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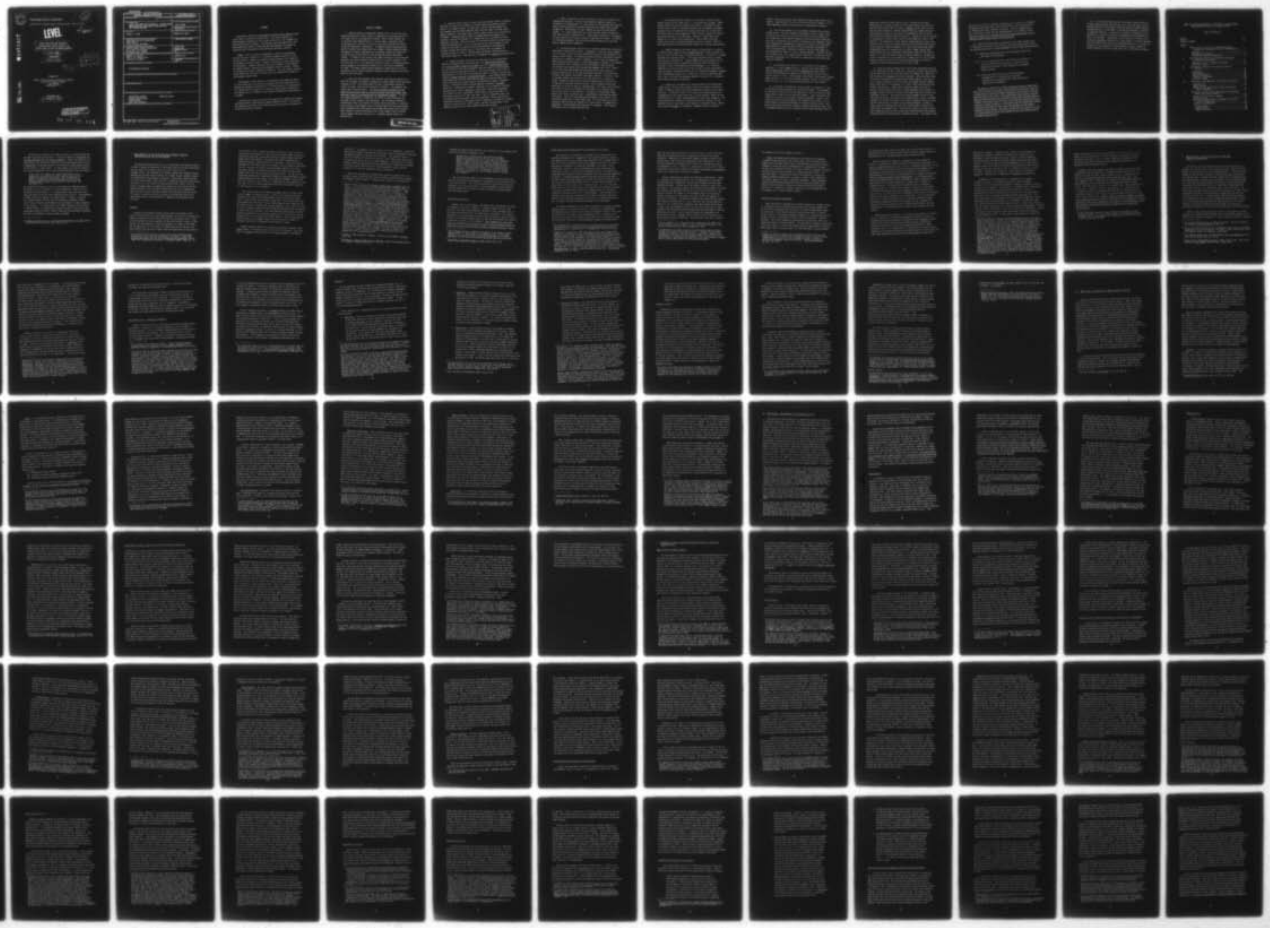

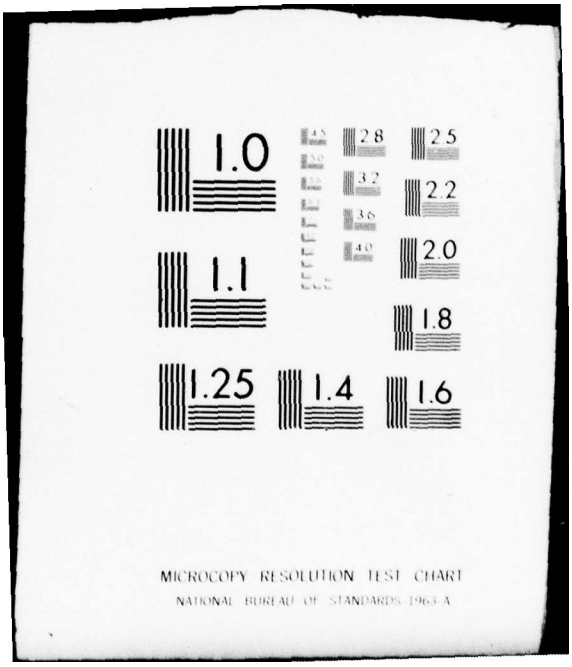
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PREFACE

The dominant theme of the Department of Defense Annual Report FY 1979 is the need to improve NATO capabilities. This study addresses the armored-warfare dimension of the problem and develops a new framework for analyzing NATO policy options. The proposals here developed differ from the conventional wisdom in being premised upon maneuver (as opposed to attrition) and in focusing on the problem of operational reserves.

Chapter I and II discuss the Department's analytical methodology, and the divergence between U.S. and Western European perceptions of the military balance. Chapter III examines current proposals for countering the preemptive surprise attack. Chapter IV offers more robust alternatives to the problem. Chapter V analyzes Territorial Defense in the framework of armored warfare, focusing on the preemptive surprise problem. Chapter VI discusses the issue of operational reserves. The final chapter evaluates three alternative solutions for obtaining a true conventional defense of the European central front.

The purposes of this study are to contribute to the debate on NATO, to focus attention on the art of war aspects (now often neglected) and to examine the assumptions underlying U.S. military doctrine and organization. It is hoped that this study will be useful to policy-makers responsible for shaping the U.S. response to the problem of deterrence and warfighting in Europe.

The study was funded by the Assistant Secretary of Defense for Manpower and Reserve Affairs under Contract Number MDA903-76-C-0270. The opinions here expressed are those of the author and do not constitute an expression of official opinion or policy.

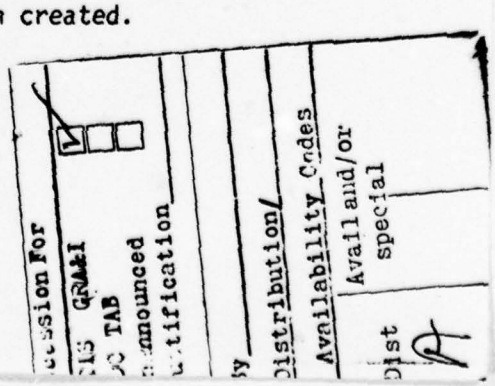
EXECUTIVE SUMMARY

1. NATO can obtain a conventional balance. But it can only do so by generating additional forces to man its ramparts or by placing the bulk of its present forces into operational reserve. While strong ramparts can in principle stop armored attacks, it has not been a successful tactic in the past and is unlikely to be one in the future even with the advent of the new "defensive" technologies. If ramparts develop discontinuities (which is highly likely given the size of today's forward deployed forces), the defense is readily compromised by an opponent geared for finding and exploiting these discontinuities (the present-day Soviet operational scheme). If ramparts prove strong, they remain vulnerable to the echeloned battering ram tactics formerly characteristic of a Soviet offensive. On the other hand for all its compelling military virtues, a strong operational reserve without a corresponding forward wall is politically infeasible for NATO. The Germans demand forward defense to commit their allies (for deterrence) and to counter ambiguous incursions into or possibly territorial grabs of their territory.

2. While the United States since 1963 has acted upon the premise of a NATO 14/3 strategy, the Western Europeans have remain wedded to the deterrence strategy of 14/2. The United States has seen a conventional defense as within its grasp, requiring only marginal adjustments. The Europeans have always seen a large disparity. Thus while expensive adjustments of the AD70 variety have been seen as closing the gap by the United States, they have been viewed as counterproductive by the Western Europeans. In their view these adjustments are expensive, do little to close the actual gap, and undercut their emphasis upon deterrence. For the Western Europeans, conventional forces are primarily to satisfy the United States in peacetime and to provide a good enough "show" in wartime (again for the United States, since presumably the Soviets would have already anticipated and discounted their impact) to justify escalating first to the symbolic use of tactical nuclear weapons and then quickly to U.S. strategic weapons against the Soviet Union.

3. Tactical nuclear forces as they exist today perform neither (strategic) deterrence by threat of punishment nor (conventional) deterrence by denial; theirs is a linkage function. By definition, tactical nuclear weapons are not targeted upon the Soviet homeland (most lack the range), and they cannot defeat comparably armed enemy ground forces except by heavy use of destructive firepower. Inadequate denial forces can weaken deterrence because their presence indicates the defender will attempt their use, providing an intent aggressor with time. Time can be used for territorial grabs and thereby induce long-term demoralization. Or it can be used for the rapid movement of armor along axes of advance in order to unravel the cohesion of the defending military system, particularly that of a coalition--with its tendency to shatter at points of stress. Reliance upon conventional forces requires a true denial capability. Anything less is dangerous and potentially destabilizing.

4. Western European willingness to contribute to a true conventional balance is dependent upon three conditions: (i) undiminished deterrence, (ii) costs at roughly today's real levels, and (iii) contained destruction. The last condition rules out warfighting both with tactical nuclear weapons and by sustained conventional warfare o the kind practiced in World War II. Considerations of cost rule out anything more than a "stalwart" conventional defense if today's posture is the building block. A true defense would require considerably more divisions than NATO has today and obtaining them with today's building blocks would require proportionate increases in budgetary outlays. Continued deterrence always requires a meaningful strategic capability. Paradoxically, however, deterrence in the context of strategic equivalency may actually decline as conventional forces are strengthened. This holds true until conventional forces attain a significant denial or warfighting capability in their own right. That is, deterrence looks like a"U",being high (but unstable) with few conventional forces, declining as conventional forces are increased to give a semblance of conventional defense capability (the so-called nuclear pause), and then climbing again as the adversary perceives that a true capability has been created.



5. NATO is considering numerous measures for coping with surprise and reduced warning attack. Besides being expensive, however, several are vulnerable to countermeasures, are more suited to short warning than surprise attack, and may actually be counter productive when viewed from a broader perspective. None address the chaos induced by partisan and heliborne raiders. It is here argued that less costly and more robust alternatives than those presently advocated exist. These address surprise as a by-product of other objectives and require (complex) organizational change. In addition the "Associated Measures" and "Confidence-Building Measures" of the arms control community merit attention.

6. In armored warfare the brunt of a successful defense has historically been borne by operational reserves. A fortiori, if tactical nuclear weapons are to be used: static positional defenses are obviously more targetable than elusive mobile forces. For Westerners against Russians operational reserves should have an additional special poignancy. First it must be recognized that positional warfare implies a certain passivity on the part of the defense and an emphasis upon firepower and attrition warfare. Mobile warfare, on the other hand, depends upon maneuver and command flexibility. Second it is to be noted that Western and Eastern militarys putatively have opposite characteristics: the East has numbers and lacks initiative while the West lacks numbers and prides itself upon individual initiative. That is the West depends upon tactical brilliance and fine coordination to offset inadequate resources and reserves--characteristics which can only be obtained by wide-open maneuver warfare. Soviet command rigidity may make them susceptible to maneuver counterattacks. But that is quite distinct from attrition losses to firepower and the inability to replace losses at critical points in time and place. The West as now organized cannot absorb such losses; the Soviets can. Traditionally, they function amidst high losses. Their size and organizational pattern allows them to field a military system that is almost hydra-like. As in the fable, the Soviet system may similarly not be vulnerable to losses unless its command-brain subsystem is itself damaged and thrown off its "program". This requires dislocation, not the losses from attrition.

7. By contrast NATO has deployed its divisions in national corps sectors (the so-called "layer-cake") in little more than a cordon. NATO's forward forces are so thinly deployed that there is no defense-in-depth (in the sense of physical occupation by many units as opposed to movement through an area or occupation of alternative positions by a single unit), and units cannot be leap-frogged past others to give a measure of respite and precaution against the unforeseen. Reserves in each corps sector amount to little more than a brigade each. Each of NATO's two army groups retain only one earmarked German division for reserve. NATO can thus mount neither a serious positional defense nor a serious counterattack.

8. NATO's shortage of divisions cannot be filled from U.S. sources. The United States could reinforce considerably faster than at present, but only up to the ceiling posed by absorption capacity, a function of in-theater personnel and equipment stocks. The binding constraints are at present organizational and doctrinal. Greater POMCUS stocks and enhanced airlift are expensive and address symptom manifestations rather than the real problems of rapid reinforcement and field deployment. U.S. forces by themselves can also form but a small part of total alliance requirements; they can become a meaningful addition only if the Western Europeans increase their reinforcement capability, in which case it will be found that NATO can in fact field more than adequate numbers of divisions for its defense within present budgetary constraints.

9. Analysis of the German Blitz and the present Soviet operational scheme clearly indicates that programs which do not address the central issues of maneuver warfare and strong operational reserves are not viable solutions. It should be noted in this regard that standardization and interoperability for ground forces are of little practical import as long as NATO retains its present compartmentalized "layer-cake" deployment. The Soviet operational scheme will reinforce the natural tendency for each national corps to view itself as the target of a principal thrust. Rather than releasing brigades (in themselves inadequate forces) to adjacent

sectors, each corps will be likely demanding brigades from adjacent corps sectors. Sophisticated C^3 will do little to correct this anomaly: it will simply aggregate and pass-on perceptions of subordinates to seniors.

10. The trained manpower for large Western European reserve forces already exists. But their equipment procurement and their proper organization into structured units has been inhibited by the transference of U.S. experiences to the Western Europeans, who have different experiences and live in a qualitatively different institutional and geographic context. This influence has caused NATO to organize its reserves into replacement pools geared for sustaining active units by individual replacement in lieu of the traditional continental system of forming large numbers of units designed for impact in a war of spaced campaigns. Echeloned forces--the way armor ought to be fought--reduces logistical and readiness requirements upon individual units and permits a mobilization system based upon sequenced readiness.

11. The challenge with reserves is (i) to contain their monetary costs and (ii) their demands upon the c tizenry while making them (iii) rapidly mobilizable and (iv) militarily effective upon mobilization. Israeli-like solutions with repeated call-ups satisfy criteria 3 and 4, but not criteria 1 and 2. Cadre systems--like those of the Soviets--straddle these criteria. For territorial defense systems, criteria (ii) conflicts with (iii) and (iv). Only the Dutch RIM satisfies all four criteria.

12. A solution satisfying the criteria stated in paragraph 4 is that of the mobile defense combined with territorial defense. The advantages of territorial defense and military operations in built-up areas are their organizational simplicity and cost-effectiveness. They can be based upon reservists, and they do not require expensive equipment. However, they cannot be expected to stand against full combined-arms attacks using the entire range of weapons and equipment available to regular forces. They must be considered auxiliaries, capable of coping with regular forces only in secondary sectors and only in special terrain conditions where they can

engage the attacker without becoming readily targeted and destroyed. Operationally, it should be noted that territorial defense and defense of built-up areas have no function except as adjuncts to the regular forces. They are purely defensive. Against opposing forces as large as those of the Warsaw Pact, which are too large to be defeated by attrition alone, these forces by themselves cannot be decisive. Victory can only be obtained by the maneuver of heavy regular forces to break down the attacker's own cohesion. The importance of these defense systems therefore derives from the fact that (i) they can be more effective against surprise than prohibitively expensive readiness measures; (ii) they can tie down large numbers of opposing forces if integrated into an overall scheme whereby these defense forces can play a meaningful complementary role with the regular forces; (iii) they can relieve expensive regular formations, allowing the latter's concentration into an operational reserve; and (iv) they provide screening forces and territory to mask the positioning of reserves for launching flanking ripostes against Soviet thrust lines.

13. While Territorial Defense may be politically unacceptable because of its undermining the NATO "layer-cake , two other solutions (Restructuring and the Dutch RIM) are available that retain the form of the "layer-cake", while obtaining the essence of the mobile defense. These solutions accept the political imperative of deterrence and forward defense. But they do so in a way that remains militarily viable (as opposed to NATO's present plans, which have all the earmarks of a "Plan D"--the 1940 British-French advance into Belgium). Though taking different routes, both rely on already trained European reservists, thereby generating large numbers of suitably trained divisions to thicken the forward crust and to provide the operational reserves. The essential difference between the two is that restructuring requires large scale army reorganization in order to release personnel for manning the cadres of the newly structured reserve divisions. The RIM solution does not require these wrenching changes. Instead it focuses upon replicating active units by a system that in effect places entire units on extended leave. This solution requires very small cadres, small enough that most can be provided from "double hatting" the personnel overhead normally associated with a peacetime military. The anomaly of the

RIM solution is that its (present) formations are to be used in a framework of armored warfare when these formations internally remain structured for an "infantry with tanks" approach to warfare. This can be made to work, but it obviously follows that the optimum solution is to combine the two: NATO units should be restructured specifically for armored warfare and its Western European reserves should flow from the RIM.

14. However desirable both to restructure and to adopt the RIM, each is nevertheless sufficient for attaining a true conventional defense within the outlined constraints by taking advantage of the following three Realities:

(i) Additional reserve divisions can be obtained at much less cost than active formations.

(ii) U.S. air assets double the size of the central front air forces (including France and the U.K. base) cannot be deployed by M+30 days, in part because of the European beddown problem.

(iii) No further need for air and sea-lift enhancement programs exists if in-place U.S. forces are restructured and reconfigured for rapid absorption of CONUS-based reinforcements.

The import of Reality (i) is that the Western Europeans could triple their division count at less than a 30% increase in army costs. Half this increase would be high quality mobile formations; half would be sufficing anti-tank blocking divisions. Their combination would provide a long-war hedge, and after suitable time a measure of (physically-occupied) defense-in-depth. NATO could retain the form of the layer-cake while providing the essence of the mobile defense. A very robust and true conventional defense could thus be obtained for less than a 15% increase in total Western European military budgets. The import of Realities (ii) and (iii) is that it is even possible to obtain this defense at less than present costs by structural specialization.

15. A shift from balanced national contingents towards (partial) alliance specialization--the Americans to air and naval power, and the Western Europeans to land power--indirectly leads to greater equipment standardization as a side-effect of the implied dominance of countries in specified functions. This presents a structural argument for standardization in addition to those of interoperability and economies-of-scale in procurement. Significantly, this approach to Alliance rationalization preserves a favorable U.S. trade balance in military equipment (and the long-run viability of the peacetime presence of U.S. troops in Europe) and, by solving the military problem in Europe, allows U.S. security planning to be cast wider than that of a continental strategy.

SHORT (AND LONG) WAR RESPONSES: RESTRUCTURING, BORDER DEFENSE, AND RESERVE MOBILIZATION FOR ARMORED WARFARE

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

SHORT (AND LONG) WAR RESPONSES: RESTRUCTURING, BORDER DEFENSE, AND RESERVE MOBILIZATION FOR ARMORED WARFARE

The Best Strategy Consists in Being Very Strong, First Everywhere and Then At The Decisive Point - Clausewitz

It is reputed that Herman Kahn once told the assembled generals of the USARVN that there were many ways to win the war in Vietnam but only one to lose it--and they had found that one. Something similar seems to be occuring in NATO's central region. NATO's forces today--as will be discussed below--are incapable of coping with a serious Warsaw Pact attack. Yet NATO spends more on its military forces than the Warsaw Pact;[1] and if France is included, NATO has nearly a quarter million more men in its peacetime air and ground forces stationed in the NATO Guidelines Area (NGA) than has the Warsaw Pact.[2] This strongly suggests that solutions can be found to at least some of NATO's military problems. This paper is designed to show that there are indeed at least three ways, not mutually exclusive, to solve NATO's long and short war and surprise attack problems.

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[1] According to The Military Balance, NATO outspent the Warsaw Pact in 1976 by $160 to $136 billion. (In fact, due to the index number method of converting Soviet budgets to dollar terms, the differential is larger.) In military manpower, NATO again had more men under arms (4.82 to 4.75 million). In estimated reservists the pact led NATO 6.1 to 5.1 million. (However, if estimated reservists were commonly defined (vice institutionally defined by law) as all men or all men with formal military training within specified age brackets, NATO's number would again be the larger.) The Military Balance 1977-78, International Institute of Strategic Studies, London, 1977, pp. 82, 84.

[2] The statistic normally cited for the NGA is (in thousands) 782 NATO versus 935 Pact (ground) and 193 NATO versus 204 Pact (air). The French have an additional 280,000 ground and 104,000 air, the bulk of which are stationed in Northeast France. Ibid, pp. 22, 23, and 110.

The fact that a solution has eluded us for the last three decades does not mean a solution does not exist. It may only mean that the problem has not been approached from the right perspective. Indeed, the solutions suggested during that period were generally of the same generic breed--that of a System View, an approach central to the analytical methodology developed in this country in recent years. For the problem in Europe, this approach can be aptly summarized from a recent Defense Department report to Congress:

> If our goal is to improve the combat effectiveness of our forces, we should improve the basic functions which must be performed to produce combat power in war and readiness in peace. An examination of those functions and how they are performed should improve the evaluation of the forces' combat capability.[1]

This approach is plausible, and a valid technique for component analysis. But being a subset of economics, it can be addressed in those terms and recognized as micro-analysis. In economics, macro-logic does not follow from, and cannot be derived from, aggregated micro-analysis. Correspondingly if NATO's conceptual approach to armored warfare in Europe is invalid, the systems approach will not solve the problem by component analysis. It will only refine the manifestations of the approach in vogue, regardless of its validity. If it can be shown that NATO's approach to war planning is indeed invalid, it follows that solutions directed at attaining a true conventional defense of NATO's central front must be accordingly reassessed for their correspondence with the change in concept.

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[1] A Report to Congress on U.S. Conventional Reinforcements for NATO, Office of the Secretary of Defense, June 1976, p. VI-7.

I. NATO STRATEGY: THE POLITICAL PROBLEM OF DIVERGENT INTERESTS AND PERCEPTIONS OF THE MILITARY BALANCE

Current NATO strategy (MC 14/3), as is well-known, was formally adopted in 1967, following the departure of the French from the military organization, and after years of acrimony between the United States and its European allies. The strategy of the nuclear tripwire and automatic nuclear response was replaced by the strategy of a nuclear "pause", generally known as forward defense and graduated escalation. Conventional forces were now officially given greater status and role in defensive operations, and nuclear escalation was to be a matter of (American) deliberate choice. But the matter of by whom, when, and how nuclear weapons are to be first used and employed remains the core of NATO strategy (at least for the Europeans), and contributes to most frictions between the United States and its allies. This paper is concerned with but one aspect of the problem--the role of conventional forces, in particular the r deterrent and warfighting capabilities.[1]

Overview

Originally the Western European nations under the auspices of the Western Union (Brussels Treaty of 1948) accepted the notion of a conventional defense, proposing as many as 80-85 divisions for the central front. Even after the Western Union was expanded into the North Atlantic Treaty in 1949, the goal of large numbers of divisions remained. At Lisbon in 1952, NATO set its famous goal of 96 divisions, of which 25-30 active divisions and 30-35 reserve divisions (mobilizable within one month) were to be maintained

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[1] For a discussion of strategy in general and of the interface between conventional and tactical nuclear weapons, see Steven L. Canby, The Alliance and Europe, Part IV: Military Doctrine and Technology, Adelphi Paper 109, International Institute of Strategic Studies, 1974, pp. 1-9.

on the central front. Shortly thereafter, the new U.S. goal (initially resisted by the Europeans) of "more bang for the buck" began an erosion of these force objectives, substituting tactical nuclear weapons and force modernization for manpower. By January 1961, NATO's projected force objective had been reduced to 28 and 1/3 divisions. During this period, strategy and force levels (but not structure) could be argued as consistent. The U.S. strategic and tactical nuclear monopoly offered a one-sided advantage, whereby the United States could wield NATO's military power without undue cost and retaliatory burden upon itself. At that time the appropriate analogy was a conventional shield of Europe-based forces and the avenging American nuclear sword. For the Western Europeans, this was the best of all worlds: low-cost defense in peacetime and the opportunity to be the 'eye' of any war storm, whose destructive forces would fall primarily on the homelands of the superpowers.

This idyllic world for the Western Europeans ended in the late-1960s with the advent of strategic parity. At the risk of oversimplification, European politicians have remained wedded to conditions that no longer exist. Their military and diplomatic leaderships, on the other hand, have been mesmerized by the fear of a tacit Soviet-American deal refocusing the destructive forces of war onto the European homelands, and by the possibility of a U.S. withdrawal that would leave Western Europe defenseless and exposed to Soviet political coercion. Thus while NATO has come to mean a nuclear shield (or umbrella) and a non-nuclear sword for the United States, for the European allies it has retained its former meaning. Their view of defense remains essentially unchanged, though they are willing to concede (in principle) that NATO's conventional shield should be strong.

Western European adherence to what could be termed a strategy of the <u>stout</u> tripwire is prevalent in most of their policy statements. Their concept of a <u>stalwart</u> defense does not mean a <u>true</u> conventional warfighting

capability.[1] Its meaning is in the context of crisis management: conventional forces strong enough to provide options during crises, and to prevent excursions and nibbling actions on the part of the Soviets. Its practical import is similar in meaning (if phrased differently) to the French view, that the role of conventional forces is to test enemy intentions. According to this French concept, ambiguous aggression would be countered with a conventional response, and serious aggression would be met with an automatic (French) nuclear response, as in the old strategy of massive retaliation.[2]

This is not the American interpretation, which now assumes that it is possible to have a major war that does not rapidly escalate to use of theater or strategic nuclear weapons.[3] Elements of U.S. policy, as articulated by

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[1] See for example, the British Statement on the Defense Estimates 1977 (pp. 9-10); "...it is unrealistic to expect NATO to have sufficient forces in place to be able to deal effectively with every form of attack in every location without ever needing to isolate the level of conflict. ...Adequate conventional forces are required to repel *limited* conventional attacks and to impose delay and inflict serious losses on large-scale conventional attacks, thereby demonstrating to the aggressor the determination of the Alliance to defend itself, making credible to him the risks of escalation that he is running, and providing time for diplomatic efforts to resolve the conflict." The German White Paper 1975/1976 (The Security of the Federal Republic of Germany and the Development of the Federal Armed Forces)--is more explicit: "The conventional contribution of the European allies must be substantial to ensure the continuation of the strategic contribution made by the United States to the protection of Europe (p.48). Attacks launched by an overwhelmingly superior aggressor must be contained until the political leaders can resolve the military conflict with political means or until they decide to proceed to one of the various stages of escalation in the interest of defence (p.84). NATO's response must be such as to preclude sustained combat operations in the territory of the Federal Republic ..." (p.85). A report to the Assembly of the Western European Union (Rational Deployment of Forces on the Central Front), April 1975, p.22) by General U. de Maiziere, former Generalinspekteur der Bundeswehr, states: "With the available forces the deterrent effect demanded by the strategy of flexible response can only be produced if nuclear means are included. With purely conventional means, only an attack limited in regard to area and objective can be warded off with a chance of success."

[2] General d' Armee Adrienne M. Fourquet, "The Role of the Forces", Survival, July 1969.

[3] Planning U.S. General Purpose Forces: Overview, Congressional Budget Office, U.S. Congress, January 1977, p.13.

Secretary of Defence Donald Rumsfeld, are distinctly at cross purposes with those of the Western Europeans, to wit:

> Nuclear forces credibly deter some limited--although potentially devastating--hostile acts, but the primary burden of deterrence now falls increasingly on conventional forces, although their effectiveness is enhanced by the nuclear capabilities that underlie them; conventional wars appear relatively controllable, since their tempo tends to be slower, allowing policy makers to act without excessive pressure.[1] Limitations on a conventional conflict in terms of territory, weapons, or aims can more readily be defined and accepted.[2]

Due to the obvious danger to its own homeland, the United States has come to view warfighting (conventional, and possibly even tactical nuclear) as desirable options. This shift to warfighting could hardly please the Europeans, but on the other hand it could be regarded as no more "unfair" than the burden which the Soviet strategic buildup had already shifted onto the United States.

The NATO Policy Failure

However right in the abstract, the United States nevertheless has erred in "packaging" its shift in emphasis. Instead of addressing this issue directly, the United States addressed subsidiary issues, allowing itself to be accused of deviousness and its credibility to be eroded. U.S. analyses contending that a conventional balance of forces existed--or nearly existed--served to fuel Western European suspicion that the United States was creating a rationale to justify a U.S. withdrawal. More fundamentally, the United States, as the leader of the alliance, failed to devise programs whereby the forces for a true conventional defense could be generated and used in such a

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[1] This statement implies a profound misconception of the nature of modern armored warfare, a theme which will be addressed later in this paper. Suffice it to say that it hardly describes the behavior of the French Government and its British ally during the German invasion in June 1940.

[2] Annual Defense Department Report FY 1978, January 1977, p.22.

manner that Western Europe would not be destroyed in the process.

The causes of this failure (it is contended in this paper) were the American philosophy of war, compounded by the systems approach to analysis. The American military have allowed their approach to war to become dated; in turn, the civilian leadership and analytic community sought to rely upon a methodology independent of substantive knowledge of the subject field (conventional warfare). With a methodology based upon constrained maximization but unable to define an Effectiveness Function, this methodology broke down into exercises of cost minimization,[1] and trans-national comparisons of inputs.[2] Flawed methodology combined with the realization that NATO's military inputs in men and budgets were larger than those of the Warsaw Pact (the so-called People-PEMA paradox) led U.S. civilian decision-makers to underestimate the magnitude of the military problem. Where U.S. decision-makers have seen the military gap as small and resolvable through adjustments in resource rationalization, the Western Europeans have seen the gap as large and unresolvable save by U.S. nuclear weapons. And even had the U.S. approach closed the gap at reasonable cost, there still would remain the problem of the perceived destructiveness of the U.S. firepower approach to war, its memory revived by the media coverage of the Vietnam War.

The continued adherence of the Western Europeans to a tripwire strategy, however clothed, in conjunction with U.S. conceptual and methodological shortcomings accounts for the inconsistency in strategy and force levels that has arisen with U.S. emphasis upon conventional forces. Instead of the 28 and 1/3 divisionsof the trip-wire period, NATO now has the smaller number of 24 divisions in place for a more demanding strategy of forward defense.

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[1] For a mathematically-based exposition of the deficiencies of a truncated maximization model, see Steven Canby, Military Manpower Procurement: A Policy Analysis, Lexington, Mass.: D.C. Heath & Co., 1972, pp. 135-144.

[2] Comparisons like percent of GNP spent upon military forces (which NATO spends so much rhetoric on) are an indication of relative monetary burden. They are, however, poor indicators of military effectiveness and the efficacy by which a society generates its military forces. Sweden (3.7) and the Netherlands (3.4) spend roughly the same percent of GNP on their military. Yet the smaller Swedish nation with a population of 8.3 million generates a much more credible defense force than Holland with a population of 13.9 million. Similarly Finland with a population of 4.7 million spends relatively less than half (1.1) that of the Dutch and Belgians (3.0), but yet has developed and demonstrated (in WWII) a credible defensive capability. The Military Balance, op.cit., pp. 82-83.

NATO can count upon an additional 5 French divisions, but only after some delay and at the political cost of compromising its plans for nuclear escalation. Removing the inconsistency between strategy and force levels by returning to the trip-wire strategy hardly seems appropriate. Yet it could be preferable to attempting the fiction of a strategy which cannot be implemented. The U.S. notion of a nuclear pause is only valid if strong conventional forces exist. Without such strength, deterrence is compromised--a point well-recognized by the Western Europeans.

Little is being done to correct this dangerous inconsistency. Though it is sensed,[1] the United States has still to acknowledge its conceptual and methodological inadequacies, and deal with programs which now remain premised upon them. Instead, the United States continues to busy itself with detail: with alliance programs like AD-70 which are designed to increase the readiness and homogeneity of NATO's 24 divisions,[2] and with U.S. programs to increase the numbers of reinforcements from its own resources, thereby increasing its contribution, but with insufficient overall conventional significance. The Western Europeans find themselves torn between their desire to please their U.S. ally, and their fear that the NATO programs will only increase their peacetime costs while weakening deterrence. In their view, the programs do little to close the military gap, as highlighted by the difference remaining between the available number of NATO and Warsaw Pact divisions. Even if present programs are implemented, the Warsaw Pact will still outnumber NATO 58 to 29 in terms of divisions in a standing-start attack; by M+30 days, the Warsaw Pact could still reinforce

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[1] See, for example, U.S. Senator Gary Hart, "Prescribing for NATO's Ills: Is the Diagnosis Right?", Address to the 92nd Annual Conference of the Militia Association of New York, September 10, 1977.

[2] Standardization can obtain economies-of-scale through common equipment and make multi-national forces more similar. Interoperability attempts to make multi-national units operationally compatible. (However, standardization can in fact cost more because of the political realities of multi-national licensing; and interoperability for ground forces is somewhat moot as long as NATO retains its layer-cake deployment.)

with another 30 divisions compared to NATO's 5.

Indeed, the upgrading and modernization of Soviet forces deployed in Eastern Europe during the last several years,[1] and the growing Soviet capability for surprise attack, have caused back-tracking among the Western Europeans in their desire to accommodate the U.S. demands for increased reliance upon conventional forces. As late as 1974-75, the Western Europeans were beginning to accept the need for strong conventional forces. The mood now, however, is more akin to that at the beginning of the decade. Stagnant European economies are, of course, a factor in this regression. (It should, however, be seen as secondary contributor. Western European impetus toward enhanced conventional forces occurred during West German Chancellor Helmut Schmidt's accession to power and James Schlesinger's tenure as U.S. Secretary of Defense, events which occurred after the OPEC oil embargo with its severe economic impact.)

Closing the Divergent Interest Gap

While the relative interpretation of NATO strategy has a semantic flavor, it is nevertheless true that the timing of the use of nuclear weapons will be of critical importance, both as to who is to bear the destructive impact of nuclear war, and to Soviet incentive to use military force in central Europe. Both U.S. and Western European strategies are 3-tiered (conventional, tactical nuclear, and strategic nuclear), as was the preceding trip-wire strategy. The critical questions, particularly since the early 1960s, have always been those of relative emphasis. For the Western Europeans, conventional forces are primarily to satisfy the United States in peacetime and to provide a good enough "show" in wartime (again for the United States, since presumably

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[1] Whereas it used to be argued that the numbers of Soviet divisions were largely offset by the larger size of Western divisions, Soviet divisional establishments today are as large as Western divisions in terms of actual combat manpower, tanks, and artillery. The Military Balance, op. cit., pp. 92-93.

the Soviets would have already anticipated and discounted their impact) to justify escalating first to the symbolic use of tactical nuclear weapons and then quickly to U.S. strategic weapons against the Soviet Union.

Western European willingness to contribute to a true conventional balance is dependent upon three conditions: (i) undiminished deterrence, (ii) costs at roughly today's real levels, and (iii) contained destruction. The last condition rules out warfighting both with tactical nuclear weapons and by sustained conventional warfare of the kind practiced in World War II. Considerations of cost rule out anything more than a "stalwart" conventional defense if today's posture is the building block. A true defense would require considerably more divisions than NATO has today and obtaining them with today's building blocks would require proportionate increases in budgetary outlays. Continued deterrence always requires a meaningful strategic capability. Paradoxically, however, deterrence in the context of strategic equivalency may actually decline as conventional forces are strengthened. This holds true until conventional forces attain a significant denial or warfighting capability in their own right. That is, deterrence looks like a "U", being high (but unstable) with few conventional forces, declining as conventional forces are increased to give a semblance of conventional defense capability (the so-called nuclear pause), and then climbing again as the adversary perceives that a true capability has been created.

Deterrence works in two ways: by the threat of punishment if a hostile act is initiated, or by denying the aggressor the objective of his act. Strategic forces pose the threat of punishment on one's homeland; conventional forces pose the denial function against ground-seizing forces. Tactical nuclear forces as they exist today perform neither of these functions; theirs is a linkage function. By definition, tactical nuclear weapons are not targeted upon the Soviet homeland (most lack the range), and they cannot defeat enemy ground forces except possibly by heavy use of

destructive firepower.[1] Inadequate denial forces can weaken deterrence because their presence indicates the defender will attempt their use, providing an intent aggressor with time. Time is a critical commodity. It can be used for territorial grabs and thereby induce long-term demoralization. Or it can be used for the rapid movement of armor along axes of advance in order to unravel the cohesion of the defending military system, particularly that of a coalition--with its tendency to shatter at points of stress. Reliance upon conventional forces requires a true denial capability. Anything less is dangerous and potentially destabilizing.

If NATO had a true denial capability, NATO would still require a strategic coupling. And linkage would still be required between the two. Thus it can be argued that NATO's strategy of graduated response is correct in the abstract. The problem is in implementation. Conventional defense requires a denial capability both to enhance its version of deterrence and to reduce the possibility that the use of nuclear weapons might have to be initiated by the defender should deterrence fail. For their own protection, conventional forces must also be designed for nuclear operations should nuclear weapons be used, whichever side initiates their use. But for the sake of alliance cohesion, the U.S. should also visualize tactical nuclear weapons only as a link to strategic nuclear weapons. In-theater tactical nuclear warfighting is not a politically viable NATO option. Neither the United States nor Western Europe should have to bear the prospect of nuclear devastation alone. If this burden is not explicitly surfaced and

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[1] Contrary to published reports, enhanced radiation weapons are not efficient "tank-killers": (i) the radii of kill (thermal, blast, and radiation) can be re-channeled, but the radius of enhanced radiation remains relatively small against armor; (ii) tank units are normally linearly disposed and in movement, and are not good targets except in assembly areas; (iii) normal artillery CEPs are large; (iv) timelags associated with nuclear weapons even after their widespread use normally inhibit their use for other than stationary assembly areas; and, (v) reliance upon radiation also produces a "zombie" effect. Despite these operational limitations, it is nevertheless true that the neutron warhead from a purely military viewpoint (in the words of the new Western European euphemism) has advantages over existing nuclear warheads. (This euphemism of course evades the real issue and illustrates the problem. The Western Europeans always view tactical nuclears for their political impact. Thus while the U.S. may see enhanced radiation weapons as increasing deterrence through their more efficient warfighting impact, the Western Europeans would see them as enhancing deterrence from their increasing the nuclear commitment of the American ally and by their lowering the nuclear threshold, thereby increasing the credibility of their use and of their concomitant linkage to strategic weapons.)

shared (as opposed to each side now attempting to shift it covertly onto the other), alliance friction will continue to fester, presenting a fissure for the Soviets to exploit.[1] This, of course, means West Europeans for their part must reduce the likelihood of nuclear devastation upon the U.S. by generating strong conventional forces.

As matters now stand, however, the Western Europeans can be expected to be ambivalent towards programs for strengthening conventional forces. The Western Europeans see NATO's present posture, and U.S. initiatives to improve it, as *undermining deterrence* while increasing their costs. The U.S. viewpoint seems to range from any increase in conventional capabilities being good per se, to the assertion that a conventional balance already exists. The "good per se" view fails to recognize the U-shaped characteristic of deterrence. Whether a balance or near-balance exists (so that various U.S.-sponsored initiatives enhance rather than detract from deterrence) is a matter of judgment as well as fact, and can be argued but not conclusively proven short of war itself. However, numerous persuasive arguments do suggest that a conventional balance does not exist today, and that there are militarily superior and less costly alternatives which could in fact unambiguously satisfy the criteria of undiminished deterrence, reasonable cost, and contained destructiveness.

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[1] So far the Soviets have never much exploited this divergence in NATO alliance interests. It is, of course, central to the French withdrawal from NATO, and to the present alliance embroglios over the cruise missile in SALT and the "neutron bomb".

II. NATO STRATEGY: THE MILITARY PROBLEM OF OPERATIONAL CONCEPT AND ORGANIZATION

Historically, military vitality and military thought have been correlated. For the West this is not an auspicious omen. American strategic thought has become stale and increasingly ideological.[1] French strategic thought is specialized for France as a medium-sized power and tainted by its "spoiler" role. The West's maritime thought has not progressed much past that of Mahan's a century ago. By contrast, Soviet maritime thought is not so shackled and seems attuned to the age of nuclear superpowers.[2] For armies, the traditional centers of intellectural thought have been French and German; but it is the Soviet that is more vital today. The French have generated serious work in counter-insurgency; but their thinking on continental warfare has been shackled to Pluton and their specially conceived "spoiler" role. The West Germans, who revolutionized warfare in the preceding century with their systematized organizational approach to war,[3] have been preoccupied with the democratizing role of "Innere Führung" and have been content with being a "good" ally (defined as accepting the leadership of others while providing the financial wherewithal).

NATO's military deficiency derives from this discrepancy in military thought: its conceptualization of modern war in the European theater is more akin to that of Douhet than Guderian.[4] This is manifest in NATO's cordon-like

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[1] For a perceptive discussion, see Edward N. Luttwak, "Salt and The Meaning of Strategy", Washington Review, Spring 1978.

[2] For an excellent discussion of the relationship between Soviet intellectual thought and naval force structure, see Steven F. Kime, "Soviet Naval Policy and Strategy: Trends and Prospects", unpublished.

[3] For a detailed discussion, see Theodore Ropp, War in The Modern World, New York: Collier Books, 1959, pp. 161-238.

[4] Guilio Douhet, The Command of the Air, London: Faber & Faber, 1943; Heinz Guderian, Panzer Leader, London: Michael Joseph, 1952.

defense and lack of operational reserves (historically two guaranteed prescriptions for defeat in tank warfare), and strong tactical air forces designed for offensive use. Writing after World War I, Douhet extrapolated from the Russian, Austrian, and German collapses that the critical element for the nation-at-war was morale at home. As long as national will could be maintained, modern industrial states could sustain their forces in the field, and war would simply break down into massive attrition of the stalemated armies. Accordingly, Douhet argued that the attrition of modern war could be circumvented by attacking the adversary's national will directly through the air, with one's own army minimizing its casualties by foregoing the offense and holding to a static defense. Douhet's thinking, through such men as Trenchard, Mitchell and other disciples, has had a profound influence on the Western approach to warfare. During World War II, it led to the massive allocation of resources to bombardment air forces (as much as 40% of British war production). After World War II, nuclear weapons clearly seemed to validate this approach.

This thinking remains the underpinning for NATO's approach to war. It is reflected in a recent statement by General Andrew Goodpaster:

> What can be assured is that any attacking force would be subjected to heavy, continuing and increasing losses with no certainty of tactical success, and with rapidly escalating threat to rear areas and to the aggressor's homeland.[1]

Accordingly, ground forces are seen as holding and, in the process, attriting enemy ground forces; their larger rationale, however, is to gain time for escalatory decisions against the enemy's rear and homeland areas.[2] NATO's force structure corresponds to this thinking: strong tactical air forces oriented towards offensive air capability (nuclear strike and conventional ground support), and ground forces deployed in cordon-like national corps sectors across the front.

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[1] "NATO Strategy and Requirements 1975-1985", Survival (IISS), September/October 1975, p. 212.

[2] The critical assumption in this argument is that ground forces will in fact be able to hold. If they cannot, as implied in General Goodpaster's statement, this thinking plays into the hands of an aggressor; see the discussion on time, pp. 10-11.

If NATO's strategy is to be accepted as the Western European visualization of MC 14/3, that is, basically the same as MC 14/2 except for a stouter tripwire, this emphasis upon air forces and the linear disposition of ground forces is satisfactory. According to the Western European view:

> The deterring effect of the present deployment is mainly due to the fact that in the GDP [General Deployment Plan] combat sectors are assigned to the forces of five NATO nations, charging each of them with direct responsibility at the frontier to the Warsaw Pact countries. This system--often called the "layer-cake" principle--must not be changed under any circumstances.
>
> The political and military significance of the "layer-cake" has priority over all other operational considerations, as long as it remains the main strategic objective to preserve peace by deterrence.
>
> In spite of its undesirable shortcomings, the present deployment and the current GDP are still the most favorable solution under the aspect of deterrence.[1]

Present cordon-like deployment on the central front can thus be seen to have several rationales. Logically, its suits the Western European and, in particular, West German preference for deterrence. It is inherited from the post-war occupation zones, and would be costly to re-arrange. But most significantly, and at the core of NATO's conventional difficulties, it is representative of a style of warfare carried over from World War I--a style which NATO has inherited through the Anglo-American experience of World War II, the influence of post-war U.S. Military Assistance Advisory Groups, and Anglo-American dominance of SHAPE in the post-war period.

In juxtaposition to the Douhet view of warfare is that of Guderian, which came to be embodied in armored warfare and the Blitzkrieg. This view accepted the Douhet thesis of the necessity of striking at national will.

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[1] Ulrich de Maiziere, op.cit., p. 57.

But it did so in a completely different manner.[1] It sought to break national will to resist by a combination of psychological shock (terror-bombing, surprise, and rumor) and impending military collapse. Most important, technology and technique were developed to restore mobility to warfare, invalidating Douhet's key premise that armies would be readily able to hold each other off. Instead, armies could now be quickly defeated, air bases seized, and even entire countries quickly overrun. Of course, it can be argued that the Germans eventually became bogged down and lost the war. Yet it should be noted that so long as the Germans were able to gather operational tank reserves and to keep them free from opposing air interference, the Germans remained dangerous opponents, able to turn apparent defeat into tactical victory even against considerably stronger adversaries. Equally relevant for NATO is the fact that a military system explicitly designed for short but decisive campaigns could in fact fight a prolonged, sustained conflict against overwhelming material resources. Allied superiority in resources were matched by superior German technique; its organization for war, tactics, and operational control.

If NATO's strategy is to be the U.S. visualization of MC 14/3, relying explicitly upon strong conventional forces for the purpose of deterrence by denial (in addition to deterrence by threat of punishment), NATO must re-think its ground force disposition and use of tactical air power. Tactical air forces must become more of a complement to the ground forces, assisting the ground forces in their scheme of maneuver. Strategic-like bombardment of rear areas and lines of communication will not be adequate unless nuclear weapons are used, at which point the conventional phase will lose much of its significance. The futility of deep

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[1] The German Blitzkrieg is reminiscent in many respects to the system of Genghis Khan. Neither had a large resource base, relying instead on organization, technique, and fluidity. Both sought a system avoiding close combat: The Mongols used a crossbow and wheeling-back technique on horseback; the Germans used detailed reconnaissance to pull armor through gaps in the defenses. And, finally, both were masters of sowing misinformation to confuse the adversary's mind and undermine the will to resist in the opposing command and body politic. The Byzantine military system of the 5th to 9th centuries A.D. also incorporated these features, albeit from the perspective of strategic defense.

interdiction is now generally conceded by the U.S. and Western European air forces, and need not be developed here.[1]

Air forces remain an important element in overall NATO strategy, but it is in ground forces where NATO's most serious deficiencies arise. It is these whose correction is most important. To the extent that NATO is violating good military practice, incremental improvements to the present disposition and force organization will be inadequate. Programmatic methodology based upon component analysis, however inclusive, is not adequate to the task. Similarly, new technology, however elegant, will not suffice when placed under operationally dated or misconceived concepts.

Approaches to War: Firepower or Maneuver?

NATO's driving deficiency is indicated by the contrast between Douhet and Guderian. The first is a firepower approach to war; the second, a maneuver approach.[2] It can, of course, be argued that all military tactics are based upon fire and movement. The critical distinction is in the relative purpose of each. Is maneuver to be used to create killing zones, or is firepower to be used to facilitate maneuver? The question of which

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[1] For an essay on this theme, see Steven L. Canby, The Contribution of Tactical Airpower in Countering a Blitz: European Perceptions, TSC, May 1977, especially Appendix IV (The Interdiction Mission: An Overview).

[2] As has been recently extensively quoted, Raymond Aron has made the pointed observation that "the entire American theory (of graduated response) attempts to reconstruct the manner in which a strategist would behave if, like his counterpart in economic theory, he were both intelligent and well-informed." This devotion has caused much of modern theory to become bogged down in quantitative models of relative destruction, as if destruction were an end in itself. To his credit (though he spoke of deterrence and used much of today's strategic jargon), Douhet avoided the trap of modern strategists in confusing means with ends, and always recognized that the air weapon was but a means to obtain a psychological impact upon the opposing side's will. As Liddell Hart has written (Thoughts on War, p.48), "The real target in war is the mind of the enemy commander, not the bodies of his troops."

is to be the handmaiden and which the master drives the design of armies and tactical air forces. A killing zone approach leads to the practice of applying strength against strength, and the physical destruction of the opponent. A maneuver approach seeks to beguile the opponent, focusing strength against weakness, eventually getting inside the opponent's time-decision window. In the first case, war is attrition on the battlefield; in the second, war is the avoidance of costly battle with the operational aim of unraveling the opponent's ability to organize himself and to act. The first becomes a protracted conflict; the second seeks a quick victory.

The U.S. approach to warfare is firepower-oriented, as exemplified by Lanchesterian firepower models, the bombardment orientation of U.S. air power, and the evolution of army tactics and organization from their genesis in the French experience of World War I.[1] The U.S. Army now accepts the possibility of a Blitzkrieg in Europe; but its new FM 100-5 operations field manuel indicates that the Army remains tied to its earlier firepower and organizational habits. By contrast, German (as well as Soviet) armored doctrine is maneuver-oriented. Its origin is in German World War I infiltration tactics designed explicitly to finesse firepower-oriented set-piece battle tactics. These attempt to use maneuver to create conditions for surprise and shock in order to gain a psychological advantage over the

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[1] For a detailed account of the U.S. Army reorganization in 1939-41 that set the pattern for present day Tables of Organization and Equipment (TO&E) see Robert Greenfield, et al., The Organization of Ground Combat Forces, United States Army in WWII, Washington, D.C., Department of the Army, 1947.

opponent.[1]

The two approaches are thus diametrically opposed philosophically. As could be expected, their implementation implied different tactics, organization, equipment, and uses of technology. U.S. initiatives and equipment procurement choices implicitly presume that the firepower approach is correct--for that system is embedded in the U.S. military structure. Similarly, the NATO approach follows that of the alliance's major and most influential member. If that premise is faulty, it follows that many U.S. and NATO initiatives and choices will be correspondingly amiss.

NATO's adherence to a firepower doctrine in its ground forces can be seen in the following:

1. Operations. While its forces are now largely armored and mechanized (a post-1962 phenomenon), NATO's operational style remains based upon an infantry with tanks (French) approach. NATO uses its armor in an infantry mode of warfare based on the primacy of firepower on the battlefield. The Warsaw Pact, on the other hand, is structured for true armored warfare, based on maneuver in, and beyond, the battlefield. In lay terms, this means the United States fights battles to wear down opponents. The Soviets fight battles to avoid further battles: that is, the Soviets view the battle as but a means

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[1] The operational objectives of the German and Soviet blitz systems are similar. The major differences are that the Germans created the illusion of a strength which really did not exist, while the Soviets have replaced illusion with reality; and the German system was "recce pulled" while the Soviet is "command pushed".

The original German Blitzkrieg relied heavily upon demanding reconnaissance, the excellence of small units, and the sheer competence of commanders and command system. The basis of the Soviet version is their recognition of their own strengths and limitations (which runs deep in the Russian psyche and is rarely mentioned in their doctrinal debates). Thus, rather than mirror-imaging a system which only Germans (and Israelis) might pull off, the Soviets have quite appropriately substituted resources for command ability at all levels, relying instead upon large numbers of units, the relative flexibility inherent in such numbers, and an apparently professional and able general staff and corps of senior officers. Recent evidence indicates that the Soviets are attempting to upgrade the quality of their sub-units to more clearly imitate German battlefield techniques of small unit maneuver, infiltration, and tactical surprise.

to move to the higher form of warfare, the operational maneuver designed to break the cohesion and will of the enemy, resulting in a military collapse.[1]

2. Deployment. Armored warfare operates on thrust lines in both the attack and the defense, a style which suggests echeloned forces and large operational reserves. NATO, by contrast, has disposed its forces in cordon fashion.[2] The result is a paucity of operational reserves after mobilization, and virtually no available reserves against an unreinforced Soviet/Warsaw Pact attack that is increasingly plausible in terms of deployed military capability. Distribution of forces by national corps sectors is useful for symbolic effect, which was indeed the defense's primary purpose under NATO's earlier nuclear-emphasis deterrent strategy. As a posture for conventional warfare, on the other hand, it is a prescription for defeat-in-detail by armored forces penetrating in depth.

3. Organization. Armored warfare requires large numbers of maneuver units, both for the substance and appearance of strength. Armored units are designed to show up where the enemy is not. When they do, they must appear strong, even if they are not. This creates the impression of omnipotence, a critical step in the process of creating confusion and forcing the collapse of the enemy's command system and will to resist. NATO violates this maximum by deploying relatively few but well-supported combat forces individually suitable for sustained combat. With a comparable manpower base, the Warsaw Pact deploys a larger number of combat units and finds itself needing proportionately less support. Since it has few combat units, NATO finds itself hard pressed to cover its front; by contrast the Pact, with its relatively

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[1] For discussions of the distinctions and implications of firepower versus maneuver approaches to warfare, see William Lind, "Some Doctrinal Questions for the U.S. Army", Military Review, March 1977, pp. 54-65; and John R. Boyd, "Patterns of Conflict", January 1977, unpublished.

[2] For a discussion on deployment modes, see pp. 71-75.

large number of combat units, is able to deploy its forces laterally and in echelon in accordance with good military practice. The fact that NATO has qualitatively superior combat units on the battlefield is relatively unimportant per se, since adequate reserves are not available to out-maneuver the attacker or to hold him in place.[1]

4. Teeth-to-Tail Ratios. The long war-versus-short war dichotomy is a determinant of the teeth-to-tail ratio. By itself, however, it is of minor significance, and even that is largely derived from the correlation of "long" war with infantry warfare, and the "short" war with armored warfare. An infantry style of war calls for a disproportionate allocation of resource inputs into "tail" rather than "teeth". An infantry doctrine with its linear deployment stresses firepower because of its need to support the killing-zones of strung-out maneuver forces. It also stresses staying power (ability to absorb casualties and still function) and sustainability (organic logistic assets), since units are deployed on line for considerable periods. Armored warfare, on the other hand, requires intermittent shock power executed by highly mobile and concentratable maneuver units. Armored warfare seeks to keep a large percentage of its units off-line and in reserve. It seeks to enhance the mobility

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[1] For example, it is sometimes alleged that NATO and WP forces are roughly balanced, given the defensive nature of the Alliance. This statement implies (1) NATO has fewer combat forces and (2) the defender can organize the battlefield, obtaining an axiomatic 3 to 1 advantage. However, an outgunned defender can only win if the attacker were to attack across-the-front (i.e., losing by attrition) or if he were to become over-extended, setting himself up for a riposte (i.e., losing through maneuver). The first is representative of quantitative firepower models in this country; it is not the Soviet style. Instead, a Soviet breakthrough offensive resembles an echeloned pile-driver. Accordingly, it is vulnerable to over-extension and maneuver (or large-scale use of tactical nuclear weapons). Attempting to counter it by attrition through battlefield defenses is a prescription for defeat. The defender is faced with a hydra; and if the defense is pierced, it is too readily outmaneuvered and defeated.

Against weaker defenses, a more apt description of the Soviet operational style is that of a thrusting hand with fingers extended. Some fingers will be blocked; others will find discontinuities in the defense for the reserve echelons to be pushed through. Against this scheme, the attrition of the fingers is of little moment; it is the enveloping columns which must be countered. This requires operational reserves commanded by "Manteuffels".

of its units by freeing itself from the shackling effect of staying power and of organic sustainability. Accordingly, an armored-style deployment allows these resources to be centralized above division level and utilized more efficiently, shifting the characteristics of staying power and sustainability from the individual unit to the force as a whole, and creating the wherewithal to form additional combat units.[1]

Solutions Do Exist

A defensive system can be organized in several ways, reflecting the relevant contextual factors of the period. A defense which operates within itself according to its own inner rules, however, will not recognize changing contextual factors and the new opportunities inherent in them. Accordingly it will inevitably collapse when faced with an adversary who does (or in the case of a small opponent, be stalemated and frustrated). Military theory should be dynamic. In recent decades, it should have been increasingly so to cope with the strains created by rapid technological breakthroughs and weapons with dramatically greater capabilities. However it is intellectually and institutionally difficult to program truly innovative equipment concepts which are ahead of the tactical doctrine of the users, and which may not fit well into the traditional equipment categories and their distribution by service and branch. Inevitably, the tactical and operational payoffs of new equipments will be constrained. The tactical potential of the new equipment will normally not be fully understood, in turn inhibiting the development of improved operational and organizational methods which seek to exploit the potential constraint-releasing effect of the new equipments. Thus it comes to pass that new technology equipments are simply added to the existing force structure, with no further change in the organization of combat formations, and no adjustment of operational methods or tactics.

[1] For example, the recent restructuring of the BAOR permitted a 12 percent increase in line strength by centralizing functions above division, and by eliminating an intermediate headquarters (brigade). Unfortunately, no additional equipment has been procured, and the additional combat manpower has been channeled into a purely foot-infantry Field Force.

Dialectical analysis, on the other hand, suggests that any system will develop its own inherent contradictions, which can be recognized and developed to produce a new system of a higher order. Earlier sections of this paper pointed to the more salient contradictions within NATO strategy and force posture. These can serve as a set of criteria and guidelines for the development of higher-order defense systems.

It was contended in the earlier sections that NATO's strategy and posture has more of Douhet than Guderian. In terms of force structure and operational concepts, this means that NATO is at least one and perhaps two tactical revolutions behind its principal opponent. The first lag, it was argued, was NATO's failure to integrate tanks and the tactical fighter aircraft into a higher order of armored warfare, as opposed to the infantry mode of warfare into which tanks and aircraft were originally incorporated. The second lag is what has been popularly termed the PGM revolution,[1] which in reality is a catch-phrase for a range of defensive technologies to be employed against weapons of the attack/offense.

It should be recalled that NATO plus France has nearly a quarter million more men under arms in the NATO Guidelines Area than does the Warsaw Pact. Nor is NATO lacking in overall resources or trained reservists. NATO's problem--at its simplest--has been its inability to transform its resources into active divisions in peacetime and rapidly available reinforcements in wartime. Overcoming the first lag in tactical revolution--shifting from concepts of infantry warfare to armored warfare--would make it possible to rectify the combat numbers deficiency. It could lead to a force structure similar to that of the Soviet and therefore to military symmetry and military balance. It could lead to a "mobile" defense of West Germany. Whether it can lead to a physical defense of the border area itself depends on the reserves that can be mobilized. If large enough numbers can be mobilized, it will be possible to man strong ramparts and strong operational reserves; but the latter cannot be sacrificed for the former (as at present).

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[1] For an account of Soviet doctrinal evolution in this regard, see Phillip A. Karber, "The Tactical Revolution in Soviet Military Doctrine", BDM Corporation, March 1977.

Overcoming the second lag in tactical revolution, however, can lead to a solution by which NATO could implement a true forward defense (in the German sense of an active defense within a "belt" as opposed to the U.S. sense of a quasi-passive defense of a FEBA "line"), while retaining large operational reserves. This possibility arises from the potential of new defensive technologies in the hands of citizen-soldiers, a form of defense whose considerable discussion has been ahead of its time in terms of practicability.[1] This type of warfare may now acquire even more attractiveness as a result of Soviet cognizance of the implications of new defensive technologies, which some argue are turning the Soviets toward a pre-emptive surprise attack with tank forces.[2] This threat of surprise may make territorial defense concepts attractive to NATO, for greater Soviet emphasis upon the tank can make territorial units (using the proper tactics) more difficult to counter in the built-up and forested areas of West Germany.[3]

The common features of the possible solutions to central Europe's defense are (1) a large operational reserve and (2) protection against surprise attack. Other force characteristics acquire their desirability from their effect on these features. The cordon, for instance, may be desirable for deterrence, but it puts units on line rather than in reserve. Restructuring for greater teeth-to-tail ratios is mainly to generate the wherewithal to create large reserves and to counter surprise (as well as to create a mind-set and streamlined units more suitable for armored warfare). Countering surprise has been a salient theme among the Western Europeans since the Yom Kippur War of 1973. It has since been raised to greater

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[1] For excellent and reasonably balanced discussions of territorial defense, see Adam Roberts, Nations In Arms: The Theory and Practice of Territorial Defense, New York: Praeger, 1976; Horst Mendershausen, Territorial Defense in NATO and non-NATO Europe, RAND Corporation, R-1184-ISA, February 1973, and in particular, Jon L. Lellenberg, The Citizen-Army Concept in Germany: Political-Military Implications, SRI Strategic Studies Center, July 1973.

[2] Karber, op.cit.

[3] For two excellent discussions on this issue, see Oberst i. G, Dr. Franz Uhle-Wettler, "Leichte Infanterie in Konventionellen Auseinandersetzungen", Truppendienst, Zeitschrift für die Ausbildung im (österreichischen) Bundesheer, 16. Jahrgang, Heft 2 (April 1977); and Leichte Infanterie Im Atomzeitalter: Die Gefahr Der Übertechnisierung Moderner Streitkräfte , Wehr Und Wissen Verlagsgesellschaft mbH, Darmstadt, 1966.

prominence by the Nunn Report and other analyses,[1] and as one of the "Rs" in SACEUR's "3R" program.

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[1] NATO and the New Soviet Threat, Report of Senator Sam Nunn and Senator Dewey F. Bartlett to the Committee on Armed Services, U.S. Senate, January 1977. See also the much publicized and reprinted article by Phillip A. Karber, "The Soviet Anti-Tank Debate", Survival, May/June 1976, pp. 105-111.

III. NATO DEFENSE: COUNTERING THE SURPRISE ATTACK--A CRITIQUE

Surprise in NATO parlance seems to have several meanings. Air forces view surprise in the sense of zero-warning air defense. Armies have tended to view surprise in terms of little warning, varying from zero to 48 hours. Some civilian analysts have interpreted surprise to mean anything less than being fully deployed, a positioning which could require as long as 7 days. Still others have come to view surprise as synomonous with the recently highlighted Soviet capability for a standing-start attack by the Group of Soviet Forces Germany (GSFG), without telltale mobilization and reinforcement from the Eastern Europeans and the western Soviet Military Districts. In official Washington, Soviet/Warsaw Pact attack with reduced warning time for NATO has been deprecated because of its resource implications. Many therefore deny the existence of a serious NATO military problem, and deny the contention that (1) an opponent with sufficient in-place strength could in fact launch a near-zero-warning attack with suitable preparation (and motivation), and (2) that scenarios have contingent probabilities. The very fact that surprise is deprecated increases its conceptual probability of occurence. In this regard, it should be noted that while Russians are congenitally more risk-minimizing than Germans, many of Hitler's attacks in World War II were planned and launched in a matter of days.[1]

In coping with surprise and reduced warning, the military have developed a set of possible measures. All serve to gain time to deploy active forces and mobilize reserves. Except for air defense, however, these measures generally presume some warning; they therefore fail to distinguish and cope with the special demands of a true out-of-the-blue attack. The U.S.

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[1] See, for instance, Panzer Leader, pp. 50, 65, and 144.

military (and to a lesser extent the Western European) advocate greater unit readiness, correction of maldeployment, rapid reinforcement, early warning/electronic surveillance, and tactical air power. The diplomatic community advocates political measures, such as "Associated Measures" in the Mutual Balanced Force Reductions (MBFR) negotiations with the Warsaw Pact, and the "Confidence-Building Measures" in the Conference on Security and Co-operation in Europe (CSCE) accords. Less obvious measures are greater numbers of active combat units, economy-of-force armored cavalry, low-level (gun) air defenses, and territorial defense.

While the measures advocated by the military are the basis of various NATO programs, they are very costly and can be circumvented. Representative Les Aspin has estimated that U.S. costs alone may be as much as $36.6 billion in one-time and $2.0 billion in recurring costs.[1] While one may challenge his estimates, it is nevertheless apparent that measures like more intensive field training, greater air lift capacity, and greater pre-positioning of U.S. equipment can be expensive. It is obvious that requisite funds might not be forthcoming from the U.S. Congress, and that whatever incremental monies are allocated should be used to best effect. Indeed, closer scrutiny suggests that less costly alternatives than those presently advocated may exist, and that several advocated measures may actually be counterproductive from a broader perspective. Equally important, several low-cost measures may be more robust and less vulnerable to countermeasures.

Readiness. The meaning of readiness has been difficult to define and quantify. If readiness is interpreted as personnel over-strength and continuous field training, readiness can be costly and elusive. Personnel and O&M costs will be high, while equipment will be in need of constant repair. An emphasis upon readiness can mask the importance of and preclude the funding for reserves that need not be maintained in high readiness. If readiness, in addition, is interpreted to mean forward billeting in peacetime to reduce movement to GDP times, readiness can even compromise the viability of a defense against a well-executed surprise attack. Thus

[1] Congressional Record--House, March 16, 1977, pp. H2211-16.

readiness is a term to be approached with caution.

The two normal meanings of readiness are (i) to squeeze down unit availability or deployment time and (ii) to increase unit field proficiency. Effective readiness can also be obtained by expanding the time available. Intelligence is one means, but this can never be foolproof. More dependable is what might be termed a combat-stalling capability. In a surprise attack neither side can nor needs to bring its full strength to bear. The Soviets practice this principle by their system of echelons and categories of readiness. NATO should but does not subscribe to this practice.

Readiness can be enhanced in many ways. Some like forward positioning and uploading of ammunition can be highly cost-effective. Excessive field training is to be avoided. It is expensive, wearing on equipment, and fails to exploit non-training methods, such as changes in institutional practices.[1] Readiness does little to increase the availability of U.S. 7th Army units, other than through more restrictive leave and pass policy. Readiness can increase the availability of Western European units because of their reliance upon varying percentages of reservists to fill out their active units. This raises the important issue of the tradeoff between greater structure and force availability/proficiency. NATO has traditionally opted for the latter, but both are required for a viable defense.

Maldeployment. Maldeployment has strategic and tactical elements. It is argued that the U.S. 7th Army or at least major U.S. units should be shifted from the more defensible and strategically less dangerous middle

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[1] The single best method, at least for the U.S. Army, to improve operational proficiency while reducing O&M demands is by block personnel replacement for training continuity and advancement. Individual replacement requires continuous intensive use of equipment for relatively demanding sub-unit training; block replacement allows training to move to higher levels where intensive use of field equipment is unnecessary. For details, see Robert Komer and Steven Canby, Restructuring NATO Forces to Compensate for MBFR, RAND Corporation, November 1973.

and southern portions of West Germany to the North German Plain. Tactically, it is argued that allied units are not well billeted relative to their wartime deployment areas, that many are too far back, and that units in general have to criss-cross each other in their movement forward to EDPs during a period of limited time and general confusion. The central drawback to any shifting of units, however, is high re-location costs. For armored/mechanized brigades, the capital investment in infrastructure for a new garrison costs as much as the equipment in these units. Simple switching of garrisons with similar infrastructure facilities is, of course, much cheaper, amounting to roughly 10 million DM at 1975 prices.[1] Given that combat units are already forward relative to their own support, major shifting of units to forward positions would not be possible without large related infrastructure costs. Two aspects which could be addressed, however, with only simple relocation costs are the placing of a U.S. brigade in the British corps sector (their on-going restructuring and consolidation will free five garrison sites), and the sorting out of interspersion among national units.[2] A third aspect--not addressed in this paper--is restructuring. Restructuring allows support assets organic to combat formations (company through division) to be converted in place into "teeth" units, thus eliminating most relocation costs.

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[1] 1975 DM costs for relocating to new Kasernes amounted to 50 million DM per battalion. With 3 line battalions, 1 artillery battalion, and associated brigade companies equating to an additional 1-2 battalions, relocation costs for a brigade at 1975 price levels were 250-300 million DM (DeMaiziere, op.cit., p.30). At 1973 prices, original procurement cost for German armored/mechanized brigades were 250 million DM. White Paper 1973/1974, op.cit., p.68.

[2] In addition it is sometimes forgotten that major shifts can sometimes be effected by re-grouping and switching subunits only. For instance, the U.S. 8th Division (Mech) could reverse positions with the U.S. 3rd Armored Division. This is sometimes represented as requiring a massive shift, when in reality it requires only the switching of a tank battalion and armored infantry battalion, plus some minor TO&E adjustments.

However, it is questionable whether these minor-cost relocations are as desirable as they might appear. The interspersion of national units is the result of a conscious West German political decision.[1] The West Germans have placed seven of their twelve divisions near the East German/Czech border in order to have both presence and a unilateral capability for crisis management should NATO's response be lethargic or not forthcoming.[2] Such West German force dispositions are militarily undesirable; but they are a political reality and a manifestation of the real problem of coalition warfare. Accordingly, this aspect of maldeployment is beyond the scope of technical solutions and re-location funding. It can only be resolved as a by-product of military solutions capable of satisfying West German political and military objectives.

Strategic maldeployment of U.S. troops has become interlinked with the Nunn Admendment's two additional brigades and rapid reinforcement, it being argued that U.S. forces are necessary in NORTHAG and that a brigade in NORTHAG can serve as a nucleus for expansion into a corps. It is here argued, however, that stationing U.S. troops in NORTHAG is a political and military mistake. The intent of Brigade 76 (and possible follow-up forces) is to:

(1) Strengthen alliance resolve;

(2) Catalyze the Western Europeans into greater efforts; and

(3) Strengthen the relatively weaker NORTHAG sectors.

The issue pivots on one critical question: How serious are the Western Europeans in their desire for a meaningful conventional defense? If they

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[1] The distortions initially caused by narrowing corps sectors to fit in the West German corps have been largely rectified over the years. See Appendix I for a map of the corps sectors and the relative billeting of the Western and GSFG divisions.

[2] Similar reasoning applies to the West German desire for operational control of their offensive air divisions in 2nd and 4th ATAF. In 4th ATAF the Germans have operational command of their air division; in 2nd ATAF, the German air division headquarters has been operationally bypassed by 2nd ATAF's national cell arrangement in favor of direct ATAF-wing coordination.

remain wedded to a strategy of nuclear deterrence, the intent of the NORTHAG Brigade will not be met. By attempting to shore up a still inadequate defense, the U.S. efforts could be seen as undermining the Western European preference for (nuclear) deterrence--leading to resolve-weakening dissension and troop thinouts by the Dutch and Belgians, cancelling out the conventional effect of the U.S. increment.[1] If the Western Europeans are now prepared to generate strong conventional defenses, the NORTHAG Brigade becomes redundant. More fundamental forces will be at work, and the brigade and its time-lagging follow-on reinforcement will no longer be necessary. The Western Europeans have more than enough means to cope with the situation, and any additional U.S. forces can be better used to strengthen and develop a strong counterattack force (for which only the U.S., West German and French forces will have sufficient means).

The question for U.S. policy is therefore not redeploying U.S. troops into NORTHAG but channeling any shift in Western European attitudes toward a meaningful alliance response--recognizing that, while they may now be willing to accept the need for strong conventional forces, parliaments everywhere are reluctant to spend more on defense. Placing a brigade in NORTHAG alone is not likely to induce parliaments into greater matching efforts. At most, it could only induce the Dutch and Belgians to maintain and possibly marginally increase forward stationing of their contingents. While this would be desirable for strengthened deterrence and to reduce the impact of U.S.-FRG bilateralism, its impact is slight should the Soviets mount a major attack. For this eventuality, NATO should more than double its effective divisional strengths. Accordingly, forward stationing and U.S. contingents as envisaged in NATO and U.S. planning assume less significance, the burden now being placed upon the Western Europeans. Consequently, U.S. forces in NORTHAG under present circumstances can be regarded as neutral to counterproductive: neither nuclear (threat of destructive reprisal) nor conventional (denial by defense) deterrence is

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[1] On separate tracks, the Belgians have decided to withdraw two of their four brigades in Germany while the Dutch are considering an increase in their stationing from one to two brigades.

enhanced, and the positive effect of U.S. troop hostages in NORTHAG is countervailed unless these forces are immediately thrown into the breach and not held back in reserve in the event of attack. U.S. troops in NORTHAG would only be militarily useful if the Western Europeans were to field additional divisions to bolster each corps sectors, and the consolidating NORTHAG reserve were to be a U.S. corps. In this case, U.S. troops in NORTHAG would have to be held in reserve and postured for fast reinforcement. If the Western Europeans were to generate even more divisions, U.S. reinforcements should be retained in the U.S. 7th Army sector.

In short, redeploying U.S. troops in general, and a brigade in NORTHAG in particular, represents a laudable, but narrowly premised and misguided effort. It is not likely to strengthen allied cohesion or catalyze the Western Europeans into greater efforts. Nor have the European allies been particularly supportive, as evidenced by West German demurring on infrastructure and the Dutch mini-cabinet crisis provoked by Mr. Vredeling's agreeing to a Dutch share (when no one offers them similar support, requiring instead offsetting Kasernes in Holland for West German support troops). Militarily, the brigade is insignificant. Possible follow-ups (as now envisaged) would require substantial time and cost; in any case, they are likely to have little credibility with the allied MODs, who already view REFORGER skeptically.[1] Similarly, the NORTHAG initiative provides no new paths for Western defense, save the unattractive one of replicated force structures and proportionately higher defense costs. Thus, the program accomplishes little, while in the long-run risking Congressional support for NATO by broadening the U.S. burden.

Rapid Reinforcement. Enhanced airlift and more rapid U.S. reinforcement is sometimes put forward as a response to growing Soviet surprise attack capability. Against a true out-of-the-blue attack, however, such

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[1] A seeming paradox is that the same Europeans who have been the most caustic toward REFORGER have been among the most eager to grasp the U.S. initiatives for NORTHAG. The answer lies in European relief at the Carter Administration's new commitment, and a realization that the U.S. Army needs a NATO justification for increasing its armor content and its increase from 14 to 16 divisions.

airlift could not be a valid response. Under the best of circumstances, several days would be required for their in-country assembly, and several more for their deployment, all in the context of the general confusion which could be expected to accompany a surprise attack. Such reinforcement could only be useful if some measure of early warning were available, and if existing reinforcement procedures were revised.[1]

Electronic Intelligence. Radio intercept and electronic surveillance in general have become the major source of raw military intelligence, being developed into a considerable art by the United States. However, it is also an expensive collection system subject to counter-measures: passivity, jamming, spoofing, and deceptive misinformation. The latest addition to the early warning/electronic surveillance inventory is AWACS, advocated for both early warning and real-time surveillance and control of the air/ground battle. As a technique for command and control of the air and ground battle (the so-called "Boerfink bunker syndrome"), serious questions can be raised about AWACS' appropriateness.[2] As a system for early warning, it can be argued that (1) it suffers from the normal limitations of electronic intelligence; (2) it can not monitor the movement of Pact ground forces; (3) it can monitor Soviet air preparations, but a Soviet air offensive is not a prerequisite for a surprise attack and its absence can be part of a "cover" plan; and (4) a stripped-down airborne early warning platform without sophisticated C^3 pretensions can perform AWACS' early warning function. The latter is particularly crucial, since the contemplated AWACS plan consumes roughly 10 percent of projected Western European modernization funding for the next 10-year planning cycle, funds that are critically in short supply.

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[1] For a discussion on revising present procedures, see Steven Canby, Interim Technical Report Task 1: European Mobilization: The Policy Issue of U.S. and NATO Reserves, Technology Service Corporation, February 1977, pp. 19-24.

[2] The RAF and Luftwaffe do not subscribe to the USAF's method of close control of aircraft for air defense and offensive air (TACS), and are fundamentally opposed to the USAF's scheme of command and control and of managing offensive air and the ground battle. For detailed discussion, see Steven L. Canby, Tactical Airpower in Europe: Airing The European View, TSC, July 1976.

Tactical Airpower. While not a measure for obtaining early warning, or a new measure consuming additional funding for countering surprise attack, tactical airpower is often justified as the first line of defense in slowing and blocking a ground attack which may occur before ground forces can be deployed (the so-called Golan Heights rationale). While prima facie true, it must nevertheless be noted that this contribution may be less substantive than claimed. Accordingly, serious consideration should be given to shifting some of these resources (particularly Western European) from air to ground forces, and especially for low-level gun air defense. Specifically, it should be recognized that (1) fighters are not good at countering the most disconcerting part of surprise attack--a multitude of small helicopter-borne operations causing confusion and disruption among the populace, government, and defending forces; (2) tactical air forces cannot cope with the light "dash" forces likely to accompany a surprise attack launched at night (see p. 69); (3) tactical air forces in the absence of complementing ground forces or major obstacles can only attrite advancing armor columns. It cannot block them or impose major delays; (4) tactical air forces in recent decades have found coping with tanks difficult; (5) tactical airpower is bedeviled by weather in general and air-to-ground visibility in particular; (6) if the surprise ground attack is coupled with the vaunted Soviet air offensive (hence USAF concern for AWACS), air forces are likely to be fully ensnarled in air defense and air base defense, forfeiting the needed turn-around times and sorties needed to blunt tank spearheads effectively; and (7) the USAF with its reliance upon PGMs and specialized air defense suppression aircraft (the so-called Task Force or Alpha-Strike approach) may be particularly handicapped because Soviet tank thrusts will be operating initially under an unattrited air defense umbrella.[1]

Arms Control. It can thus be argued that the military measures presently advocated for the purpose of countering a Soviet preemptive attack conflict with West German political concerns, and militarily are expensive

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[1] For a development of these themes, see Tactical Airpower in Europe, ibid, and The Contribution of Tactical Airpower in Countering a Blitz, op.cit.

for the results obtained. Less expensive means to obtain a measure of protection have been recently highlighted by several members of Congress. Representative Aspin has noted the explicit tradeoff between the advocated military measures and a restrictive arms control agreement with the Warsaw Pact.[1] More recently, in a widely publicized speech, Senator Nunn warned that the Carter Administration's latest MBFR proposals inadvertently lost sight of the one objective which could be validly met--that of inhibiting a surprise attack.[2]

Until recently, NATO's Phase I proposal has centered on the proposition that Soviet reductions take the form of a tank army, consisting of 68,000 troops, 1700 tanks, and associated equipment. This proposition is derived from the concern of verification and from the salience of the tank (the weapon of the offense) in the Soviet force structure. From these viewpoints alone the form of reduction may not make much difference. But from the point of view of NATO's ability to fend off surprise attack, and to mobilize internally more rapidly than external reinforcements can arrive, the form of reduction can be quite important.

The driving factor in the form of reduction has been verification. Large units are visible and their reduction is easier to verify than either small-unit specialities (though it ought to be easy to spot the absence of all artillery or engineers, etc.) or personnel. The inconsistency, since verification falls under the confidence-building rubric, is that personnel draw-downs can be more stabilizing than corresponding reductions in full-strength divisions: the Pact could still mount a surprise attack with fewer divisions; but if enough personnel are taken from in-place divisions, these divisions may no longer be suitable for mounting surprise attacks

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[1] Congressional Record--House, February 7, 1977, pp. H911-14.

[2] Senator Sam Nunn, "Mutual and Balanced Force Reductions--A Need to Shift Our Focus", Speech before the Georgia Chamber of Commerce, November 14, 1977.

(or for suppressing revolts Hungary-style).[1] The disadvantage in personnel reductions is the retention of a greater structure for faster reinforcement (e.g., by air) from the Soviet Union. However, this is not a reinforcement technique suitable for out-of-the blue attacks. It should be noted in this regard that the new Western proposals in MBFR possess the worst features of both forms. They do little to restrict a surprise attack, and, by calling for reductions in tanks rather than specific tank units, they allow equipment prepositioning and faster reinforcement, reducing NATO's ability to mobilize internally before external reinforcements can be brought in.

NATO should thus seek Soviet reductions in a manner that inhibits surprise attack and facilitates its own mobilization; this gains time to deploy active forces and permits a deployment configuration suitable for mobilizing without fear of enemy ground force interference. Removal of a Soviet tank army would be advantageous primarily because of its forward location near the inter-German border, and secondarily because of the Soviet preference to lead off with tank-heavy forces against weak or disorganized defenses (as in a surprise attack). Removal of the Soviet divisions in the more forward portion of Czechoslovakia would ease the threat against Bavaria (partly from removing the Soviet stiffener in a multi-national force), and could allow several West German divisions to be redeployed and reconfigured for rapid expansion into a large corps in operational reserve.

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[1] The exact percentage needed to debilitate a division is difficult to specify. The figure is probably about 75 percent of full manning for Soviet divisions, this being the lower and upper boundary of Soviet readiness Categories I and II. NATO's proposed Phase I reduction of 68,000 Soviet troops taken from in-place divisions would put divisional manning at 65-75 percent, the lower figure reflecting that actual strength is generally less than the Table of Organization and Equipment (TO&E) authorization.

Reductions of this order are particularly debilitating to peacetime formations attempting to maintain operational readiness and full equipment authorization. The result tends to be disproportionate manning of headquarters, logistical support, and heavy weapons, but correspondingly low manning in tank and, in particular, infantry platoons. A defense can be built on heavy weapons (as the Germans proved in World War II), but an offense cannot suffice without its "fluid" combat maneuver elements.

IV. NATO DEFENSE: NEW APPROACHES FOR COUNTERING SURPRISE[1]

The problem with normal measures for countering surprise are three-fold: (1) they are expensive, (2) a clever and devious opponent could neutralize them, and (3) it pictures surprise in a systems view and fails to grasp its essence, thereby missing the full range of necessary counters. In continental warfare, the purpose of surprise is less destruction then the psychological effect upon the adversary's political leadership and military command structure. These effects are obtained in three ways: (1) physical destruction of limited but highly visible objectives by air forces; (2) the appearance of overwhelming, irresistible force invading across tne border; and (3) the physical disruption and general chaos and confusion generated by large numbers of small desant forces, preferably in conjunction with numerous fifth columnists.[2] Surprise conjures up the image of a decisive, physical attack, as at Pearl Harbor or the more recent Israeli attack upon Egyptian airfields in 1967. Air and naval forces can be crippled by attacks of this nature.[3] Armies cannot. Armies have less visible weapons systems, and possess them in much larger numbers. The surprise which hurts armies most is not destruction of equipment, but the loss of organizational and command cohesion. For example,

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[1] This chapter argues that since the Soviets could launch a pre-emptive attack, NATO ought to develop reasonable counters. This does not mean that the author subscribes to the surprise attack thesis. In the author's opinion as long as NATO remains tactically "maldeployed" (i.e. so forces have time to sort themselves out in case of surprise) and the Soviets perceive that NATO may have "Manteuffels" orchestrating its response, NATO from the Soviet viewpoint has in effect a defense with large operational reserves that presents too many unpredictables. Far better from this perspective to allow NATO to position itself forward, in its own "Plan D", ensuring that NATO forces will become ensnarled in the Soviet operational scheme. For a brief description, see the footnote on p. 21.

[2] For an excellent discussion of the rationale underlying German paratroop operations against Norway, Denmark and Holland in 1940, see Brigadier M.A.J. Tugwell, "Day of the Paratroops", Military Review, March 1977. For a discussion of how the Soviets might employ desant operations against NATO, see Maj. Gen. Robert Close, Feasibility of a Surprise Attack Against Western Europe, NATO Defense College (Rome, Italy), February 24, 1975.

[3] In the above cases it is worth noting that casualties were relatively light (cf the high British losses with the sinking of the Prince of Wales and Repulse at sea). It was the equipment which was lost, and with it the corresponding naval and air capabilities. For air and naval forces, equipment is the constraining factor in the short-run. But in the long-run, it is experienced cadres. For example, in 1944-45 the key constraint upon the Japanese Navy and German Luftwaffe was not lack of aircraft or carriers, but the loss of their experienced pilot corps.

Operation Barbarossa surprised the Russians; the large ensuing Soviet losses were not from initial destruction but from the Soviet command's inability to regroup. By contrast, the Red Air Force was crippled for some time by the severe losses in aircraft among its forward bases.

It must also be recognized that the normal military measures are not foolproof and several are more oriented to short warning than with a true zero warning, out-of-the-blue surprise attack. As much as one would like to obtain early warning and increase the readiness of one's forces, it will still be possible for the enemy to attack them in their Kasernes, seriously delaying their deployment. Large forces cannot be kept in constant alert. It is therefore necessary to devise a system that is more robust, that is to say, a system which is relatively insensitive to counter-measures and nearly instantly capable of being fielded and sent into combat near the border. This can be accomplished in three ways: with restructuring, with economy-of-force armored cavalry, and with border police and territorial defense. The latter types of defense are facilitated by the characteristics of the terrain in the border areas. They can now be made practical with the past decade's new defensive technologies, assuming proper organization and tactics.

Restructuring

If countering a surprise attack were the only objective, the mere generation of a large number of active divisions would be a sufficient soltuion. Large numbers provide a robustness that is difficult for an opponent to overcome. High states of readiness for all units are not required; levels of readiness can be rotated to reduce demands upon individual units. With large numbers of Kasernes with combat troops, coordinating a surprise airborne attack directly against them would be difficult. Any compromise of surprise would cause the attackers themselves to be ambushed. In addition, with the redundancy inherent in large numbers, much of the lasting effect of surprise is lost: the defender would have the surplus to fill gaps created by the failure of some units to reach their general deployment positions, whether by enemy action (e.g. desant roadblocks) or general confusion (e.g. refugees, unexpected detours, etc.). Most

importantly, if the number of active divisions were indeed large and their generalship adequate, being surprised would be an embarrassment but only a minor factor in the final outcome. Extra losses would occur and more territory would have to be temporarily abandoned to gain time, but the means would nevertheless soon be available for a decisive counterstroke.

A solution dependent upon active divisions, however, has one major liability: it must be capable of terminating the war upon delivery of its riposte. If it is not, an opponent with similarly large active forces and a rapid mobilization and reinforcement system will prevail.[1] NATO's particular dilemma is that as postured and deployed it possesses neither sufficient active forces to counter a surprise attack, nor a sizable or rapid mobilization and reinforcement system. Yet the two complement each other. Without sufficient in-place strength, the cadres cannot be shielded, and without the cadres, a conventional defense may not be feasible.

In this situation, the normal analytical solution of the optimal tradeoff is inoperative. NATO has neither enough active forces nor cadres. Similarly, the previous section's military-preferred measures for countering surprise may be inoperative. These do not address the issue of mobilization:[2] in fact they work against continental mobilization through their

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[1] A special condition of the surprise attack is its use by an opponent with an inferior active force but with a much superior mobilization system. Such an opponent could be attracted to a pre-emptive surprise attack to gain time for mobilization. The modern state of Israel is a case in point.

[2] That is, these measures have addressed only half the problem--that of allowing rather meager existing forces to make a good "show" for themselves. The fact that these forces are obviously inadequate against follow-on Pact reinforcements, and that NATO must provide similar forces, has been neglected under the guise that the United States can compensate for inadequacies in West German, Belgian, and Dutch mobilization.

emphasis upon in-place readiness, and through their high cost. This absorbs the funding needed to equip reserve formations, whose personnel are already trained and available. The military measures would only be satisfactory if they both gave reasonable assurance of shielding mobilization and reinforcement, and were low in cost. Their failure on these counts indicates that they would only be practical if NATO were to restructure its forces and in addition posture them for rapid mobilization and reinforcement. In this eventuality, resources could be freed for the classic tradeoffs, as well as for obtaining and procuring expensive hedges for countering surprise.

That the necessary resources could in fact be obtained from restructuring can be gleamed from examining the force structures of the U.S., British and West German armies. Improvements in the teeth-to-tail ratio on the order of 10-15 percent have been obtained, or are now in sight, in all three armies. Yet it can be argued that still larger savings can be obtained. The wartime division slices of the Western allies (including French, Belgium, and Dutch) are still nearly double that of the Group of Soviet Forces, Germany (GSFG), adjusted for equal strength in combat maneuver platoons (tank, infantry, anti-tank, and recce/armored cavalry). Even with its sliding-scale mobilization system, whereby combat brigades are almost fully manned and support units are manned at varying percentages, peacetime Western European division slices are still 25 to 50 percent larger than wartime GSFG slices. This suggests that further adjustments are at least conceptually possible. It is also apparent that adjustments of this order require more than just "lemon-squeezing", whereby cooks, drivers, etc. are squeezed out of current organizations. Instead, adjustments of the kind needed require fundamental changes in peacetime and wartime behavior and operational patterns. Such changes, of course, are wrenching. They have been addressed elsewhere for U.S. forces, and are mentioned here only for the sake of completeness.[1] For the purposes of this paper other measures must be sought.

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[1] For an exercise in challenging the premises underlying U.S. Army TO&Es, see Restructuring NATO Forces to Compensate for MBFR, op.cit., and Steven Canby and Richard Rainey, Restructuring U.S. - NATO Ground Forces: The Division, RAND Corporation, October 1970.

Armored Cavalry

The most apparent solution satisfying the criteria established above is recce/armored cavalry. Whereas regular tank and mechanized units obtain their effectiveness through their "heaviness" and multi-arm coordination, cavalry units function best in a much different environment, that of the chaotic battlefield where intelligence is meager, coordination is difficult, and small units can still hold sway. Cavalry can protect the main body from surprise and relieve it from many defensive tasks. This allows larger operational reserves to be formed from available forces, in a sense accomplishing the same purpose as restructuring and rapid mobilization itself. Though it has received little emphasis, it is the most cost-effective and robust of the conventional military measures. This oversight is especially quixotic. Cavalry has historically performed this mission.

In countering surprise attacks, armored cavalry offers three special advantages compared to heavier tank and mechanized units: their decentralized operational mode, their neutralization of opposing recce, and their economy-of-force nature. Except for moving in o pre-planned static defenses, regular line units require time for assembly, concentration, and coordination before they can be effectively used. In the general confusion associated with surprise, this may not be possible. This can cause these units to be wasted: attacks into the wrong areas or taking up defending positions too easily flanked and cut off. Cavalry, by contrast, can be dispatched piecemeal from their Kasernes, and need not operate as an integral unit. Through the technique of screening, cavalry provides its own intelligence and is not readily flanked.

This last attribute is connected with a little known feature of Blitzkrieg warfare: thrusting attacks seek to avoid combat. Since even small forces can effectively hold up much greater strength (e.g., roadblocks), fast-moving armor seeks to avoid these checks. Supporting recce is therefore assigned the tasks of probing for weaknesses in order to indicate the path of least resistance for the tanks to follow. If these recce antennae are blocked or destroyed, this tactic breaks down. The significance of these feelers has not been appreciated by the U.S. or British armies, but

it is at the heart of what the West Germans term "good" defensive tactics--the necessity to counterattack immediately any initial enemy presence so as to cut off these feelers and to prevent their expansion and subsequent exploitation.[1] With the loss of these feelers indicating the paths of least resistance, the attacker must fight his way forward or divert following echelons to attack along other axes. The former, to be avoided wherever possible, causes undesirably high casualties, clogging of forward road space with fire support and logistical vehicles, and (worse) loss of irreplaceable time. Thus while cavalry may be spread too thin for effective positional defense, checking the attacker's forward units and the stopping of their reconnaissance accomplishes the desired objectives of slowing his momentum and gaining the time necessary to coordinate the defender's reactions.

Cavalry can neutralize the adversary's antennae through screening, a technique that disperses cavalry across the front for ambushing and light blocking roles. Screening is a standard cavalry tactic; but it is usually rationalized in infantry terms of denying enemy observation/information, and of providing warning and light guard. These remain valid for armored warfare; but to these tasks the notion of countering the antennae of the Blitzkrieg must be made a salient one.

The third important feature of armored cavalry is the economies it offers. In terms of unit costs, little difference exists between cavalry and tank/mech units. It is obvious that its organization allows it to perform intelligence-like missions more efficiently than normal line units. But its characterization as an economy-of-force unit derives from its ability to function in a ground-holding role as a substitute for line units. Wherever a requirement exists for a light guard over a wide frontage (in the attack as well as in the defense), cavalry is an efficient substitute

[1] While the Soviet Army has not relied as heavily on these recce feelers as the Wehrmacht did, recent evidence suggests this may change. Karber, The Tactical Revolution in Soviet Military Doctrine, op.cit.

for its heavier counterparts.

It can thus be argued that cavalry is an attractive measure against an out-of-the-blue surprise attack (cf short warning attack) and a means of garnering larger operational reserves. Yet it is a measure little appreciated and emphasized in the NATO armies. To be sure, NATO possesses considerable recce/cavalry, it being in roughly equal proportion (though distributed differently) in all NATO armies. The U.S. Army has regiments, battalions, and platoons organically assigned to corps, divisions, and line battalions. The British have a regiment (read battalion) organic to each of their four (new) divisions and field force. In all cases, the cavalry has been conceived as a special force to provide information and to help protect the main body or parent unit. In former years, this meant scouting but not fighting; in recent years, particularly in the U.S. Army, a heavy covering force (anti-tank) mission has been emphasized, to the neglect of the scout and counter-scout tasks.[1]

NATO has not appreciated the special role of recce in armored warfare, nor has it sought to use armored cavalry as a major means of countering surprise and of obtaining force concentration. The new German Brigade-80 organization rekindles their recognition of the recce role. That organization will feature a recce regiment of 2 battalions organic to each of the restructured 11 divisions, in addition to the scout elements organic to brigade and battalion. But the issue of cavalry for coping with surprise and for force concentration remains open. This problem follows from the way cavalry has been conceived as auxiliary to other arms, rather than as an independent entity as in the far past. Cavalry has been designed to support a generalized mechanized formation, itself designed to fight in open terrain. This means that while cavalry may be suitable for protecting

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[1] This is manifest in the covering force deployment of the U.S. cavalry regiments and divisional cavalry battalions in Europe and their conversion with the Sheridan vehicle to light tank units. The Cavalry Fighting Vehicle (CFV) would extend this concept to the battalion scout platoons, already ill-equipped for scouting with M-113Als. The latest (1978) cavalry platoon reorganization, which replaces the 6 Sheridans with 4 MBTs and doubles the scout section to 4 M-113Als, remains oriented to the covering force mission.

parent units from surprise, cavalry has not been conceived or designed to protect borders (much of it rough and heavily forested) and the country as a whole from surprise. Nor has cavalry been perceived as a large-scale economy-of-force organization capable of defending large border tracts, possibly in conjunction with small numbers of back-up regular units or within the framework of territorial defense.

Organizationally, cavalry has several deficiencies that must be corrected before it could fit into this broader scheme.[1] First, its most serious deficiency has been its weak anti-tank capability, a weakness now being corrected in Western European armies with the new defensive technologies: ATGMs and various caliber cannon on light armored chassis. For its part, several years ago the United States converted its cavalry to light tank formations in the mistaken belief that a light tracked vehicle (the Sheridan) could perform both the tank and scout mission. This error is now being partially corrected by trading-off Sheridans for fewer tanks and more scouts. Second, while cavalry and combat engineers can effectively cooperate in open warfare through the control technique of temporary attachment and direct support, this is not possible in sharply contoured or heavily forested terrain representative of much of the German border area. In these conditions, cavalry needs to be complemented with strong sapper detachments for constructing numerous obstacles in series along each road and track. For coordination, these would have to be organically assigned. In this case organic assignment would not be wasteful in personnel. Sapper detachments can double as an infantry component for cavalry, performing close security at night, small defensive blocks, forest outposting, and occasional "raids". Third, if a territorial defense scheme for border defense is developed, cavalry in these areas should be meshed into the territorial organization for coordination and familiarization. Otherwise, cavalry units as they move laterally and rearward are in danger of being cut off and ambushed by territorial units. This would be particularly true for non-German cavalry.

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[1] For a discussion of organizational change for cavalry, see The Alliance and Europe Part IV, Military Doctrine and Technology, op.cit., pp. 17-18.

Coping With The Desant Threat: Anti-Terrorist And Cavalry Byproducts

In addition to air attack and fast-moving armored thrusts across the border, a third dimension exists, that of attack by air-and heli-borne troops. This dimension is almost purely that of zero-warning surprise. It assumes particular poigancy with the widespread deployment of HIND, a helicopter that is too large and unwieldly as an attack helicopter (other than anti-helicopter). Against alerted forces, desant techniques are likely to be costly and offer little pay-off. An alerted Kaserne, for instance, is a dangerous target; an empty one, not worth the effort. A successful desant operation requires the insertion of many small raiding groups. Against an alerted defender, each of the groupings can be readily isolated and destroyed en route or upon landing. Against an unaware opponent, these groupings in toto can do extensive physical damage and generate even greater confusion and uncertainty, profoundly, if intangibly, affecting military decisions and home and governmental morale (in the mode of the 1968 Tet offensive).

Higher readiness levels, greater numbers of combat units and cavalry, etc., counter this threat indirectly as byproducts. Active measures can take a number of forms. Early warning can neutralize the threat if Kasernes can be emptied and the units deployed in the warning time available; otherwise early warning may accomplish little more than that accomplished indirectly by other measures. Home Guard units prevalent in many smaller Western European countries are a possibility. But unless several hours' warning is obtained, they may only contain the damage, not prevent it. Home Guards are suitable for protecting critical government installations and routes of march within hours of alert, but they are not suitable for protecting troop cantonments, depots, key leaders and other assets which may be the initial targets of an out-of-the-blue terrorist-like desant attack.

Effective counters to low-level heliborne attack require an airborne detection platform (e.g., AWACS, as a sophisticated example) and an active ground system capable of reacting with little warning. Both are necessary. Early warning of in-flight helicopters will not provide sufficient time for most short warning attack measures to be effective, except for locations deep in country. Normal air defenses are designed to counter medium-to-high altitude

penetrators, not helicopters flying at nap-of-the-earth altitudes. Air defense fighters are not suitable. Low-level ground-based air defense can be made suitable, but it is too demanding to deploy except in periods of tension. This puts the focus on the types of units that could be effectively deployed in the short time provided by an airborne warning platform.

Maintaining specific capabilities for countering the desant dimension can be expensive. Fortunately to a great extent, the cost for protecting the civil sector is already being borne in West Germany. Many of the measures being taken to protect against terrorism are equally effective against fifth columnists and small heliborne raiding parties. West German police are already armed with light automatic weapons, maintain standby police reserves, and are posted at sensitive locations. In Bonn, Bundesgrenzschutz units guard the residences of key leaders and patrol the streets in armored cars. This is obviously a labor-intensive system. Given this size and political sensitivities in and towards Germany, its increase is probably neither necessary nor desirable. Rather, the problem is that the organization has been designed to counter terrorism with little thought of countering a surprise military attack. Many measures designed for countering terrorists are similar to those for countering military groupings, particularly saboteurs. But there are also differences. Military groupings will be landing in vulnerable helicopters, will have heavier weapons and more ammunition at their disposal, and will most likely appear in much greater numbers. This suggests that if the various police groups are to be used effectively, some organizational, training, and heavier equipment changes will be required.

In the military sector several solutions are possible. More emphasis could be placed upon Home Guard territorial units. But these lack the readiness and control features necessary to counter short-warning desant attacks. Their value would be limited to reinforcement (largely static) and maintaining order. A second solution would be the random deployment of low-level air defense subunits, a deployment which could be justified as training. This solution has the advantage of tight air defense control, but would be deficient in available numbers. A third solution of randomly deploying the light air defense missile detachments organic to combat and

combat support units would provide considerable numbers. But tight control would be difficult, and civil authorities would be unattracted by the prospect of small detachments of REDEYE/BLOWPIPE throughout the countryside. These detachments are also effective only against airborne targets. They have no capability against landed troops.

A fourth solution is raised by the prospect of new defensive technologies and their implication for the roles and missions of the ground branches. For many tasks, multi-barreled anti-aircraft cannon are the most effective ground weapons: breaking up ambushes and roadblocks; anti-tank suppression; night defense; city fighting; and even assault against defending infantry. Yet for many years after the Korean war, these weapons were withdrawn from the U.S. and NATO force structures, succumbing to the argument that U.S. and allied air superiority made them redundant. Reinforcing this was a natural institutional bias in favor of the latest technology. The air defense establishment was concerned with high-performance aircraft, not secondary ground missions. With its limited resources, it wanted the best all-weather system available. The result has been single-purpose missile systems (e.g., Roland) or equally expensive anti-aircraft tanks (e.g., Gepard). Their cost and vulnerable radar dishes precluded their widespread deployment.

Several new technologies can lower the cost of these systems to levels comparable with other armored vehicles. The French have developed cheap radar-guided guns and placed them upon the AML armored car.[1] More significant is the potential of bistatic radar. With the emitter on an airborne platform, each vehicle need only passively receive, reducing costs, maintenance, and vehicle size and signature. Particularly interesting is the possibility of bistatic radar with a central receiver that could grid the targets for the ground vehicle. It eliminates ground clutter and ground masking, allowing the

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[1] For example, see "Return to Satory VI", International Defense Review, 5/1977 p. 925. For greater detail, see Satory VI (1977), Vol. 1 and 2, Armament, pp. 117-121, and Mobility, pp. 74-75.

ground vehicle to "see" beyond the mask and lay its guns accordingly. Each vehicle would again be passive, cheap, maintainable, and, in this case, would not require a vulnerable radar dish.

There are three distinct operational advantages to widespread deployment of cheap AA armored vehicles. Foremost is the potential impact on the tank-infantry team, a team now in question because of the need for better anti-tank suppressive fire to accompany tanks in the attack and the vulnerability of the infantry inside infantry carriers. Second, light cannon are more effective than SAMs of the REDEYE variety against low-level high performance aircraft[1] and attack helicopters. Third, and particularly relevant for this paper, its desirable air defense and ground fire capabilities allow armored cavalry to be expanded into a major force category more suitable for the surprise and border defense tasks discussed in the preceeding section and for countering the helicopter. Absorption by cavalry of light gun air defense also yield a proliferation which would not be available if these systems were institutionally confined to air defense artillery.

For the task of countering short-warning desant attacks (as well as those following a major breakthrough), an AA cavalry grided with an airborne radar platform offers a certain flexibility. They

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[1] For three distinct elements of tactical encounters (i.e., ground-based airspace surveillance, air-to-air combat, and air-to-air anti-radiation missile deployment), the existence of sensor emissions (radar energy) plays a critical role in the implementation and effectiveness of the U.S. approach and philosophy to tactical air warfare. Current concepts of defense suppression become meaningless when battlefield radars are driven by transmitters well removed from the battle (i.e., a sanctuary).

Aircraft can also use this "sanctuary illuminator" for its own radar needs and missiles can utilize this mode for semi-active terminal guidance. It must be emphasized that there are no major technology breakthroughs required to make this concept viable. Present studies show that this is well within the state-of-the-art technology.

This technology renders air-to-ground and air-to-air anti-radiation missiles useless since there is no radiation. It makes the defense suppression task significantly more difficult, if possible at all. There is no way to tell whether the attacking aircraft has been detected or not, and further, no way to tell whether any capability has been denied the ground-based radar/missile or radar/gun system. And finally, it makes the jamming/ECM job extremely difficult because one must assume that a sidelobe jamming mode (requiring considerably more power) is required, since there is no way to tell when an aircraft is being detected with the radar.

have the numbers to be deployed randomly for training, the requisite control, and the required effectiveness against landed groups. In line units, the cavalry platoon could readily be the nucleus for counter-desant alerts, with several vehicles kept on stand-by and moved near likely landing sites on alert. In the larger cavalry formations, AA cavalry offers the prospect of quick deployment and dispersal. This fact alone might act as a deterrent. If as much as an hour's warning were available, a considerable amount of AA cavalry could be dispersed throughout the countryside, making heliborne desant operations potentially costly and their prospects of success uncertain.

V. TERRITORIAL DEFENSE: COUNTERING SURPRISE AND OBTAINING BORDER AND IN-DEPTH DEFENSE

Border Police-Territorial Defense

The three modes of surprise attack (air, desant and armored ground thrusts) have been discussed along with various counters. Those measures officially proposed, it was argued, are too expensive and several are subject to counter-measures or are more suited to short warning than surprise attack. Armored cavalry offers one attractive solution, but it is not part of an official program, and it does suffer from deficiencies inherent in regular forces. For cavalry these derive from its purely military orientation towards protecting its parent unit, a unit itself oriented toward combat in open terrain. This necessarily implies a certain unsuitability towards combat in non-open terrain, a certain willingness to give up such terrain, and a tendency to view terrain from the military perspective of the security of the parent unit. The NATO use of cavalry highlights the violation in NATO force structuring of two time-honored principles: the political imperative that an alliance not readily yield the territory of a member, and good military practice that terrain be a determinant of force design and structure.

That terrain could be such a determinant and could be made highly defensible becomes apparent from a terrain analysis of the German border area and from recognition of the potential of new defensive technologies. Contrary to lay opinion, these technologies do not mean that well-organized and thoughtfully-led armored forces in open terrain will be readily overcome by the simple distribution of new defensive weaponry.[1] On the other hand, the new defensive technologies do give lightly-equipped forces capabilities not previously available. Light forces now have the weapons to destroy the tank and the fighter. Light forces, however, have to ensure that they are

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[1] For the best known exposition of this thesis, see James F. Digby, Precision-Guided Weapons, Adelphi Paper Number 118, Summer 1975. For a critique arguing 5 of 7 presented propositions misunderstand the nature of conventional war, see Steven Canby, "Comments on James F. Digby's Precision-Guided Weapons: New Chances to Deal With Old Dangers", a discussant presentation before the United Nations Association, May 5, 1975.

It should also be noted that Israelis - as they openly admit - suffered inordinate casualities in the opening phase of the 1973 war because of improper organization and unthinking e'lan. For excellent accounts, see Edward Luttwak and D. Horowitz, The Israeli Army, Harper & Row, New York, 1975, pp. 363-372; and Uri Ra'anan in G. Kemp, L. Pfaltzgraff, U. Ra'anan, The Other Arms Race: New Technologies and Non-Nuclear Conflict, D.C. Heath, 1975, pp.79-90.

it is experienced cadres. For example, in 1944-45 the key constraint upon the Japanese Navy and German Luftwaffe was not lack of aircraft or carriers, but the loss of their experienced pilot corps.

not themselves destroyed in the process. Light forces can survive and fight only if organized for two contextual extremes. A mobile element must be amorphous, capable of striking and fading before the opponent can react. A static element can only be effective if abnormally well-entrenched and if its flanks and rear are suitable covered by agile forces, whether they be cavalry or amorphous light forces. This means that light forces can only operate and survive in forest tracts or from readily fortified built-up areas. This is not an unreasonable condition in West Germany; 45 percent of the FRG is forested or built-up.[1] In much of the border region, this condition approaches 100 percent.

The practical import is that NATO's critical and decisive element--its expensive, and therefore necessarily relative scarce, tank/mechanized forces--can be concentrated and oriented towards the open corridors, portions of which can itself be blocked by well entrenched light forces in the cities and villages.[2]

The remainder of the border can be covered by quickly mobilized territorial units, employing static defense in villages and sapper and hit-run tactics in the forest tracts.

Terrain Analysis

Terrain analysis of the German border region indicates the potential involved, and several terrain features that could be used to advantage by armored cavalry and territorial defense units. Two-thirds of AFCENT's front has the terrain to make passage difficult, with a little help. Appendix 2

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[1] Of the total FRG land area, 29.0% is forest; 8.9%, built-up area; and 6.6%, wasteland, swamp and the like. The ratio of built-up area to forests and agricultural land changes by approximately 300 km^2 (1.5%) annually in favor of residential, industrial, and transportation facilities. [1972 Statistical Yearbook of the Federal Republic of Germany. Quoted p. 4 of The Engagement of Combat Troops in Built-Up Areas, Special training manual for combat troops, No. 3/76, General Army Office, Cologne.]

[2] For instance, the North German Plain corridor at its widest, between the Harz Mountains (Goslar) and the Luneburger Heath (Gifhorn), is 65 kms. Of this distance, 20 kms. is composed of the Salzgitter-Wolfenbuttel-Braunschweig sprawl, while the open countryside is laden with village complexes lying astride the secondary road network. Near Hannover, the corridor narrows and can be made even more restrictive.

shows that of AFCENT's 685 kilometer frontage (straight line distance from Hamburg-Fulda-Bayreuth-Passau), fully 450 kms. (66%) are sheltered by forest tracted heath and sharply contoured terrain. Even in the much touted North German corridor, only about 65 kms. at its maximum width are relatively open terrain (Goslar-Braunschweig-Gifhorn); 80 of the remaining 95 kms. to the Elbe River (Gifhorn-Uelzen-Luneburg) are covered by the Luneburger Heath, with a depth stretching back one-third the distance to the Dutch border.[1] The remaining distance to the North Sea is covered by the Elbe River and the Hamburg metropolis. The 220 kms. of the Bavarian/Czech border are formed by the watershed line of the rugged Bohemian Forest. The 350 kms. between the North German Plain and the Czech border are relatively rugged terrain interspersed by numerous corridors suitable for armored forces. The most notable of these is the Goettingen-Hessian combination, suitable for taking either the shortest (Paderborn) route to the Ruhr region (on a good road net but through readily defensible terrain), or the easiest route to the Frankfurt-Mainz Rhine crossings (through gently rolling terrain highly suitable for armor).

The second notable feature is the road network. In general, good East-West connections exist only in the invasion routes listed in Appendix 2. This terrain supports off-road trafficability and, in the major corridors, paralleling roads exist, making any successful block dependent upon the success of adjacent blocks. In the remaining areas, armor is restricted and can not be as effectively deployed. Armor can move through rough terrain (e.g., the strikingly similar Ardennes Forest of World War II), but armor can only fight effectively where it can maneuver, whether off-road or on adjacent tracks. In open areas where terrain trafficability restricts armor to column movement, it becomes vulnerable to long-range anti-tank fire

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[1] Truly good trafficability begins behind the Weser River on the Oldenburg-Osnabruck line, or about two-thirds the distance from the inter-German to the Dutch border. In this area there exists a dense roadnet, "firm" agricultural land, and relatively little urban sprawl, except for the omnipresent village.

Throughout much of the rest of the so-called North German Plain, good trafficability is generally limited to the (high-banked) roads. In the heath lands, tanks cannot follow in tandem. The pasturelands characteristic of this part of Germany are often drained marshes with frequent drainage ditches that are difficult for unaided tanks to cross.

(in the now famous episode of The Bridge Too Far, it was but a handful of 88s which imposed the delay). Where similarly restricted in the midst of dense and widespread forests, armored units can be blocked, cut up, and defeated in detail (in the mode of the Finnish Winter War).

A third feature is the relative density of the West German roadnet vis-a-vis that of the East. Eastern access to the border region is relatively restricted; but once the West German roadnet is reached, units can rapidly fan out. This phenomenon is particularly noteworthy in the wide forest tracts from Eisenach to the Austrian border. The sparseness of the roadnet and the denseness of the East German Thuringer Forest and the Bohemian Forest suggests that a high military pay-off could be obtained by interdicting/blocking these routes. Along a frontage of 320 kms., including that of the Fulda, Meiningen, Coburg, and Furth Gaps, such blockage could do much to restrict the flow of logistical and follow-on second echelon forces into the southern half of West Germany.

A fourth feature is urban sprawl. West Germany is a densely populated land of distributed villages (except Schleswig-Holstein), connected by a good interlacing transportation net.[1] Since World War II, population growth, the automobile, and industrial activity has caused a new grid to be laid over the old. Historic cities have expanded into adjacent villages. Linear industrial and residential fingers have grown along roads and rail lines. And a new high-speed roadnet has been superimposed over the old. This sprawl--most prevalent in the natural transportation/industrial/commercial clusters--has absorbed the surrounding flatlands and created potential obstacles and protected firing positions. It is present in all border corridors; it is particularly noticeable along the high-speed armor axis Helmstedt-Braunschweig-Hannover-Bielefeld-Ruhr. In many areas where the sprawl has not noticeably developed, as in the Bohemian Forest, movement can often be controlled by the stone villages sitting astride the transport net.

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[1] In the Federal Republic, there are 20,915 of these localities with a population of less than 3,000 inhabitants. They average 3.5 km. (2.2 mi) apart, or one such town per 12 km^2 (4.6 mi^2). (The Engagement of Combat Troops in Built-Up Areas, op.cit. p. 5.)

A fifth terrain feature, not readily apparent from map analysis, is the construction of the roads themselves. Major autobahns, contrary to popularized notions, are not suitable for front-line combat units. They tend to be treeless and silhouetted, exposing traffic to easy target acquisition by opposing ground and air forces (including static, urban-entrenched militia that can now be armed with long-range anti-tank weapons). Many roads are built upon embankments. It is often difficult to deploy from them, and they all have numerous bridgespans which can be dropped. The new (non-autobahn) high-speed roads often bypass the towns and villages; but they too suffer from the same military limitations as the autobahns. For an attacker, the pre-war roads have the disadvantage of being less direct and of going through the villages, but they are more covered and suitable for movement and deployment under fire. The net effect is that with a minimum of effort, the new high-speed roadways can be made unuseable to an attacker who has not yet consolidated his control over the adjacent countryside (and its stone villages). Until such control is established, the attacker can be forced onto the slower secondary roadnet dominated by these stone villages.

At this juncture, three significant points are worth noting: (1) control over the countryside can be forfeited by abandonment (as mobile forces are prone to do), or the countryside can be suitably armed, in which case the attacker must invest considerable time and resources to wrest control; (2) simple sapper techniques along roads can thoroughly disrupt any attempt at fast passage, requiring the attacker to spend time to repair multiple damage; and (3) control of the countryside and sapper techniques undercut the potential of blitz techniques, forcing a return to slower and better supported attacks.

Territorial Border Defence and Defence of Built-Up Areas In Perspective

In recent years, a considerable literature has developed on the subjects of territorial defense and military operations in built-up areas. Interest has been generated by the apparent inability of NATO to defend itself in other ways, save through self-destructive nuclear weapons. Unfortunately, much of this literature has also suffered from a discrediting surrealism and naivete about the nature of warfare. Territorial defense and military operations in built-up areas have their limitations. But they also confer advantages which the defense should incorporate.

The advantages of territorial defense and military operations in built-up areas are their organizational simplicity and cost-effectiveness. They can be based upon reservists, and they do not require expensive equipment. However, they cannot be expected to stand against full combined-arms attacks using the entire range of weapons and equipment available to regular forces. They must be considered auxiliaries, capable of coping with regular forces only in secondary sectors and only in special terrain conditions where they can engage the attacker without becoming readily targeted and destroyed. They cannot engage mechanized forces in open terrain and survive. Within these limitations, they can defend fortified urban areas and they can readily cope with the recce and advance guard screening forces of an armored thrust and its attempt to exploit gaps, weakness, and disorganization in the defense. As a corollary, it should be noted that the latter is what a surprise attack and 100 km./day penetrations are about.

Operationally, it should be noted that territorial defense and defense of built-up areas have no function except as adjuncts to the regular forces. That is, whereas regular forces can perform the complete range of military functions, these forces can only delay, block, and attrit 1st echelon attacking forces; they can also divert and absorb 2nd echelon forces, especially if the enemy were to attack into the conurbations. They are purely defensive. Against opposing forces as large as those of the Warsaw Pact, which are too large to be defeated by attrition alone, these forces by themselves cannot be decisive. Victory can only be obtained by the maneuver of heavy regular forces to break down the attacker's own cohesion. The importance of these defense systems therefore derives from the fact that (1) they can be more effective against surprise than prohibitively expensive readiness measures; (2) they can tie down large numbers of opposing forces if integrated into an overall scheme whereby these defense forces can play a meaningful complementary role with the regular forces; (3) they can relieve expensive regular formations, allowing the latter's concentration into an operational reserve; and (4) they provide screening forces and territory to mask the positioning of reserves for launching flanking ripostes against Soviet thrust lines.

Territorial defense forces play three major roles for which tactics and techniques should be worked out: (1) defense of the

border belt where terrain is suitable, about two-thirds of AFCENT's frontage, (2) defense of built-up areas in the open terrain corridors, and (3) assisting regular forces in defense and counterattack.

Defense of the Border Belt

Defense of the terrain-sheltered border belt has three components. The villages across the roadnet must be hedge-hogged. Light infantry must deploy into the forest tracts. And light infantry should be inserted into the Thuringer Forest and the Czech regions of the Bohemian Forest. Because they are local and organized in small units, forces of this type can be deployed within several hours, and the borders sealed against a surprise ground attack. Even small forces employing good military techniques can convert rough terrain into major obstacles for an attacker, causing irreplaceable time-losses and dissipation of his infantry strength. Initial obstacles can be costly to overcome and passage must be guarded for follow-on combat and supporting units.

Once the terrain-sheltered border area is sealed, little would be gained by further attempts at passage. The defender's tasks are to ensure that (1) the border can in fact be sealed by irregular forces, and (2) sealing cannot be disrupted by Pact countermeasures. Sealing means that Pact forces would be channeled into the open corridors while NATO forces would retain full use of the border space for maneuver and for launching ripostes; that NATO's mobile forces could be concentrated, creating the wherewithal for meaningful counter-attacks; and most important for countering a surprise attack, that a relatively small (rotated) deployed force operating mainly in the open corridors and employing the proper combination of blocking and anti-recce tactics or acting in conjunction with territorial units in the corridors could provide the time needed to alert and deploy the remaining active forces and to begin reserve mobilization. In this way the attacker's advantage of the initiative in time and place of the attack can be neutralized and even converted into a disadvantage if combined with a timely riposte.

To the extent that sealing the borders becomes an effective NATO option, the Pact could be expected to seek suitable counter-measures to at least prevent a few axes of advance from being sealed. For a standing-start surprise attack, their success implies capturing West German border communities before the amorphous small units can leak into the surrounding forests and the communities themselves can be fortified. Assuming an alert border (and customs) police capable of sounding the alarm and activating prepared obstacles, near-zero warning attacks upon the designated communities would require enemy raiding parties crossing the border by helicopter or infiltration. Due to the short distances, surprise desant attacks could be mounted on the communities. The disadvantage of this from the Pact viewpoint is the loss of surprise elsewhere in NATO. A phased attack upon border communities would minimize this loss, but could conceivably provide sufficient alert warning for the local territorial units to slip out. If NATO employs an "AWACS", as discussed earlier, this distinction becomes moot; any helicopter movement trips the alarm.

Old-fashioned foot infiltration may no longer be a feasible option. The possibility of detection by modern sensors or by random border and custom patrols could pose too high a risk. Early detection of even a single infiltration group could compromise a theater operation. Even without sensors, surprise infiltration would be an unlikely technique. A great many targets located at many varying distances from the border are involved. Detection is very likely, and it is almost certain that some groups would become lost or delayed and fail.

While complete surprise against border communities will be difficult for the Pact to achieve, it is nevertheless conceivable. Accordingly, several precautions would be necessary. First, it would be organizationally desirable to place territorial border defense under operational control of the border police, in effect making them mobilizable units of the border police.[1] This would eliminate intermediate command links, and ease delicate

[1] The Federal Border Police, responsible for airport security and other anti-terrorist activity as well as security of the inter-German border, are being expanded from 20 to 25 thousand. The similar task on the German/Czech border is performed by a 8 thousand man unit of the Bavarian State Police. There is also a system of stations and patrols by the Customs Police.

coordination during the first confusing hours of an attack.[1] Second, light automatic weapons (at least for officers) might be kept at home, in the Swiss tradition. Third, ammunition and weapons might be cached in the forests.[2] Fourth, some personnel (on a rotating basis) might be maintained at home on semi-alert, and those living on the outskirts of communities could be assigned forest assembly points.

Village Defense. Techniques for defending (and attacking) built-up areas are well-defined.[3] For small villages, they consist of the cross-firing of automatic weapons from the village's outer crust, obstacles across approaches leading into the village, all-round perimeter defense, and a reserve to reinforce and give depth to the attacked sector(s). Against a surprise attack where neither the attacker will be in deployed strength nor will the defense have time to become fully developed, particular emphasis is upon quick sapper obstacles across the frontal approaches and machineguns cross-firing from cellar outlets. This, in effect, forms a roadblock which the time-pressed attacker will first attempt to force, particularly if adjacent off-road maneuver space is limited, as will often be the case. If the frontal forcing fails, flank and rear attacks can be expected. But this requires time, in which the defenders can implement their own measures.

A well-defended village presents an attacker with several choices. The village can be assaulted, but this is generally to be avoided. Unless properly supported by artillery, the attack can cause high casualties and premature wearing-down of attack units. Moreover, in a surprise attack the artillery will often not be immediately available. It competes for

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[1] It would also have an obvious low-profile political advantage, particularly in conjunction with MBFR.

[2] Solutions of this type are of course sensitive due to West German terrorist problems. However, terrorists already have access to most of these weapons, the border regions in question have stable rural populations, and caches can be appropriately camouflaged and sensor-monitored.

[3] Excellent examples are C.N. Donnelly, "Soviet Techniques for Combat in Built-Up Areas", International Defense Review, April 1977, pp. 238-242; The Engagement of Combat Troops in Built-Up Areas, op.cit; and l'Urbanisation: ses Consequences sur l'Equipment et la Composition des Unites de l'Armee de Terre, French Command and General Staff College, 1974.

limited roadspace and cannot be moved into position too near the border prior to hostilities for fear of compromising surprise. After the attack moves beyond the initial border village, artillery availability will generally be limited because of ensuing time-lags and the forward roadspace that artillery and its ammunition resupply occupy. Generally the initial fire support available for covering an assault of the village will be direct-fire weapons and high rate-of-fire mortars and multiple rocket launchers. These do not require much roadspace, and mortar ammunition in particular is compact. It should be noted that the Soviets have recently deployed a very high rate-of-fire gun/mortar optimally suited for this work.

An advancing armored column when encountering resistance will generally attempt to "flow" around it, leaving it to be mopped up by following echelons. With multiple columns, by-passing can also take the form of shifting back-up echelons and pushing harder on adjacent roads. In areas where roads and trails are common, this implies that any successful block becomes its own trap as it is cut off and isolated, physically and psychologically, from sustaining support. If, as in the terrain-sheltered border regions, this option may not be available, Soviet formations must rely upon what might be termed German-style Blitzkrieg wherein emphasis is placed upon recce feelers to find paths around the immediate area of the strong-point, again leaving it to be mopped up later. This technique is more difficult for Soviets than Germans. Soviet divisions do not have the recce capability that was organic to German panzer divisions.[1] Nor do the Soviets presently have the requisite small-unit quality and leadership required for this type of "reconnaissance pull" technique. Instead, the Soviets rely upon a "rearward push" technique. The forward-recce function will generally be done by regular units in advanced guard formation. Clearly

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[1] In 1940, almost one-third of the panzer division's organic infantry were motorcyclists. There was a company in the recce battalion and in each of the two infantry battalions of the panzergrenadier regiment. In the larger 1939 panzer division, there was a motorcycle battalion in addition to motorcyclists in the recce battalion and in the four infantry battalions.

Soviets will not be as nimble as Germans in bypassing strongpoints, creating a weakness which can be exploited by the defense.[1]

Forest Infantry. The light infantry assigned to forest tracts has three tasks. Foremost is that of attacking the enemy's vulnerable recce feelers as they attempt to find and lead the way around the defended village. In the sheltered border area, this implies movement along the tangled trails of the German forest. Local light infantry can know these trails and can therefore readily position themselves to ambush interlopers, and generally seek a defeat-in-detail solution against armored units unable to use their weapons to full advantage. These tactics should result in early elimination of the rather limited number of specialized Soviet reconnaissance formations, causing increasing reliance upon less capable advance guard formations with even greater susceptibility to these tactics.

The second task of local forest infantry is that of guerilla-style tactics against enemy movements through the border region.[2] The attacker is interested in moving his columns quickly through the forests while using it as temporary cover. Forest infantry works against these interests with the tasks, in order of importance, of delay, attrition, and general harassment. Against surprise attacks, delay is the dominant task, attrition and troop weariness being both means and byproducts of obtaining delay. Assaults upon enemy columns are one tactic of delay. In general, however, such overt tactics should be avoided: they fritter away strength, and forest units may not initially be well enough trained and coordinated to attack large bodies of regular troops, however disadvantaged the latter may be. Instead, the

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[1] As mentioned in the footnote, p.19 , small-unit leadership is a weakness recognized by the Soviet High Command, and corrective action is being taken, but should nevertheless persist for some time.

It is important to note that this should not imply that the Soviet system is inflexible. On the contrary the Soviet command has considerable flexibility inherent in large numbers. Within this "program", the Soviets will be quite flexible. NATO's problem is to invalidate the program and force a break in the command and information flow between seniors and juniors, a break that is vulnerable to the unexpected maneuver but not to attrition or to the set-piece counterattack.

[2] Considerable legal distinction exists between partisan warfare and guerilla-style tactics. "Regularized" infantry employing guerilla-style tactics do not involve the local civil population (the Finns maintain that this is a major distinction between their system and that of the Yugoslavs) and retain protection of the Geneva Convention.

emphasis should be upon amorphous techniques. The enemy should be targeted without the defender becoming similarly so. The leading technique is that of the sapper. In forest areas there are frequent opportunities to create small but numerous obstacles. These can be used as the basis for ambushes or full-scale roadblocks. Most often their purpose will be limited to that of destroying the first several vehicles, most often by AT mines and AT fire, and their contingent of deploying infantry.

The new defensive technologies can add several dimensions to the traditional block and hit-run destruction technique. The most obvious is the ATGM added to the sapper block: more vehicles could in theory now be destroyed and from a safer distance. The difficulty is that the terrain generally does not lend itself to this technique.

A capability that could be developed is light infantry comprising observation and firing parties controlling terminally-guided rockets in an indirect-fire mode. This system obtains its strength from the ability of the observation and firing parties to remain masked at some distance from the target area. If discovered, they fade into the forest o: ambush and booby-trap pursuing infantry. A variant could consist of a line-of-sight laser-designator party a kilometer or so from the target, and a firing party 3-5 kms. from the target. Each laser spotter could target 3-4 tanks per minute until column vehicles masked themselves with smoke or moved off the road and "hid" under adjacent foliage. Low-powered radios and M-10 (mortar) plotting boards are sufficient for command and control. (Components for such systems are already on-the-shelf. Since the U.S. military has no requirement for this approach, no interest has been shown in the potential and the RDT&E community has been unwilling to invest in component integration. For example, the anti-tank rocket could be a 2.75-inch rocket with an anti-tank warhead and a terminal seeker. System costs would be roughly $200 for the rocket and warhead, and $2,500 for the seeker. Rocket and warhead compose the system's bulk and weight. Large numbers of the rockets/warheads could be economically cached in the forests; the high-cost seekers could be kept in suitcases with the firing party.)

A second more potent (but not self-contained) variant would consist of only a spotting party and a high-powered radio for communicating to a firing party safe behind one's own lines. With the use of U.S. Navy's SMARTROC, a 500-lb warhead could be fired from commercial trucks at a distance of 26 kms., at a cost of $11,000. Time lags would not allow this system to be fired at moving columns. Instead, one SMARTROC could be fired to block the road at a weak link (pass, culvert, etc.), or crater it with newly developed sub-munitions (e.g., the British JP 233). A second SMARTROC with an APAM[1] warhead could then be fired at vehicles queuing up at the block.

The third task of forest infantry is to serve as the connecting fabric for the border belt, in conjunction with armored cavalry and small numbers of regular units assigned to provide visible as well as physical back-up to the territorial units. A connecting fabric is psychologically necessary to reduce the sense of isolation among the defenders of forward villages. It also ensures that well-defended villages will not be contained by small enemy investments, that supplies can be filtered into the villages, and that regular counter-attack forces can be quickly and safely guided into advantageous attack positions.

Infantry Insertion. The third component of border defense is the insertion of light infantry into the East German Thuringer Forest and the Czech side of the Bohemian Forest, respectively 35 kms. and 10 kms. from the border. Its military rationale is to take advantage of the restrictive road-net leading into West Germany from these areas. This adds depth to the delay, attrition, and general harassment zone to be established by the forest infantry. Interdicting these areas in this way is also more effective than targeting them with tactical airpower, while at the same time allowing these expensive assets to be focused upon more dangerous areas where no substitute for their unique capabilities may exist.

Given the questionable loyalties of the Eastern European states, infantry insertion can also have a larger political purpose: to test the mettle of the

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[1] For anti-personnel/anti-materiel cluster-bomb. SMARTROC with APAM costs about $17,000 each.

Pact alliance. Light infantry roaming these tracts would have to be countered by similar light infantry. A characteristic of the Soviet force structure is the relative scarcity of infantry. A Soviet attempt to "police" the forest tracts would require diverting their airborne divisions from potentially high-payoff desant operations, or the "grounding" of several MRDs. In mounting a pre-emptive surprise attack the Soviets should lack the strength for either diversion. They could therefore be expected to reduce the frontage of their assault, or to assign the policing role to less critical and more redundant East German and Czech units. From the Soviet viewpoint, this has drawbacks. Coping with light infantry requires a motivation and diligence the Soviet Union's allies may lack. Any exposure of this weakness could quickly snowball into a serious problem. From a Soviet viewpoint, it might also not be advisable to allow East Germans to fight alone against West Germans.

In the Bohemian Forest, the tactics and techniques of inserted forces could be similar to those discussed for forest infantry. In the Thuringer Forest security and logistics are constraining and tactics would have to be more traditional, with particular empha is upon sapper techniques. Use of the 2.75-inch terminally-guided rocket system would be limited because caches could not be prepositioned. Similarly, while longer-legged ASROC launchers could be developed for SMARTROC, radio communication in the midst of enemy territory would compromise their location; the weapon system's use would have to be restricted to particularly worthy targets, or as an occasional means to draw attention and divert enemy defenses. Within these restrictions, a technique that would require minimum coordination and could yield a high pay-off would be a combination of SMARTROCs timed a minute or so apart. The first set would form a block (dropped bridgespan or craters); the second, larger set would follow with spaced APAM and cratering submunitions.

Corridor Defense and Defense of Built-Up Areas

As has been mentioned, techniques for defending built-up areas are well defined. What is missing is an appreciation of their role. Much of

this confusion was generated by a series of MOBA studies (Military Operations in Built-up Areas) in the early 1970s. These technically-dominated studies tended to transpose recent U.S. "Hue" experiences into the center of Europe. Abstracting from the political sensitivities of the West Germans who do not care to see their cities destroyed again, these studies displayed a military naivete, common in much of the U.S. analytic community. Why would the Warsaw Pact ever attack major industrial complexes? Their defense would not prevent their being bypassed; their defense would hinder the Soviet advance, but the Soviets could still shatter the alliance by destroying the northern army corps or by appearing in strength beyond the cities of the Ruhr and on the LOC to Holland and Belgium. Indeed, Soviet attacks upon cities would--or should be--a NATO-preferred strategy. As Stalingrad shows, a city the size of Hamburg could pre-occupy the entire GSFG for several months and will very likely be avoided by Soviet ground forces for that reason.

Consequently, the notion of a strategy based upon combat in cities is a non-option for NATO. However, this should not be interpreted that combat in built-up areas is not of interest to NATO. As was argued earlier, static defense of the small villages sitting astride the West German roadnet can be an important component of Western defense. This applies equally to the open corridor areas of the inter-German border region. Second, and for much the same reason, static defense of the large conurbations can fit in with an overall scheme of defense.

In this scheme, the purpose of defending the small villages in the corridors is essentially the same as previously stated for terrain-sheltered areas. These blocks impede the enemy advance and attrit his strength.[1] The villages of some regions will hold; others will not. But the success of even some is a major boon for the defense. The defense, at little cost to its own mechanized

[1] An important distinction is that just as NATO's regular forces cannot afford to engage in a war of attrition with those of the Pact, Pact forces cannot afford a war of attrition with those of the village. With PGMs and guided cluster munitions, even bypassed villages can extract serious attrition on the bypassing 1st echelon formations.

assets, can now discern where and how the enemy attack is unfolding. Instead of being forced to disperse its forces, the defense can concentrate and counterattack, often using the successfully held regions as the shoulder and mask for attacking deep into the enemy's thrust lines. The defense can now more than fully offset the advantage of the offense's initiative, being able to counter surprise, screen its own movements, and to concentrate more than the attacker. That is, while territorial defense overall allows the defense to shift its focus to the corridors and obtain a measure of operational and organizational symmetry with an attacker, territorial defense within the corridors allows the defense to concentrate even more than the attacker. Equally significant the defender's mobile forces are accorded full maneuver room while those of the attacker are restricted. In this way the advantages of the new defensive technologies can be made to favor the defender.

In effect, cities perform the same role in this scheme. The task of defense of cities is not street-by-street defense, but defense of the conurbation's outer crust. The objectives are to attrite and contain enemy mechanized strength, to substitute for and concentrate one's own mobile units, and to provide sally points for counter-attack. In addition, cities can provide cover and concealment for forces waiting for and moving to counter-attack, as well a better roadnet to support counter-attacks than that available to an opponent stretched on one or both sides of the urban obstacle.

Countering these urban crusts can pose a dilemma for the attacker. Avoiding the city causes movement to be canalized and costs investure forces; this dissipates his strength and maneuver room, increasing his vulnerability to counter-attack from a defender retaining operational reserves. Moreover if not neutralized, their omnipresence implies passing formations will be continually bled and harassed, particularly given new defensive technologies.[1] Yet assaulting them will be costly. An attack consumes his strength and

[1] Laser-guided indirect fire 2.75-inch rockets and SMARTROC would be useful for targeting tanks and vehicular columns from protected cities. Line-of-sight could be obtained from any height above the city's outer crust. Alternatively cheap weapon systems mounting periscopes and guided mortar-like rounds could also be cheaply developed. For an example of such a system, see Steven L. Canby, Terminal Guidance On The Battlefield: Obtaining Its Potential Payoff, TSC, May 1975, pp. 45-53.

slows his momentum (which after all is the essence of the blitz in particular and armored warfare in general). Their perimeters are large. They can be difficult to take and control, and the crusts must be continually garrisoned with infantry (a scarce Soviet commodity) to prevent their being re-occupied and re-used.

From the point of view of territorial militia the crust of cities can be quickly fortified and defended. This deters attacks and inhibits city occupation. In a pre-emptive surprise attack the enemy will lack both the forces to seize them and the conventional artillery to level them. Leveling would require a concentration of artillery and an ammunition re-supply which the Pact could not afford. City-leveling and city-attack would not be a prevalent enemy tactic during a surprise attack or during any conventional phase dependent upon out-maneuvering and annihilating NATO field forces to achieve a quick and decisive victory. It would only become a Pact objective if its military moves were frustrated and NATO formed a strong defense. But that, of course, is exactly the purpose of a strong conventional defense. For NATO there is additional benefit: the decision to escalate to nuclear weapons is now upon the Soviets, in which case the U.S. response is likely to be less ambiguous.

The military purpose of urban defense can thus best be visualized as an obstacle and maneuver pivot for counter-attacking reserves. Large cities can be quickly transformed into defended obstacles which an armored opponent must skirt. The more he must skirt their outer limits, the greater his movement is canalized and the easier it becomes for the defender's mobile forces to block and counter-attack. Defending forces now gain time to discern where the major thrust lines are developing. Defending generals can allocate forces to block further advance with less fear of their being flanked and cut off. Tactical air forces can focus upon second echelon forces feeding into the active thrust lines. Most important, by containing the attack's fluidity, the defense can plan decisive counter-attacks on protected routes leading deep into exposed flanks, with less fear of being caught enroute by superior enemy counter-counter-attacks.

Special Distinctions of Territorial Defense in Open Areas. The concept of territorial defense in the open corridors necessarily differs from that of the terrain-sheltered borders. There the terrain provided a sufficient degree of isolation so villages could fight and attain significance as individual identities. Even a single well-prepared village situated across limited transport net and in the midst of a large forest tract could form a significant block to enemy plans with little need for immediate outside assistance. In the open corridors, on the other hand, any single village or urban obstacle has little significance. The enemy can readily flank any single block, either from adjacent roads or more immediate filtering around. The light infantry which helped preoccupy the enemy's attention and hold the system together in the terrain-sheltered areas cannot survive in the open country. Nor can manpower now be spared from the static defense of the village itself. The villages now become a passive and static element of a larger system, rather than an active defense on their own. Accordingly, villages in the open corridors must be grouped into blocks and held together with mobile forces. Active forces must perform the fabric and the counter-fluidity roles of the forest infantry. Village forces can not now fully stop enemy recce attempting to move around the village. If the enemy attempts to move in-force between villages, they must now be blocked or counter-attacked by active forces. Similarly, it is the presence of these mobile forces that give the psychological and occasional physical and logistic support necessary for the village militia to carry on.

Grouping by village blocs is necessary for several reasons. Tactically, bloc defense provides the individual villages with a degree of mutual support. In the corridors, most villages are in line-of-sight of each other. Even if not, much of the surrounding countryside is visible from several villages, providing some degree of overlap with indirect fire and longer-range anti-tank weapons. Psychologically, bloc defense and mutual fire support provide a degree of encouragement for village militia understandably nervous and prone to flight. Operationally, village defense in the corridors serves little purpose unless large spaces can be secured and the enemy thrust canalized at little cost to the defender's active forces. From the operational viewpoint, village blocs and large conurbations are but a means toward

leveraging of the defender's forces. Thus whereas random defense of a given number of villages would simply provide limited attrition and time-delaying detour, bloc defense in addition can attain a measure of operational significance. It restricts the ways in which the Pact could envelop NATO forces, provides protected avenues to counter-attack deep into Pact flanks, and allows force concentration to replace force dispersion.

Organizationally, there might also be differences between territorial defense of the open corridors and of the terrain-sheltered tracts. In the latter, control would center around the fall-back of border police units and operations within the forests. Overall coordination could be amply provided by the paramilitary border police. In the corridors, control would center around allocation of artillery support, coordination with the armored cavalry serving as the connecting link between villages and outside assistance, and passage of mechanized units through village complexes. Control would rest best with the possessor of artillery and cavalry support. This would normally rule out the border police. Giving them these additional assets could erode their qualitative character. Regular forces, on the other hand, generally lack intimate knowledge of local terrain, and should therefore be freed as much as possible from fixed responsibilities and allowed full scope for operational maneuver. This process of elimination will leave control to the local territorial commander who could be assigned skeletonized units of artillery and armored cavalry as well as cadred units for occupying key terrain within the region.[1]

Special Considerations Against Surprise. Much of the discussion of this section has been couched in terms of normal defense against armored thrusts. In the surprise variant, several distinctions become apparent. First, in this case, the Pact would want to preempt and disrupt local mobilization and move through as much of the border belt as possible before warning could be disseminated and widespread mobilization sufficiently activated. This suggests a night attack, possibly in bad weather. Second, the attacking force will be

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[1] It is interesting to note that in Schleswig-Holstein where the Germans are self-dependent, they are already evolving towards a similar territorial defense system with active skeleton units backed up by mobile forces (6th Armored Infantry Division). Elsewhere the German territorial army is oriented to logistic support and rear area security for forward NATO corps. See p. 77 for a further discussion of the territorial army.

organized for fast movement and shock impact, not heavy combat with substantial firepower support and logistical support. Third, defending active forces will be scarce to non-existent at the outset, putting the burden of initial defense almost entirely upon village defense.

The main problem is ensuring an hour or so of time to activate pre-planned measures. In this amount of time, motorcycle formations--of which the Germans were so fond in 1939-41, and which are now coming into vogue again in several armies, including the Soviet--can travel as much as 100 kms. on autobahns and perhaps 60 kms. on secondary roads. Armored cars and other light armored vehicles could dash half this distance. In particular, it should be noted that the Soviets seem to have something similar in mind with their so-called "super BMP" regiments, one of which is now organic to each tank and MRD division.[1] These dashes could also, of course, be assisted by heliborne units, though the majority of these units would probably be assigned even deeper-penetration tasks.

NATO is presently quite vulnerable to such out-of-the-blue dashes. Regular air and ground units cannot cope with them. Tactical airpower cannot respond in strength in the time available; it also has special problems of ground coordination in a confused situation which will be further aggravated by night and possibly bad weather. Nor can ground units be alerted and distributed in the time available.[2] Ground formations which happen to be in the area for training could move into

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[1] Karber, op.cit.

[2] These are the conditions that lend force to such Soviet comments as: "The increase in the role of surprise in operations and battles has been caused by the fact that under conditions of very rapid development of combat operations, enemy groupings often generally will not manage to take steps to eliminate the consequences of surprise attacks made against them. In these cases, surprise may be the deciding factor in achieving total success...."

"A third (preferred) way to achieve surprise is for commanders and staffs to employ methods which are new or unexpected for the enemy in the organization and conduct of an operation or battle. It is newness in methods of their preparation and conduct which opens the broadest possibilities for employment of surprise actions under any conditions of the combat situation. This is a constant and genuinely inexhaustible source for achieving surprise." V. Ye. Savkin, The Basic Principles of Operational Art and Tactics, A Soviet View, GPO, Washington, D. C., pp. 232 & 237.

blocking positions. But any local success would likely mean only their being flanked on adjacent axes of advance, and cut off. Counter-attacking with these training units would be more profitable, but probably impossible due to general confusion, the need to distribute live ammunition, and the fact that most training is by separate units rather than by combined arms. The only regular forces now in existence that could be reasonably be expected to cope with these dashes are armored cavalry, augmented with combat engineer detachments employing sapper techniques. But the latter also implies delaying tactics that give up West German territory. The German practice of maintaining a third of its forward divisional forces on 4-hour alert does not cope with this problem and in fact, given NATO's posture and shortage of operational units, could compromise the viability of NATO's defense.

The conclusion can thus be reached that as opposed to the present, NATO can defend all its territory in place and guard against pre-emptive surprise on the ground through a territorial defense scheme based jointly on static defense of villages and the outer crust of forward cities and large operational reserves.

VI. ORGANIZING FOR ARMORED WARFARE AND OPERATIONAL RESERVES

A defense can be organized in many ways, though only a few may be suitable when considering the threat, the terrain, and the type of forces that could be made available. For NATO, the threat is tank-heavy combined arms thrusts by Soviet forces, capable of attacking either from a standing start with relatively small forces or after full mobilization with larger forces echeloned in depth and with full combat support. In most of West Germany, the terrain is rolling; flat terrain exists only in the Rhine Valley and the North German Plain. In all areas of West Germany the lines-of-sight are remarkably short, with the terrain broken and channelized by numerous forests, built-up areas, and marshes. NATO has traditionally favored active standing forces, giving little recognition or value to other forces. NATO nevertheless possesses large numbers of militarily trained civilians. But little effort has been made to organize these ex-servicemen for uses that could run the full gambut from mobile forces (equivalent to those of the active forces) to simple light infantry employed in a coherent territorial defense scheme.

Modes of Defense

NATO's mobile forces can be deployed in three general modes: cordon, cordon-like (positional) defense-in-depth, and mobile defense. A cordon defense is characterized by thinly disposed forces across the front. It is appropriate for symbolism and for nuclear deterrence. Its warfighting capability is little more than a trip wire. As a posture for conventional warfare, it is a prescription for defeat in-detail by armored forces penetrating and enveloping weakly

held forward positions.[1]

Defense-in-depth resembles the cordon in its linear dispersement, differing in that the depth of its forward defenses can be belted and can extend many miles. Defenses on the Western Front in World War I had this characteristic. It is appropriate against slow moving infantry, being able to hold (as at Verdun) against large scale attack. But it also required large numbers of divisions and a nation-at-war committment. When the Germans towards the end of World War I buckled these defenses with their "Hutier" tactics, events still unfurled slowly enough so that the defender could reposition reserves to maintain the depth of the defensive belt and to counter-attack on the flanks of an attacker in the process of over-extending himself and creating his own vulnerabilities.

A third generic defense is that of the mobile defense. In this defense relatively small forces are deployed forward, with relatively large forces being held in reserve. This was the style of defense that the Germans executed so masterfully in North Africa and in Russia. They recognized that in armored warfare the problem is not to stop a penetration, but what to do after a penetration. That is, as much as one would like to fight a positional defense in depth, the resources simply are not available for it. Even Russians against Germans do not have the resources. It can be argued that the Battle of Kursk proves otherwise, that a defense in depth could stop

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[1] Napoleon was once shown a plan to defend France where almost the whole Grand Army was placed in fairly even, linear defense, along the French frontier. He asked if it was to prevent smuggling. Quoted in Adrian Hill, "Could Napoleon's Army Win Today," RUSI, March 1977. Similarly, A. V. Suvorov, the great 18th Century Russian general who the Soviets publicly credit as the intellectual father of their version of blitzkrieg, stated, "I am obligated to direct your attention to the military truth that the cordon line always can be overrun: at his will, the enemy rushes forces against one point while the defender remaining still in uncertainty, has his forces dissipated. For this reason I see with dissatisfaction the breaking up of your corps....I would like to see all routes and paths occupied, not to defend each of them, but only to observe; for this just light forces are sufficient; but the main forces must be held together so as to await at some point the enemy attack or go toward him and cut him off. Thus the troops win time and manage to uncover the foe's intentions before he attacks." V. Ye. Savkin, Operational Art and Tactics, U.S. Government Printing Office, Washington, D.C. p.207.

the tank attack. However it is to be recalled that both sides prepared months in advance for Kursk. Had the Germans called off the operation and attacked elsewhere, the Soviet concentration and preparation would have been for naught and could have lead to the familiar maneuver warfare proposition of local success begetting its own demise.

In armored warfare events are likely to unfold too fast for positional defense. No side has the resources for defense-in-depth theater wide.[1] Defense-in-depth--as at Kursk--can only be obtained by concentrating theater level reserves. If the attacker shifts his forces, so must the defender shift his, both to avoid their own encirclement as well as to counter other initiatives. In slow-paced infantry warfare, the defense has ample time to discern the true state of affairs and to physically move men and material. In armored warfare, events may be deceptive and may break too fast. The defense can be penetrated and forward forces can be enveloped. Accordingly in armored warfare the brunt of the defense is upon the mobile reserves. A fortiori if tactical nuclear weapons are to be used: static positional defenses are obviously more targetable than elusive mobile forces. In addition a defense oriented to positional warfare could have difficulty coping with a Soviet unreinforced surprise attack. With small reserves, recouping lost territory would be difficult and attempting to prevent initial territorial losses with a forward defense could jeopardize the entire defense.

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[1] As aptly put by Liddell Hart, "Views about the strategical minimum of forces required for effective defence still tend to reflect the habit of thought that developed in the First World War, and its doctrinal legacy. The continuous trench-front that came to be established in 1914 on the Western Front, and persisted throughout the war, left a lasting impression. It was deepened by the low mobility of forces at that time. Ever since there has been a tendency to assume that the whole strength of a frontier ought to be provided with the tactical minimum for effective defence of every sector, both in forward troops and in local reserves for their support. Thus the strategical minimum requirement has come to be regarded as basically no different from the tactical minimum. It is a view which amounts to visualizing the extreme case, extremely improbable, of having to meet a heavy attack on all sectors simultaneously--and demanding forces strong enough for defence everywhere. Its influence is apparent in suggestions and arguments that, without the use of nuclear weapons, NATO would need a standing force of as much as seventy divisions on its central front, even against Russian forces of lower strength." "Shield Forces For NATO", Survival, IISS, May-June 1960, pp. 109-110.

The conclusion must therefore be drawn that however much new technology or other means may strengthen forward defenses and reduce the need for reserves, large operational reserves nevertheless remain the sine qua non for defense in armored warfare.[1] For Westerners against Russians (and auxiliaries), operational reserves have special poignancy. First it must be recognized that positional warfare implies a certain passivity on the part of the defense and an emphasis upon firepower and attrition warfare. Mobile warfare, on the other hand, depends upon maneuver and command flexibility. Second it is to be noted that Western and Eastern militarys putatively have opposite characteristics: the East has numbers and lacks initiative while the West lacks numbers and prides itself upon individual initiative. That is the West depends upon tactical brilliance and fine coordination to offset inadequate resources and reserves--characteristics which can only be obtained by wide-open maneuver warfare. Soviet command rigidity may make them susceptible to maneuver counterattacks. But that is quite distinct from attrition losses to firepower and the inability to replace losses at critical points in time and place. The West as now organized cannot absorb such losses; the Soviets can. Traditionally, they function amidst high losses. Their size and organizational pattern allows them to field a military system that is almost hydra-like. As in the fable, the Soviet system may similarly not be vulnerable to losses unless its command-brain subsystem is itself damaged and thrown off its "program". This requires dislocation, not the losses from attrition.

In discussing mobile defense, it must also be recognized that the Anglo-Americans have not visualized their use of reserves in the same manner as the Germans of the Guderian/von Manstein period. Partly because of the numbing influence of tactical nuclear weapons, the Anglo-Americans have viewed the mobile defense as a technique for channelizing the attacker

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[1] Again as so well put by Liddell Hart, "Analysis of recent war experience tends to show that the higher the ratio of the mobile reserves to the troops holding the forward position the greater is the prospect of defeating concentrated thrust. In past practice the divisions in mobile reserve, not tied to a particular sector, have often been less than a quarter of the whole force. Analysis of operations suggests that a half of the whole force would be a better proportion--even where it entails thinning the forward defence to a hazardous degree." Ibid, p. 110.

into "killing zones" for destruction by firepower.[1] The German view differs in two major respects: (i) they were never subject to the grandoise notion that their forward strength was sufficient to channelize the attacker and (ii) their reserves destroyed interlopers by the maneuver technique of breaking their cohesion. The latter is an operational (as opposed to battlefield) concept Hitler permitting, the preferred German technique was that of allowing breakthrough forces to pass through and create its own conditions for destruction through over-extension. This set the stage for a major counter-attack to turn self-imposed dislocation into forced dislocation, thus breaking the armored thrust's cohesion through the German ideal of the Cannae.[2]

Why NATO Loses So Fast

NATO's problem is that its corps sector divisions are deployed in little more than a cordon. NATO's forward forces are so thinly deployed that there is no defense-in-depth (in the sense of physical occupation by many units as opposed to movement through an area or occupation of alternative positions by a single unit), and units cannot be leap-frogged past others to give a measure of respite and precaution against the unforeseen. Reserves in each

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[1] The U.S. Army position is exemplified by the following two statements:
--Although there may be occasions when the counterattack is made by fire alone, more decisive results usually follow from the use of a combination of fire and maneuver.
--The primary objective of defensive operations is to destroy the enemy. This is accomplished by bringing the most effective fires possible to bear on the attacker. Maneuver may be required to increase the effectiveness of the fires in a given area to exploit them.
Correspondence Course of the U.S. Army Command and General Staff College, Subcourse 12/2, Division Operations-II, Feb. 1972, pp. 1-3 and Lesson 1, Solutions, p. 1-2.

[2] For an excellent description of this technique, see F.W. von Mellenthin's description of Balck's 48th Panzer Corps operations on the Chir River, Panzer Battles, Ballantine Books, 1976, pp. 211-224.

It is to be noted that 48 Panzer Corps is increasingly becoming the "model" for the Bundeswehr. The caveat is that the Corps in general is a smallish unit to be conducting a (operational) mobile defense on its own, though, to be sure, NATO has long practiced the anomaly of (battlefield) mobile defense within compartmentalized Corps sectors.

corps sector amount to little more than a brigade each. Each of NATO's two army groups retain only one earmarked German division for reserve. NATO can thus mount neither a serious positional defense nor a serious counter-attack. The U.S. Army now admits it lacks the forces for either positional or mobile defense for its assigned sector in Europe; it is attempting to rectify a bad situation through what might be termed an active positional defense.[1] The Germans and British for their part are opting for the old German belt defense built upon the counterattack.[2] Both tactical systems flounder upon lack of combat units.

Reserves Do Not Exist

The only reinforcements of any significant size that are immediately available are those of the French and the German territorials. The five French divisions could be made rapidly available and constituted into a counter-attack force. However, using the French in a counter-attack role raises serious questions. Most notably, the French may not abide by NATO ground rules for the use of nuclear weapons. French declaratory doctrine states that unambiguous aggression will be met with nuclear weapons. Hence NATO (read the United States) may not want French intervention in an active corps sector. Second, the French center-of-gravity is northeast France. A French counter-attack into northern Germany would be difficult

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[1] For a frank admission, see the debate generated by William Lind, "TRADOC's Reply", "the tactics set forth in FM 100-5 are the exact opposite of a linear defense. In the past the U.S. Army planned on defending with a broad front, thinly held, somewhat linear defense. This defense was brittle and would have been penetrated. Such penetrations were to be ejected by the committing of reserves usually in a piecemeal fashion. The reserves would then be subject to defeat in detail. Or, the old "mobile defense" envisioned a large sweeping counter-attack which gave up the "advantages of the defender". The active defense, on the other hand, plans for defense in depth using maneuver to concentrate sufficient combat power at the critical place and critical time to prevent an enemy penetration. Carefully selected counter-attacks are an integral feature of an active defense." Armed Forces Journal International, October 1976, p. 27.

[2] Reference Book: Interoperability Handbook for British, German, and U.S. Forces, USACGSC, Ft. Leavenworth, KA, November 1976.

to position. Third, French forces are the least integrated of the available forces. The French tactical air army is representative of the problem: it is the only air force which does not use English as the cockpit and control tower language.[1]

The West German Territorial Army represents a growing capability.[2] Plans now call for six brigades (mech), six heavy regiments (motorized), fifteen light regiments and 150 security companies. These brigades and regiments equate to nearly nine divisions. However, only the six brigades are envisaged as suitable for front-line tasks. The remainder are oriented to rear-area security. The most serious limitation, however, is that while these units can be assembled in less than three days, only a few have cadres large enough to permit early deployment in a demanding combat role. Most are equipment-holding units; they will not be suitable for more than light combat duties until after a shakedown period of several weeks. While personnel are adequately trained individually, they have had little group and unit training. Individual personnel are also often unfamiliar with the equipment in the Territorial Army, since it is generally one generation older than that in the Bundeswehr.

Nor can this shortage of divisions be filled from U.S. sources. The United States could reinforce considerably faster than at present, but only up to the ceiling posed by absorption capacity, a function of in-theater personnel and equipment stocks. The binding constraints are at present organizational and doctrinal. Greater POMCUS stocks and enhanced airlift are expensive and address sympton manifestations rather than the real problems

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[1] For details of the French position and the on-going French restructuring exercise, see Carl Bernard, Interim Technical Report: Task 2: French Forces for NATO, An Overview, TSC, June 1977.

[2] For an excellent discussion on the Territorial Army and its potential, see Major Wolf D. Kutter, The West German Territorial Army: A Potential Combat Force for Sustaining NATO's Flexible Response Strategy and Forward Defense Doctrine in the 1980s, Armed Forces Staff College, Norfolk, VA, December 2, 1977.

of rapid reinforcement and field deployment.[1] U.S. forces by themselves can also form but a small part of total alliance requirements; a truly significant U.S. conventional contribution is physically, politically, and financially unattainable. Significantly larger U.S. forces are unlikely to be deployed in Europe in peacetime, the requisite number of active divisions simply do not exist in the CONUS force structure, and U.S. reserves suffer from special American institutional factors that go back to the founding of the Republic. In the worst case of a pre-emptive surprise attack progressing as rapidly as the German attack in May 1940, these CONUS divisions even under (optimistic) contemplated deployment plans will have no impact other than increasing the number of American hostages. Against a fully mobilized M+30 day attack, these (active) divisions in themselves are inadequate in number. They can become a meaningful addition only if the Western Europeans increase their reinforcement capability, in which case it will be found that NATO can in fact field more than adequate numbers of divisions for its defense within present budgetary constraints.

Overlooked Complications Of No Reserves

Lack of wherewithal and loss of flexibility obviously follow from a posture lacking in total numbers and in operational reserves. However, additional impacts which are not fully appreciated include the following:

1. Without adequate numbers of combat groupings, NATO's modernization programs are likely to be of little avail. For example, in the positional defense the introduction of larger numbers of more sophisticated anti-tank weapons is unlikely to show a significant military payoff in present circumstances. Defensive units which lack both depth and dispersed anti-tank groupings can be readily detected and neutralized by Soviet artillery suppressive fire. Ladening the infantry with ATGMs is an inefficient means of obtaining

[1] For an elaboration, see Steven Canby, Interim Technical Report: Task 1: European Mobilization: The Policy Issue of U.S. and NATO Reserves, TSC, February 1977.

greater AT strength. Infantry is often employed in roles where these weapons become a burden. The two more general problems are (i) that the standard NATO defensive stance has not been designed for anti-tank warfare and (ii) that sophistication is being driven by the need to offset doctrinal and organizational deficiencies. The one requires technology to compensate for tactics, the other for inadequate numbers.

2. Present emphasis on modern, centralized, tactical airpower to blunt enemy tank threats presumes strong army reserves. Without them, NATO's large investment in tactical airpower will have been for naught. Air forces acting alone can only exact attrition. In conjunction with ground forces, they can obtain more than their firepower value through disruption, being particularly effective if they act as the leading edge of armored thrusts whose goal is to shatter the cohesion of the enemy. Defensively, airpower can be used most effectively to disrupt the attacker's operational coordination, gaining time for the ground force to deploy its forces and position its reserves. But these disruptive effects can only materialize if the ground force is organized and deployed in such a manner that its reserves are stacked in echelon, available for forward movements in blocking and counter-attack roles. If these reserves do not exist--as is now the case--only piecemeal results are gained. Only if the defense builds reserves behind its forward deployments can air forces be instrumental in breaking the attacker's plan. Airpower's full potential benefit--that of assisting in the dislocation of the enemy force--can only be obtained in conjunction with counter-attacks by friendly ground forces.

3. A defense without large reserves suffers from passivity. It lacks the means to take advantage of rigidities existing in the enemy command system, or of the inherent vulnerabilities of armored forces seeking decisive results through thrusting tactics. In armored warfare, in juxtaposition to the homily of the attacker's advantage of the initiative (or of the 1st move), a properly organized defender has the greater advantage of defensive/offensive tactics (or of the 2nd move).

4. In armored warfare, a defense without strong reserves may trap itself in a surprise attack if it attempts to deploy its forces forward prematurely in an attempt to contain territorial losses. Counter-attacks will be difficult to organize and successful blocking actions often only lead to envelopment and likely loss of irreplaceable units, making a subsequent and more organized defense impossible. The West German policy of placing seven of their twelve divisions near the border (much of it out of sector), with a third of their line strength on four-hour alert, is a case in point.

Deriving A Solution From Deployment Modes And Force Requirements

The total number of divisions NATO would require for a conventional war is difficult to specify. On the low side, a school exists among the West German General Staff that two additional German corps with nine divisions would suffice. By this they mean West German divisions of Wehrmacht standards in operational reserve against Soviets of World War II standards. While the Germans did successfully cope against even greater odds in World War II against Russians (as well as others), the contention presumes a relative quality which no longer exists. The "green", high turnover conscript divisions of the Bundeswehr cannot be considered the equal of the elite and experienced Panzer divisions of 1940-43. For their part, Soviet armies are no longer masses of foot infantry and ill-trained tankers. They are now familiar with and thoroughly trained in armor

technique; and they are not now suffering from prewar (Stalinist) officer purges or the catastrophic losses wrought by the Germans on their peacetime cadres. Similarly, while the Soviets may still suffer from command rigidities, it cannot be assumed the Soviets are unaware of the problem and have not taken a modicum of remedial action, however congenital the problem.

On the high side, NATO requirements can be derived from the Pact threat. According to PRM-10's "Military Strategy and Force Posture Review", this threat ranges from 86-92 divisions by M+30 days, and up to 130 divisions for a longer war.[1] Given the relative restrictiveness of the NATO central front, and the increased strength and modernization of Pact divisions, this would put corresponding NATO requirements at 60 to 80 divisions.

The low and high estimates indicate a range of an additional 10 to 50 divisions from the NATO (plus France) baseline of 29 divisions. A strategy based on a pure mobile defense suggests a requirement for around six tank-heavy corps of four divisions each in operational reserve, plus some measure of forward defense. The latter could be generalized heavy mechanized divisions (as present), reinforced armored cavalry, or reinforced territorial defense. A forward crust with only active mechanized forces would require on the order of 20 divisions; with active forces serving as a stiffener for territorial defense, possibly as few as five divisions might be needed. NATO could then suffice with 15 additional divisions for the case of generalized mechanized forces, or only a handful if a strong territorial defense existed.[2]

If a positional defense-in-depth is the mode, NATO would require a smaller operational reserve, but its forward defenses would have to be considerably improved. The operational reserve could be reduced to two smallish tank-heavy corps of three divisions in the north and a large French corps in the south. The national corps sectors, however, would have to be strengthened by about two divisions each. This would not provide

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[1] Richard Burt, "U.S. Aralysis Doubts There Can Be Victory in Major Atomic War", New York Times, January 6, 1978, p. 1.

[2] For surprisingly similar conclusions, see Liddell Hart, op.cit. He concludes that even fewer divisions would be required, but his threat projection was also that of a short war with only partial Soviet reinforcement.

true defense in depth. But it would allow units to leap frog each other when withdrawing and provide for a corps reserve of one tank division in each corps sector. This solution would therefore require on the order of an additional 22 divisions. This number could be reduced by integrating territorial brigades and battalions into the various national forces.

It can thus be argued that the number and type of divisions that NATO requires is dependent upon NATO's mode of defense. However, this choice should also be affected by the degree of difficulty encountered in generating various types of divisions. This is to say, a mobile defense is the least demanding solution in terms of divisions but the most demanding in terms of the types of forces required. A positional defense has the opposite characteristic. Tank divisions in operational reserve and cavalry formations in forward defenses are demanding forces. They are expensive and require a degree of skill normally found only in well-trained active forces.[1] They demand generalship and technique. On the other hand, infantry formations performing a blocking or territorial role need not be demanding, assuming that active armored packets are available for the local counter-attack.[2] Such infantry can be cheaply equipped and operated on a reduced manning scale in peacetime.[3]

All the NATO countries have difficulty fielding high-quality field forces. American units suffer from internal personnel turbulence; British units from their duty in Ulster; and the 4 Belgian brigades from lagging modernization. The Germans, Dutch, and French are trying to attain operational proficiency with high turnover, short-term conscripts (with a trend towards ever shorter

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1 Mobilized reserves can only reach this state of training by repetitive re-call training (as in Israel), or by placing already trained units on stand-by leave for limited periods (as in the Dutch RIM system).

2 These armored packets could not be detailed from the operational reserves, for these must be maintained intact. In addition, since these counter-attack forces are small and depend on detailed knowledge of local conditions, they would have to be locally billeted and the active part of local formations. Their function is primarily to destroy the recce probes in order to prevent their ready expansion into major penetrations.

3 As for forward fire support, costs can be contained by reliance upon heavy mortars and suppressive multiple rocket launchers. For whatever tube artillery is maintained, only the demanding target acquisition and fire direction functions need be kept on a quasi-active status.

tours of duty. For a discussion of this issue, see Appendix III). This weakness is tolerable because of the enemy's similar weakness; in his system there is less internal turbulence but a quarter of his units are "down" for several months every half year. NATO could ease its problem of attaining operational proficiency if it would worry less about the proficiency of single units and more about the proficiency of the force as a whole. It would then find there are also organizational variables in the problem and that the solution to proficiency is more than just aggregating the proficiency of individual units.

A possible political liability of mobile defense and large operational reserves is its implications for deterrence. A pure mobile defense implies the demise of national corps sectors and the NATO layer-cake. This strikes at the heart of past policies designed to indicate alliance resolve, as underlined by the symbolism of many countries defending sections of the West German rampart. It can be argued also that removal of sectoral responsibility could remove a disciplinary effect upon the various countries and lead to a slackening of effort. While the argument may have little factual basis, anything suggesting a bilateral U.S.-West German alliance is nevertheless a sensitive one. On the other hand, large operational reserves impose a special deterrence vis-a-vis the Warsaw Pact: a NATO ability to seize in kind, threatening the political stability of the Soviet glacis. This, of course, raises the even more serious question of the extent of West German participation and control.

Finally a (operational) mobile defense heightens the need for interoperability. By definition, a mobile defense means moving in directions and ways which cannot be foreseen. Logistical support cannot rely on prepositioning and must be made more flexible and able to follow the multi-directional movement of combat units. Similarly, coordination must be developed as events occur and more dependence must necessarily be placed upon implicit understandings. Conversely, a positional defense minimizes the complications inherent in an international force with its many languages, diverse equipments, national preferences, and different interpretations of negotiated doctrinal agreements.

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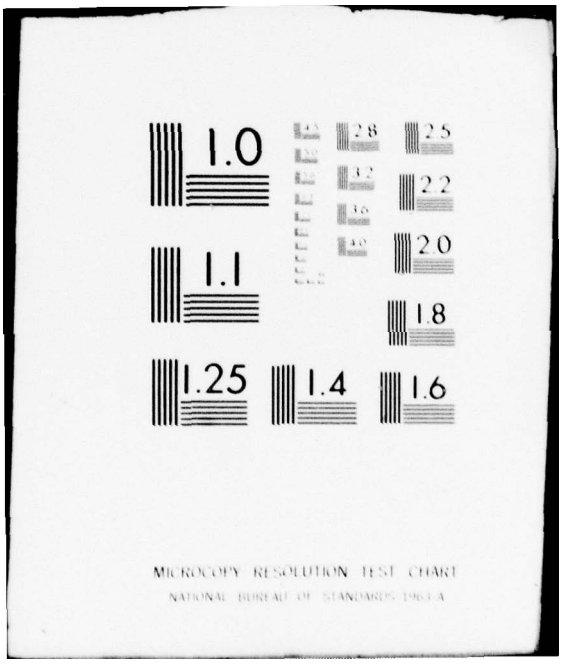
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National corps sectors limit the presence of and complications from other nationalities. A mobile defense implies the opposite: national units moving randomly throughout NATO's rear areas. These, however, must be coordinated, often with little more than brief tasking statements (so-called mission orders). In practice, this effectively limits the operational reserve to national corps entities since major counter-attacks must be of division and larger size. National groupings of corps size minimize the inherent problems of interoperability, and supporting assets can be more concentrated and efficiently allocated. This short circuits the need for detailed dovetailing of multi-national practices at divisional level and below where, in addition to assimulating the task, the various arms must be coordinated in detail.

VII. DERIVING MILITARILY ROBUST AND POLITICALLY SATISFACTORY SOLUTIONS

The foregoing discussion clearly suggests that only programs which address the central issues of maneuver warfare and strong operational reserves are viable solutions. This means that the defense must be keyed to large mobile reserves; but it does not mean that all forces must be homogeneous, in-being, or of high quality. This certainly was not a German characteristic even when executing highly successful ripostes against quantitatively superior opponents. (It is noteworthy that less than 20 percent of the German Order of Battle in World War II were panzer and panzergrenadier, and that when Germans organized panzer divisions from captured Czech and French equipment, they modified (ie. destandardized) their tactics to accommodate the technical characteristics of their equipment.)

The focus upon maneuver and operational reserves also indicates that NATO's problem is conceptual and organizational. It is not one of resources, or of attaining economies or improvements from the prescripts of economic theory. Recognition that the problem is structural and not incremental means that the demanding criteria outlined on p. 10 (undiminished deterrence, costs at roughly today's real levels, and contained destruction) can in fact be satisfied. This can be accomplished in three encompassing manners, none of which are mutually exclusive.

Mobile Defense Combined With Territorial Defense

This possibility arises from the potential of new defensive technologies in the hands of citizen-soldiers; they can now significantly complement regular forces. This solution was discussed in detail in Chapter V, albeit largely in terms of countering a surprise attack across the border. The essence of this solution is the replacement of the forward national corps with West German territorials and concentrating these corps into operational reserves.

Unfortunately this scheme has a debilitating political defect: it imposes a qualitative distinction between Germans and non-Germans. This can be conducive for allies to be remiss in their commitments,

and it creates an opening for the Soviets to exploit politically. The Federal Republic might therefore reject this solution as incompatible with deterrence.

Mobile Defense Combined With Large Numbers of Structured Reserve Divisions: Restructuring and The Dutch RIM

While territorial defense founders by its undermining the NATO "layer-cake", two other solutions are available that retain the form of the "layer-cake", while retaining the essence of the mobile defense. These solutions accept the political imperative of deterrence and forward defense. But they do so in a way that remains militarily viable (as opposed to NATO's present plans, which have all the earmarks of a "Plan D"). Though taking different routes, both rely on already trained European reservists, thereby generating large numbers of suitably trained divisions to thicken the forward crust and to provide the operational reserves.

The essential difference between the two is that restructuring requires large scale army reorganization in order to release personnel for manning the cadres of the newly structured reserve divisions. The RIM solution does not require these wrenching changes. Instead it focuses upon replicating active units by a system that in effect places entire units on extended leave. This solution requires very small cadres, small enough that most can be provided from "double hatting" the personnel overhead normally associated with a peacetime military. The anomaly of the RIM solution is that its (present) formations are to be used in a framework of armored warfare when these formations internally remain structured for an "infantry with tanks" approach to warfare. This can be made to work, but it obviously follows that the optimum solution is to combine the two: NATO units should be restructured specifically for armored warfare and its reserves should flow from the RIM.

However desirable both to restructure and to adopt the RIM, each is nevertheless sufficient for attaining a true conventional defense within the outlined constraints by taking advantage of the following three realities:

1. Reserve divisions can be obtained at much less cost than active formations.

2. U.S. air assets double the size of the central front air forces (including France and the U.K. base) cannot be deployed by M+30 days, in part because of the European beddown problem.[1]

3. No further need for air and sea-lift enhancement programs exist if in-place U.S. forces are restructured and reconfigured for rapid absorption of CONUS-based reinforcements.[2]

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[1] The Military Balance, 1976-1977, credits the Central Europeans (including France) with 1,700 aircraft (unit equipment aircraft; with floats, total numbers are 20-30% higher); the United States, 6,000 (including training base reserves, and maintenance float). The United States can deploy somewhat less than 2,000 aircraft to Europe in the first several weeks, leaving a balance twice as large as the combined Western European peacetime strength. International Institute for Strategic Studies, London, 1976. The Annual Defense Department Report FY 1978, (p. 208) credits the United States with an authorized active inventory of 5,200 tactical aircraft. Lucas Fischer (Defending the Central Front: The Balance of Forces, Adelphi Paper No. 127) lists 1,734 U.S. aircraft available for Europe.

[2] Restructuring would permit the present United States Army strength in Germany to be transformed from 5 divisions into 9 2/3 division equivalents. Technically this would be 8 division flags (exclusive of 2 armored cavalry regiments) plus 21 additional maneuver battalions (there are 12 in a division). If the forces were in addition organized for rapid deployment, a 14-division structure could be maintained in the theater. Technically this would be 12 division flags, with a peacetime combat strength of 9 division equivalents. The wartime strength would however equate to 14 division equivalents. At the moment there are only 11 sets of division-equivalent equipment in Europe: 5 with the stationed divisions, 2 sets prepositioned for reinforcing formations; about 2 sets in authorized war reserve stocks, and a further 2 sets which could be obtained from streamlining and consolidating within divisions. For details, see Restructuring NATO Forces to Compensate For MBFR, op.cit. Illustrious examples of the restructuring process are cited in footnote 58 of The Alliance and Europe: Part IV: Military Doctrine and Technology, op.cit. The rapid absorption problem is addressed in Interim Technical Report Task 1, op. cit., pp. 20-24.

Reserve Divisions. Conscript armies have a characteristic of large annual throughputs whereby age cohorts are militarily trained and passed back into civil life. The West Germans and French each have annual throughputs of 200,000 men. Throughputs of this magnitude mean that Western Europe has the wherewithal to create the forces necessary for its own defense, even while conscripting only a fraction of its age cohorts.[1] The trained manpower for large Western European reserve forces thus already exists. But their equipment procurement and their proper organization into structured units has been inhibited by the NATO adoption of the Anglo-American concept of sustainable combat, and by SHAPE's fear that anything less than expensive standing forces would lead members of the alliance to be remiss in their commitments. That NATO has failed to appreciate and take advantage of the military value of its trained conscript can be attributed jointly to the Western European focus upon nuclear deterrence and the U.S. military dominance in the NATO command structure. For just cause, the U.S. military give little credence to their own organized reserves. Their mistake has been in transferring U.S. experiences to the Western Europeans, who have different experiences and live in a qualitatively different institutional and geographic context.

NATO's problem has been conceptual and organizational: by failing to recognize the utility of structured reserves, it has allowed its reserves to be organized into replacement pools geared for sustaining active units by individual replacement in lieu of the traditional continental system

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[1] The comparison of forces available at the start of World War II with those of today is suggestive both as to NATO's potential and its conceptual and organizational malaise:

1. In September 1939, Germany had 98 divisions (52 active plus 46 reserve). By May 1940, German forces had been increased to 135 divisions. Of these, 13 were panzer and motorized infantry divisions in 1939, a number increasing to 16 in 1940. Total German mobilization (much of it coming late) was 17,000,000.
2. France in 1939 mobilized the equivalent of 110 divisions (65 active plus 45 reserve).
3. Britain deployed 5 divisions to France in September 1939; the BEF totaled 13 divisions by May 1940. By 1945, total British mobilization was 12,000,000.
4. Belgian initial mobilization of January 14, 1940, numbered 700,000; increased to 1,000,000 by May 10, 1940.
5. Holland mobilized 14 divisions in January 1940.

B.H. Liddell Hart, History of the Second World War, 1970; The Encyclopedia Americana, 1953; and German Liaison Office Brief, Fort Leavenworth, KS, 1977.

of forming large numbers of units designed for impact in a war of spaced campaigns. Echeloned forces--the way armor ought to be fought--reduces logistical and readiness requirements and facilitates replacement absorption: each readiness echelon (e.g., Categories I-III if a cadre system is used) need only block until the next readiness echelon can mobilize and deploy; forward echelons can be active while rearward echelons retrofit themselves; and echelons can operate in a nonorganic support framework, the amount of support provided being a function of combat activity. This, of course, capsulizes the Soviet system; but it is in reality nothing more than an adaptation of the post-1870 continental mobilization system to the natural "contours" of armored warfare.

The cost advantage of reserves is apparent. Personnel and operating costs (roughly 75% of all-service military cost) are sharply reduced. No R&D is required (5%), and equipment (17%) and construction (3%) costs are generally low since reserves have habitually been assigned older equipment with little market value. The costs of reserve units in many countries can therefore be quite low, amounting to only a few percent for Home Guard, Territorial Defense-type units, and those field units mobilized from equipment holding detachments. On the other extreme, reserves of the Israeli model with extensive in-service and refresher training are demanding upon civilians, and relatively expensive. But they are also as effective as their active counterparts.

Reserve Criteria. The challenge with reserves is (1) to contain their monetary costs and (2) their demands upon the citizenry while making them (3) rapidly mobilizable and (4) militarily effective upon mobilization. Israeli-like solutions with repeated call-ups satisfy criteria 3 and 4, but not criteria 1 and 2. Cadre systems--like those of the Soviets--straddle these criteria. A Soviet Cat II division with 50% to 75% personnel strength and complete with equipment[1] can be rapidly flushed out in wartime from its former personnel. It is not demanding upon former conscripts. Its relative cost and effectiveness are proportionate; its costs

[1] The Military Balance 1976-77, op. cit., p. 9.

and initial effectiveness approach that of corresponding active divisions. Soviet Cat III divisions, on the other hand, at roughly one-third strength (possibly complete with fighting vehicles), are cheap. Mobilization requires call-up of civilian logistic vehicles, and they cannot be made combat ready until after a shakedown period of several weeks. However, it should be noted that the Soviet system of echeloned deployment allows much of this shakedown to occur as the unit is moved into East Germany, positioned in reserve, or used as a secondary mop-up and occupation force. Accordingly, while cadre systems are not fully effective initially, they are nevertheless a cost-effective technique if their use is properly sequenced.[1]

Restructuring. Restructuring for greater teeth-to-tail ratios has four objectives:

1. It generates the wherewithal to generate more combat units--active and reserve;
2. Smaller, more streamlined units are more suitable for both armored warfare and tactical nuclear warfighting;
3. It creates a mind set more suitable for armored warfare; and,
4. The combination of the above postures NATO for fluid warfare, creating numerous imponderables for risk-minimizing Russians well aware of their own qualitative limitations.

That the necessary resources could in fact be obtained from restructuring can be gleaned from examining the force structures of the U.S., British and West German armies. Improvements in the teeth-to-tail ratio on the order of 10-15 percent have been obtained, or are now in sight, in all three

[1] A critical distinction between Cat II and Cat III divisions is that the former can be flushed out rapidly from its own discharges (requiring no refresher periods), while the latter must accept and integrate unfamiliar discharges from Cat I divisions. It should be noted that the Soviets do not practice wide-scale refresher training. Their balance among division categories is probably explained by this training flow of personnel, the more demanding nature of tank units (all tank divisions are Cat I and II), and the fact that "follow-up" infantry, while performing an essential task, does little actual fighting.

armies. Yet it can be argued that still larger savings can be obtained. The wartime division slices of the Western allies (including French, Belgium, and Dutch) are still nearly double that of the Group of Soviet Forces, Germany (GSFG), adjusted for equal strength in combat maneuver platoons (tank, infantry, anti-tank, and recce/armored cavalry). Even with its sliding-scale mobilization system, whereby combat brigades are almost fully manned and support units are manned at varying percentages, peacetime Western European division slices are still 25 to 50 percent larger than wartime GSFG slices. This suggests that further adjustments are at least conceptually possible. It is also apparent that adjustments of this order require more than just "lemon-squeezing", whereby cooks, drivers, etc. are squeezed out of current organizations. Instead, adjustments of the kind needed require fundamental changes in peacetime and wartime behavior and operational patterns. Such changes, of course, are institutionally wrenching. Nevertheless Western armies are evolving towards restructuring, as evidenced by the partial restructuring of the British, French, Italian, and West German armies, and more dramatically by the U.S. Army's proposed restructuring of its division.

The Dutch RIM. A mobilization system which meets all four criteria is now in effect in the Netherlands. Unlike other nations which have built their reserve to fit the active army, the Dutch have structured the latter to fit the reserve system.[2] The Dutch RIM (direct intake mobilizable) system matches reserve battalions with an equal number of identical active units. Upon release from their active unit, conscripts pass in company-sized organic units (to retain intra-unit and interpersonal training and familiarity) to "short" leave for four months and then to their parallel reserve unit for 16 months. RIM battalions can deploy with equipment to assembly areas within 24 hours, and in tests have performed as well or better than regular (conscript) units.

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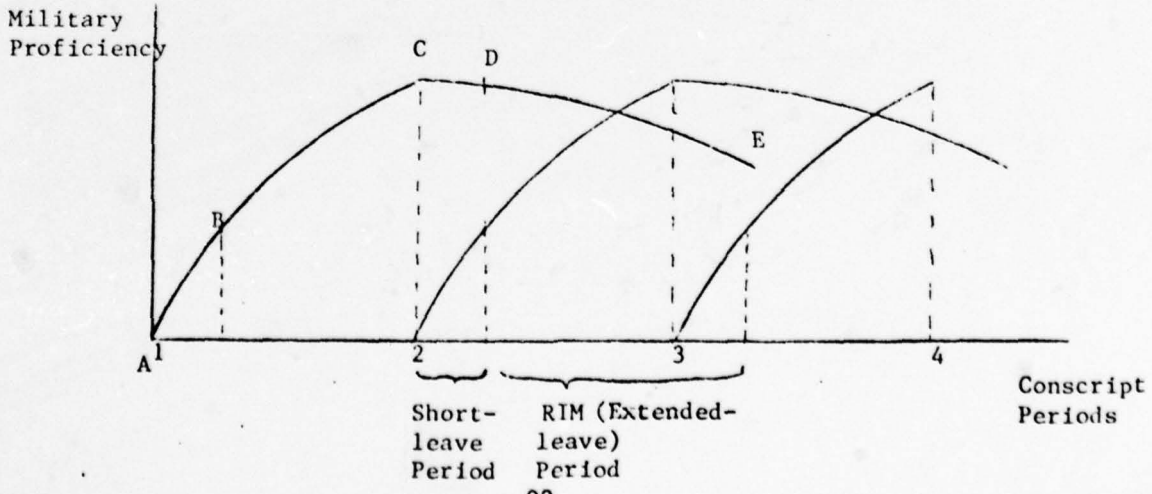
[1] Division Restructuring Study (Draft), U.S. Army Training and Doctrine Command, Ft. Monroe, VA, undated.

[2] Brigadier General Neal Creighton, Mobilization of NATO Ground Reserve Forces in Central Europe, Senior Seminar in Foreign Policy, Department of State, 1973, p. 17.

The innovation in the Dutch system is that rather than assigning former conscripts to equipment holding or cadre units, structured "active" units are placed in toto on "leave", complete with equipment. Accordingly, all the relationships of personnel that develop with each other and their equipment are retained for a period short enough before atrophy of skills becomes serious. Figure 1 graphically compares the Dutch system with that of the standard NATO conscription system. The vertical axis represents military proficiency; the horizontal, conscript periods. The (integrated) area under the proficiency curve represents military effectiveness. In the standard system, conscripts enter service, became trained, and at the peak of training are dismissed from service. The cycle is then repeated for the next younger age cohort. For most countries, the period of actual usefulness (BC in Figure 1) is somewhat less than the full conscription period (AC). Personnel are usually assigned to a training unit for 4 months (AB), then placed in a combat unit. RIM introduces two variations. Full use of a conscription period is obtained by the concept of the short leave (or standby reserve in the new West German system). That is, conscripts follow the same assignment pattern as in the standard system. The difference is that at the normal termination of service, a period of short leave (CD) equal to the initial training time (AB) is tacked onto military service. In a crisis, they return from leave and replace those undergoing initial training. The second variation is another full use of a conscription period from the same conscripts, obtained by extending the concept of short leave into a full conscription period (DE). The differences between

Figure 1
THE DUTCH INNOVATION



short and extended leaves are that personnel in the later are no longer legally constrained to reside in a specified area of the Netherlands, and that the company-size units no longer return to their parent battalion. Instead they are grouped into a reserve (RIM) battalion from units sequentially flowing from the original parent battalion.

The result is that at the cost of an additional set of first-line equipment, of civilian maintenance personnel representing roughly 1.5% of unit strength, and of a regular officer and senior NCO cadre of around 7%, the Dutch can field an additional combat battalion which is equal in quality to that of a standard conscript battalion.[1] It should be specifically noted that this is a dominant mobilization system for field forces. By reducing the size of the required cadre, costs are lower than comparable cadre systems. No additional demands are placed upon the citizenry for refresher training. Units can be mobilized as rapidly as that of any reserve system. Units are effective almost immediately after their assembly, as compared to the cadre system which always requires some integration of reservists and personnel familiarization.

Criticisms can, of course, be leveled against the RIM system:

1. It is not a system that can be generalized. It is only valid for a limited period after normal termination of military service. It is limited to a one-to-one matching of a reserve with an active unit. But if NATO could double its mobile formations at such a low incremental cost, this should not be a cause for criticism; and after the RIM period, furthermore, standard reserve systems with cadres and refresher training are not foreclosed.

2. It is sometimes argued that RIM is only appropriate for

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[1] The Dutch MOD computes their tank/mechanized RIM units and equipment holding mobilizable units at 20% of the cost of regular units. Cost details are not available. However, the Dutch use 10 years for equipment amortization and count the full cost of assigned cadres. Since army equipment life in NATO has considerably exceeded 10 years, and cadres are assigned other duties associated with the functioning of a peacetime military, actual costs may be less than 20%.

small countries. This, however, is only a matter of degree. All Western European countries are relatively small, public transportation is more elaborate than in the United States, and Western Europeans do not practice the labor mobility prevalent in this country.

3. Unit training above company level is not practiced. However, it should be noted that few countries do. RIM is no worse than any conscript system in this regard. It may also be no worse off than in U.S. units. While U.S. units in Germany now go into battalion and brigade level training in their annual training cycle, personnel turbulence is so intense that its value is moot. For instance, in the demanding tank units, only 18 percent of tank crewmen occupy the same "seat" 6 months after the annual tank gunnery course. In the RIM system battalion and higher field exercises are not precluded even if companies of the same battalion have different experience levels. Moreover it should be noted that large-scale maneuvers are training vehicles for higher level staffs and commanders; junior personnel receive little training benefit. In any case, these exercises have become so expensive and their content so artificial that they offer little advantage over other staff training techniques.

4. RIM raises two serious political problems, as noted by the West Germans. It makes reserves more visible than the low-profile West German Territorial Army approach, which also advantageously (for Germans) connotes the image of mere self-defense.[1] And RIM results have been so favorable that Dutch politicians, to the dismay of the Dutch military, have

[1] The Dutch have chosen to give their RIM units visibility in two of their divisions. Lower visibility could be obtained by placing RIM battalions into reserve brigades and divisions staffed by regular personnel on peacetime duty elsewhere, as in their 5th Division (Mech). In this case there would be little political difference between RIM and the cadre units the German territorial army is slowly evolving to. Accordingly a low-profile RIM system is much to be preferred over present West German territorial units which lack group training and familiarization.

used it as a way to maintain force level commitments to NATO while cutting active duty strengths in order to pay for increasingly expensive new equipments.

Reserves In Perspective. In discussing reserve divisions, it is often assumed that all divisions must be high quality field force formations. It is questionable whether the Soviets expect or require such standards from their Cat III divisions. Similarly, once NATO fields a sufficient number of armored/mechanized formations, additional divisions need not be of such high caliber. Once the potential for a large operational reserve and for smaller packets of local counter-attack forces exists, the quality of additional reserve divisions can be reduced to that of blocking anti-tank infantry. By stripping away the need for the demanding attack function, reserve divisions can be developed that are cheap and not demanding of the time of the former conscript. If it is also recognized that these units are as much hedges against a long war, and unexpectedly larger and more proficient Pact forces, these blocking divisions can be deployed in a more leisurely manner and allowed time to shake down, often while performing a precautionary blocking role in reserve. If these formations are viewed from this perspective, their equipment can be simple, their cadres can be limited to less than 10% and only a few refresher periods are required to maintain an adequate level of military proficiency. Dutch mobilizable field formations performing the demanding roles expected of field formations are costed at 20% of active forces. Stripping out these demanding roles should therefore allow a simply equipped anti-tank blocking infantry to be costed at less than 10% of an active mobile formation.

The import is that the Western Europeans could triple their division

count at less than a 30% increase in army costs.[1] Half this increase would be high quality mobile formations; half would be sufficing anti-tank blocking divisions. Their combination would provide a long-war hedge, and after suitable time a measure of (physically-occupied) defense-in-depth. NATO could retain the form of the layer-cake while providing the essence of the mobile defense. A very robust and true conventional defense could thus be obtained for less than a 15% increase in total Western European budgets.[2] The next section will show that it is even possible to obtain this defense at less than present costs by structural specialization.

Partial Force Specialization And Saving Money By Buying More Divisions. If Western Europe can triple its divisions for an additional budgetary outlay of 15%, it is apparent that divisions could be obtained at bargain basement prices that ought not be foregone. Nevertheless, questions arise as to parliamentary willingness to spend more (regardless of value), the possibility of trading off Western European air and naval contributions for those on the ground, and the possibility of reducing airlift and sea-lane protection costs by enhancing in-place capabilities. It is apparent that the incremental Western European "dollar" stretches nearly seven times (1/.15) farther for ground forces than the incremental U.S. dollar. Incremental dollars for air and naval forces are roughly equal for Western Europeans and Americans. This structural asymmetry raises the natural question as to the desirability of a comparative advantage accomodation between the United States and Canada on the one hand and the Western Europeans on the other.

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[1] NATO of course has some reserves and is not starting de novo. Tidying up details accordingly shows incremental outlays would be less than 30%. For the FRG and France costs would be considerable less than 30%. Dutch costs would be greater. The Dutch now only conscript a third of their age cohort. This would have to be increased by half (reducing the Dutch incremental 'dollar', below from 7 to 2.3 ground units). The UK has a pure volunteer system and generates few trained reserves, most of which are presently needed as replacements and fillers. The Belgians have a volunteer system for their field army; conscription, for home defense. Preferably the Belgians could be induced back to conscription. If not their costs in this scheme would amount to upgrading existing units and would be less than 30%. Their field army of 4 active and 2"ex-regular"brigades would have to become a proficient mobile reserve corps operating from behind a positional defense manned by large numbers of Belgian anti-tank blocking infantry.

[2] The budgetary shares of Western European militarys are 50:30:20 for ground, air, and naval forces respectively.

Since the budgetary ratio in the Western European military establishments is 50:30:20 for ground: air: naval, a 30% army increase implies a corresponding decrease in Western European air and maritime budgets and capabilities. For tactical air forces, a 30% reduction in Western European assets could be replaced at virtually no cost by the United States, resulting in no loss in overall air capability.[1] Only a portion of U.S. air assets are deployable to the European theater. 40% are siphoned off by the Navy and Marines for service-oriented missions, most with little relevance to a conflict with the Soviet Union.[2] Nor can the full strength of the USAF be deployed to Europe, due to secondary commitments, sustaining base training requirements, and the limited supporting (beddown) capacity in Western Europe itself. The result is that if a war in Central Europe were to last only several weeks (i.e., M+30 days), almost two-thirds of U.S. tactical airpower would not have been brought to bear, a force double that of the Western European air forces.

A similar shift is possible with naval forces. If the United States were to restructure its forces for armored warfare and posture them for fast reinforcement, it could structure its (1973) authorized European equipment stocks into eleven divisions. These divisions would equal only seven and a half division equivalents in peacetime, but could be immediately deployed in wartime and fully manned within fourteen days, requiring only the seating capacity of commercial aircraft. The reinforcement problem is not that of lift capacity and reception facilities. Rather, it is

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[1] It should be recalled that NATO requires operational ground reserves for its air forces to obtain their true benefit. In addition, it must be noted that the U.S. rule of thumb linking air wings and ground divisions was based on an incorrect (infantry) view of war that visualized tactical air power as little more than an artillery supplement and which assumed most divisions would be on line.

[2] For a discussion of these issues see Stansfield Turner, "The Naval Balance: Not Just a Numbers Game", Foreign Affairs, January 1977 and Nancy Bearg, Planning U.S. General Purpose Forces: Tactical Air Forces, Congressional Budget Office, January 1977.

organizational within the Army. These are caused by an FM 101-10-1 staff officers approach that accepts standardized building blocks and solutions to all problems. This stereotyped approach fails to recognize and address the specific bottlenecks inherent in the plan to reinforce with large units: difficulties over keeping formations ready in the United States, marrying them with equipment on arrival in Europe, and giving them time to shake down and make themselves ready for operations after that.[1]

In the context of a three-fold increase in Western European divisions, and of the removal of a possible emotive charge of the United States using Europeans as cannon-fodder, no further U.S. ground reinforcements are likely to be required for a conflict on the Central European front. Additional U.S. ground forces would be needed only as a protracted war hedge. Accordingly, these divisions need not arrive for many months, removing the requirement for that part of the air/sealift and sea-lane protection force justified by rapid reinforcement to the central front. These redundancies could be partially cashed in for a U.S. saving (or converted into greater combat capabilities elsewhere), and partially shifted to pick up that part of Western European naval responsibilities released by their shift in focus to greater efforts on the ground.

Standardization by Partial Force Specialization. A shift from balanced national contingents towards (partial) alliance specialization--the Americans to air and naval power, and the Western Europeans to land power--indirectly leads to greater equipment standardization as a side-effect of the implied dominance of countries in specified functions.[2] This presents a stronger

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[1] For details, see the Task 1 submission, op.cit., and footnote p. 87. In addition, since the binding resource constraint in this case is equipment stocks and not manpower, 20,000 U.S. troops could still be withdrawn. It is to be noted that with restructuring, a U.S. division slice can be made comparable to that of the Soviet with equivalent numbers of men in combat platoons. 20,000 is therefore almost a full division slice. A personnel reduction of this size requires a disproportionate reduction in division equivalents because of the need to retain the 11 division infrastructure necessary for fast absorption of reinforcements.

[2] Economists and system analysts tend to categorize specialization under the economic rubric of economies-of-scale and international comparative advantage, producing savings on the margin. The logic of specialization in this section, however, is based on the much different concept of structural asymmetry and meshing.

military argument for standardization than the conventional approach (which attempts to superimpose standardization upon diverse military establishments via the rationale of economies-of-scale, many of which do not bear scrutiny). In addition, the specialization route skirts the political pressures for multi-national production of common equipment inherent in balanced forces, which, besides eroding the savings, makes standardization almost unmanageable (e.g., F-16 and Roland).

The major arguments against specialization are: (1) the military vulnerability inherent in entrusting national security to the constancy of interdependent partners; (2) the emotive charge that Western Europeans are to serve as cannon fodder; and (3) the reluctance of Western European air and naval forces to relinquish their institutional prestige and status. The second objection can be satisfied as above by increasing the absolute numbers of U.S. combat troops in Europe for a short war.

Of the first objection, the vulnerabilities of functional interdependence are less serious than they appear. Interdependence need never become total. Each of the traditional great powers of Western Europe would want to, and can retain, some capability in each area. The defense of Western Europe is already interdependent; no defense is practical without the joint participation of Great Britain, France, and West Germany. Functional interdependence would simply acknowledge explicitly the existing interdependence. At worst, functional interdependence might cause some additional difficulties from the smaller countries, which tend to opt out of proportionate burdens with the plea that their smallness makes their contribution insignificant.[1]

The analytically intractable argument against specialization is its impact upon the industrial complex associated with high-technology air and naval forces. In regard to the third objection, the impact on the

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[1] On the other hand, functional specialization increases each country's significance, somewhat countering the "small country effect". Functional assignment of traditional or politically sensitive tasks can also be a form of pressure. The Danes, for instance, have become increasingly sensitive to encroaching Soviet exercises in the Baltic, recognizing that closing the straits (a NATO mission) is a prerequisite for their own defense across a variety of scenarios.

institutional status of these services is not as serious a problem in Western Europe as it might be in the United States. Except for Britain, the military staffs have traditionally been army-dominated. The main problem in reducing the institutional status of these services is not the resistance of the uniformed personnel, but of industry. The emotively powerful assertion is that spillovers from a sophisticated aerospace/electronic industry are necessary for maintaining industrial modernization. The validity of this once widely-held belief has eroded over time.[1] Spill-overs are readily passed along via the mechanism of the multi-national corporation, and even the employment-intensive commercial airframe industry has become less dependent on military R&D and procurement volume. At a more aggregate level of comparison, while it may be true that the aerospace industry is an economic locomotive, it is obviously no longer a powerful one. Industrial modernization in the three countries which lead in the aerospace industry--the United States, Great Britain, and France--has fared worse than in West Germany and Japan. Only Sweden, which depends partly on aerospace licensing, has maintained both a rapid rate of industrial modernization and a large aerospace industry.

Finally, shifting the Continental countries toward ground force specialization would mean greater industrial employment. The relative shift from air/sea to ground would not mean greater wage bills for soldiers: active air and naval personnel would shift to army cadres; the mobilizable troops would be essentially previously-trained conscripts on extended leave (but structured into organized units rather than assigned to amorphous replacement pools). The funding impact from the shift from air and sea to ground would thus be mainly felt in the procurement programs. And whereas aerospace purchases in particular have a large import content, army procurements are more representative of indigenous industrial production.

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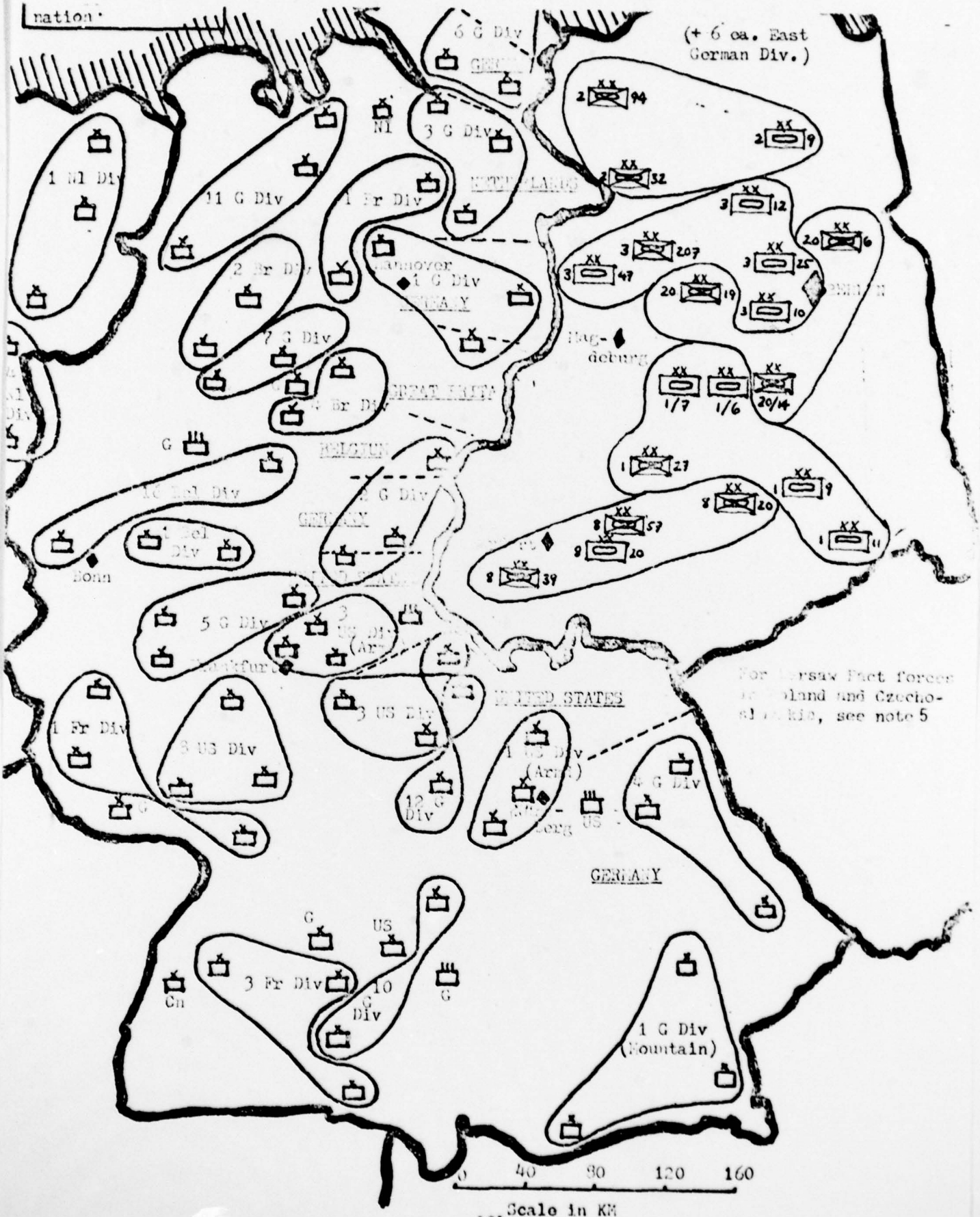
[1] For a counter-argument, see Lawrence G. Franko, Restraining Arms Exports To The Third World: Will Europe Agree?, CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE, Washington, D.C., January 1978.


nation
(+ 6 ea. East German Div.)
6 G Div
3 G Div
1 Nl Div
11 G Div
1 Br Div
2 Br Div
7 G Div
1 G Div
Hannover
Bag-deburg
1/7
1/6
20/14
Bonn
5 G Div
3 US Div
8 US Div
1 Fr Div
12 G Div
4 G Div
3 Fr Div
10 G Div
1 G Div (Mountain)
GERMANY
BELGIUM
UNITED STATES
For Warsaw Pact forces in Poland and Czechoslovakia, see note 5
0 40 80 120 160
Scale in KM

1. NATO Divisions are as marked.

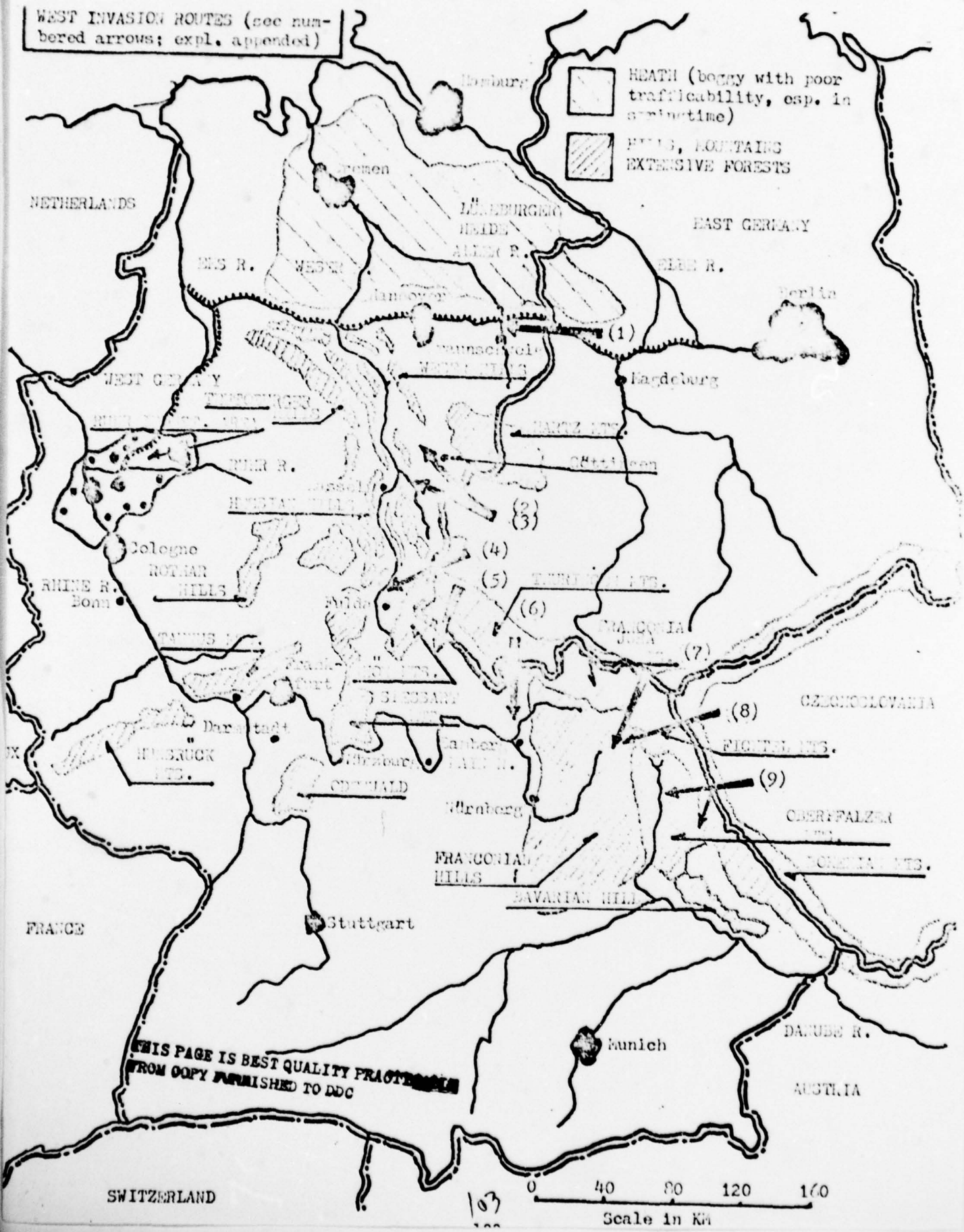
2. The numbers attached to Soviet Divisions in Germany (Group of Soviet Forces in Germany) refer, to the left of the div. symbol, to the Army to which the div. is attached; those to the right refer to the div. designation.

3. The locations of the Soviet Divisions on the map were plotted using the names of the towns in or near which those divisions are deployed and a standard East German road atlas.

4. Of the six East German Divisions two are Tank Divisions and four are Motorized Rifle Divisions.

5. Soviet Forces in Poland (2 tank) are deployed in the west, close to the border with the DDR. Polish Forces consist of 5 tank, 8 MRD, 1 ABN, and 1 Naval Infantry, located mainly in west and centre Poland. Soviet Forces in Czechoslovakia (2 tank and 3 MRD) and Czech. Forces (5 tank and 5 MRD) are deployed in the western half of the country, in Bohemia and Moravia, with the exception of one Soviet MRD and the two understrength Czech. tank which are stationed in Slovakia.

References: Ulrich de Maizere, op.cit, Enclosure #1; and, Die Armeen der Warschauen Pakt Staaten, J.F. Lehmanns Verlag, München, 1977



Germany, Main East to West Invasion Routes

Traditional Name/ Most Probable Route	Distance	Width of route at selected points[1]	Major Obstacles[2]
1. "North German Plain" Helmstedt through Hannover to Duisberg (i.e. Rhein River)	355 KM	(Goslar to Wolfsburg) 57 KM (Steinhuder Lake to Deister Ridge in vic. Autobahn E8) 15 KM	Oker R. Leine R. Innerste R. Aue R. Erse R. Fuhse R. Weser R. Mittelland Canal Weser Gebirge Teutoburger Wald
2. "Goettingen Corridor" Vic. Goettingen through Paderborn to Duisburg (i.e. Rhein River)	255 KM	(Kaufuner Wald to Harz Gebirge) 40 KM (Rheinhardswald to Solling Naturpark) 15 KM	Leine R. Weser R. Rheinhardswald Solling Naturpark Lippe R. Egge Gebirge
3. "Hessian Corridor" Vic. Kassel via Autobahn E4 to Frankfurt a.M. (i.e. Main River)	215 KM	(Kassel to the Ringgau) 60 KM (vic. of the Wetterau) 20 KM	Werra R. Kaufunger Wald Fulda River Knüll Gebirge Intermittent hills between Kassel and the Wetterau
4. "Fulda Gap" Vic. Fulda Gap via Bundesstrasse 40 to Frankfut a.M. (i.e. Main River)	120 KM	(Hohe Rhön Gebirge to Vorder Rhön Geb.) 15 KM	Ulster R. Fulda R. Vogelsberg Büdinger Wald Hessischer Spessart Geb.
5. "Meiningen Corridor"			
a. Vic. border south of Meiningen via Aschaffenburg to Rhein R. in vic. Darmstadt	175 KM	(Hohe Rhön to the Hass Berge) 20 KM (in the Spessart Gebirge) less than 5 KM at points	Spessart Geb. Main R.
b. Vic. border south of Meiningen to Würzburg (i.e. Main River)	90 KM	(Hohe Rhön to the Hass Berge) 20 KM (Gmunden to Schweinfurt) 40 KM	Some intermittant hills and forests

6. "Coburg Gap" a. Vic. Coburg to Bamberg (i.e. Main River) b. Vic. Coburg to Nürnberg[2] via Bamberg	40 KM 95 KM	(vic. Coburg) 20 KM (vic. Coburg) 20 KM (vic. Bamberg, vic. Erlangen) 15 KM	Main R. Intermittant hills Main R. Regnitz R. Intermittant hills and forests
7. "Hof Gap" Vic. Hof to Nürnberg via Autobahn E6	150 KM	(vic. Hof) 20 KM	Saale River Hilly the whole way with intermittant forests
8. "Cheb (Eger in German) Gap" Vic. border west of Cheb to Nürnberg	150 KM	(vic. border and numerous points to Nürnberg) less than 10 KM	Fichtel Gebirge Franconian Hills
9. "Furth Gap" a. Furth im Wald to Nürnburg b. Furth im Wald to Munich	220 KM 160 K	(vic. border and numerous points to Nürnberg) less than 10 KM (vic. border and numerous points as far as the Danube) less than 10 KM	Oberpfälzer Wald Naab River Franconian Hills Oberpfälzer Wald Bayrischer Wald Danube River

Notes:

1. Population centers are not included as obstacles, however below are listed relative samples of the density of villages with populations of less than 5000. The numbers indicate the number of villages in an area of 400 square kilometers (20 KM x 20 KM) astride the invasion route near the border. Populations are greatest in the North German Plain Area and least along the Czechoslovak border.

   Gebirge and Berge are German words meaning roughly hill/mountain area. Wald is also a German word which means heavily forested area. All the areas mentioned in the obstacles with the term Wald are also typified by rough, hilly or mountainous, terrain.

2. The distance from Nürnberg to Munich is approximately 165 KM. Major obstacles are the Franconian Hills and the Altmühl, Danube, and Amper Rivers. The terrain flattens out past the Altmühl River in the vicinity of Ingolstadt.

3. Relative Density of Small (less than 5000 pop.) Villages astride Invasion Routes

North German Plain	43	Meiningen	36	Furth	19
Göttingen	26	Coburg	30		
Kassel	30	Hof	28		
Fulda	28	Cheb (Eger)	21		

APPENDIX III

THE EQUITY AND MANPOWER PROBLEM

NATO is ironically being weakened by population growth, specifically from the growth in the supply of young men relative to the demands of military service.[1] The problem is equity.[2] The apparent solutions are either shorter conscript periods to spread the burden, or voluntarism. Voluntarism is particularly to be avoided for the Western European countries.[3] Under voluntarism, the throughput of sufficient numbers of trained personnel will no longer exist (as in Great Britain), foreclosing NATO's ability to mobilize reserves and mount a true conventional defense. On the other hand, it can be argued that further reductions in the European period of service, now averaging little more than a year, is no longer possible if NATO's forces are to be equipped and trained with sophisticated weapons for armored warfare. Equity and security must now be jointly served. This requires higher pay to those selected or a return

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[1] For example, by going from 18 to 15 months conscription, the West Germans were able to keep conscription from falling below 50% of an age cohort. In the Netherlands, the percentage entering military service has already dropped to 35%.

[2] For a detailed discussion slanted towards American perspectives, see Steven L. Canby, "Voluntarism or Conscription", in W. Schneider and F. Hoeber (ed), Arms, Men, and Military Budgets: Issues For FY 1978, National Strategy Information Center, 1977, pp. 240-285.

[3] On balance the U.S. contribution to NATO can best be served by voluntarism. Strategic, maritime, and air forces are best manned by low-turnover, long-term volunteers. A large pool of former servicemen is not critical to the U.S. Army mission in Europe, a mission satisfied by the forces in place and by fast reinforcement of the active forces in CONUS. The ocean prevents timely reinforcement of additional forces, a condition that could only be overcome by expensive additions to non-combat lift support and which can be more effectively and more cheaply satisfied by the Europeans themselves.

As for costs, if institutional practices were changed to reflect more than the simple replacement of short-term draftees with equally short-term volunteers, voluntarism in the United States could actually save upwards of $5 billion/year. For details, see Steven L. Canby, "The Military Manpower Question", in W. Schneider and F. Hoeber (ed.), Arms, Men, and Military Budgets: Issues For FY 1977, National Strategy Information Center, 1976, pp. 207-211.

genuine universal conscription. The former is already practiced in the Netherlands; the latter in Denmark. The solution seems to be a two-tiered system: longer service and higher pay for those drafted for the regular forces; shorter service and lower pay for those rounding out the draft for placement in territorial/home guard units. Its viability requires that the light infantry produced by a return to universal conscription be given a meaningful role in the defense of Europe, a condition readily satisfied if territorial and mechanized formations are designed to complement each other.