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**U.S. Army Research Institute
for the Behavioral and Social Sciences**

Research Report 1577

Historical Development of the Estimate of the Situation

Rex R. Michel
U.S. Army Research Institute

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U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) This report traces the development of the U.S. Army's estimate of the situation as described in consecutive editions of the Army Field Manual, FM 101-5, Staff Organization and Operations. Nine editions and one unpublished draft of FM 101-5 were studied, beginning with the first edition published in 1932. The goal was to find out what led to the original form of the estimate and to judge the stability of the estimate across time. In the six topic areas investigated, the basic tenets remained remarkably stable. Detail was added to the descriptions of procedures through 1968, with relatively little detail added in the three subsequent editions. The unpublished 1977 draft of FM 101-5 contains interesting deviations from the basic tenets. These deviations are also discussed.					
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Research Report 1577

Historical Development of the Estimate of the Situation

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**Human Factors in Training and
Operational Effectiveness**

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FOREWORD

Our nation's relatively low unemployment rate and the declining pool of 17- to 21-year-old youths are creating increasing demands on the U.S. Army's recruiting resources and personnel. This demand may not be lessened by force reductions because such reductions are being accompanied by budget cuts for recruiting and in increases in requirements for the most highly qualified recruits. The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has designed and executed three surveys (New Recruit Survey (NRS), Recruit Experience Tracking Survey (RETS), and the Army Communications Objectives Measurement Survey (ACOMS)) that assess respondents' perceptions of opportunities offered by the Army. The U.S. Army Recruiting Command (USAREC) uses this information to design marketing strategies and to evaluate such recruiting programs as the Army College Fund incentive. This research examines the responses to advertising attribute items from the three surveys to determine how the different survey samples perceive Army opportunities and identify any differences across the survey samples.

This ARI effort is part of an ongoing research program designed to enhance the quality of Army personnel. This work is part of the mission of ARI's Manpower and Personnel Policy Research Group (MPPRG) to conduct research to improve the Army's ability to effectively and efficiently recruit its personnel. This research was undertaken in response to a request by the Director of the Programs, Analysis, and Evaluation Directorate, USAREC, dated 22 February 1990. Results of this research were provided to the Chief, Advertising Research and Analysis, USAREC, 12 July 1990.

The findings from this research can be used by military personnel planners to identify how perceptions differ among youth, new soldier, and experienced soldier samples. These results can also be used to point out the attributes that need more advertising emphasis. Furthermore, the results also suggest further investigations into related areas (e.g., realistic job previews) that are needed to improve the match between new and experienced soldier expectations.



EDGAR M. JOHNSON
Technical Director

HISTORICAL DEVELOPMENT OF THE ESTIMATE OF THE SITUATION

EXECUTIVE SUMMARY

Requirement:

To determine the historical stability and basis of the various tenets of the U.S. Army's estimate of the situation, including its format, procedures, use of multiple options, and use of situational information.

Procedure:

The evolution of the estimate process was studied by comparing the estimate description in all nine editions and one unpublished draft of Army Field Manual 101-5, Staff Organization and Operations. Editions were published from 1932 to the present.

Findings:

The general method and format of the estimate of the situation have remained remarkably stable over the years. Between the 1932 and 1968 editions there has been a fairly consistent increase in the amount of detail given regarding the estimate process, along with an increase in confidence as to its effectiveness and applicability. The three editions and one draft since 1968 have added little "how to" information or data requirements. The unpublished draft suggests several arguments against having too detailed an estimate structure.

Utilization of Findings:

The results of this research have provided a full understanding of current doctrine and have helped guide the U.S. Army Research Institute's research program on the estimate process. The results have also been shared with others in the Army community, including the Command and General Staff College, where the estimate process is being studied, refined, and taught.



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HISTORICAL DEVELOPMENT OF THE ESTIMATE OF THE SITUATION

CONTENTS

	Page
INTRODUCTION	1
APPROACH	1
ORIGIN OF THE ESTIMATE	3
ESTIMATE HISTORY REFLECTED IN FM 101-5	4
Definition and Purpose.	4
Format.	4
Procedures.	4
Use of Multiple Options	7
Wargaming	9
Situation Information to Be Used.	11
SUMMARY AND CONCLUSIONS.	15
REFERENCES	19

LIST OF TABLES

Table 1. Format of the estimate	5
---	---

LIST OF FIGURES

Figure 1. History of the estimate process	2
---	---

HISTORICAL DEVELOPMENT OF THE ESTIMATE OF THE SITUATION

Introduction

The estimate of the situation has been the doctrinally accepted means of tactical decision making within the U.S. Army for nearly a century. Recent developments in the field of decision making research in general and specific research performed by and for the U.S. Army Research Institute (ARI) Fort Leavenworth Field Unit have, however, lead us to question if the estimate process as currently defined is actually followed in the field or, indeed, if it can be. Thus we have undertaken a broad research project to study the estimate process, determine its viability under field conditions, and investigate ways of aiding tactical decisionmakers in the estimate tasks.

As one of the first steps in this project we studied the history of the estimate of the situation. From this study we hoped to gain insights into the bases for some of the tenets of the estimate. We also hoped to discover the degree of historical stability in the current estimate process and the areas of instability that might indicate disagreements or a lack of confidence in the operational viability of the procedures involved. This document reports the results of our historical investigation.

Approach

All past editions of FM 101-5, Staff Organization and Operations, were reviewed to investigate the historical development of the estimate. FM 101-5 is the doctrinal organ used to describe the military decisionmaking process and particularly the estimate of the situation. The changes and growth of the estimate process should best be reflected in this field manual.

There have been nine editions of FM 101-5 published beginning in 1932 (see Figure 1). The dates of these publications are as follows:

September 1932	June 1968
August 1940	July 1972
July 1950	May 1982
November 1954	May 1984
July 1960	

In addition to these nine published revisions we included a 1977 draft of FM 101-5 that was never officially published as an FM. The reason for including this draft was its unique approach to the estimate process which, in many instances, presents a viewpoint counter to that typical of the released versions. By including it we were able to discuss some differing opinions within the context of FM 101-5.

The analysis of the estimate development was divided into six topical areas. The results of the analysis of each of these topics through the several versions of FM 101-5 are reported in this document. The six topic areas are definition and purpose, format, procedures, use of multiple options, wargaming, and use of situational information. These six topics are ones either necessary to convey how the estimate process developed or are areas of current interest and investigation.

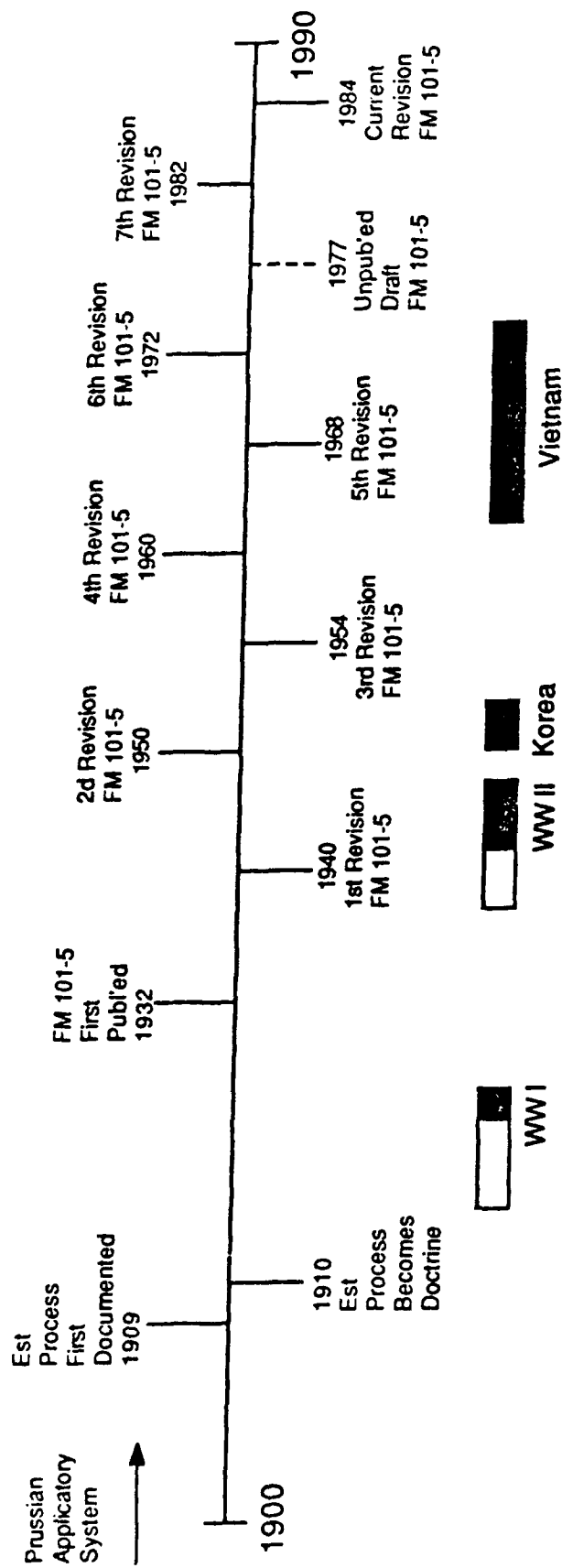


Figure 1. History of the estimate process.

The first analysis done was to attempt to discover the origin of the estimate of the situation. This investigation is reported in the next section followed by the analysis of FM 101-5. The summary and conclusions follow the analysis results.

Origin of the Estimate

The estimate process had its origins in the Prussian Army's attempt in the early 1800's to develop a systematic and logical approach to the solution of military problems. The Prussians felt a documented, systematic procedure was required "to develop by training a high average of ability in leadership" as the death of Frederick the Great and subsequent Prussian defeats had made them realize how dependent they were upon the rare chance existence of true tactical genius. Thus evolved over a half century the "applicatory system" of training military officers for battlefield command which included a mental survey of the existing situation leading up and expressed in the Decision.¹

At the turn of the century the United States had in place service war colleges that were to adopt the applicatory system. It was at the Infantry and Cavalry School at Fort Leavenworth that the Prussian system was first adapted. During the first decade of this century the School evolved and refined the estimate process as the systematic means whereby students were required to explain and justify their solutions to classroom tactical problems. "Nobody prior to this time had directed attention specifically to the factors which ought routinely to be taken into account in the decision-making process."² Thus was created the estimate of the situation which was first officially documented in 1909 by Captain Roger S. Fitch of the College in his Estimating Tactical Situations and Publishing Field Orders (Fort Leavenworth, KS, US Army Staff College Press, 1909).

In 1910 the estimate of the situation became official US Army doctrine with the publication of excerpts from Captain Fitch's document in the Field Service Regulations. The following is a quote from the Field Service Regulations of 1910:

"To frame a suitable field order the commander must make an estimate of the situation, culminating in a decision upon a definite plan of action. He must then actually draft or word the orders which will carry his decision into effect. An estimate of the situation involves a careful consideration from the commander's viewpoint, of all the circumstances affecting the particular problem. In making this estimate he considers his mission as set forth in the orders or instructions under which he is acting, or as deduced by him from his knowledge of the situation, all available information of the enemy (strength, position, movements, probable intents, etc.), conditions affecting his own command (strength, position, supporting troops, etc.) and the terrain insofar as it affects the particular military situation.

¹Sound Military Decision Including the Estimate of the Situation and the Formulation of Directives (1936) US Naval War college Serial No. 7, Newport, R.I.

²Seigle, John W., Maj, USA (1966) The estimate of the situation. USACGSC Student Paper, Fall, 1966.

He then compares the various plans of action open to him and decides upon the one that will best enable him to accomplish his mission."³

From this single paragraph beginning the detailed estimate process has evolved over the past 80 years.

Estimate History Reflected in FM 101-5

Definition and Purpose

The definition and purpose of the estimate have always included the concept of a logical investigation of pertinent battlefield information to arrive at the best course of action for the situation. Over the years the definition has expanded to reflect its continuous nature, relate the commander and staff estimates, and delineate the steps involved and the categories of factors to be considered. However, the basic definition and purpose have remained the same throughout.

Format

The basic five paragraph commander's estimate (i.e., mission, situation & courses of action, analysis, comparison, and decision) first appeared in the 1940 release of FM 101-5. These five paragraphs have remained the same throughout all subsequent versions except the 1977 draft. However, additional levels of subparagraphs were added up through the 1968 version when four levels of subparagraphs appeared under paragraph 2, "situation & courses of action." A comparison between the 1932 and 1984 estimate formats is shown in Table 1.

Since 1968 the format has remained essentially stable, except for 1977. The 1977 draft was a radical departure in many ways from both previous and subsequent versions. In 1977, the emphasis in decision making is on speed or timeliness. Only one table in this draft (p. 5-4) illustrated the "logical sequence" of the commander's estimate. It was aimed at a mental evaluation to answer a series of questions. This table contains four subheadings (i.e., mission, situation and courses of action, analysis [wargaming] and comparison of courses of action, and decision or recommendation).

Procedures

Mention of procedures for performing the estimate was limited to considering the estimate steps as a 'train of thought sequence' in the 1932 version. In that first issue it was also mentioned that an estimate may be a purely mental (as opposed to written) exercise. In the 1940 version, this recognition was expanded to conclude that a 'mental process' was the most common type of estimate at division level and below. This conclusion has been carried through every revision since then.

³Field Service Regulations, United States Army, 1910. War Department, 1910. Article III, Orders; Composition of Field Orders. Paragraph 75, p. 59.

Table 1

Format of the Estimate

FM 101-5, 1932	FM 101-5, 1984
1. Mission 2. Opposing Forces a. Enemy forces b. Own forces c. Relative combat strength 3. Enemy Situation a. Plans open to enemy b. Analysis of enemy's plans c. Enemy's probably intentions 4. Own Situation a. Plans open to you b. Analysis of plans 5. Decision	1. Mission 2. Situation and COA a. Considerations (1) Area of operations (a) Weather (b) Terrain (c) Other factors (2) Enemy situation (a) Dispositions (b) Composition (c) Strength - committed - reinforcements - artillery - air & NBC - other (d) Significant activity (e) Peculiarities & weaknesses (3) Analysis of COA (a) Dispositions (b) Composition (c) Strength - committed - reinforcements - artillery - air & NBC - other (d) Significant activity (e) Peculiarities & weaknesses (4) Relative combat power b. Enemy capabilities c. Own COA 3. Analysis of COA a. List of enemy capabilities b. Analysis of each COA vs. each enemy capability 4. Comparison of COA a. List advantages & disadvantages of each COA b. Conclusion on best COA 5. Decision (Recommendation)

The 1950 release stated explicitly the universality of the method, claiming that it was applicable to any situation or echelon and usable by any individual. With the exception of the two versions in the 1970s, this claim has been repeated in the subsequent releases.

The post-Korean war 1954 release contains a unique procedural statement. In a paragraph entitled 'Basic consideration' it is suggested that under certain circumstances an estimator might combine certain elements of the basic (five paragraph) outline. This suggestion is not repeated in subsequent releases.

For the first time in 1960 the military decision making process is described. This formal process places the commander's estimate within the broader context of all the command and staff actions required to develop and execute a course of action. The commander's estimate remains as one step in the process (step 5) and the five paragraph description of the estimate is not altered. However, most of the activity in the first two paragraphs of the commander's estimate would naturally be accomplished in the first three steps of the military decision making process, i.e., mission, information gathering, and the commander's planning guidance. Thus, the delineation of this process helped make obvious the fact that the commanders' estimate is often an interactive undertaking in which his staff plays a very active part. With the possible exception of the 1977 draft, the military decision making process became an integral part of all subsequent issues of FM 101-5.

In the 1968 issue another more abstract or general way of looking at proper decision making procedures was added. This was to explicitly consider battle-field decisions in terms of a general problem-solving methodology that consists of: 1) recognizing the problem; 2) gathering the data needed; 3) developing and listing possible solutions; 4) analyzing possible solutions; 5) selecting the best solution. The "new" science of decision making was emerging as a serious field of study and a generally accepted best way of solving problems could now be described. A discussion of this general procedure has been included in all subsequent releases except the 1977 draft. It did not, however, alter the estimate process as such a method has characterized the military estimate process since its inception shortly after the turn of the century.

The 1968 manual also contained a caveat about using the estimate process that was somewhat like the one that appeared in 1954, but did not go quite as far. The statement was made that the format was not rigid. An estimator could go on to the next step without completing the preceeding one or make several small excursions through the process within his overall estimate, revising or adding material as necessary. This caveat was repeated in 1972 and 1977 but was dropped from those releases appearing in 1982 and 1984.

The 1972 release did not add anything new concerning the general estimate procedures but the 1977 draft viewed the commander's estimate as a much more dynamic, subjective and hurried process than any version before or since. As such, it emphasized the estimate as a "natural process" most of which is taking place within the mind of the commander, a "continuous, dynamic reevaluation of changing conditions and a search for meaningful factors for consideration." It viewed the structured steps in the commander's estimate and in the military decision making process as fully applicable only when time was available, but typically "speed is the essence of the process in the fast moving environment."

Therefore, the full blown estimate and decision process were viewed primarily as training aids, "useful mainly in developing facility in giving full consideration to pertinent aspects of the situation." Not since the 1940 release had the estimate format been viewed more for training than for application on the battlefield.

The 1982 manual was a transition back to the more objective, formalized approach to the estimate process that had characterized FM 101-5 prior to 1977. It made some concessions to the "art" of tactical decision making.⁴ It also recognized the effects of time compression on who performed the estimate steps⁵, but it firmly reestablished the formal estimate process as the best way to make decisions on the battlefield. The current, 1984 release made no substantive changes in the estimate procedures or emphasis from that of 1982.

Use of Multiple Options

The first release of FM 101-5 in 1932 stated that the estimate should consider the plans open to both the enemy and yourself. It did, however, recommend a separate analysis of enemy and friendly plans; first deciding which one of the possible enemy plans he will probably adopt and then using that one enemy plan in considering the plans open to you (p. 45-46).

The 1940 version contained all the basic elements that have since characterized the use of multiple options in the estimate process. The generation of possible enemy and own lines (courses) of action was to be done in step 2 based upon consideration of the factors or facts in the tactical situation. Only those lines of action were to be retained for further analysis which may interfere with accomplishment of your mission (enemy's) or will accomplish or facilitate accomplishment of your mission (own). In step 3 each own line of action retained was to be 'separately weighted in turn' against each enemy line of action retained. Two statements appeared in the 1940 release limiting the required scope of this analysis. One was that if only one practical line of action seemed open to you, you could proceed directly to the decision (p. 90). This statement did not appear in any subsequent release of FM 101-5. The second was that, "as a general rule, not more than two or three own lines of action need to be carried forward for further analysis." A similar statement appeared in the next (1950) release but was dropped from all subsequent versions following 1950.

The 1950 release added nothing to that of 1940 in regard to the use of multiple options. The 1954 version, however, contained some new details. It was stated that not only are those enemy courses of action which have little affect

⁴"Military decision making is both an art and a science . . . How a commander or staff officer arrives at a decision is a matter of personal determination; however, sound conclusions, recommendations, and decisions result from a thorough, clear, unemotional analysis of all facts and assumptions relating to the situation." FM 101-5, May 1987, p. 5-1.

⁵". . . the commander may have to proceed through the decision making process and issue oral orders based on his own knowledge of the situation without taking the time required to formally include the staff in the process." Ibid, p. 5-9.

on your choice of a course of action to be eliminated from the step 3 analysis, but also those that affect your possible courses of action equally (p. 93). It also stated that the commander in visualizing his possible courses of action in step 2, "eliminates from further consideration those . . . which are obviously inferior to the others being considered (p. 93). It contradicted the 1940 version in stating that although in certain circumstances there may be only one practical course of action, the final decision should not be made until that course of action is tested in step 3 to determine its 'ramifications' and refine how it is to be accomplished (pp. 92-93).

In the 1960 update, the new, albeit brief, chapter describing the "Sequence of Actions in Making and Executing Decisions" (later to expand into the "Military Decision Making Process") states that the commander's planning guidance includes "any courses of action which he wishes developed" (p. 53). The chapter on the Estimate also talks directly for the first time about the level of detail required in course of action development, stating that, in most cases, they need only be developed "in sufficient detail to be readily distinguishable for analysis and comparison" (p. 55). In 1960 the discussion regarding comparing the courses of action (step 4) was greatly expanded and included a description of two possible methods. These methods were included and further detailed in subsequent releases.

The 1968 version made the first real effort to distinguish the responsibilities of the commander, G2 and G3 in the generation of possible courses of action, a problem that had been worked on at the Command and General Staff College for some time.⁶ It said that the G2 normally determines enemy capabilities and the commander considers all of these, accepting, revising, discarding or adding to them as appropriate. It also stated for the first time, that the commander includes enemy capabilities that are exploitable not only at his own echelon, but at higher and lower echelons as well. The commander/G3 relationship was stated similarly with the commander considering and accepting, rejecting, modifying, or adding to the courses of action presented to him by the G3 (p. C-3). The description of these relationships was carried through in all subsequent revisions except the 1977 draft. Also for the first time criteria were given in the 1968 revision to apply in determining good courses of action: feasibility, accomplishability, and distinguishability (p. C-3). These criteria were continued in all subsequent versions. The 1968 release also mentioned for the first time that those enemy capabilities eliminated from analysis were still valid and to be used for reference purposes, not to be discarded altogether (p. C-4). It also states that, "it is neither possible nor practical for the commander to reach an overall conclusion on the best course of action until all the information developed during the course of analysis is available and the comparison in paragraph 4 has been completed" (p. C-5). This caution was repeated in all subsequent editions except the 1977 draft.

The 1972 version added no new material concerning the use of multiple options. Although the 1977 draft was a radical departure in many ways, it continued to recognize the need for considering multiple options. The opening pages of Chapter 5, "The Decisionmaking Process" were written from the premise that

⁶For instance, see, "G3 Analysis and Estimate, a Staff Study" (1953) Command and General Staff College, Staff Study Report, 8 May, 1953.

"the commander (in the battlefield) always has a concept in mind for the employment of his unit" (p. 5-2). But it goes on to say that "when time permits, the commander's estimate and decision process may be a more detailed and orderly examination" (p. 5-3). Still later, it says, "During the battle, the same logical thought process (commander's estimate) must be used, but at a much faster pace. The considerations are the same." (p. 5-11) The example which follows has a division commander verbally considering three courses of action with his staff and says "the commander mentally wargames each CA" (p. 5-12). Where it does differ from past and subsequent versions is in refocusing the decision effort on the commander, much as in the earliest versions, with such statements as, "the staff may propose options during the appraisal process" (p. B-9). It further deviates from other releases in advocating the comparison of courses of action during the step 3 analysis (p. B-14).

The 1982 and 1984 versions added nothing significant in the use of multiple options. Their statements were much like those of the 1968 and 1972 editions.

Wargaming

The 1932 version of FM 101-5 said nothing about how courses of action were to be analyzed. The 1940 release said only that "the results to be expected in each case are visualized" (p. 127). The 1950 version added nothing in explaining the analysis but it contained, for the first time, an example of a commander's estimate. Under the analysis paragraph this example gave an "if, then" statement under each course of action for each enemy capability. The brief "then" statements considered, in general terms, the effects of terrain and enemy strength on friendly and enemy movements and time requirements and the relative probability of an enemy break-through. These suggest only a superficial level of wargaming (pp. 110-112).

The 1954 release made it clear that what was being visualized was "the action" creating "mental pictures" of the opposition and degree of success. The commander's visualization was to take into account the situational factors deduced in step 2 to "develop and refine the how of the ultimate decision" and to "determine how the factors may best be exploited by his actions." It was noted that this analysis could result in the modification of courses of action or in the creation of new ones (p. 93). The estimate example was in the same level of detail as that in 1950. The 1960 version said "each analysis results in a determination of the probable interaction of friendly and enemy forces, of critical tactical incidents, areas, and times and of the possible success of each course of action" (p. 144). The commander's estimate example in this release reflects the emphasis on force interaction. The analysis paragraph contains a 1 1/2-to-2 page analysis of each course of action. In these analyses, the course of action is "fought through" by phases identifying the effects of terrain and enemy dispositions on the actions and time required during each phase. The actions are limited to need for secondary attacks, size of the main attack and use of nuclear weapons. A summary of advantages and disadvantages is given at the end of each course of action analysis (pp. 154-158).

It was the 1968 release that first used the term "wargaming" and included a description of how it might be done and what it should produce; a level of

detail which was to characterize all subsequent versions of FM 101-5. Wargaming was to be done "from the current dispositions. . . to the objective, to include any actions that may be required subsequent to securing the objective" (p. C-4). A method is described for doing this for an offensive course of action. The method divides the operation into segments with the first one involving the penetration of the enemy's initial positions and the last being seizure of the objective. For each segment the commander first determines the combat power the enemy can bring to bear and, from this, determines the combat power he will need to penetrate. He decides which of his units he can most logically employ and may consider the requirement for control headquarters. Having done this, he visualizes the movement of his units and the enemy's reaction. This leads him to visualize the requirement for supporting attacks, supporting fires, smoke, and supporting air. While doing this, he notes critical areas and incidents as well as advantages and disadvantages of the course of action. From wargaming the initial segment, he develops the composition of the main and any supporting attacks and decides what his reserve will be and where it will be located. In subsequent segments, he considers the effectiveness of the supporting attack and the possible use or movement of his reserve. Once he has wargamed through to the objective, he considers what actions will be required to consolidate. This whole process is to be repeated for each course of action against each viable enemy capability (pp. C-5 & C-6).

The 1968 version goes on to list eight products that should result from each wargaming run. These include: the initial friendly dispositions; composition of main and supporting attacks; requirements for supporting fires and use of cover and deception; probable enemy reactions at each phase; probable critical areas and incidents and how to succeed at each; the what and where of the reserve and its possible employments; actions required on the objective; and the advantages and disadvantages of the course of action (p. C-6). The same scenario with the same analysis description is used in the commander's estimate example in this version as was used in 1960. Not all of the products listed above are evident in this example nor are many of the considerations in the method described earlier.

The 1972 manual made no significant changes to the way wargaming was described in the 1968 release. The emphasis on speed and the more informal and active style of the 1977 draft were reflected in several changes in how wargaming was presented. Wargaming is described as "more of an art than a set of prescribed procedures" (B-14). Consequently, no step-by-step method is described nor is a numbered list of results presented. There are, however, two very concrete examples given of wargaming at the division level. The first of these is used to illustrate how a decision might be reached under conditions of heavy contact when little time is available. The problem presented is the urgent need to reinforce a brigade with two additional maneuver battalions. Three feasible sources (courses of action) are considered. The commander and several of his staff discuss the advantages and disadvantages of each while standing around the situation map and quickly arrive at a decision. They consider, at a very general level, the status of the brigades involved, the current and possible future enemy situation, the situation on the flank, the ability to support with fires and logistically, and the time required to reinforce (pp. 5-12 & 5-14). There is no wargaming per se in this example, as the problem itself does not involve combat, but it does provide a good example of rapid decision making by defining and concentrating on the critical factors.

The second example is actually titled "Wargaming a Course of Action" and involves a balanced attack against a delaying enemy. This example concerns itself primarily with the size of the force needed in either attack based on the enemy strengths, probable enemy reactions, size of zone of attack, and terrain considerations. It includes the probable use of the division reserve and general statements about the need for supporting fires, air defense, smoke, and the fact that logistics and equipment are adequate for the mission. It does not talk about the advantages and disadvantages of this course of action nor discuss possible contingencies.

The 1982 and 1984 versions returned to the description of wargaming used in the 1968 and 1972 releases. Almost the same words were used. The only significant difference was the addition of two more products of the wargaming process: the attrition of friendly and enemy forces during each phase of the operation, and the probable location of the commitment of enemy second echelon elements when we are defending. The example of a commander's estimate was dropped from the 1982 and 1984 versions although examples of plans, orders, and staff studies were retained.

Situation Information to be Used

Paragraph 2 of the modern estimate, "Situation and Courses of Action" has always involved a consideration of the important situational factors that influence the choice of a course of action. The release of FM 101-5 in 1932 identified relative combat strength as the primary information concern of "any commander making an estimate of the situation" (p. 28). Its primacy has been reflected, more or less, in all subsequent releases of FM 101-5. This early version listed the force components to be compared as: disposition, numerical strength, combat efficiency (physical condition, morale, and training), composition, material means (including supply and equipment), and assistance expected from neighboring troops (p. 45). Later on, when analyzing friendly and enemy courses of action derived from relative combat strength considerations, the influence of weather, terrain and routes of communication were to be considered (p. 46).

Relative combat power was not broken into its components in the 1940 version, but dispositions, reinforcements, and status of supply and evacuation were listed as separate situational factors to be considered in paragraph two. Along with these were added time and space, terrain, and weather (p. 90). The 1940 release noted that not all the factors would be equally or consistently important across all situations. What was required was to make a deduction from the facts as to their importance in the particular situation (p. 126). This concept was carried through in subsequent releases.

The 1950 version first divided Paragraph 2.a, "Considerations affecting the possible courses of action" into two subsections: "characteristics of the area of operation" and "relative combat power." Under 'characteristics' were listed: weather, terrain, hydrography, routes of communication, politics, economics, and sociology (to include manpower, psychology and public health). Relative combat power was now considered to consist of seven factors: strength, composition, disposition, status of supply, reinforcements, morale, and training (p. 59) which, in substance, do not differ from those listed in the 1939 version.

An example estimate was also included in 1950 in which weather and terrain were the only two 'characteristics' discussed. Weather consisted of a general forecast without deductions. The terrain section covered all the OCOKA factors.⁷ The remaining sections of paragraph 2.a. covered the 'enemy situation' and 'own situation' for the factors of relative combat power discussed in the text but added 'recent and present significant activities' under the enemy situation. No deductions as to relative combat power were included (p. 107-110).

The list of situational factors was expanded in the 1954 release. Included now in the 'Characteristics of the area of operation' were additional factors relating to the local populace: science, techniques, materiel, and transportation which might be important under certain circumstances. Relative combat power now specifically mentioned 'enemy recent and present significant activity' which was to include the enemy's knowledge of our situation, his peculiarities and weaknesses, and use of new or modified weapons, materiel, techniques, or tactics. For the first time, atomic and chemical-biological (CB) weapons were mentioned as factors in relative combat power (p. 137). The example division commander's estimate was more detailed than the one in 1950. Both the 'weather' and 'terrain' subsections included a discussion of the existing situation followed by separate discussions as to its effect on enemy capabilities, our own mission, and on atomic and CB weapon use. Like the 1950 example, this one discussed all the factors mentioned in the text separately under 'enemy situation' and 'own situation' but made no deductive comparisons as to relative combat strength (pp 134-138). The text in the 1954 edition mentioned for the first time the use of assumptions when the facts are not known. It also made a strong point as to the criticality of selecting the factors to be used in reaching a decision where it says, "the judgement of a commander is indicated by his ability to select the important factors in any given situation and to accord them due weight" (p. 97).

The 1960 version established the format for paragraph 2.a. that was carried throughout the subsequent releases:

- (1) Characteristics of the area of operations.
 - (a) Weather.
 - (b) Terrain.
 - (c) Other pertinent factors.
- (2) Enemy situation.
- (3) Own situation.
- (4) Relative combat power.

⁷OCOKA stands for Observation and fields of fire, Cover and concealment, Obstacles, Key terrain, and Avenues of approach; the military aspects of terrain.

No further breakdown of these categories is given in the format section but the discussion under each subheading of (1) above emphasized the need to summarize the effects of the factors listed on enemy and friendly operations and on the use of specific weapons and devices. All those factors not related to weather and terrain which had been mentioned in previous editions (e.g. economics, manpower, etc.) were now to be discussed under "(c) Other pertinent factors." The factors to be considered under "Enemy situation" and "Friendly situation" were more prescribed now with enemy dispositions to include fire support units when appropriate. Enemy composition was to include identity, armament, and type of organization, while enemy strength was to be broken down into committed, reinforcing, air, and NBC-equipped units. Enemy recent and present activity was no longer further broken down, but enemy peculiarities and weaknesses was now a separate factor. To the friendly factors was added our vulnerability to enemy nuclear attack and friendly strength was to include air and nuclear. "Relative combat power" was now a separate, summarizing subsection which was to include a general, overall comparison, plus an evaluation of significant strength and vulnerabilities of the enemy and own forces. To emphasize the primacy of this subsection, it was stated that the results of this comparison "may indicate the basic nature and characteristics of courses of action" (pp. 143-144).

The example of an estimate in the 1960 version again gave separate subsections under weather and terrain for existing situation effects on enemy operations and effects on own operations. Unlike the 1954 example, the NBC effects were not treated separately but integrated into the enemy and friendly effects. The example used three of the "other pertinent factors" and under each had subsections for "existing situation" and "effect on our operations." The "Enemy situation" and "Own situation" sections generally discussed the factors mentioned in the format outline. The "Relative combat power" made the statement that our forces are "somewhat superior" to the enemy's in four specified categories and then listed two enemy strengths (pp. 146-152). The text of the 1960 edition said that "it is essential to consider all facts which can affect accomplishment of the mission" (p. 56). This imperative was dropped from subsequent revisions.

The 1968 release made very few changes to that of 1960. "Radio frequency environment" was added to the "Other pertinent factors" and politics, economics, sociology and psychology were combined under the single category of "civil-military affairs." Enemy composition was now to include order of battle information on the various types of combat arms and fire support units as well as irregular forces. Under "Relative combat power" it now specified that the basic factors to be considered were maneuver units and supporting fires but cover and deception, mobility, control and coordination, terrain, dispositions, weather, logistics, psyops, security and electronic warfare might also be considered. It said that the factors to be considered in determining relative combat power must be determined anew for every operation. It cautioned that the commander should base his comparison on a "general impression" and not get bogged down in "a detailed study of personnel or weapons on both sides" (p. C-3). The paragraph 2.a. in the example is considerably shorter than the one in 1960. It concentrates on the deductions and conclusions, dropping the "existing situation" subsections and the individual discussions of "Other pertinent factors. No "Enemy situation" section is included; it simply refers to the Intelligence Estimate. There appears to be a conscious effort to represent the commander's estimate as a more concise summary of information detailed in the other staff estimates.

The 1972 version was the same as 1968 except that all references to friendly use of biological weapons were removed. The only other change was the addition of "refugees" to the list of "Other pertinent factors."

The novel style of the 1977 draft makes it difficult to compare the information categories considered important with those of other versions. There is no estimate format outline with a list of relevant factors nor an example of a written estimate. For the most part it talks about information needs in general terms (i.e., terrain, weather, and enemy and friendly forces). Appendix B does give a more detailed estimate process to be used when time is available. The 1977 draft emphasized information for determining relative combat power, said to be "the most significant factors in the determination of the tactics of a course of action" (p. B-6). The factors said to comprise combat power are nearly those of the 1968 edition mentioned before. Again, "maneuver strength and firepower differentials" are considered primary and the other factors (i.e., combat multipliers) are the same as in 1968 except that cover and deception is not mentioned and combat service support is added (pp. B-5 thru B-9). Interestingly, the other situational factors otherwise considered under step (paragraph) 2.a. as characteristics of the area of operation and the enemy and friendly situations are talked about in relation to step 3, analysis of the courses of action. Here, for the first time, the term METT-T⁸ is used and the factors discussed under Enemy, Terrain and Weather, and Troops are essentially those listed under paragraph 2.a. in the other releases.

As in other areas, the 1982 edition returned to the pre-1977 format for describing information factors. No example estimate was given but the textual description of information requirements was like that of 1968 and 1972 with few exceptions. Effect of weather on enemy and friendly operations was dropped as a separate subsection and integrated into a single "weather" subparagraph. To the "Enemy strength" breakdown of committed, reinforcing, and air and NBC units was added "artillery." Enemy "air defense" and "anti-tank" capabilities were added as factors to be considered. Under "relative combat power", the combat multipliers factors no longer included "control & coordination" or "security." The burgeoning amounts of information becoming available through improved communications, increased staff and automation was now recognized as a problem in the following warning:

"Commanders must avoid the pitfall of requesting and attempting to analyze too much information personally. There is a great risk of being overwhelmed by endless details. The staff should serve the commander by analyzing details and communicating the essential information, conclusions and recommendations as often as necessary to keep up with the developing situation (p. 5-11).

The 1984 edition makes no changes in information factors or use from the 1982 release.

⁸METT-T stands for Mission, Enemy, Terrain, Troop, and Time available.

Summary and Conclusions

The general method and format of the estimate of the situation have remained remarkably stable since its inception some eighty years ago. The admonition to consider all the pertinent facts in what has become known as the METT-T factors, to generate courses of action from this review and to compare them to arrive at a decision were all present in the first official description of the estimate in 1910. This longevity is probably best explained by its rationality. The decision is a product of pure deductive reasoning. As such it can be taught and described and it leaves an "audit trail" by which the final decision can be justified. All of these things promote the science of warfare and are typical of the evolution of other fields of study. If nothing else has promoted it, the sheer weight of its instructional value and the appeal to professionalism would be sufficient to maintain it.

As with any accepted technique, what has happened over the years is the detailing of the procedures involved. This study did not investigate the history of the estimate between 1910 and 1932, but sometime during those early years the concept of comparing the relative strength of the two sides must have been added. Between the 1932 and 1968 editions of FM 101-5 there was a fairly consistent increase in the amount of detail given in each edition regarding the estimate process. Both "how to" information and the types and amount of data to be used generally increased throughout this time period. With some notable exceptions, as the amount of detailing increased so apparently did the confidence of those responsible for FM 101-5 in the effectiveness and applicability of the estimate process. Statements like the one first appearing in 1968 that it is neither "practical nor possible" to select the best course of action without going through the entire process are indicative of this confidence.

After 1968 there is a "leveling off" of the detailing of the estimate process. The subsequent three editions and one draft of FM 101-5 have added relatively little in the way of "how to" information or of additional data requirements. In fact, even the 1968 edition seems to retreat from the 1960 imperative to "consider all facts that can affect accomplishment of the mission" by dropping this statement and shortening the example commander's estimate by reducing the number of facts included. Without interviewing the principals involved it is mere conjecture as to why this occurred. It may be that the estimate was considered adequately detailed by 1968. It may also be that it was considered too detailed as is suggested by the change from 1960 to 1968 and the retreat in the 1977 draft to a less prescribed process. The next release of FM 101-5 may, however, considerably expand the detailing of the estimate process if it follows the guidance of the CGSC Student Text 100-9 "The Command Estimate" published in 1986. These documents, intended to train the estimate process, contain many stepwise details and analytical methods that could possibly be added to the FM 101-5 appendices.

There are, however, arguments against a detailed, formalized estimate process that are suggested by the apparently reactionary draft of FM 101-5 that appeared in 1977. In this draft frequent mention is made of the time constraints affecting decision making on the modern battlefield. There are statements like

"speed is the essence of the process in the fast-moving environment"; "at division level and below the commander's estimate is normally mental, rapid, and evaluates those factors having a bearing on mission accomplishment"; "the commander must not usurp planning time which is vitally needed by subordinate commanders"; and "during the heat of battle, the commander only has time to monitor critical parts of the action, judge the situation, make decisions, and issue orders." There are ample reminders that when time is available a complete estimate should be conducted, but there are also ample suggestions that on the modern battlefield this will not usually be the case. The shortcuts suggested involve limiting the staff participation, with the commander doing most of the estimate personally as a mental (i.e., unwritten) exercise. Throughout the 1977 draft it is suggested that analysis (step 3) and comparison (step 4) of courses of action occur simultaneously as one step, but other than that the commander is encouraged to follow the standard estimate process:

"During the battle the same logical thought process must be used, but at a much faster pace since time is critical The commander's mental estimate is rapid and follows the above (four step) sequence using available information and staff recommendations, tempered by the commander's experience and best judgment."

The example that follows, however, is one that would not require wargaming of the possible courses of action under any circumstances, as the problem does not directly involve contact with the enemy.

To summarize what the 1977 draft suggests about the effects of time compression on the estimate process: it will reduce the number of people involved, make it a strictly mental process but keep the same general procedure (however, the simultaneous analysis and comparison of courses of action unique to 1977 would in itself reduce the time required and alter the process). It is implied in the rapidity of the process and the reliance on the judgement of the commander that not all relevant factors described in other editions would be considered. What is explicitly stated and illustrated is that multiple options should still be generated, analyzed in some fashion, and compared.

Yet the 1977 draft is not without some ambivalence in regard to the conscious consideration of multiple options. Early in the chapter on decision making, before the estimate process is discussed, the commander's concept is described in this fashion:

"The commander always has a concept in mind for the employment of his unit. The more he knows, the more he develops the concept. When he is given a mission (or a new mission), as the situation shapes up, he refines his picture . . . He knows what he has to do and, conceptually or in detail, how his unit will do it."

Clearly, what is described here is more than just the commander's intent, it is a course of action. To some extent, this contradicts the later statements about generating and comparing multiple courses of action. It is more in line with the concept of naturalistic decision making and "progressive deepening."⁹

⁹For instance see Thordsen, Galushka, Klein, Young and Brezovic (in press) A knowledge elicitation study of military planning, ARI Technical Report 876.

This concept holds that tactical decision making under field conditions is characterized by the generation of a single course of action and its progressive detailing until it is either implemented, modified or rejected due to some discovered insurmountable fault. If this is true, then an argument against the formal estimate process is that, under time pressure and stress, it is either considered too unwieldy to carry out, or in some sense it is "unnatural". Under stress the decision maker will depend more on intuition and experience.

This last point relates to the second argument against a standardized estimate process that is also suggested by the rhetoric of the 1977 draft. This draft talks about reliance on the experience and judgment of the commander. It speaks of the commander "sensing the enemy's feelings" and "knowing and feeling the same aspects of the situation as they pertain to (his) unit." It describes wargaming as "more of an art than a set of prescribed procedures." These excerpts suggest a reliance upon experience, perception and judgment in reaching a decision. The same ambivalence exists in discussing the merits of using the logical, objective estimate approach, but the grain of the argument is here: if everyone uses the same externalized, systematic and, to some extent, quantifiable approach to decision making, then we risk losing the truly creative solutions. We become too predictable. The often unexplainable expert's "sense of what to do" would be disregarded or lost in the need to justify everything.

These are two commonly expressed fears regarding the institutionalization of the estimate process that may have motivated the authors of the 1977 draft. In any case, there was a speedy return in 1982 to a more confident expression of the universal applicability of the estimate process.

In conclusion, the estimate of the situation, as the means of selecting the best course of action has a long history, and its detailing and expansion has provided fertile ground for the development of the science of warfare within the US Army.

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