facilitate defeat of an operational center of gravity at the lowest cost, IPT must identify and prioritize physical, cybernetic, moral and maneuver decisive points within the theater. Orchestrating military actions in relation to them requires thoughtful establishment of lines of operations.

Lines of Operations

FM 100-5 defines and discusses lines of operations, but the concept is missing from intelligence doctrine.21 Due to debate over the value of interior vice exterior lines, we have overlooked an opportunity to develop the concept further. In any case, the nature of a theater of operations often decides the interior/exterior lines issue for us, before operations commence.

Jomini originated the concept, and today "lines of operation define the directional orientation of a force in relation to the enemy; connect the force with its base or bases of operation on one hand and its operational objective on the other."22 Jomini claimed that "the choice of lines of operations may be regarded as fundamental in devising a good plan for a campaign."23

IPT should help decide the selection of lines of operation by identifying the enemy's center of gravity, prioritizing decisive points, and developing an operational defeat mechanism that vanquishes the center of gravity. Lines of operation can be viewed as a series of objectives and a timeline that friendly forces employ enroute to securing a decision in the theater.

The nature of a center of gravity's decisive points form a sort of blueprint upon which lines of operation can be planned. Logistics, security concerns, forces available, and political considerations will impact upon a commander's decision, but the primary paths of lines of operation should

be developed by IPT. The sequencing of major operations in a theater can be orchestrated along lines of operation directed against various decisive points, while concurrently taking action to protect one's own.

While lines of operation are particularly important during pre-battle planning, analysts should not make too much of them as the operation unfolds. They are not guarantees of success and may require modification. FM 100-5 notes that "history is replete with examples of armies which overcame positional disadvantages by audacity, agility and sheer tenacity."24 Nevertheless, selection of lines of operation represents an important initial step in the design of major operations, especially in an contingency theater.

Lines of Support

Martin van Crefeld contends that in the last two hundred years, logistics has become "as much as nine-tenths of the business of war."24 Though not a popular topic among intelligence officers, logistics often is "the final arbite of operations" because an "army's ability to marshal, transport and distribute large quantities of material maintain the men and equipment of large units can m decisive difference between victory and defeat."2 American and British landings at Normandy in J intended to secure a base of operations to s drives deep into the continent of Europe, example of the marriage of operations and lo

Operational logistics cuts both ways. It always influences and often decides our ultimate selection of lines of operation in a theater. Similarly, it limits and makes more predictable an enemy's choice of operations directed against us. Schneider considers two elements of logistics to be crucial at the operational level: the base of operations and lines of communication.27 Both of these elements can be subsumed in an expanded definition of lines of support.

As is the case with center of gravity and decisive points, FM 100-5 confuses two other theoretical concepts in Appendix D: lines of operation and lines of support.28 They certainly relate to one another, but are different even though they occasionally occupy the same space in a theater. Blueprint adds to the confusion by defining lines of support and lines of communication quite similarly.29

Simply put, "operational logistics is concerned with delivering to the commander the means to fight, and then sustaining those forces from its base up to the forward units."30 If we consider lines of support to include the theater base or bases and lines of communication linking bases to forward tactical formations, a logical construct results.

Planning for logistic support, especially in an immature theater, requires extensive preparation. IPT must expedite the establishment of our lines of support by careful analysis of the theater and development of logistics intelligence. Logistics intelligence includes theater infrastructure

(ports, railways, airfields, supply facilities, hospitals, pipelines, power plants, communications nodes [described as a "power grid" in JCS Publication 4-0]), host nation support, and factors relevant to establishment of theater sustainment bases.[31] Only in the most fortunate circumstances will we have the time and resources to do much else besides repair and maintain existing lines of support during combat operations. Logistics intelligence may be the key to operational design, as was the case in Normandy.[32]

IPT must also evaluate the enemy's lines of support, for at least two reasons. First, lines of support provide important clues about the enemy's possible and probable operational courses of action. Second, lines of support usually feature inviting and vulnerable decisive points that yield great returns for a comparatively modest investment of force.

These four concepts--center of gravity, decisive points, lines of operation and lines of support--comprise the theoretical foundation for Intelligence Preparation of the Theater of Operations. As a test of their usefulness, we will next consider the German Ardennes counteroffensive of World War II.

PART IV: HISTORY

The German Ardennes Counteroffensive, December 1944--January 1945

The Ardennes operation was chosen to illustrate IPT's theoretical validity because it is considered to be one of the best examples of operational art, because it figures prominently in FM 100-5's theoretical discussions, and because "The Battle of the Bulge" is familiar to most American military personnel. Each of IPT's four central theoretical concepts are easy to discern in an Ardennes case study (see map at Appendix).

From a strategic standpoint, Germany had reached a monumental crossroads in the west by late 1944. The Allies had advanced to the German border after surging through France, and stood poised to penetrate into Germany near the vital Ruhr industrial area. Hitler had to protect this vital part of his lines of support in the west, and also sought to buy time for the production of new "wonder weapons," upon which so much depended. He also hoped to stun British and American forces, and perhaps force Britain to sue for peace, before turning his attention to the even greater Russian menace to the east.1

The Allies had advanced more quickly than expected, but in so doing outran their lines of support from Normandy and were critically short of supplies. The opening of Antwerp in November and establishment of new lines of support from ports in the south of France promised to improve the logistics situation, and the Allies planned a renewal of their

offensive in early 1945, with two lines of operation projected across the Rhine.2

The Allies had paused with 65 divisions along 500 miles of frontage. The largest concentration of air and ground combat power was Field Marshal Sir Bernard L. Montgomery's 21 Army Group (AG), located north of the Ardennes and nominated for the main attack into the Ruhr.3 21 AG represented the Allied operational center of gravity in December 1944. Within and to the south of the Ardennes, Lieutenant General Omar N. Bradley's 12 AG was scheduled to attack into the Saar industrial region in support of 21 AG. Lieutenant General Jacob L. Dever's 6 AG was located still further south, in an economy of force role that extended to the Swiss border.4

Hitler believed that a major operation against a cybernetic decisive point, the boundary of 21 AG and 12 AG, could split the Allies.5 Since German forces were unable to engage the powerful 21 AG directly, Hitler instead selected an indirect approach against the Allied line of support that extended from Antwerp to Brussels and forward to combat forces. The Germans assembled 76 divisions in the western theater, 30 of them in the vicinity of the Schnee Eifel region opposite a weakly defended American sector in the Ardennes Forest.6

Hitler's ambitious attack plan suffered from a major theoretical flaw: it provided for two distinct lines of operation through confining Ardennes terrain, which had roads and railways adequate for only a single line of support.

The counteroffensive was carried out by three German armies of Field Marshal Walter Model's Army Group B beginning on 16 December 1944. In recognition of the value Hitler placed on the operation, the bulk of recent tank, artillery and aircraft production was sent to Army Group B, risking other important German enterprises in Russia and Italy.7

In the north, 6 Panzer Army (PzA), commanded by Oberstgruppenfuhrer der Waffen-SS Sepp Dietrich, one of Hitler's favorite Nazi cronies though a mediocre general, represented the initial German operational center of gravity. Organized with four SS panzer divisions and most of the artillery and air available to Army Group B, 6 PzA massed its armor and attempted to conduct the main attack to seize physical decisive points--Meuse River crossing sites near Liege--then drive on Antwerp, another physical decisive point at the source of an allied line of support.8

In the center, General der Panzertruppen Hasso von Manteuffel's 5 PzA employed infantry infiltrations to create a twenty mile penetration of American defenses and began to exploit its success along a line of operation that ran toward the decisive points of St. Vith, Bastogne and Meuse crossing sites near Namur.9 (FM 100-5 incorrectly identifies St. Vith as a center of gravity.) Though intended as a supporting attack to protect the southern flank of 6 PzA, 5 PzA's line of operations coincided with the German line of support, the best road network and only railway through the Ardennes. Since the Germans were desperately short of motorized

transport and dependent upon rail supply, the St. Vith railway was essential to sustainment of the counter-offensive.10 Further south, the German Seventh Army made slight progress in its supporting attack and went over to the defense on 19 December.11

At the intended location of the main attack, surprised and disorganized American units nevertheless managed to deny to 6 PzA three of its five attack routes by retaining a maneuver decisive point on the northern shoulder of the penetration, and Dietrich accomplished little. One panzer regiment (Kampfgruppe Peiper, 1st SS Pz Div) managed to penetrate the defenses, became infamous for the massacre of American prisoners near Malmedy, and was eventually defeated in the Ambleve River valley by 23 December.12

On 20 December, Hitler ordered much of 6 PzA's remaining armor strength south to reinforce the success of 5 PzA, and also dispatched divisions from his theater reserve to the St. Vith area.13 Had he shifted his operational center of gravity two days earlier, as his military advisors urged, the counteroffensive might have achieved what Hitler envisioned.14

A day earlier, General Dwight D. Eisenhower had directed his only theater reserves, the 101st and 82nd Airborne Divisions, to move from rest areas near Rheims, France to the area of the German penetration. Making the most of superior lines of support in France, the Allies were able to position their reserve forces in the path of the reinforced 5 PzA

before it secured all the decisive points enroute to the Meuse. Also on 19 December, Eisenhower approved the dispatch of Lieutenant General George S. Patton's Third Army from 12 AG toward the threat, and directed Montgomery to orchestrate a counterattack against the penetration from the north.15

Hitler's decision to shift his main effort to the 5 PzA zone resulted in the constitution of a new operational center of gravity (the reinforced 5 PzA) and the convergence of two lines of operation into one, along the only viable line of support through the Ardennes. St. Vith finally fell to German forces on 23 December. However, the jumble of German formations from two armies was simply too unwieldy for available maneuver space and roads, and too large to be refueled, rearmed and maintained while preserving the momentum of the attack. As a consequence, the Germans lost the race to the crossroads of Bastogne, a decisive point which dominated all lines of operation and support in the southern Ardennes.16

The leading German panzer formations bypassed Bastogne and drove on toward the Meuse, but ran short of fuel and tank spare parts and stopped four miles east of the river. American defense of St. Vith and retention of Bastogne effectively cut the German line of support and denied 5 PzA the opportunity to perhaps achieve its operational objective, Antwerp.17

The 101st Airborne Division and a collection of other American units stood firm at Bastogne until relieved by

Patton on 26 December.18 Third Army's remarkable drive to Bastogne was credited to Patton's generalship, but was also made possible by a flexible and anticipatory sustainment organization. This maneuver signalled the beginning of Allied efforts to cut-off and destroy German forces in the Bulge. The selection of the line of operation to achieve this end was based on the best available line of support, a decision that had important consequences.

As Patton's forces joined the defenders of Bastogne and repulsed repeated German attempts to take the town, Montgomery positioned a British corps on the west bank of the Meuse opposite the deepest German penetration. He also reinforced the northern shoulder of the penetration, a maneuver decisive point, and prepared a corps counterattack to the south toward Third Army.19

The Allies had several possible courses of action from which to choose a plan to cut-off and destroy 5 PzA. The most promising, from the standpoint of inflicting the greatest defeat upon the Germans by slicing through the penetration at its base, was the least logistically supportable and was discarded for a less decisive but more feasible alternative, attacking the waist of the penetration.20

On 3 January, American forces under Montgomery's command attacked toward the south and on 16 January made contact with Third Army near the crossroads town of Houffalize. The last German attempt to capture Bastogne failed on 4 January.21 Regardless, the Germans slowed Third Army's counterattack and

made plans to escape the Allied trap.

On 10 January, German forces began to withdraw along their east-west line of support, at the same time fighting a series of delaying actions oriented on a north-south line of operations. Tactical skill enabled the Germans to extract a large portion of their forces from the salient, in spite of Allied air superiority. On 16 January, pursuing Allied formations began attacking to the east and re-established the original front by 28 January.22

The Ardennes counteroffensive provides considerable evidence to support the contention that "the logistics tail wags the operational dog," and offers some insights for operational planners. First, the logistics situation of each side set the stage for the counteroffensive and determined its objectives. Second, the notion of a changing, force-oriented operational center of gravity appears to be validated by the experience of 6 and 5 PzA.

Third, the American response to the attack was to reinforce various physical decisive points along German lines of operations, then capitalize on logistical advantages, particularly in motor transport, to strengthen a maneuver decisive point on the shoulders of the penetration and finally counterattack it. Retention of Bastogne, at first a physical decisive point, assumed greater importance as the operation continued and in time the town represented a physical, moral and cybernetic decisive point.

Finally, the concepts of lines of support and lines of

operations were applied by both sides with different degrees of success. The Germans elected to attack in an area that offered opportunities for surprise but had only one viable line of support running through St. Vith and Bastogne. This complication was exacerbated by the mistake of designating the 6 PzA main attack along a line of operation distanced from the line of support. It was not merely coincidence that the line of operation which eventually yielded the best results to the Germans was the one that ran nearest this line of support.

The American counterattack location was chosen because of logistics considerations and retention of decisive points, notably Bastogne, at the expense of allowing a large number of Germans to escape. Each side should be credited with a remarkable feat of logistics and operational maneuver: Third Army's dash to Bastogne and the withdrawal of 5 PzA.

The Ardennes counteroffensive suggests that each of the four theoretical elements of IPT have utility in operational planning and intelligence analysis.

PART V: CONCLUSIONS AND RECOMMENDATIONS

"Operational IPB" is an misnomer headlining inadequate doctrine. Tactical techniques and procedures are insufficient for the pre-combat preparation of operational intelligence estimates for a theater of operations, especially a contingency theater. Neither FM 100-5 nor FM 34-130 provide a clear, comprehensive explanation of operational centers of gravity. Army doctrine lacks a broad conceptual framework that can help intelligence officers determine how to distinguish an operational center of gravity from competing entities and suggest ways to plan major operations directed against an operational center of gravity once one is found. "Operational IPB" must be replaced.

Intelligence Preparation of the Theater of Operations describes a broad conceptual framework for pre-combat intelligence estimates at the operational level of war. IPT is based on the premise that military theory must accomodate advancing technology and be flexible if it is to have enduring validity. IPT is not a templating technique, it is a way of thinking about the purpose and specific requirements of operational intelligence. IPT is a predictive theoretical model that embraces the operational design elements featured in FM 100-5, clarifies and connects them, and contributes other concepts proposed by classical and modern military theorists.

IPT addresses the fundamental requirements of operational intelligence. The model begins with a refined

concept regarding operational centers of gravity, "the essence" of operational art. These are distinguished from decisive points, which focus analysis on the enemy commander and his decision-making processes among other critical nodes within a theater. Lines of operation directly link intelligence estimates to sequential operational planning. Assessment of lines of support accommodates the pivotal importance of operational logistics.

IPT posits that an operational center of gravity is almost always some expression of armed force present in a theater of operations or promptly available for employment there, and that a variety of factors can cause the operational center of gravity to shift to another subset of armed force during the course of a major operation. Should analysis determine that some other facet of national power besides armed force constitutes an enemy operational center of gravity, then friendly use of armed force is probably not appropriate.

The influence of an operational center of gravity can extend beyond the ground, sea and air of a theater into space, the electro-magnetic spectrum, and the moral domain of combat. IPT recognizes that an operational center of gravity often depends upon other entities for its cohesion, strength and freedom of action, and that it is rarely static.

By urging analysts to identify and prioritize decisive points in a theater, assess possible lines of operation that lead to the defeat or destruction of centers of gravity, and

evaluate lines of support, IPT gives purpose to the process initiated by "operational IPB." While IPT is not prescriptive, each "operational IPB" step is subsumed in the intelligence efforts necessary to identify operational centers of gravity, decisive points, lines of operation and lines of support. Discerning these theoretical abstractions requires painstaking analysis of the geographic, climatologic, military, economic, political and demographic characteristics of a theater of operations.

IPT decisive points exist in at least four variants within a theater of operations: physical, cybernetic, moral and maneuver. Possession or dominance of these decisive points will provide friendly forces with operational or strategic advantages over the opponent. Decisive points should figure in the planning of collateral operations, such as psychological operations and electronic warfare, and serve as milestones along lines of operations directed toward objectives within the theater.

Lines of operations for a force begin at its base of operations, extend across time and space to a sequence of decisive points in the theater and terminate at the objectives assigned by the operational commander. There can be and often will be several possible lines of operations within a theater. Planners must recommend the single line or combination of lines that will secure operational objectives with the least expenditure of time and resources. The feasibility of individual lines of operations and the

selection of one over another often depends upon lines of support.

Lines of support include the theater base or bases of support and lines of communication linking bases to forward tactical formations. Lines of support encompass theater infrastructure, host nation support, power grids, and health service facilities. The nature and condition of lines of support will always influence and often determine which friendly and enemy lines of operations are pursued. Similarly, lines of support feature decisive points that must be attacked or protected as circumstances warrant.

Finally, intelligence personnel must direct IPT toward their own forces, presuming that the enemy will do so, too, in order to determine friendly operational security concerns and anticipate vulnerabilities.

IPT is only a benchmark; it should be flexible and open-ended to suit particular intelligence requirements regardless of the enemy or the theater of operations. Critics may fault it for one reason or perhaps several, but if nothing else, Intelligence Preparation of the Theater of Operations should encourage intelligence personnel to look above and beyond battlefield templates and techniques when preparing for combat in a theater of operations.

Endnotes

Part I: Introduction

1. Major James A. Marks, USA, "In Search of the Center of Gravity: Operational Intelligence Preparation of the Battlefield." SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 7 June 1990), p. 39.

2. U.S. Department of the Army, Field Manual 34-130, Intelligence Preparation of the Battlefield (Washington, D.C.: U.S. Government Printing Office, 1989), pp. D-1 -- D-3. The earliest published reference found to "operational IPB" was Larry V. Buel's article, "Intelligence Preparation of the Battlefield," Military Review, October 1987. His article was based on an unpublished paper from the U.S. Army Intelligence Center and School, now used as an assigned reading at the U.S. Army War College. As an example of how the expression "operational IPB" has found its way into military discourse regarding operational art, see Marks, pp. 1-6.

3. FM 34-130, pp. D-1 -- D-2.

4. Ibid., p. D-3; D-22.

5. Carl von Clausewitz, On War, edited and translated by Michael Howard and Peter Peret (Princeton: Princeton University Press, 1984), pp. 117-119.

6. U.S. Department of the Army Training and Doctrine Command, TRADOC Pamphlet 11-9, Blueprint of the Battlefield (Ft. Monroe, VA: U.S. Army Training and Doctrine Command, 27 April 1990), p. 15; pp. 74-5. Referred to hereinafter as Blueprint.

7. In the course of conducting research for this monograph, and after prematurely priding myself on originating the phrase/acronym "Intelligence Preparation of the Theater/IPT," I found a passing reference to the it in Major John D. Frketic's monograph, "Operational Intelligence and the U.S. Army: Much Ado About Nothing or Misunderstood Excellence? A Prescription for the 1990's and Beyond." SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 18 May 1989), p. 17. Frketic observes that "...IPB is probably the wrong description of this analytic process at the operational level..., perhaps a more appropriate process would be Intelligence Preparation of the Theater." Thus, to Major Frketic goes the credit of coining the phrase "intelligence preparation of the theater."

Part II: Doctrine

1. Clausewitz, p. 71.

2. U.S. Department of the Army, Field Manual 100-5, Operations (Washington, D.C.: U.S. Government Printing Office, 1986), p. 10.

3. Blueprint, p. 75.

4. U.S. Department of the Army, Operational Warfighting, P 157 Course Syllabus (Ft. Leavenworth, KS: U.S. Army Command and General Staff College, 1989), p. ix.

5. Ibid., p. 73; FM 100-5, p. 10.

6. Blueprint, p. 75.

7. Ibid., p. 74; FM 100-5, p. 10.

8. FM 100-5, Appendix B, pp. 179-182

9. FM 100-5, p. 10.

10. Ibid., p. 179.

11. Major David R. Manki, USA, "Priority Intelligence Requirements: The Operational Vacuum." SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1990), p. 4.

12. FM 34-130, p. D-22.

13. Ibid., pp. D-1 -- D-22; U.S. Department of the Army, Field Manual 34-1, Intelligence and Electronic Warfare Operations (Washington, D.C.: U.S. Government Printing Office, 1987), p. 2-10. The manuals refer to the center of gravity but never develop the concept beyond the explanation in Appendix B to FM 100-5.

14. Joint Chiefs of Staff, JCS Publication 2-0: Doctrine for Intelligence to Joint Operations (final draft) (Washington, D.C.: U.S. Government Printing Office, 1989), p. II-3.

15. FM 34-1, p. 2-10; Blueprint, p. 48.

16. Blueprint, p. 48.

17. Manki, pp. 13-14, drawing from JCS Pub 2-0, p. II-8.

18. FM 100-5, p. 61; FM 34-1, p. 2-10; FM 34-130, p. D-3; Blueprint, p. 21.

19. Blueprint, p. 15; FM 34-130, p. D-4.

20. FM 34-130, p. D-4.

21. The Kansas City Star comics section, Sunday, March 3, 1991, p. 2, Gary Trudeau's Doonesbury, frame 2: "The latest S-2 IPBs prepared within our JINTACCS format confirms that enemy BOS's have all but collapsed."

22. Mark R. Hamilton, "IPB or IPC?" Military Intelligence, April-June 1990, p. 24.

23. Marks, p. 2.

24. AMSP Course Three, The Contemporary Practice of Operational Art, Seminar 3 discussions during Lesson 3-1, 1 November 1990.

25. General William J. Livsey, "IPB and the Theater Campaign Plan," Military Intelligence, October 1987, pp. 20-21.

26. FM 34-130, pp. D-4 -- D-15.

27. Ibid., pp. D-6 -- D-9; D-13; D-15 -- D-21.

28. Major Linda Linden, USA, "Operational Intelligence: An Alternative Approach," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1990), pp. 9-10.

29. Linden, pp. 9-10; Major John D. Frketic, USA, "Operational Intelligence and the U.S. Army: Much Ado About Nothing or Misunderstood Excellence? A Prescription for the 1990s and Beyond," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1989), pp. 16-17.

30. Clausewitz, pp. 572-3; Major David J. Benjamin, USA, "Prerequisite for Victory: The Search for the Culminating Point," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1986), pp. 3-6; Major James D. Kievit, USA, "Operational Art in the 1944 Ardennes Campaign," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1987), p. 32.

31. Frketic, pp. 16-17; Captain Ralph Peters, USA, "Wanted: Analysts," Military Intelligence, March 1987, pp. 15-17.

Part III: Theory

1. Clausewitz, p. 132.

2. FM 100-5, pp. 179-180.

3. Ibid., p. 179; Clausewitz, p. 596; Major Oliver E. Lorenz, USA, "The Battle of Britain: An Analysis in Terms of Center of Gravity, Culminating Point, Fog, Friction and the Stronger Form of War," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1989), p. 4.

4. FM 100-5, p. 180; FM 34-130, p. D-4; Lorenz, p. 13.

5. Clausewitz, p. 596.

6. Sun Tzu, The Art of War, translated by Samuel B. Griffith (New York: Oxford University Press, 1963), p. 142.

7. Clausewitz, p. 595.

8. Clausewitz, p. 486; Major Myron J. Griswold, USA, "Considerations in Identifying and Attacking the Enemy's Center of Gravity," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1986), p. 6.

9. Clausewitz, pp. 485-6.

10. Count Leo Tolstoy, War and Peace, translated by Constance Garnett (New York: Random House, 1976), p. 722.

11. Sun Tzu, p. 134.

12. FM 100-5, p. 179; FM 34-130, p. D-4.

13. Blueprint, p. 74; FM 34-130, p. D-18.

14. Griswold, p. 7; Major Thomas M. McGinnis, USA, "Jomini and the Ardennes: An Analysis of Lines of Operation and Decisive Points," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1988), p. 4.

15. Clausewitz, p. 196.

16. Baron Henri-Antoine Jomini, The Art of War, translated by G.H. Mendell and W.P. Craighill (Philadelphia: Lippincott and Co., 1862; reprint edition, Westport, Conn: Greenwood Press, 1977), p. 78; see Griswold, p. 8.

17. Jomini, p. 79; Griswold, p. 8.

18. James J. Schneider and Lawrence L. Izzo, "Clausewitz's Elusive Center of Gravity," Parameters, September 1987, p. 56; James J. Schneider, "Theoretical Paper Number Three," unpublished paper, School of Advanced Military Studies, Ft. Leavenworth, KS, March 1988, p. 28.

19. Schneider, "Theoretical Paper Number Three," p. 28;

Frketic, pp. 29-30.

20. Griswold, pp. 29-30.

21. FM 100-5, p. 180.

22. Ibid., Blueprint, p. 74.

23. Jomini, p. 109; see also extracts of The Art of War in Roots of Strategy, Book 2 (Harrisburg, PA: Stackpole Books, 1987), pp. 474-6.

24. FM 100-5, p. 181.

25. Martin Van Crefeld, Supplying War (New York: Press Syndicate of the University of Cambridge, 1977), p. 231.

26. Major William R. Betson, USA, "Centers of Gravity, Lines of Operations, and the Normandy Campaign," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1987), p. 5.

27. James J. Schneider, "Theoretical Implications of Operational Art," Military Review, September 1990, p. 17.

28. FM 100-5, p. 180.

29. Blueprint, p. 74.

30. Major T.D. Moore, USA, "Logistics Intelligence: The First Step in Operational Sustainment?" SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1990), p. 6.

31. Ibid., pp. 32; 48-52; Joint Chiefs of Staff, JCS Publication 4-0: Doctrine for Logistics Support of Joint Operations (initial draft) (Washington, D.C.: U.S. Government Printing Office, 1989), p. V-1 -- V-2.

32. Betson, p. 5.

Part IV: History

Note: The author wishes to acknowledge the contributions (cited) of Major James O. Kievit and Major Thomas M. McGinnis to the Ardennes case study.

1. Charles B. MacDonald, A Time For Trumpets: The Untold Story of the Bulge (New York: William Morrow and Company, Inc., 1985), p. 19.

2. Russel F. Weigley, Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945 (Bloomington, IN:

Indiana University Press, 1981), pp. 370-1.

3. MacDonald, pp. 49-51; Weigley, p. 373; Major Walter A. Vanderbeek, USA, "The Decisive Point: Key To Victory," SAMS Monograph (Ft. Leavenworth, KS: U.S. Army School of Advanced Military Studies, 1988), p. 24.

4. Ibid.

5. Weigley, pp. 370-1; Hugh M. Cole, United States Army In World War II: European Theater of Operations: The Ardennes: Battle of the Bulge (Washington, D.C.: Office of the Chief of Military History, 1965), p. 17.

6. Ibid.; McGinnis, p. 11.

7. Kievit, p. 5.

8. Weigley, pp. 448-9; Cole, pp. 174-6; McGinnis, p. 24.

9. Ibid.

10. Cole, pp. 174-5; FM 100-5, p. 179.

11. Cole, p. 29; MacDonald, pp. 20-25.

12. McGinnis, pp. 15-20.

13. Kievit, p. 16.

14. Ibid., p. 16; 36.

15. Ibid., p. 36.

16. Ibid.; McGinnis, pp. 15-25.

17. McGinnis, pp. 18-19.

18. MacDonald, pp. 34-7; McGinnis, p. 22.

19. Cole, p. 334.

20. McGinnis, p. 36.

21. Kievit, pp. 26-28.

22. Ibid.

Bibliography

Books

Chandler, David. The Campaigns of Napolean. New York: Macmillan, 1966.

Clausewitz, Carl von. On War. Edited and translated by Michael Howard and Peter Peret. Princeton: Princeton University Press, 1984.

Cole, Hugh M. United States Army in World War II: European Theater of Operations: The Ardennes: Battle of the Bulge. Washington, D.C.: Office of the Chief of Military History, 1965.

Howard, Michael. "Jomini and the Classical Tradition in Military Thought," in The Theory and Practice of War, ed. Michael Howard. New York: Frederick A. Praeger, Inc., 1965.

Jomini, Baron Henri-Antoine. Treatise on Grand Military Operations, translated by COL S.B. Holagrid. New York: D. Van Nostrand, 1865.

Jomini, Baron Henri-Antoine. The Art of War, translated by G.H. Mendell and W.P. Craighill. Philadelphia, PA: Lippincott and Co., 1862; reprint ed., Westport, Conn.: Greenwood Press, 1977.

Jomini, Baron Henri-Antoine. The Art of War, edited and translated by BG J.D. Hittle, contained in Roots of Strategy, Book 2. Harrisburg, PA: Stackpole Books, 1987.

MacDonald, Charles B. A Time for Trumpets: The Untold Story of the Bulge. New York: William Morrow and Company, Inc., 1985.

Ruppenthal, Roland G. Logistical Support of the Armies, Volume I. Washington, D.C.: Office of the Chief of Military History, 1953.

Sun Tzu. The Art of War, translated by Samuel B. Griffith. New York: Oxford University Press, 1963.

Tolstoy, Count Leo, War and Peace, translated by Constance Garnett. New York: Random House, 1976.

Van Creveld, Martin. Supplying War. New York: Press Syndicate of the University of Cambridge, 1977.

Weigley, Russell F. Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945. Bloomington, Indiana:

Indiana University Press, 1981.

Journals and Publications

Buel, Larry V. "Intelligence Preparation of the Battlefield." Military Review, October 1987.

Campbell, Douglas A. "Will the Army IPB Itself to Defeat?" Military Review, June 1989.

Campbell, Douglas A. and McKinney, Robert W. "Predictive Intelligence: An Old Lesson Unlearned." Military Review, August 1990.

Gaun, George A. "Intelligence Preparation of the Battlefield." Military Intelligence, Summer 1976.

Hamilton, Mark R. "IPB or IPC?" Military Intelligence, April-June 1990.

Livsey, William J. "IPB and the Theater Campaign Plan." Military Intelligence, October 1987.

Newell, Clayton R. "What is Operational Art?" Military Review, September 1990.

Porter, Lanning M. "Operational Intelligence in the U.S. Army." Military Intelligence, October-December 1986.

Saint, Crosbie E. "Intelligence Requirements at the Operational Level of War." Military Intelligence, March 1987.

Schneider, James J. and Lawrence L. Izzo. "Clausewitz's Elusive Center of Gravity." Parameters, September 1987.

Schneider, James J. "The Loose Marble and the Origins of Operational Art." Parameters, March 1989.

Schneider, James J. "Theoretical Implications of Operational Art." Military Review, September 1990.

Government Documents

Joint Chiefs of Staff, JCS Publication 1: Dictionary of Military and Associated Terms (Washington, D.C.: U.S. Government Printing Office, 1 June 1987.

Joint Chiefs of Staff, JCS Publication 2-0: Doctrine for Intelligence to Joint Operations (final draft). Washington, D.C.: U.S. Government Printing Office, October 1989.

Joint Chiefs of Staff, JCS Publication 4-0: Doctrine for Logistic Support of Joint Operations (initial draft). Washington, D.C.: U.S. Government Printing Office, 1989.

Field Manual 34-1, Intelligence and Electronic Warfare Operations. Washington, D.C.: Department of the Army, 1987.

Field Manual 34-3, Intelligence Analysis. Washington, D.C.: Department of the Army, 1986.

Field Manual 34-130, Intelligence Preparation of the Battlefield. Washington, D.C.: Department of the Army, 1989.

Field Manual 100-5, Operations. Washington, D.C.: Department of the Army, 1986.

Field Manual 100-6, Large Unit Operations (coordinating draft). Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, 1987.

Training and Doctrine Command Pamphlet 11-9, Blueprint of the Battlefield. Ft. Monroe, VA.: U.S. Army Training and Doctrine Command, 27 April 1990.

Operational Warfighting, P 157 Course Syllabus. Ft. Leavenworth, KS: U.S. Army Command and General Staff College, 1989.

Schneider, James J. "Theoretical Paper Number Three." Unpublished paper, School of Advanced Military Studies, Fort Leavenworth, Kansas, March 1988.

Schneider, James J. "Foundations of Military Theory and Doctrine." Course 1 Syllabus, School of Advanced Military Studies, Fort Leavenworth, Kansas, June 1990.

Theses and Monographs

Benjamin, David J. "Prerequisite for Victory: The Search for the Culminating Point." SAMS Monograph. 1986.

Betson, William R. "Centers of Gravity, Lines of Operations, and the Normandy Campaign." SAMS Monograph. 1987.

Coomler, James D. "The Operational Culminating Point: Can You See it Coming?" SAMS Monograph. 1986.

Frketic, John D. "Operational Intelligence and the U.S. Army: Much Ado About Nothing or Misunderstood Excellence? A Prescription for the 1990s and Beyond."

SAMS Monograph. 1989.

Griswold, Myron J. "Considerations in Identifying and Attacking the Enemy's Center of Gravity." SAMS Monograph. 1986.

Kalb, John F. "A Foundation for Operational Planning: The Concepts of Center of Gravity, Decisive Point, and the Culminating Point." SAMS Monograph. 1987.

Kievit, James D. "Operational Art in the 1944 Ardennes Campaign," SAMS Monograph. 1987.

Kriwanek, Thomas M. "The Operational Center of Gravity." SAMS Monograph. 1986.

Linden, Linda L. "Operational Intelligence: An Alternate Approach." SAMS Monograph. 1990.

Lorenz, Oliver E. "The Battle of Britain: An Analysis in Terms of Center of Gravity, Culminating Point, Fog, Friction and the Stronger Form of War." SAMS Monograph. 1989.

Manki. David R. "Priority Intelligence Requirements: The Operational Vacuum." SAMS Monograph. 1990.

Marks. James A. "In Search of the Center of Gravity: Operational Intelligence Preparation of the Battlefield." SAMS Monograph. 1990.

McGinnis, Thomas M. "Jomini and the Ardennes: An Analysis of Lines of Operation and Decisive Points." SAMS Monograph. 1988.

Moore, T.D. "Logistics Intelligence: The First Step in Operational Sustainment?" SAMS Monograph. 1990.

Rosello, Victor M. "The Origins of Operational Intelligence." SAMS Monograph. 1989.

Taddonio, Frank T. "The Concept of the Culminating Point of the Attack." SAMS Monograph. 1986.

Vanderbeek, Walter A. "The Decisive Point: Key to Victory." SAMS Monograph. 1988.

Viale, Charles R. "A Conversation in the Club: Another Analysis of the Concept of Center of Gravity." SAMS Monograph. 1988.

Extracted from Atlas for the Second World War, Europe and the Mediterranean, Thomas E. Griess, editor; Avery Publishing Company, Wayne, New Jersey, 1990, p. 73.