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SCHOCL OF ADVANCED MILITARY STUDIES

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Identification of Decisive Terrain: Useful Concept or Historical Label

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ABSTRACT

IDENTIFICATION OF DECISIVE TERRAIN: USEFUL CONCEPT OR HISTORICAL LABEL? by MAJ Harry D. Scott Jr., USA: 47 pages.

This monograph analyzes the concept of decisive terrain to determine if a commander can identify decuive terrain at the operational level of war. The monograph begins by examining the introduction of decisive terrain into doctrine and provides a more comprehensive definition based on several theorists and research. Next an analysis is made of how the United States Army's current publications address decisive terrain. The documents reviewed include FM 100-5, FM 34-3, FM 101-5-1, FM 34-130, and ST 100-9. The purpose of the next section is to examine how the Russians, British, Germans, and Chinese armies study key terrain. Two case studies, the Gettysburg Campaign and the Austerlitz Campaign, provide examples of commanders who successfully and unsuccessfully identified decisive terrain. The commanders who failed to recognize decisive terrain at the operational level of war suffered massive casualties that had a significant impact on the future of their armies.

The monograph concludes with a section on the importance of decisive terrain and recommendations on how better to define decisive terrain and increase the awareness of decisive terrain in our literature and military schooling. Decisive terrain can be identified at the operational level of war. However, the identification of decisive terrain by a commander or recommendations by the staff demands determining if an area has a combination of geographical advantages, affords a marked advantage, becomes so critical that its loss would mean destruction to the defender, and requires the commander to have experience in analyzing terrain. Failure to identify decisive terrain can lead to defeat on the next battlefield.

Table of Contents

Title Page	i
Approval Sheet	i
Abstract	i
Table of contents	v
Introduction	1
An Explanation of Decisive Terrain	4
Decisive Terrain as Expressed in the Current United States Army Publications	0
Terrain as Addressed by Other Armies 1	5
The Gettysburg Campaign 1	9
Napoleon Bonaparte and the Austerlitz Campaign 2	8
Conclusions and Implications	5
Maps:	
 Lines of Site from Little Round Top 2 Elevation of the Gettysburg Battlefield 2 Elevation of the Austerlitz Battlefield 3 	2
Endnotes	9
Bibliography 4	5

iv

INTRODUCTION

Weather and terrain have more impact on battle than any other physical factor, including weapons, equipment, or supplies. The terrain on which battles are fought will present opportunities to both sides. In some cases the advantages are unmistakably clear. Indeed, most battles have been won by the side that used terrain to protect itself and to reinforce fires to destroy the enemy. 1

Two of the many challenges facing the armed forces today are providing a common base of understanding in terms of standardized operational terms and analyzing the terrain. Terms such as key terrain, decisive terrain, decisive points, decision points, critical point, strategic decision point, decisive geographic point, decisive points of maneuver, and geographic decisive points are important, but unfortunately are frequently interchanged and sometimes thought to be synonymous. Each of these terms should be clearly defined and understood, not only in United States Army doctrine, but also in joint and combined doctrine. In an attempt to solve this dilemma and the difficulties associated with terrain analysis at the operational level of war, this monograph will address the most important of these terms, decisive terrain, and answer the question: Can decisive terrain be identified at the operational level of war?

It appears that the obvious answer to the research

-1-

question is an indisputable yes. However, research indicates that very few commanders had or have the capability to identify decisive terrain prior to a battle. The problem is threefold: the current definition of decisive terrain is vague; the military education system fails to provide formal instruction on how to identify decisive terrain; and the doctrine fails to elaborate on decisive terrain.

To answer this question, I will examine six areas: an explanation of decisive terrain; decisive terrain as expressed in the current United States Army (USA) publications; terrain as addressed by other armies; a case study of the Gettysburg Campaign; a case study of Napoleon Bonaparte and the Austerlitz Campaign; and the conclusions and implications.

The first area is an explanation of decisive terrain which examines the introduction of decisive terrain into the doctrine, the current definition of decisive terrain, and an examination of how three predominant theorists, Carl Von Clausewitz, Sun Tzu, and Antoine Henri Jomini viewed terrain. A more comprehensive definition of decisive terrain will be provided based on research.

The next area is a review of how decisive terrain is expressed in United States Army publications. The publications include Army field manuals: FM 100-5 (1993

-2-

Final Draft and 1986), FM 34-3, FM 101-5-1, and FM 34-130 (1992 Preliminary Draft and 1989) and student texts from the Command and General Staff College at Fort Leavenworth, Kansas. The review of publications highlights how the literature emphasizes the importance of decisive terrain. It also notes the absence of guidance on how to identify decisive terrain, the variances in the definitions of decisive terrain, and the general lack of attention paid to the subject of decisive terrain.

The focus on key terrain by the Russians, British, Germans, and Chinese armies is analyzed in the third section. The goal is to determine if these established armies analyze terrain and identify significant terrain features at the operational level of war.

Another section provides a case study of the Gettysburg Campaign. The intent of this section is to provide an example of decisive terrain at the operational level of war and show how various commanders successfully and unsuccessfully conducted their terrain analysis.

A case study of where decisive terrain was identified by the commander and was successfully seized is the purpose of the fifth section. Napoleon Bonaparte, prior to the Austerlitz Campaign, was able to identify decisive terrain and shape the battlefield for

-3-

a major victory.

The final area is conclusions and implications. This section discusses the importance of decisive terrain and serves as a summary of the previous areas. Recommendations for the introduction of decisive terrain into the programs of instruction at the various levels of military schooling and incorporation into more of the doctrinal literature is provided.

AN EXPLANATION OF DECISIVE TERRAIN

The identification of decisive terrain on the battlefield can be extremely important, provided it can be done prior to the battle. Once a terrain feature or features is (are) identified as decisive terrain, commanders and staff should direct their efforts in terms of resources and personnel toward seizing or retaining it.

In 1981, the term decisive terrain was introduced into US Army doctrine. The definition provided in the Infantry Officer Advance Course in 1981 was,

> any area or locality, whose seizure or control affords a marked advantage to either opposing force, covers primary avenues of approach, and whose loss 2 would mean destruction to the defender.

In 1982, in Field Manual 100-5, <u>Operations</u>, the definition was modified to, "key terrain is decisive terrain if it has an extraordinary impact on the

-4-

mission."

The difference between these definitions is substantial. The first definition is more specific and provides clear guidelines for identifying decisive terrain. The second definition is more open ended and in fact too vague. It requires the commander to determine what is considered an extraordinary impact on the mission.

To help clarify decisive terrain, an examination of works by Sun Tzu, Clausewitz, And Jomini was conducted. Sun Tzu directs that war be studied in terms of five 4 fundamental factors, of which terrain is one. By terrain he means "distances, whether the ground is traversed with ease or difficulty, whether it is open or constricted, and the chances of life or death." In his often quoted verse, "Know the enemy, know yourself; your victory will never be endangered. Know the ground, know the weather; your victory will then be total," -he tells the reader the importance of analyzing the terrain. In several verses, he stresses the significance of knowing the conditions of mountains, forests, dangerous defiles, marshes, and swamps and the degree of difficulty of the terrain.

Very similar to decisive terrain is Sun Tzu's classification of one of the nine varieties of ground which he refers to as key ground. Key ground is defined

- 5 -

as "ground equally advantageous for the enemy or me to 7 occupy." Tu Mu, in the footnote on the verse, calls this ground "strategically important." Sun Tzu decrees that key ground should not be attacked if 9 occupied.

Antoine Henri Jomini made numerous observations of topography in his book, The Art of War. He provides many terms and definitions, but he highlights one term which parallels decisive terrain and "whose importance is constant and immense", that term is decisive strategic point. He defines decisive strategic point as being "capable of exercising a marked influence either upon the result of the campaign or upon a single 11 enterprise." He provides guidance in how to determine the decisive point of a battlefield by examining "the features of the ground, relation of the local features to the ultimate strategic aim, and positions occupied by the respective forces." His guidance could be expressed as looking at the interrelationships and impacts of physical, economic, and cultural geography on the battlefield.

In <u>Qn War</u>, Carl Von Clausewitz provided a chapter on terrain and in separate chapters addressed how to handle situations based on various types of terrain such as mountains, swamps, forests, rivers, and streams. He highlights the importance of the correlation between

-6-

terrain and warfare:

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This relationship, to begin with, is a permanent factor - so much so that one cannot conceive of a regular army operating except in a definite space. Second, its importance is decisive in the highest degree, for it affects the operations of all forces, and at times entirely alters them. Third, its influence may be felt in the very smallest feature of the ground, but it can also dominate enormous areas. 13

He cautions the use of expressions such as "a dominating area" and "key to the country," if an area is selected without first knowing the relative quality of the two 14armies and their commanders.

Clausewitz suggests that only a commander with talent, experience, imagination, and a sense of locality can accurately grasp the topography of an area and overcome the disadvantage of not being able to 15 completely reconnoiter the terrain. In reference to decisive terrain, he discusses terrain as being decisive if the ground selected is combined with other geographical advantages, such as the surroundings and the nature of the ground in relation to one's 16 opponent.

Based on the writings of Sun Tzu, Jomini, Clausewitz, and other research, a more comprehensive definition of decisive terrain at the operational level of war might be any area or locality that is a combination of geographical advantages, affords a marked

-7-

advantage to either opposing force, loss that would mean destruction to the defender, and should be recognized by the practiced military eye.

There are clearly distinct components to this definition. The first component of decisive terrain (e.g., "any area or locality that is a combination of geographical advantages") accounts for incorporating the interrelationships and impacts of physical, economic, and cultural geography. The specific interrelationships of the terrain are its dimensions, 17composition, form, and dynamics.

The physical features include the topography, hydrography, and climate and weather. At the operational level of war, analyzing the topography includes examining the interrelationships of the natural and man-made features. This includes studying surface features such as mountains, rivers, valleys, swamps, and marshes and their relationships with cultural features like buildings, towns, road systems, and dams. The type of vegetation, relief, and drainage patterns are assessed to determine the impact on air corridors, avenues of approach, lines of communication, and landing 18 zones.

The next physical feature, the hydrography of an area, includes inspecting all the areas affected by water, including coastlines, stream beds, and regions

-8-

subject to snow melt and lava flow. The last physical feature, climate and weather, must be addressed by examining the current and projected temperature, humidity, precipitation, and visibility, and the impact 19 on operational maneuver, fires, and logistics.

The economic features encompass transportation, communications, and plutology. An area is viewed in terms of railroads, airfields, roads, waterways, and the storage facilities associated with the transportation network. The communications assessment examines the available phone lines, cable, television, and radio assets. The plutology encompasses the financial facilities, industrial infrastructure, commerce, agriculture, labor force, public works and facilities, 20 and other economic infrastructure.

The cultural features comprises the sociological and political aspects of the area. The sociology covers the language, religion, population parameters, social attitudes, and other similar factors. The politics are 21 how an area is governed and organized.

The second component of decisive terrain (e.g., "affords a marked advantage to either opposing force") means the area seized or occupied provides distinct advantages to the occupying torce. The advantages provided are in terms of observation, fields of fire, and cover and concealment.

-9-

The third component of decisive terrain (e.g., "loss that would mean destruction to the defender") states the extreme importance of decisive terrain. The physical disregard, loss, or failure to seize the feature translates into heavy casualties, rendering the forces combat ineffective, or forcing the withdrawal or surrender of the defenders.

The last component of decisive terrain (e.g., "should be recognized by the practiced military eye") means that the commander needs to use his experience to identify the terrain as decisive. This involves the commander sensing space and time relationships, war gaming the battle through visualization, and constantly reflecting upon the actions he would take on the battlefield. He reconnoiters the ground for restrictions and specific soil and vegetation conditions, determines the roughness of the terrain, and 22 calculates how the terrain will protect his forces.

DECISIVE TERRAIN AS EXPRESSED IN THE CURRENT UNITED STATES ARMY PUBLICATIONS

These two factors - weather and terrain have decisively influenced the outcome of battles throughout the history of warfare. Yet, incredibly, military planners can still be found who are willing to cast their operational mold in ignorance of, or with disregard for, the dictates of these two vital considerations. 23

-10-

It is important to review the current United States Army doctrinal and academic literature in order to gain a better understanding of how decisive terrain is addressed. Decisive terrain is mentioned in some of the doctrine, but unfortunately no guidance is provided reference how to identify it. There are no field manuals, field circulars, or training circulars that offer procedures or techniques in how to identify or utilize decisive terrain.

The keystone doctrinal manual of the Army, FM 100-5, Operations (Final Draft), has a discussion on the commander's view of terrain at the strategic, operational, and tactical level. A detailed explanation and a definition of decisive points is provided, but is lacking for decisive terrain. The presentation on decisive terrain is limited to remarks in the sections on movement to contact, offensive terrain and weather considerations, and defensive terrain and weather considerations. In the section on movement to contact, a decisive terrain feature is mentioned as the objective of two forces striving to obtain its occupation. Offensively, decisive terrain "can become the focal point of the attack", while defensively "some terrain may be so significant to the defense that its 25 loss would prove decisive.

In the 1986 version of FM 100-5, Operations,

-11--

decisive terrain is mentioned several times. In a discussion on defeating enemy forces at the operational level, it is recommended that the occupation of decisive terrain by friendly forces can force the enemy to fight 26 under unfavorable conditions. The paragraph on decisive terrain is very similar to the definition provided in FM 101-5-1.

The commander may designate key terrain as decisive terrain if accomplishment of his mission depends on seizing or retaining it. Many battlefields will not have decisive terrain. The commander designates decisive terrain in his concept of operation to communicate its importance to his staff and to subordinate commanders. 27

One more difference in terms of decisive terrain between the draft FM 100-5 and the 1986 version is that the 1986 version mandates that when decisive terrain is 28 identified it becomes the focal point of the attack. The 1993 final draft implies that it is optional in making decisive terrain the main focus.

FM 34-3, <u>Intelligence Analysis</u>, defines decisive terrain as "that terrain which, if not controlled or if controlled by the opponent, significantly degraded the commander's ability to successfully accomplish the 29 mission." An example is provided that compares decisive terrain with key terrain. The crossing sites on the Fulda River in Germany are considered decisive terrain because crossing the river without fording

-12-

capabilities is impossible because the river is too wide and difficult to cross. The Hann River is considered key terrain, but not decisive terrain because it is not an obstacle to movement, but does hinder enemy 30 movement. The definition of decisive terrain provided is vague and differs from the one provided in FM 101-5-1, Operational Terms and Graphics.

<u>Operational Terms and Symbols</u>, FM 101-5-1, provides the following definition of decisive terrain.

Key terrain is decisive terrain if it has an extraordinary impact on the mission. Decisive terrain is rare and will not be present in every situation. To designate terrain as decisive is to recognize that the successful accomplishment of the mission, whether offensive or defensive, depends on seizing or retaining it. The commander designates decisive terrain to communicate its importance in his concept of operations, first to this staff and, later, to subordinate commanders. 31

The Command and General Staff College at Fort Leavenworth, Kansas publishes ST 100-9, <u>The Command</u> <u>Estimate Process</u>. This student text is not doctrine, but offers a description of the tactical decision making process, and offers examples of how to implement the doctrine found in FM 101-5. In the chapter on intelligence preparation of the battlefield, the section on terrain briefly addresses decisive terrain. Decisive terrain is defined as "key terrain that has an extraordinary effect on the accomplishment of the

-13-

mission. Accomplishing the mission normally depends on 32 seizing or controlling decisive terrain." Once again, no mention is made of how to identify decisive terrain.

FM 34-130, Intelligence Preparation of the Battlefield, has the same two sentences on decisive terrain that were previously stated in ST 100-9. It does emphasize the importance of normal y seizing decisive terrain in order to insure accomplishment of 33the friendly mission. Regrettably, this is the extent of the explanation on decisive terrain.

FM 34-130, Intelligence Preparation of the Battlefield, (1992 Preliminary Draft) has an excellent discussion on analyzing terrain as part of describing the battlefield environment and considerations for terrain analysis at the tactical, operational, and strategic levels of war. Unfortunately, there is only one paragraph on decisive terrain. This paragraph describes decisive terrain as being rare and not always present. It also mandates the success of the mission on seizing or retaining decisive terrain and requires the commander to select it and convey its importance to 34staff and commanders.

This review of the United States Army doctrinal literature reveals some of the problems associated with decisive terrain. Very few of the manuals address

-14-

decisive terrain and those that do, only mention it in several sentences. There is not a single publication that tells the commander specifically how to identify decisive terrain or how to assist the intelligence and operations officer in making recommendations to the commander. A distinction should be made for the commander in how to identify decisive terrain at all the levels of war.

TERRAIN AS ADDRESSED BY OTHER ARMIES

Conformation of the ground is of the greatest assistance in battle. Therefore, to estimate the enemy situation and to calculate distances and the degree of difficulty of the terrain so as to control victory are virtues of the superior general. He who fights with full knowledge of these factors is certain to win; he who does not will surely be defeated. 35 Chinese General, Sun Tzu

It is important to study how other armies analyze terrain, especially with respect to the identification of key terrain and possibly decisive terrain. The Russian, British, German, and Chinese successes and failures in battles throughout history have been related to terrain.

Combat success to a great degree depends on the exactness with which terrain is studied and evaluated and on the ability to detect difficult and beneficial conditions which it creates for subunit operations. 36

-15-

This quotation by P.T. Savchenko suggests that the Russians are concerned about terrain analysis. A concerted effort is made by the Russians to analyze terrain in order to calculate its best utilization for mission success. Special emphasis is placed on the ground force officers' training to include terrain analysis as part of the study of military topography. The Russian officers are trained to approach terrain analysis as a science and evaluate terrain by using aerial photographs, maps, other terrain data, and most 37 importantly personal reconnaissance. "Military topography, in its broadest sense, is one of the most important components in the tactical training of officers, sergeants and enlisted men in all arms of the 38 service."

However, in the same study conducted by the US Army Russian Institute, it was concluded that the operational and tactical commanders suffered several major weaknesses in analyzing terrain. The time allocated by the higher headquarters to conduct personal reconnaissance was insufficient. Additionally, the officers' ability to correctly evaluate terrain was limited, because of only being exposed to one specific type of terrain during training. Finally, their methods of conducting terrair. analysis were scientific, but the Russians were weak in practicing the art of terrain

-16-

39 analysis.

The Russians' terrain analysis at the operational level did include some identification of key terrain. In the 1930s, operational targets were assaulted by using airborne forces at the same time as massed armored forces were deployed. The mission of the airborne forces was to seize key terrain in order to block the withdrawal or reinforcement of enemy soldiers, while the 40 armored forces advanced rapidly to link up.

More recently, prior to the end of the cold way the Russian war plans called for the seizing and denying of key terrain that would serve as future battle 41 positions for the deployment of NATO forces. Also decisive strategic and operational points were planned 42 as part of the Russian deep attack.

The British acknowledge the concept of key terrain, especially in conducting the defensive operational battle. Key terrain is defined as "an area the holding 43 of which gives a marked advantage to either side." In establishing their main defensive battle, the positional defense or mobile defense is employed. The selection of the type of defense depends on the presence or absence of key terrain, tactical nuclear weapons and 44 air superiority.

The Germans, similar to the British, place enormous emphasis on holding key terrain. Commanders are

-17-

required to identify key terrain within their assigned sectors. Their key terrain is very similar to the US Army decisive terrain. The commanders are instructed to defend key terrain against all attacks and to immediately counterattack to seize the terrain if 45 lost.

The Chinese armed forces or People's Liberation Army (PLA) view terrain in several aspects. China's current focus is on a defensive land strategy with offensive actions oriented at the operational and tactical levels of war. Also China's geography and climate causes seasonal analysis of the terrain. The severe winter season in the northern part of China limits the construction of defenses and aerial support, while freezing lakes, rivers, and swamps provide additional avenues of approach to consider. Finally, because of the dominant mountainous terrain, emphasis is placed on seizing key heights and passes and defending 46 these positions even if enveloped.

The Russians, British, Germans, and Chinese practice varying degrees of terrain analysis. They all identify key terrain, similar to decisive terrain, but fail to provide detailed instruction on how to identify decisive terrain.

-18-

THE GETTYSBURG CAMPAIGN

... that hill (Little Round Top) was, as is universally admitted, the key to the whole position, and the issue of the battle and probably the destiny of the government depended upon its occupation. 47

The American Civil War provides numerous examples of how terrain was viewed by commanders as decisive. The Gettysburg Campaign provides an example of decisive terrain at the operational level of war. The commanders who successfully recognized Little Round Top as decisive terrain were Generals: Robert E. Lee, George G. Meade, James Longstreet, Jubal A. Early, and John Bell Hood, and Colonel William C. Oates. However, one commander, General Daniel Sickles, fails to recognize Little Round Top as decisive terrain.

I will prove that Little Round Top was decisive terrain by using the components of decisive terrain (e.g., "any area or locality that is a combination of geographical advantages", "affords a marked_advantage to either opposing force", "loss that would mean destruction to the defender", and "should be recognized by the practiced military eye").

The first component of decisive terrain (e.g., "any area or locality that is a combination of geographical advantages") is portrayed very well by Little Round Top. From Little Round Top the view is limited only by

-19-

Seminary and Snyder's Ridges, "its western face cleared by chance the year before the battle, afforded the finest panoramic view then available of the countryside 48south of Gettysburg." The land between Seminary Ridge and Cemetery Ridge consisted of cultivated ground covered with wheat and corn, peach orchards, and cow pastures. The ground "was open to the foot of the hill, and an advance of the enemy from that direction could be 49plainly seen from the main line" (See Map #1). Because the ground was open on the western face of Little Round Top, artillery could be drawn up its slopes more readily and thus provided excellent coverage of the avenues of approach by fire.

Little Round Top exemplified another component of decisive terrain (e.g., "affords a marked advantage to either opposing force") in terms of its elevation (See Map #2). Little Round Top can best be described as one of the most predominant terrain features in the vicinity of Gettysburg. It is about fifty feet higher than Cemetery Ridge and affords a view of several miles to include Seminary Ridge and the southern part of Gettysburg. Little Round Top enabled a very small force in the defense to control a very large force in the attack. If anyone tried to attack Little Round Top, he would first have to ascent a very steep hill so "thickly strewn with huge rocks, so that no deployment

-20-





of troops could be made." Additionally, the faces of Little Round Top were open, having been deforested to provide lumber for cassions, and thus limited concealment for the attacker while providing the defender excellent fields of fire.

The third component of decisive terrain is that the occupation of a key terrain feature would mean destruction of the defender which is also the situation with Little Round Top. If the Confederates were to occupy Little Round Top, the last Union position on the left flank, they could place effective artillery fire on the flank of the Army of the Potomac, be poised to cut off communications, and force the Union to withdraw from Cemetery Ridge. Besides forcing the Union to withdraw to low open terrain, the Confederates could seize control of the Taneytown Road. Control of the Taneytown Road would mean the seizure of General Meade's entire supply trains, his artillery reserves, and the elimination of one of only two roads he could use to 53 conduct a retrograde operation.

Supporting the last component of decisive terrain (e.g., "should be recognized by the practiced military eye") are some observations of Little Round Top made by Union and Confederate leaders. The Commander of the Army of Northern Virginia, General Robert E. Lee, first visualized the importance of Little Round Top when he

-23-

decided to conduct a spontaneous two front attack with General Ewell in the north and General Longstreet in the south. General Lee determined that General Meade would place more emphasis on his right flank in preparation for an attack from Ewell than on his left, neglecting the natural bastions of Little Round Top. Lee would then attack from the southwest

... to overlap the enemy's left flank and roll him up to the north of the Round Tops. When the enemy flank was completely turned, the Confederates would push on to the high ground of the ridge and take and hold the plateau. The Federal troops ... would be caught in enfilade and forced to abandon the position. 54

General George G. Meade, Commander of the Army of the Potomac, also identified Little Round Top as being vitally important. He emphasized that it was more elevated than the terrain the Confederates were on and consequently the artillery was provided greater range. General Meade also alluded to the fact that the terrain to the west of Little Round Top was open and diminished the chance of surprise. Besides these advantages, "... the enemy must advance to the attaok up an ascent, and must therefore move slower, and be, before coming upon us, longer under our fire, as well as more 55exhausted."

Other leaders felt that Little Round Top was the key to the Union defense. According to General James

-24-

Longstreet, Commander of the First Corps, Army of Northern Virginia, Little Round Top not only provided outstanding protection, but also served as a rallying point. It inspired Federal troops so much by its massive defensible boulders, that it was transformed into an impregnable defense, stopping the Confederate 56 advance. General Jubal A. Early, division commander under Ewell, believed that if the harsh terrain of Little Round Top was defended either on top or at the 57 bottom of the hill no defender could be moved.

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General John Bell Hood, division commander under Longstreet, made the following comment concerning Little Round Top:

it seemed to me that the enemy occupied a position so strong - I may say impregnable - that, independently of their flank fire, they could easily repel our attack by merely throwing or rolling stones down the mountain side as we approached. 58

Finally, Colonel William C. Oates, Commander of the 15th Regiment under Longstreet, was astonished when he climbed Big Round Top, overlooking Little Round Top, and determined that it would only take thirty minutes to transform Little Round Top into a Gibraltar capable of 59defending against ten times his numbers.

These leaders all recognized the importance of Little Round Top as a decisive terrain feature. However, one man, General Daniel Sickles, Commander of

-25-

III Corps, Army of the Potomac, failed to realize the importance of Little Round Top. He felt that his defensive sector along Cemetery Ridge and Little Round Top was too low and would spread his forces too thin. He also believed the terrain along the Emmitsburg Road, if occupied by the Confederates, would provide them with the capability of placing effective artillery fire on Cemetery Ridge. General Sickles regarded the area between Little Round Top and Emmitsburg Road as providing the Southerners with good cover and 60 concealment.

Believing the Confederates would have these advantages, General Sickles, without orders, moved forward and positioned one division along the Emmitsburg Road and formed a right angle with his other division stretching from the Peach Orchard to Devil's Den. This formed a line twice the length of the mile long stretch of ridge vacant to his rear (Little Round Top and Cemetery Ridge). This move physically separated his corps from the rest of the Union army and allowed his flanks to be fired upon simultaneously. "As a result, the position had little depth, practically no reserves or physical feature to fall back on, and was unsupported on both ends. To some, it seemed an outright invitation 61 to disaster ..."

General Sickles' mistake was a fatal one. His

-26-

defensive line broke wide open when the most extended part of his formation was hit on all sides. Sickles' Third Corps, rendered combat ineffective, attempted to retreat to Little Round Top. While III Corps was retreating, a foot race was taking place between Union General Warren and Confederate General Hood, both realizing the first one to occupy Little Round Top could win the battle.

Brigadier General G.K. Warren, Chief of Engineers on General Meade's staff, rode along the Union line, as General Sickles' III Corps was being decisively engaged. General Warren discovered the bald, unoccupied knob he was standing on, Little Round Top, was a very important position. He saw a long line of enemy soldiers approaching it and knew, if it was occupied by the Confederates, they could enfilade the entire length of Cemetery Ridge. At the same time, General Hood, who outflanked Sickles' III Corps, sent a six man reconnaissance party to investigate Little Round Top. The scout party

climbed to the summit of Round Top, looked down on the Federal army with its trains and artillery reserve that had been parked with a scant guard in the rear of the Round Tops, and discovered that its flank was in front of these eminences. Thousands of Federal soldiers could be seen along lines extending to the north but none were on the Summits. 62

The race continued between General Warren and

-27-

General Hood to seize Little Round Top. The winner was General Warren, for he was able to convince Colonel Strong Vincent, a brigade commander under General Barnes, to place his brigade along Little Round Top, without waiting for orders. Colonel Vincent's brigade arrived ten minutes before the Confederates and held Little Round Top after one and one half hours of gruesome combat. Holding Little Round Top meant the Union left flank was protected and the trains and artillery reserves kept intact.

Little Round Top was decisive terrain. It was an area of geographic advantages and it could have served as a marked advantage to both the Union or the Confederacy. The loss of Little Round Top would have surely meant the destruction of the Union defensive line. General Sickles chose to ignore Little Round Top and his III Corps suffered substantial casualties.

NAPOLEON BONAPARTE AND THE AUSTERLITZ CAMPAIGN

The greatest talent of a general and the surest hope of success lie in some degree in the good choice of these points (objective points). This was the most conspicuous merit of Napoleon. To detect at a glance the relative advantages presented by the different zones of operations, to concentrate the mass of the forces upon that one which gave the best promise of success, ... such was the system followed by Napoleon in his first campaigns. 63

-28-

Napoleon decided to fight in Central Europe after his plan to attack England was revoked by the major defeat off Cape Trafalgar. He would fight the allied powers of Tsar Alexander I of Russian and Emperor Francis I of Austria. This significant battle would take place near the village of Austerlitz in December 1805.

The Battle of Austerlitz provides another example of how terrain was viewed by a commander as decisive at the operational level of war. The commander who successfully analyzed terrain and recognized Pratzen Heights as decisive terrain was General Napoleon Bonaparte.

By using the components of decisive terrain it will be demonstrated that Pratzen Heights was decisive terrain. First, Pratzen Heights was an area that exhibited the combination of geographical advantages. The relationship between the topography and hydrography of the Austerlitz battlefield exposes Pratzen Heights as decisive terrain.

Bordered by the Moravian Alps in the north and the Littawa River in '... south, the highest point of elevation is the Dratzen Heights, a three hundred meter elevated plateau (See Map #3). It was almost three miles in length and one and one half miles in width at the widest point. On the northwest corner was one hill

-29-



mass, the Stare Vinohrady and in the southwest was Pratzeberg (340 meters). To the west of the plateau were the Goldbach Brook, Goldbach Stream, and the Bosenitzen Stream. Based on the warmer water temperatures of the numerous streams, combined with the cooler air temperatures, the formation of fog was inevitable. The heights were high enough in elevation not to be impacted by the formation of fog except to limit the observation of lower terrain.

The Brunn-Vienna Highway and the Iglau-Brunn Highway were the only roads that physically accommodated an operational concentration of soldiers on the battlefield. If the enemy used the ground south of the Pratzen Heights he would have to use roads which became narrow defiles as he approached the Goldbach Brook. The river could easily be defended by a small 65 force.

The Pratzen Heights exemplified another component of decisive terrain by affording a marked advantage to the French and the Russians in terms of its elevation and observation. As previously mentioned, the Pratzen Heights is the highest point of elevation between the Moravian Alps to the north and the Menitz and Satschan Ponds in the south. The heights provide observation of the seven mile stretch from the town of Brunn to Austerlitz and the only two major roads the Olmutz and

-31-
Brunn-Vienna.

The third component of decisive terrain was also illustrated by the Pratzen Heights in terms of the destruction of Tsar Alexander's forces. The abandonment of the Pratzen Heights by Tsar Alexander I would split his forces in two and subject their movement through restricted terrain to the north and south of the Pratzen Heights. If Napoleon could seize the heights, he could cut off Alexander's line of communications, sever his command and control, and fight only a 66 fraction of the Allied forces one at a time.

The last component of decisive terrain is pertinent to Napoleon. His experience and ability to see the battlefield and prepare for this battle is best expressed by his own words,

If I always appear prepared, it is because before entering on an undertaking, I have meditated for long and have foreseen what may occur. It is not genius which reveals to me suddenly and secretly what I should do in circumstances unexpected by others; it is thought and meditation. 67

Napoleon's ability to visualize terrain and identify key and decisive terrain was part of his inherent genius. His time spent in terrain analysis was thorough and extremely accurate. He required several items to be completed prior to commencing an operation. He would carefully study the terrain, making sure every road was reconnoitered and march tables were prepared.

-32-

Next, he would inform his commanders, via letters and verbal instructions of the objectives for the campaign, and how to use the terrain. Finally, he constantly war gamed the impacts of terrain on his and the enemy's 68 operations.

On the evening of 21 November, more than one week before the Battle of Austerlitz, Napoleon completed his ground reconnaissance and selected the Pratzen Heights as the decisive terrain.

The Emperor slowly and silently went over this newly discovered ground, stopping several times on its most elevated points, looking principally toward the Pratzen. He carefully examined all its characteristics and during this survey turned towards us, saying, "Gentlemen, examine this ground carefully, it is going to be a battlefield; you will have a part to play upon it." 69

The following summary of the Battle of Austerlitz stresses the importance of Napoleon's terrain analysis and his focus on the Pratzen Heights. The Russians under Alexander demonstrated on the Olmutz Road on Napoleon's left flank. Alexander's forces advanced from the village of Kobelnitz to Tellnitz using his forces from the center and left, abandoning Pratzen Heights, in an attempt to envelop Napoleon's right flank and cut his line of communications to Vienna.

Napoleon maneuvered his secondary effort against Alexander's secondary attack along the Olmutz Road. Napoleon's main effort, using the heavy fog along the

-33-

Goldbach Brook and Bosenitzer River to cover his movement inneuvered his forces concentrated between Puntowitz and Jirschikowitz and advanced for the Pratzen Heights.

By seizing the Pratzen Heights, Napoleon was able to attack the flank of Alexander's center forces enroute to Kobelnitz. He then divided Alexander's forces by retaining the Pratzen Heights. He blocked the crossing sites of the Goldbach Brook and forced the enemy in the south into the frozen Satschen Pond. In the north, Napoleon blocked Alexander's forces on the Olmutz Road and forced them to withdraw.

The decisiveness of the Pratzen Heights and the subsequent French victory at the battle of Austerlitz at the operational and strategic levels of war are demonstrated by the casualty figures and the political significance. The French losses were 1305 killed, 6940 wounded and 573 captured. Alexander's forces suffered 11,000 Russian killed, 4000 Austrians killed, 12,000 70 prisoners, and 180 guns and 50 colors captured.

Politically, Napoleon annihilated the armies of two emperors and forced the collapse of Britain's Third Coalition. Francis II, Emperor of Austria, signed the Treaty of Pressburg and ceded territories to the Kingdom of Italy and Bavaria. Alexander I, Emperor of Russia, informed Napoleon that he was going away and it would

-34-

require a hundred years for his army to equal Napoleon's forces. William Pitt, the British prime minister, received no profitable returns for Britains financing of Austrian, Prussian, and Russian forces and when hearing of Napoleon's victory, replied "roll up the map of 71 Europe. We shall not need it these seven years."

CONCLUSIONS AND IMPLICATIONS

Occupation of Cemetery Ridge and the two elevations, especially Little Round Top, with enough Federal Troops would give the Army of the Potomac an almost impregnable position. 72

Napoleon drew the larger army from its position on a strategic height (Pratzen Heights), captured those same heights and easily annihilated much of the army that had been sent to crush him. 73

The answer to the original question: Can decisive terrain be identified at the operational level of war?, is "yes". Several commanders at the Battle of Gettysburg and Napoleon at the Battle of Austerlitz identified decisive terrain such as Little Round Top and the Pratzen Heights. The decisiveness of this terrain had major impacts on the operational level of war.

The Battle of Gettysburg marked the turning point of the Civil War and it was the last time the Confederates were able to launch a major offensive into northern territory. The victory by Napoleon at the

-35-

Battle of Austerlitz forced the Austrians and Russians out the war the next day after the battle, and permitted Napoleon to control most of continental Europe for the next two years.

However, the identification of decisive terrain by a commander demands determining if an area has a combination of geographical advantages, affords a marked advantage, becomes so critical that its loss would mean destruction to the defender, and requires the commander to have experience in analyzing terrain.

It is important to remember that it is a commander's responsibility to designate decisive terrain and that not all battlefields will have decisive terrain. The intelligence and operations staffs need to make recommendations and assist the commander in identifying decisive terrain and therefore also need the training in identifying decisive terrain. Based on interviews with students and instructors at the infantry and intelligence basic and advanced courses, Combined Arms Staff Services School, Command and General Staff College, the School of Advanced Military Studies, the Pre-Command Course, and the Army War College, decisive terrain is briefly mentioned only in the advanced course 74 instruction and only at the tactical level.

Our educational institutions need to revise their programs of instruction to include guidance on what

-36--

decisive terrain is and how to identify it. Formal instruction must be provided on how the physical, economic, and cultural geography interrelate and yield advantages. The experience required of the commander and staff can be gained by conducting exercises involving decisive terrain and by examining historical case studies.

To train commanders and staffs on how to properly conduct a terrain analysis and identify decisive terrain the United States Army, joint, and combined publications need to standardize the definition and provide more detailed guidance on what constitutes decisive terrain. Manuals such as FM 100-5, Operations, FM 101-5, Staff Organization and Operations, FM 34-3, Intelligence Analysis, ST 100-9, The Command Estimate Process, FM 101-5-1, Operational Terms and Graphics, FM 34-130, Intelligence Preparation of the Battlefield, and AR 310-25, Dictionary of United States Army Terms, JCS Pub. 1, Department of Defense Dictionary of Military and Associated Terms, and Army Field Circulars need to adopt a better and standardized definition of decisive terrain and provide guidance on how to identify decisive terrain.

The importance of decisive terrain needs to be emphasized in our doctrine and schooling institutions. History is replete with examples of commanders who

-37-

achieved overwhelming success by properly using terrain. But the commanders who failed to recognize decisive terrain at the operational level of war suffered massive casualties that had a significant impact on the future of their armies. Failure to identify decisive terrain can lead to defeat on the next battlefield.

ENDNOTES

```
1
     US Army, FM 100-5, Operations, (Washington, DC:
Department of the Army, 1982), 3-1.
    2
     Information presented during the Infantry Officer
Advance Course, Fort Benning, Georgia, 1982.
    3
     FM 100-5, 3-4.
    4
     Sun Tzu, The Art of War, (New York: Oxford,
1971), 63.
    5
     Tzu, 64.
    6
    Ibid, 129.
    7
    Ibid, 130.
    8
     Ibid, 130.
    9
     Ibid, 131.
   10
     Antonie Henri Jomini, Jomini and His Summary of
the Art of War, ed. Brig. Gen. J.D. Hittle, Roots of
Strategy Book 2. (Harrisburg, PA: Stackpole Books,
1987), 467.
   11
     Ibid, 467.
   12
     1bid. 468.
   13
     Carl Von Clausewitz, On War, (Princeton, New
Jersey: Princeton University Press, 1976), 109.
   14
     Ibid, 354.
```

```
15
     Ibid, 109.
   16
     Ibid, 142, 353.
   17
     Stanley M. Needleman, "Earth Science Applied to
Military Use of Natural Terrain," (Bedford,
Massachusetts: Air Force Cambridge Research
Laboratories. 1969), 75.
   18
     Joint Chief of Staff Pub 5-02.1, Joint Operation
Planning System Volume 1 Deliberate Planning Procedures
(Washington, D.C.: GPO, 1988), Appendix C-2.
   19
     Ibid, Appendix C-2.
   20
     Ibid, Appendix C-4.
   21
     Ibid, Appendix C-4, C-5.
   22
     Don T. Riley, "A Sense of Locality and Tactical
Agility," (Monograph, SAMS, US Army CGSC, 1986), 8.
   23
Allan C. Bevilacqua, "Weather and Terrain
Forgotten Factors", <u>Marine Corps Gazette</u>, (Quantico, VA:
Marine Corps Association, 1973), 42.
   24
     US Army, FM 100-5, Operations (Fina) Draft),
(Washington, DC: Department of the Army, 1993), 11-3.
   25
     Ibid, 13-3.
   26
     US Army, FM 100-5, Operations, (Washington, DC:
Department of the Army, 1986), 29.
   27
     Ibid, 80.
   28
     Ibid, 121.
```

29 US Army, FM 34-3, Intelligence Analysis, (Washington, DC: Department of the Army, 1990), 4-10. 30 Ibid, 4-10. 31 US Army, FM 101-5-1, Operational Terms and <u>Symbols</u>, (Washington, DC: Department of the Army, 1985), 1-22. 32 US Army Command and General Staff College, ST 100-9, The Command Estimate, (Fort Leavenworth, Kansas: US Army Command and General Staff College, 1992), 7-3. 33 US Army, FM 34-130, Intelligence Preparation of the Battlefield, (Washington, DC: Department of the Army, 1989), A-31. 34 US Army, FM 34-130, Intelligence Preparation of the Battlefield (Preliminary Draft), (Washington, DC: Department of the Army, 1992), 3-13. 35 Tzu, 35. 36 James P. Reams, "The Science and Art of Soviet Terrain Analysis," (Garmisch, Germany: U.S. Army Russian Institute, 1981), 6. 37 Reams, 10. 38 Reams, 3. 39 Reams, 15-16. 40 James L. Saunders, "Rear Operations," (Monograph, SAMS, US Army CGSC, 1987), 17. 41 Ibid, 27. 42 Ibid, 39.

43 Christopher Bellamy, The Future of Land Warfare, (New York: St. Martin's Press, 1987), 146. 44 Bellamy, 147. 45 Bellamy, 142. 46 Bellamy, 160-162. 47 Jacob Hoke, The Great Invasion, (New York: Thomas Yoseloff, 1959), 350-351. 48 William A. Frassanito, Gettysburg A Journey in Time (New York: Charles Scribner's Sons, 1975), 154. 49 Oliver W. Norton, The Attack and Defense of Little Round Top, (New York: Neak Publishing Co., 1913) 266. 50 Theodore W. Howard, "A Terrain Study of the Gettysburg Battlefield, " (Carlisle Barracks, Pennsylvania: US Army War College, 1986), 20. 51 Howard, 16. 52 Norton, 299. 53 Jack McLaughlin, Gettysburg The Long Encampment, (New York: Appleton-Century, 1963), 90. 54 Clifford Dowdey, Death of a Nation, (New York: Alfred A. Knoff, Inc., 1958), 182. 55 Frank A. Haskell, The Battle of Gettysburg, (Boston: Houghton Mifflin, 1958), 27. 56 Hoke, 351.

57 Dowdey, 156-157. 58 Shelby Foote, The Civil War, (New York: Random House, 1963), 499. 59 Glenn Tucker, <u>High Tide at Gettysburg</u>, (New York: The Bobbs-Merrill Company, 1958), 254. 60 Abner Doubleday, Chancellorsville and Gettysburg, (New York: Charles Scribner's Sons, 1882), 162-163. 61 Foote, 496. 62 Tucker, 245. 63 Jomini, 468-469. 64 Albert S. Britt, III, Campaign Atlas to Wars of Napoleon, (West Point, New York: United States Military Academy Department of History, 1976), 22. 65 Eben Swift, "The Development of Modern Strategy. The Influence of the Terrain as Shown in the Campaigns of Napoleon," (Carlisle, Pennsylvania: Army War College, 1910), 9. 66 Robert M. Epstein, "The Different Levels of War in the Napoleonic Period - Austerlitz and Friedland," (Fort Leavenworth, Kansas: US Army Command and General Staff College, 1989-1990), 18. 67 US Army, FM 34-8, Combat Commander's Handbook on Intelligence (Final Approved Draft), (Washington, DC: Department of the Army, 1992), 3-13. 68 Swift, 8. 69 Epstein, 16.

70 Geoffrey Regan, <u>The Guinness Book of Decisive</u> <u>Battles</u>, (New York: Canopy Books, 1992), 152. 71 Ibid, 152. 72 McLaughlin, 76. 73 Kenneth C. Davis, <u>Don't Know Much About</u> <u>Geography</u>, (New York: William Morrow & Co., 1992), 229.

74

Author interviews with two instructors in the Infantry Officer Basic and Advance Courses, two students in the Intelligence Officer Basic and Advance Courses, three students and one instructor in the Command and General Staff College, one student in the Army War College, one instructor in the Pre-Command Course, and one instructor in the Tactical Commander's Development Course, from 6-22 Jan 1993. (Due to the nonattribution policy the officers' names are withheld)

BIBLIOGRAPHY:

<u>Interviews</u>

- Author interviews with two instructors in the Infantry Officer Basic and Advanced Courses, two students in the Intelligence Basic and Advanced Courses, three students and one instructor in the Command and General Staff College, one student in the Army War College, one instrutor in the Tactical Commander's Development Course, and one instructor in the Pre-Command Course, from 6-22 Jan 1993. (Due to the nonattribution policy the officers' names are withheld)
- Information presented during the Infantry Officer Advance Course, Fort Benning, Georgia, 1982.

Government Publications

- Joint Chiefs of Staff Pub 5-02.1, Joint Operation <u>Planning System Volume 1 Deliberate Planning</u> <u>Procedures</u>. Washington, DC: GPO, 1988.
- US Army. <u>FM 34-3, Intelligence Analysis</u>. Washington, DC: Department of the Army, 1990.
- US Army. <u>FM 34-8, Combat Commander's Handbook on</u> <u>Intelligence (Final Approved Draft)</u>. Washington, DC: Department of the Army, 1992.
- US Army. <u>FM 34-130, Intelligence Preparation of the</u> <u>Battlefield</u>. Washington, DC: Department of the Army, 1989.
- US Army. <u>FM 34-130. Intelligence Preparation of the</u> <u>Battlefield (Preliminary Draft)</u>. Washington, DC: Department of the Army, 1992.
- US Army. <u>FM 100-5, Operations</u>. Washington, DC: Department of the Army, 1982.
- xUS Army. <u>FM 100-5, Operations</u>. Washington, DC: Department of the Army, 1986.
- US Army. <u>FM 100-5, Operations (Final Draft)</u>. Washington, DC: Department of the Army, 1993.

- US Army. <u>FM 100-15-1, Corps Operations (Unedited</u> <u>Coordinating Draft)</u>. Washington, DC: Department of the Army, 1991.
- US Army. <u>FM 101-5-1, Operational Terms and Symbols</u>. Fort Leavenworth, Kansas: US Army Command and General Staff College, October 1985.
- US Army Command and General Staff College. <u>ST 100-9</u>, <u>The Command Estimate</u>. Fort Leavenworth, Kansas: US Army Command and General Staff College, July 1992.

<u>Books</u>

- Bellamy, Chris. <u>The Future of Land Warfare</u>. New York: St. Martin's Press, 1987.
- Britt, Albert S. <u>Campaign Atlas to Wars of Napoleon</u>. West Point, New York: United States Military Academy Department of History, 1976.
- Clausewitz, Carl Von. <u>On War</u>. Princeton, New Jersey: Princeton University Press, 1976.
- Davis, Kenneth C. <u>Don't Know Much About Geography</u>. New York: William Morrow & Co., 1992
- Doubleday, Abner. <u>Chancellorsville and Gettysburg</u>. New York: Charles Scribner's Sons, 1882.
- Dowdey, Clifford. <u>Death of a Nation</u>. New York: Alfred A. Knoff, Inc., 1958.
- Foote, Shelby. <u>The Civil War</u>. New York: Random House, 1963.
- Frassanito, William A. <u>Gettysburg A Journey in Time</u>. New York: Charles Scribner's Sons, 1975.
- Haskell, Frank A. <u>The Battle of Gettysburg</u>. Boston: Houghton Mifflin, 1958.
- Hoke, Jacob. <u>The Great Invasion</u>. New York: Thomas Yoseloff, 1959.
- Jomini, Antonie Henri. Jomini and His Summary of the Art of War. ed. Brig. Gen. J.D. Hittle, <u>Roots of</u> <u>Strategy</u> Book 2. Harrisburg, PA: Stackpole Books, 1987.

- McLaughin, Jack. <u>Gettysburg the Long Encampment</u>. New York: Appleton-Century, 1963.
- Norton, Oliver W. <u>The Attack and Defense of Little</u> <u>Round Top</u>. New York: Neak Publishing Co., 1913.
- Regan, Geoffrey. <u>The Guinness Book of Decisive</u> <u>Battles</u>. New York: Canopy Books, 1992.
- Sun Tzu. <u>The Art of War</u>. New York: Oxford University Press, 1971.
- Tucker, Glenn. <u>High Tide at Gettysburg</u>. New York: The Bobbs-Merrill Company, 1958.

Unpublished Dissertations, Theses, and Papers

- Epstein, Robert M. "The Different Levels of War in the Napoleonic Period -- Austerlitz and Friedland." SAMS, US Army Command and General Staff College, 1989.
- Howard, Theodore W. "A Terrain Study of the Gettysburg Battlefield." Carlisle, Pennsylvania: US Army War College, 1986.
- Needleman, Stanley M. "Earth Science Applied to Military Use of Natural Terrain." Bedford, Massachusetts: Air Force Cambridge Research Laboratories, 1969.
- Reams, James P. "The Science and Art of Soviet Terrain Analysis." Student Research Report, US Army Russian Institute, Garmisch, Germany, 1981.
- Riley, Don T. "A Sense of Locality and Tactical Agility." Monograph, SAMS, US Army Command and General Staff College, 1986.
- Saunders, James L. "Rear Operations: Protecting the Points of Decision." Monograph, SAMS, US Army Command and General Staff College, 1987.
- Swift, Eben. "The Development of Modern Strategy. The Influence of the Terrain as Shown in the Campaigns of Napoleon." Carlisle, Pennsylvania: Army War College, 1910.

Journals and Publications

Bevilacqua, Allan C. "Weather and Terrain Forgotten Factors." <u>Marine Corps Gazette</u>, December 1973.