

1982

The Bottom Rung of the Ladder: Battlefield Nuclear Weapons in Europe

Peter D. Zimmerman

G. Allen Greb

Follow this and additional works at: <https://digital-commons.usnwc.edu/nwc-review>

Recommended Citation

Zimmerman, Peter D. and Greb, G. Allen (1982) "The Bottom Rung of the Ladder: Battlefield Nuclear Weapons in Europe," *Naval War College Review*: Vol. 35 : No. 6 , Article 9.

Available at: <https://digital-commons.usnwc.edu/nwc-review/vol35/iss6/9>

This Article is brought to you for free and open access by the Journals at U.S. Naval War College Digital Commons. It has been accepted for inclusion in Naval War College Review by an authorized editor of U.S. Naval War College Digital Commons. For more information, please contact repository.inquiries@usnwc.edu.

The Bottom Rung of the Ladder: Battlefield Nuclear Weapons in Europe

by

Peter D. Zimmerman and G. Allen Greb

Introduction

A war in Europe would pit the heavily armored forces of the Warsaw Pact (WP) against the far more lightly equipped North Atlantic Treaty Organization (Nato) defenses. The Nato forces can expect to find themselves outnumbered and outgunned by those of the Pact. Nato has historically accepted this situation, and relied on a succession of strategies which exploit the nominal Western qualitative superiority in conventional arms. Additionally, Nato (via the United States) possesses large numbers of "small" nuclear weapons for battlefield use, and embraces a strategy by which conventional war in Europe is "linked" in stages to the US strategic arsenal. Under most of these doctrines prompt use of the atomic defense is required.¹

Nuclear explosives long ago decreased in yield to the point where the smallest nuclear weapons have less destructive power than the largest conventional bombs (e.g., Grand slam) dropped in World War II. Indeed, according to a "rule of thumb" given by Samuel Glasstone, only about 50 percent of the energy released in a nuclear air burst produces blast waves, so a nuclear weapon with a "ten ton" energy yield may be much less effective on the battlefield than ten tons of modern chemical explosives by a factor of about two in blast or cratering.² Arguments favoring a nuclear "forward defense" in which atomic weapons can be used immediately because of the supposed comparability of the smallest nuclear and largest conventional weapons miss an important point. Nuclear weapons differ qualitatively and politically from conventional weapons, even when their effects are quantitatively similar. Escalating levels of violence have been common features of all wars, and it is unreasonable not to expect the same to occur in a nuclear conflict, with terrible consequences. Nevertheless, if small nuclear weapons, the bottom rung of the escalation ladder, are not used so the nuclear firebreak remains intact it is less likely that larger weapons which lead more directly to catastrophe will be employed.

It is our purpose to show in this paper that Western technical superiority with conventional munitions can be exploited in such a way as to provide a cost-effective nonnuclear defense of Europe. We will show that it is possible for Nato forces to halt a combined arms blitzkrieg launched by the Warsaw Pact without Western resort

to nuclear fires, and that there are military advantages to be gained by adopting tactics which depend upon the speedy use of masses of precision-guided projectiles rather than upon the much clumsier command process needed to obtain nuclear release. We will advocate a set of steps which can make a policy of no first use of battlefield nuclear weapons a preferred one for the Western Alliance and the United States, and we will show that this goal is in fact achievable.

Such a strategy would replace less credible nuclear weapons with more credible and responsive conventional weapons. This would have the immediate effect of raising the nuclear threshold, making the transition from conventional to nuclear warfare a more serious one, even in the minds of the strongest advocates of prompt nuclear release. Lessened reliance on nuclear weapons would not be desirable unless a conventional defense of Nato was simultaneously made both possible and believable. Precision-guided munitions (PGMs) represent a many hundredfold potential gain in effectiveness against small hard targets, such as tanks, compared to unguided and randomly scattered munitions. These small projectiles which may be wire-guided, laser-designated, or fully self-contained visible light, infrared, or millimeter wave length seekers, have a high probability of stopping a tank on the first shot. PGMs may be shoulder launched, fired from racks on vehicles, or launched from aircraft, rockets, artillery or naval guns. Their effective ranges extend from one kilometer up to more than ten nautical miles. Modern unguided rockets, such as the French Apilas which can destroy any existing Soviet tank with one shot at a cost of about \$1000, give each infantryman his own effective antitank gun. When the Germans skirted the Maginot Line, fixed fortifications acquired a distasteful image. This was true even though the line was never breached or even seriously attacked; missing were defensive components to make use of the channeling imposed by the line. Barriers of mines, concrete and wire can convert good tank country into readily defended land. We believe that whatever "mini-nukes" can achieve on the battlefield can be accomplished by PGMs, barriers, and other modern conventional munitions without risking nuclear escalation.

We believe that Nato should be provided with the means to defend Western territory without recourse to nuclear arms. Specifically, we advocate a policy which contemplates no first use of nuclear arms, and no use of nuclear weapons on the battlefield. The ability of Nato to retaliate in kind to Pact nuclear weapons would, however, be retained as the principal deterrent to Soviet first use.

It should be added that the technologies and political issues we will be discussing in this paper are not entirely new. Scholars and analysts have been debating the so-called "nuclear problem" in Europe on a sporadic basis for many years, including the possibility of implementing a conventional PGM defense strategy and no-first-use policy. With the advent of a new administration in Washington and renewed interest in tactical or "limited" nuclear exchanges as viable options, however, it seems particularly appropriate to analyze the ramifications of this problem anew and offer a comprehensive policy alternative.

The Military Task

At the moment battle is joined between the Warsaw Pact and Nato, the Nato forces will face the difficult job of halting an opponent numerically superior in almost all the indices of modern warfare. The International Institute for Strategic

Studies (IISS) estimates that on the northern and central fronts the balance of tanks is 26,300 for the Pact against 8,900 for Nato (excluding France). The Pact can field seventy-eight first-line divisions; the West only forty-four.³ A modernized Soviet tank division is supposed to comprise 11,000 men, while a full-strength motorized rifle division is now expected to have a complement of 13,000. An American division, in comparison nominally has 18,000 men, supplemented by nondivisional brigades and regiments (4,000-5,000 men each) plus separate artillery, aviation and maneuver battalions. The disparity between Warsaw Pact and Nato conventional forces is not, therefore, as great as a simple enumeration of the number of divisions might imply. Western scenarios concede the Pact the advantage of striking first, however, probably with tactical if not strategic surprise.

Nato must halt a WP blitzkrieg without conceding too much of her own territory and without the destruction of the land being defended. In West Germany, for example, there is little or no room for retreat without the surrender of important cities. Geography, the quality and reliability of Western troops and equipment, and the "three to one" edge for the defense first identified by Clausewitz make Nato's task possible, if difficult, so long as nuclear weapons are not used by either side. First nuclear use, by any belligerent including France or Britain, must almost inevitably lead to nuclear escalation. In an area as densely populated as Europe, escalation must lead to horrendous civilian casualty rates, more escalation, and finally continental catastrophe. It need not happen if the nuclear firebreak is maintained, if the bottom rung of the escalation ladder remains unused.

A blitzkrieg exploits the speed and striking power of an armored column to inflict decisive damage on an opponent without engaging in a succession of set-piece battles. The success of a blitzkrieg depends upon maintaining the momentum of the armored forces and the supporting infantry used to occupy territory. If the velocity of a combined-arms blitzkrieg can be reduced to the speed of walking infantry, the lightning war loses the punch which has provided decisive outcomes in the past. Rapid deep penetration of defended territory destroys the defender's command structure and his ability to support forces opposing the relatively narrow front of the armored force. As one of the foremost proponents of armored forces pointed out long ago, the tempo of blitzkrieg operations is necessarily geared to the speed of tanks and not infantry.⁴ The job of the defender is to alter that situation. If a blitzkrieg is slowed to a walk, it ceases to exist.

Precision-guided munitions fired by defending forces are one means to decelerate an armored attack. In the opening confrontations of the 1973 Yom Kippur War, Egyptian forces using the AT-3 Sagger antitank missile destroyed a large number of Israeli armored vehicles. Initial reaction to this event was to proclaim a "revolution" in weapons and tactics.⁵ More sober study showed quickly that the proclamation was premature; as many Israeli tanks were stopped by unguided weapons such as the RPG-7 as by the Sagger, and the effectiveness of the Sagger could be enormously reduced by directing suppressive fire at the missile's controller.⁶ (Suppressive fire was less effective when Saggars were fired in groups of three all aimed at the same tank.⁷ Presumably these missiles were fired from different points on converging flight paths.) Even so, the PGM will be the key to our proposed tactics and policy.

The Tools

US supplied TOW and Maverick missiles were spectacularly successful in the Sinai campaign. Fifty-two Egyptian tanks were destroyed by the fifty-eight Mavericks launched.⁸ The lesson of the Yom Kippur War is not that PGMs mean the death of the tank, or that PGMs are of limited use and not much better than the descendants of the World War II bazooka. The lesson is that manually guided missiles (Sagger) are vulnerable to suppressive fire, and that missiles with advanced guidance systems which require less exposure of the defender can be extraordinarily effective. Finally, we learn that PGMs permit a staunch defender to slow a blitzkrieg to the speed of dismounted infantry. Since the principal task for European defense must be to improve the trade-off between territory lost and time gained, decelerating a Soviet blitzkrieg will be the first objective. The advantages which naturally flow to the defense should then make it possible for the West to win a set-piece battle, given the qualitative edge possessed by Nato forces.

The nonnuclear defense of Europe can be carried out by using the family of PGMs and related systems now in service or well into the procurement cycle. Combat experience with antiarmor missiles has indicated quite precisely the improvements which must be made in the next generation of missiles; these changes are possible.

Most existing wire-guided systems, even second generation missiles like TOW, require the defender to guide the missile to its target or to keep the target centered in a telescopic sight. Since the flight times of these weapons can be as long as thirty seconds, suppressive fire directed at the missile controller can be sufficient to defeat the PGM. Alternatives to these guidance systems are available.

The second generation optical tracking systems now in common use bring the missile to the line of sight from director to tank. Countermissile fire aimed at the PGM is therefore also aimed in the general direction of the missile controller, a soldier equipped with a telescope and firing panel. Each controller can direct a single missile at a time. Three changes are desirable: the missile should be faster, decreasing flight time; target designation and guidance should be performed in a way which does not reveal the position of the missile controller, and, when possible, PGMs should operate in a "fire and forget" or "designate and depart" mode so that once committed, the missile needs no external inputs.⁹

Appropriate seekers exist. Pulse code modulated lasers operating in the near infrared have already been demonstrated by both the Navy ("SAL-GP") and Army ("Copperhead," "Hellfire"). When using this type of guidance the PGM operator aims a narrow laser beam at the enemy target. The pulse code modulation for each round is different from that of every other round so as to eliminate interference when many rounds are used simultaneously and to reduce the effects of countermeasures. Since the seeker in the missile looks only at the illuminated spot on the target, the orientation of the laser beam to the flight path of the missile is virtually unrestricted. The laser light can be seen directly only by the intended target although weak side lobes may present some problems near the illuminator, a small infrared laser "spotlight" used to identify the target to the seeker in the missile. The illuminator may be deployed near the battlefield or may be many miles away, for example in a scout plane or helicopter well out of range of anti-aircraft fire. Since modern illuminators have spot sizes only 30-50 cm across at useful ranges, detection by the

targeted tank is difficult.¹⁰ SAL-GP and Copperhead are artillery fired; Hellfire is air or vehicle launched. Designators can be located near the battlefield or on aircraft many kilometers away out of range of shoulder-fired anti-aircraft missiles.

Thermal infrared seekers and millimeter wave radiometers provide another means to achieve designate and depart capability. The PGM operator can point the weapon at his target, wait until the missile's seeker reports acquisition, much as the US "Redeye" shoulder-fired surface-to-air missile (SAM) does now, and fire. Once such a missile is in flight the defending infantryman is free to change position. Millimeter wave length detectors are now being developed and tested; infrared seekers have been operational in anti-aircraft weapons for decades. A tank is a bright source of millimeter wave and thermal infrared emissions. Such seekers need no control from their operators once the target has been acquired and the missile launched. Both long wavelength infrared and millimeter waves penetrate better than does visible light through smoke, rain, cloud or fog and most obscurants. They therefore add an extra measure of all-weather and night operations capability to PGMs which is not available with the TOW type tracking system.

The PGMs discussed thus far must all be transported to the battle area where they can then be fired by defending troops. This is true whether the missiles are air-launched (Maverick, Hellfire, TOW), vehicle mounted (TOW), shoulder-fired (Dragon) or carried in a box which serves as both transporter case and launching rack (Mamba, a West-German missile). As Richard Ogorkiewicz points out, a vehicle which provides both full protection for a PGM crew against any weapons the enemy can use and also confers mobility will look very much like a tank and probably cost nearly as much.¹¹ Nevertheless, mobility is an important component of a PGM defense and must be achieved at lower cost than with a tank-like vehicle. This can probably be accomplished by trading weight of armor for increased speed, smaller size, and reduced infrared and acoustic emissions. Such a vehicle will be hard to find and harder to hit.

New Tools

Functional mobility means the ability to redirect fire rapidly to adjust to changing dispositions of enemy forces. In the case of a defense built around today's PGMs, mobility must be achieved by the shifting of missile carriers and men. But the simple lever provides an example where a small movement at one point is translated into a very large movement elsewhere. Such an image leads to the notion of indirect fires which can reach the combat area from long range.

Three systems in various stages of development will provide indirect fire and functional mobility in the middle to late 1980s. Two, Copperhead and SADARM, exploit the newly developed ability to package a guidance system in a small volume and to harden it enough to shoot out of an artillery tube. The third, "Assault Breaker," is a rocket-launched vehicle carrying, in its present form, up to twenty independent "mini-missiles," each of which contains a passive infrared or millimeter wave seeker.¹² Copperhead is fired from a 155 mm howitzer, contains one shaped-charge warhead, and seeks a laser-designated target. SADARM is a "MIRVed" eight-inch shell. In flight it ejects several submunitions each of which deploys a parachute. Each submunition contains its own independent multispectral sensor, a device which can see two or more different "colors" in the infrared, and which is

thus able to discriminate against countermeasures and to identify targets on its own. The colors will probably be in the infrared and millimeter wave lengths of the spectrum, which are regions where armored vehicles radiate strongly. Each SADARM projectile can, therefore, destroy more than one tank, and the combination of sensing elements makes it capable in bad weather and at night as well as resistant to most countermeasures. Each Assault Breaker might stop up to ten tanks if the submissiles are launched in pairs.

All three systems engage from above where tank armor is necessarily the thinnest. For that reason, each has a somewhat easier task than PGMs which engage the sloping and heavily armored front parts of tanks. The most important advantage shared by all three systems is the long range at which they can be used to seek out tanks while still having a very high probability of achieving a first round kill. Because of the many kilometer long lever arms involved, each can shift the fall of its missiles rapidly from point to point to keep up with moving armored vehicles. Lastly, SADARM and Assault Breaker do not require round by round designation but seek out targets independently within a "footprint." Although targets for Copperhead and the five-inch SAL-GP being developed for the Navy must be designated, the controller is far more secure than with TOW type systems. Targets need only be illuminated for the last moments before the round hits, thus reducing tremendously the exposure of the controller. The illuminator can be placed almost anywhere in line of sight to the target and at almost any angle to the ground track of the round, further reducing the exposure of the observer/controller and permitting operation from concealment. Such systems which provide enormously destructive fire from extended range with minimal vulnerability are essential to a conventional defense against armored forces.

The Rest of the Arsenal

Atomic demolition mines (ADM) which can alter terrain or stop armor have a yield estimated at fifty tons (.05 KT). The principal weapons effect utilized when planning the use of an ADM is cratering, but small nuclear weapons apportion only about one half of their energy release as blast. While a PGM cannot replace an ADM, less than twenty-five tons of chemical explosives can (nuclear yield is defined in terms of TNT equivalent; more powerful explosives are now available). It is probably politically feasible to prechamber twenty-five ton chemical charges, while it remains politically impossible to do the same with nuclear mines. The ADM may be technologically "sweeter" than simply burying twenty tons or so of high explosives; it is not clear that it is militarily more advantageous. An ADM is certainly more dangerous than large conventional mines because it crosses the nuclear threshold.

Minefields, particularly when composed of rapidly emplaceable air-scattered mines, provide an effective way to slow and destroy tanks. US development practice has, unfortunately, tended to concentrate on newer and ever more clever mines, without ever advancing these weapons to the production and deployment state.¹³ The potential value of air-dropped or artillery-emplaced mines is so great that they must be deployed soon and in large numbers, even if the versions used are simple and less "sophisticated" than could conceivably be developed if time were unimportant. Rapidly emplaceable barriers, coupled with prepared defenses, greatly increase the numerical edge an attacker needs in order to gain territory, and do so without causing significant collateral damage.

Precision in the delivery of a weapon is of little use unless the target can be "seen." In this case "seeing" can refer to detection in any part of the electromagnetic spectrum. It will be important to be able to fight at night and in poor weather; sensors working in the near and thermal infrared will be needed because fog, rain, and smoke are more nearly transparent at these wave lengths than they are in the visible spectrum. Nato must also have the capability to see in the millimeter wave region and with advanced imaging radar. The specific need is for airborne, side-looking, moving target indicator (MTI) radar which can pinpoint tanks against ground clutter. Such radar is needed to provide midcourse guidance data to Assault Breaker and the targeting data for the effective use of artillery-fired PGMs. Neither the radar nor the shorter wave length sensors are significantly beyond present technology; only the commitment to their development and deployment in combination with the present and future PGMs is needed.¹⁴ Such hardware could be available in less than five years if a real commitment were made; in the meantime, existing equipment provides a significant capability to Western forces.

The mine is an old tool; so too is the tank used as an antitank weapon. The Nato nonnuclear defense of Europe must include a significant role for armored forces. On the Golan Heights in 1973 Israeli armor was often outnumbered by force ratios of up to fifty to one. Nevertheless, fighting from prepared positions Israeli tanks regularly exacted exchange ratios of ten to one or more.¹⁵ The Israeli 7th Brigade, after the first day of battle, never possessed a force larger than forty tanks but held off five hundred Syrian tanks.¹⁶ The combination of prepared positions, well-trained troops, and the advantage of being on the defensive is formidable, and it in no way requires the defending side to match the aggressor tank for tank. The attacker must move and break from cover in order to advance to his goal, while defending troops may fire from concealment until an attack is broken. This clearly requires vastly more materiel on the attacking side.

Weapons which are already available, and organizational changes which are desirable offer a way to restructure European defense around conventional forces. As the emphasis shifts from tactical to nuclear weapons, which are unlikely to be used in any case, to arms which have real utility and not just deterrent value, the position of the Western Alliance will once again become credible. PGMs are no panacea but are an important building block in this process.¹⁷

The Political Task: Possible European Perspectives on TNWs and PGMs

The technical advantages of conventional PGMs over battlefield nuclear weapons can be argued endlessly, but the actual decision to implement a nonnuclear forward defense strategy ultimately will require the concurrence of at least the major West European powers. As Colin Gray writes, TNWs "comprise a region of debate wherein technology, doctrine, and political judgment all interact."¹⁸ How are the governments of Europe likely to react to an initiative that represents a clear-cut and definite break with the past?

Tactical nuclear weapons have been a fixture in Europe for nearly thirty years and their presence has come to serve deep political, economic, and psychological functions. In 1953-54, the United States proposed and Nato ministers accepted the initial deployment of TNWs on the continent as the quickest and cheapest means to counteract perceived Soviet conventional superiority. This substitution of

"technology for manpower," as Jeffrey Record describes it, still acts as a powerful rationale to maintain the TNW arsenal. Another is the persistent European belief in the so-called "Nato triad" concept, whereby TNWs nominally "link" or "couple" European conventional forces to the US "strategic" deterrent.¹⁹ By the end of the 1960s, the triad (embodied in the so-called "flexible response" doctrine) had become, in the words of one scholar, almost a "sacred thing" in West European capitals.²⁰

The political establishments in particular have been content to live under the triad defense-security posture. "Official strategic thought in Western Europe has slept comfortably during a quarter century under the U.S. nuclear umbrella," the French commentator Marc E. Geneste, a retired colonel, concludes. "The Europeans have allowed their American friends to carry the main burden, intellectually and materially, to the breaking point."²¹ Except for the initial ban-the-bomb movement of the 1950s and 1960s, the public, too, has paid little heed to the implications of the accumulation of approximately 7000 US nuclear warheads on their soil.

Within recent years, however, policymakers, analysts, and the general populace all have shown a heightened interest in the whole question of nuclear arms and nuclear war. While the political debate has been broad in focus and somewhat chaotic, it could, if properly channelled, open a "window of opportunity" for the policy changes we recommend.

A number of forces building over the past several years has combined to reopen discussion of the role of nuclear weapons in Europe, dramatically underscoring the tensions and uncertainties of Nato-European nuclear strategy in the process. All of these relate in one way or another to a single key change in the nuclear equation: the inexorable growth since 1957 of Soviet TNW capability to the point where the stockpile is now generally estimated at 4000 weapons. The Mutual and Balanced Force Reduction (MBFR) talks, begun in Vienna in 1973, stimulated the first major reassessments of both this TNW capability and the conventional military balance between Nato and WP countries.²²

More recently, the debate over long-range theater nuclear forces (LRTNF) has continued to spark interest in the "nuclear problem." The latest example of a larger, ongoing controversy over TNW modernization, the LRTNF debate derives from the December 1979 Nato Nuclear Planning Group (NPG) decision to deploy advanced medium-range Pershing II rockets and ground-launched cruise missiles (GLCMs) to counter the new Soviet SS-20s and Backfire bombers. NPG officials designated 1983 as the target date to begin deployment of 108 Pershing IIs and 464 GLCMs, while in the interim reducing the US TNW arsenal by 1,000 warheads. Meant to reassure Europeans, the LRTNF Brussels decision, like the 1977-78 effort to introduce the neutron bomb or "enhanced radiation weapon" (ERW) into the Nato arsenal, has had the opposite effect on many who fear the spectre of Europe as a nuclear battleground.

Finally, the election of Ronald Reagan to the US Presidency has raised the anxiety level of Europeans even further. Precipitated by such international and domestic crises as Vietnam, Watergate, and Iran, European confidence in American leadership has been steadily eroding since the late 1960s. In the wake of Afghanistan, Europe has blamed US leaders for giving up completely on détente (witness the failure to ratify SALT II) rather than seeking some modified form of accommodation with the Soviet Union. President Reagan has done little to alter this image; his

actions in fact have exacerbated tensions between the United States and Europe. Immediately upon assuming office, he adopted an aggressive approach toward the Soviets that includes resurrecting the ERW option for Nato. In addition, despite the President's LRTNF "zero-option" disarmament proposal, administration spokesmen have not been enthusiastic about arms control initiatives in general. Moreover, they have made offhand public comments suggesting the possibility of a nuclear war confined to certain targets or regions. Again, whether simply rhetoric or not, the cumulative effect of Reaganism's provocative style has been to alarm and disturb rather than to comfort and reassure.²³

Thus although the current European nuclear debate does not address the problem of short-range, battlefield nuclear weapons directly, it has elicited a wide range of response—within Nato, within each European country, and among governments—which can afford an invaluable political barometer for not only our proposals but for all future alliance nuclear decisionmaking. The reactions can be broken down into three categories: (1) popular response, (2) the response of Nato's minor partners and, of most interest for our purposes, (3) the response of the Big Three governments of Britain and France, each with national nuclear forces, and the Federal Republic of Germany (FRG), Nato's "nuclear storehouse"²⁴ on the continent.

Public sentiment for nuclear disarmament in Europe has never been stronger. Responding to the LRTNF decision and other nuclear issues, political activists and intellectuals organized the campaign for European Nuclear Disarmament (END) in 1980. Led by the historian Edward P. Thompson, END has grown dramatically and today loosely coordinates a spreading network of national protest groups: the Campaign for Nuclear Disarmament (CND) in Britain, the Campaign for Atonement and Peace and the ecological Green Party in West Germany, the Interchurch Peace Council in the Netherlands, and the No to Nuclear Weapons campaign in Norway. Membership in these organizations is diverse, ranging from German and Dutch churchmen and pacifists, to Scandinavian neutralists, to British unionists and leftists, to former soldiers and professional people.

Under the banner "a nuclear free zone from Poland to Portugal," END leaders sponsored a conference on "nuclear war in Europe" in April 1981, which received tremendous media coverage, and have mobilized huge peace demonstrations in Bonn, London, and other major cities.²⁵ Because the immediate focus is on US missiles and warheads, these demonstrations have taken a distinctly anti-American, anti-Nato, as well as antinuclear tone. Placards proclaiming "No Euroshima" and "To Be or Nato Be" have become common sights at the protest rallies and marches, for example. Undoubtedly such simplistic goals and slogans are at the very least politically naive and provide excellent propaganda fodder for Eastern bloc leaders.²⁶

One important and encouraging exception to this anti-Nato trend has been manifested in the activities of the British Labor Party. Defense issues in general and the nuclear question in particular have occupied a conspicuous place in the Party's Parliamentary Conferences of 1980 and 1981. At both of these meetings, Laborites voted overwhelmingly in favor of unilateral nuclear disarmament and to close all nuclear bases on British soil. At the same time, however, the membership supported the Alliance system "by the largest majority in living memory."²⁷

Although at first glance contradictory, these votes taken together augur well for a possible reorientation of Nato strategy toward a defense based primarily on conventional rather than nuclear capabilities.

At another level of response are the governing elites in Scandinavia, the Netherlands, and Belgium. The political leadership in each of these regions traditionally either has stood aloof entirely from nuclear tasks (Norway and Denmark) or has demonstrated strong antinuclear sentiments (the Netherlands and Belgium). Although they by no means share END's extremist views or condone its tactics, many politicians and defense analysts in these countries believe the current antinuclear groundswell presents an excellent opportunity to reassess the role of Nato's nuclear defense posture.

Government positions on the LRTNF question reflect this attitude. While giving reserved support for the modernization program, they continue to push for a reduced overall reliance on nuclear arms. Holland's coalition government of Christian Democrats and Liberals, for example, recently stated it would not shrink from making any necessary "nuclear contribution" in the short run but that its ultimate aim was "to reduce the role of nuclear armament." The Van Agt government also sees a direct relationship between TNW and conventional strength; reinforcing the latter "could contribute to a reduction of the West's dependence on tactical nuclear arms."²⁸

In another case, the Norwegian Parliament fully endorsed the Nato LRTNF decision. Yet, according to Johan Holst of the Foreign Affairs Ministry, the government will continue to work toward "the establishment of a nuclear-weapon-free zone in the Nordic area as part of the efforts to reduce nuclear weapons in a broader European context."²⁹ Klaas G. de Vries, Dutch parliamentarian and member of the North Atlantic Assembly, and Henri Simonet, former Belgian foreign minister, have suggested further that the utility of new conventional weapons technologies should be explored to help "lessen the pressure for first use of nuclear weapons" by the Alliance.³⁰

But what of the outlook of the Big Three governments? The official position of these powers has been much less cautious and equivocal than their neighbors on the periphery. Differences in political coloration notwithstanding, the governments of Margaret Thatcher, Helmut Schmidt, and Francois Mitterand all continue to rely heavily on nuclear weapons for deterrence and defense (including keeping open the option of initial use in the event of WP aggression), regard modernization of nuclear forces as essential, and are severely critical of the END campaign. In the latter case, the response has been both vocal and coordinated, coming from the NPG as well as individual officials. Chancellor Schmidt, for example, who had staked his political career on the LRTNF decision, said recent demonstrations in Bonn amounted to a "declaration of war" on his government.³¹ Others, including Nato Secretary General Joseph Luns, have charged that the movement is communist-inspired and financed.

Despite these harsh official pronouncements, there have been hesitant but clear signs of a changing attitude about the role of nuclear weapons on the part of many in the European establishment. In the United Kingdom, at least three former chiefs of defense staff and other defense spokesmen have expressed doubts about the need to bolster nuclear strength, questioning specifically the belief that the use of nuclear weaponry somehow could be held to the tactical or battlefield level. Just before his

assassination in 1979, Admiral Lord Louis Mountbatten wrote that he found such a notion "incredible." "In all sincerity," he elaborated, "as a military man I can see no use for any nuclear weapons which would not end in escalation, with consequences that no one can conceive."³²

While highly critical of the unilateralist protests, Field Marshall Lord Michael Carver and former defense science advisor Lord Solly Zuckerman agree that more emphasis should be placed on Britain's conventional forces as the major line of Nato defense. "[I]f anything is going to inhibit the Russians from launching an invasion into NATO Europe, it will be NATO's conventional forces," Lord Zuckerman contends. "The technological skills that go to nuclear weapons could be used to increase the R and D that is devoted to conventional armaments. Such a move would do far more to add to the real military options open to NATO"³³ Several prominent civilian defense experts have articulated similar views, among them Lawrence Freedman, head of policy studies at the Royal Institute of International Affairs, and Gregory Treverton, assistant director of the International Institute for Strategic Studies.³⁴

Within the past several years, there have been voices of moderation coming out of Paris as well despite the virtual mystique that has grown around *la force de frappe*. Cracks first began to appear in the Gaullist policy of security through near total reliance on the independent nuclear force during the presidency of Valéry Giscard d'Estaing. From his election in 1974, Giscard in his public interviews and press conferences began to put more emphasis on the conventional rather than the nuclear component of the Fifth Republic's defense program. Military spending and defense rhetoric reflected this new line. While reaffirming the government's commitment to essential Gaullist principles, Minister of Defense Yvon Bourges explicitly stressed the need for European "solidarity" and indicated he had certain reservations about home-grown atomic armaments. As he put it in a key policy pronouncement in August 1979, "[W]e must not be misled or let a false idea take root: strategic nuclear armaments cannot supply all the answers to all the situations and all types of aggression."³⁵

This official challenge to certain aspects of Gaullist nuclear orthodoxy precipitated a major debate among French defense specialists which persists today under Mitterand's government. Led by Marc Geneste, a coterie of top military men—including Air Force General Jean Thiry and Army Vice Chief of Staff Jacques Menard—and members of the French Atomic Energy Commission propose restructuring French forces around improved TNWs to blunt an enemy attack. Significantly, however, other military professionals believe that a tactical nuclear defense mode, no matter how sophisticated, involves too great a risk of escalation. Commandant Guy Brossollet heads this school of thought. Brossollet recommends reorganizing forces not around TNWs but around small, mobile units equipped with PGMs and reinforced by helicopters and heavy armament.³⁶ Even the chief architect of French nuclear policy and the best known of all the Gaullist analysts, retired General Pierre-Marie Gallois, sees some merit in PGMs vis-à-vis TNWs. Gallois, who advocated an overall strategy of massive retaliation with LRTNF if attacked, grudgingly acknowledges that "some of these 'precision munitions' are doubtless more advantageous than TNWs since, in theory, PGMs should not start the dangerous process of escalation."³⁷

In the FRG, where the threat of invasion is most immediate, a kind of love-hate relationship has evolved with regard to nuclear weapons. Bonn, too, has its tactical nuclear defenders (centered primarily in the conservative opposition parties) who argue the need to overcome the firebreak mentality and formulate an explicit employment doctrine for an improved and expanded generation of TNWs.³⁸ But the dominant strain is one of ambivalence and apprehension, perhaps best exemplified by Chancellor Schmidt himself. Schmidt stands by the FRG's official support of Nato's readiness to make first use of TNWs against the WP.³⁹ Yet he has eloquently pointed out the irrationality of a European nuclear exchange in his past strategic writings. "Many have yet to learn," he stated as early as 1962, "that in the event of a collision in Europe our peoples would be destroyed by tactical nuclear weapons every bit as efficiently as by strategic bombs, and that, furthermore, the fact of their existence scarcely reduces the risk of the outbreak of war at all." "Those who think that Europe can be defended by the massed use of such weapons will not defend Europe, but destroy it," he concluded.⁴⁰

During the 1977-78 ERW controversy, several retired Bundeswehr generals echoed Schmidt's concerns. Retired Army General Wolf Graf von Baudissin, former head of the Nato Defense College, and former Luftwaffe Chief of Staff and former chairman of the military committee of the NPG General Johannes Steinhoff criticized the ERW in particular and the deployment of any small scale TNF in general. As summarized by General Steinhoff:

I am in favor of retaining nuclear weapons as political tools, but not permitting them to become battlefield weapons. I am not opposed to the strategic employment of these weapons, however, I am firmly opposed to their tactical use on our soil. I cannot favor a nuclear war on German territory while the two superpowers observe safely at a distance.⁴¹

For the West German leadership, then, TNWs appear to be a necessary evil—required for their deterrent and coupling value but greatly feared because of the consequences of their actual use in battle.

In fact it is this TNW dilemma that is in the back of every European political official's mind, whether articulated or not. "Political leaders of the NATO countries," Harold Feiveson notes, "believe that they are condemned to the possession of tactical nuclear weapons."⁴² Moreover, these leaders must now deal with a better educated and much more vocal electorate on nuclear questions, which at the very least forces them to face squarely the implications of a contradictory nuclear strategy and perhaps even creates entirely new ground rules for defense decisionmaking. "For the foreseeable future," Nato Fellow Catherine Kelleher argues, "any acquisition plan which involves nuclear warheads or potential and is not directly tied to arms limitation efforts will encounter stiff, continuing, and perhaps ultimately successful resistance."⁴³

In this climate of public apprehension and official irresolution, a well conceived conventional forward defense strategy based on PGMs, barriers, and other conventional arms offers a possible "exit from ambivalence"⁴⁴ for the European establishment. Such a defense mode presents a way to reject short-range nuclear arms without impairing the European defense program. By raising the nuclear threshold and making less likely the scenario of trading US cities for Frankfurt, Paris and London, it should actually enhance security and reestablish what Europeans have

viewed as a waning US commitment to the continent. This European uneasiness regarding the US nuclear guarantee is well justified. As Christoph Bertram observes, the uncertainty (until recently largely unspoken) "is perhaps inevitable, since in the absence of a war that nobody wants, there is no guarantee that the United States will indeed use its nuclear weapons in the pursuit of European security objectives."⁴⁵ Finally on a more immediate level, a cost-effective militarily viable alternative to battlefield TNWs should be welcomed by governments strapped with severe economic and energy problems and public unrest over the nuclear threat.

A New Nuclear Policy

The new generation of precisely delivered munitions can accomplish virtually any mission ascribed to small nuclear weapons in the defense of Europe. New conventional weapons should, therefore, replace nuclear warheads. Conventional explosives do not require Presidential authority for their use, nor do they require the involvement of the Nato NPG. The cumbersome procedures to request a nuclear strike are not required before the launching of a TOW or Assault Breaker.⁴⁶ PGMs can be used instantly when and where needed. And, *per tank destroyed*, PGMs may actually cost less than artillery fired nuclear rounds, including neutron bombs. Lastly the fallout, political and radiological, from a PGM is far less than that of a mininuke.

Since the utility of small nuclear weapons is low, and their effectiveness probably less than that of PGMs, mines, and prechambered conventional demolition charges, we believe Nato can afford to renounce all nuclear weapons with yields less than 10KT. Because it is difficult to envision a battlefield task for nuclear weapons which is not better left to conventional explosives, we believe it should be Nato policy and doctrine not to use any nuclear explosives on or adjacent to the FEBA. It may be catastrophic to start up the escalation ladder, a trip which begins most easily at the bottom rung. We therefore propose the removal of the first rung, and propose that Nato proclaim unilaterally that it will:

- (a) not use any nuclear weapons in the zone of combat, because it has no need to use such weapons.
- (b) not use any nuclear weapons with a yield less than 10KT anywhere, because the utility of such weapons is duplicated by conventional weapons.
- (c) not use nuclear weapons on Nato territory.

This policy eliminates any conceivable blurring of the distinction between nuclear and conventional weapons. In effect going to nuclear war becomes a more serious step than it is now, and in Alton Frye's words, "if escalation is necessary, the enemy will pay the entry price on his own territory."⁴⁷ Nato might anticipate an essentially equivalent and interlocking statement from the Warsaw Pact. The policies we recommend however, are in the best interest of the Western alliance and ought not to be held hostage to Soviet reciprocation. A nonnuclear defense capability for Nato makes sense and should be acquired.

To implement a credible, stabilizing policy, Nato should then

- (a) declare it will not be the first to use nuclear weapons.
- (b) declare that any WP use of nuclear weapons will be met with Nato weapons, all of yield greater than 10 KT to be aimed at targets within the Pact territories, including the Soviet Union.

(c) withdraw all nuclear warheads, bombs and shells, although not dual-capable missile and artillery systems, to west of the Rhine in order to indicate the retaliatory nature of the weapons and to increase their distance from the East German frontier. This increases the likelihood that these second strike weapons will be survivable and available if needed.

Survivability is as critical to the Nato nuclear deterrent as it is to the US strategic deterrent. We assert that Nato should adopt a no-first-use policy because such a policy is in Nato's best interest. Second strike weapons need to be guaranteed of survival and located in such a way as not to provide an attractive target for the WP forces. Initially, this implies basing such weapons at least west of the Rhine. Nato should hope for a similar pull back of Warsaw Pact weapons, but should not insist on it.

Indeed, we believe that even remote location on the continent of Europe is less preferable than a sea-based force. The means to base Nato nuclear forces at sea already exist. Long-range aircraft may be based on aircraft carriers. Sea-launched cruise missiles (e.g., Tomahawk) may be mounted on patrol boats, destroyers, nuclear attack submarines, and, most advantageously, on existing classes of very quiet diesel submarines. This idea is, in fact, not unprecedented in US policy circles. In 1977, a Congressional Budget Office report recommended that the Alliance "reduce or eliminate marginally useful or highly vulnerable and destabilizing" land-based systems (Honest John, ADM, and QRA forces) and "vigorously pursue more survivable peacetime basing modes for theater nuclear weapons, such as sea-basing and combinations of hardening, concealment, and early dispersal" ⁴⁸

At the present time several Trident or Poseidon submarines are assigned to SacEur for long-range nuclear strikes. These are only satisfactory for use when very large (up to 200 KT) bombs are needed. Furthermore, the MIRVed Poseidon missiles carry up to fourteen weapons, each of approximately 40 KT yield, while the Tridents carry eight 100 KT weapons each. Such missiles are not appropriate to waging a limited or controlled nuclear battle with some hope that escalation to central strategic warfare can be avoided.

We propose, therefore, the development of a highly accurate (CEP less than 50 meters) Nato sea-borne medium-range ballistic missile. This system should carry a *single* warhead with selectable yields in the 10-100 KT range. The limited capabilities and range of this rocket permit serious consideration to be given to carrying it in pods attached to the outside of the pressure hull of small submarines which resemble existing boats. This resembles the smallsub undersea mobile (SUM) proposal of Richard Garwin and Sidney Drell for a new generation of strategic missiles,⁴⁹ but construction and operation of these SSBE (Submarine Ballistic Missile, Electric propulsion) boats will be enormously simplified by the reduction in size of the missiles to be mounted.

Conclusion

The policies proposed in this paper are in the best interest of Nato, and the asymmetry introduced by a partial withdrawal of US nuclear weapons is not a concession to the WP. Each step suggested will, when taken together, increase the ability of Nato to defend its central region with lessened risk of nuclear holocaust.

The elements in this plan are affordable, and made more so by the recognition that many of the 35,000 men Jeffrey Record believes are assigned to nuclear custodial duties and the many nuclear-capable quick reaction alert aircraft reserved for that purpose alone could be freed to become part of the defense "tooth" instead of its "tail."⁵⁰

Nevertheless, adoption of a doctrine under which Nato is called upon to defend its territory without recourse to battlefield atomic weapons must have political consequences. Besides the obvious need to fully consult and involve the major European governments in the decision making process, the major political requirement will revolve around the question of the US defense commitment to the Atlantic Alliance. In this context, the United States must make clear that its security shield is not being removed but that the present tenuous nuclear guarantee is being replaced with a more viable conventional alternative. The nearly automatic coupling of events in Europe to the US strategic deterrent is lost, but the probability of using Eurostrategic forces is diminished. Moreover and perhaps more important, the bottom rung of the nuclear ladder will have been removed.

Notes

1. John J. Mearsheimer, "Precision-Guided Munitions and Conventional Deterrence," *Survival*, March/April 1979, pp. 68-76; Mearsheimer, "Debate on Precision-Guided Munitions: Rejoinder," *Survival*, January/February 1980, pp. 20-22.

2. Samuel Glasstone and Philip J. Dolan, eds., *The Effects of Nuclear Weapons* 3d ed. (Washington: Department of Defense, 1977), p. 7.

3. The number of Pact divisions includes Trans-Caucasus forces. Estimates of the French contribution to the totals are as follows: 1,500 tanks; fifteen divisions. See International Institute for Strategic Studies, *The Military Balance, 1981-1982* (London, Autumn 1981), pp. 32, 124.

4. Richard Ogorkiewicz, *Armour* (New York: Praeger, 1960), p. 121.

5. Mearsheimer, "Precision-Guided Munitions and Conventional Deterrence," p. 75.

6. Uri Ra'anan, "The New Technologies and the Middle East: 'Lessons' of the Yom Kippur War and Anticipated Developments," in Geoffrey Kemp, Robert L. Pfaltzgraff, Jr., and Uri Ra'anan, *The Other Arms Race: New Technologies and Non-Nuclear Conflict* (Lexington, Mass.: Heath, 1975), pp. 80-82; James Digby, private communication.

7. Edgar O'Ballance, *No Victor, No Vanquished: The Yom Kippur War* (San Rafael, Calif.: Presidio Press, 1978), p. 116.

8. Jorma K. Miettinen, "Can Conventional New Technologies and New Tactics Replace Tactical Nuclear Weapons in Europe?" in David Carlton and Carlo Schaerf, eds., *Arms Control and Technological Innovation* (London: Groom Helm, 1977), p. 58; Digby, private communication.

9. On early PGM technology and its shortcomings, see James Digby, *Precision-Guided Weapons*, Adelphi Paper No. 118 (London: IISS, Summer 1975); S.J. Dudzinsky, Jr. and James Digby, "New Technology and Control of Conventional Arms: Some Common Ground," *International Security*, Spring 1977, pp. 143-59; C. Ivan Hudson, "New Conventional Munitions," in *New Conventional Weapons and East-West Security, Part I*, Adelphi Paper No. 144 (London: IISS, Spring 1978), pp. 45-50; Cecil I. Hudson and Peter H. Haas, "New Technologies: The Prospects," Eric Klippenberg, "New Technologies: Some Requirements," and Digby, "Precision Weapons: Lower the Risks with Aimed Shots and Aimed Tactics," in Johan J. Holst and Uwe Nerlich, eds., *Beyond Nuclear Deterrence: New Aims, New Arms* (New York: Crane, Russak, 1977), pp. 107-176.

10. Captain Joseph Miceli, USN, private communication.

11. Richard Ogorkiewicz, "Tanks and Anti-Tank Weapons," in *New Conventional Weapons and East-West Security, Part I*, Adelphi Paper No. 144 (London: IISS, Spring 1978), p. 40.

12. *Jane's Weapon Systems* (New York: McGraw Hill, 1978), p. 151; "Sense and Destroy Armor," *Popular Mechanics*, July 1981, p. 68; Philip J. Klass, "New Weapon System Feasibility Shown," *Aviation Week and Space Technology*, 24 September 1979, pp. 173-181.

13. Digby, private communication; Edward Luttwak, private communication.

14. Digby, private communication.

15. Chaim Herzog, *The War of Atonement, October 1973* (Boston: Little, Brown, 1975), pp. 87, 101, 127.

16. *Ibid.*, p. 107.

17. Cf. Daniel Gouré and Gordon McCormick, "Debate on Precision-Guided Munitions: PGM, No Panacea," *Survival*, January/February 1980, pp. 15-19. The relatively low rate of fire and large bulk of PGMs, which means that a single vehicle can carry fewer rounds than a tank's store of conventional ammunition, are often said to be military disadvantages. To be sure, if a PGM had the same probability of scoring a hit as a conventional round, this argument would carry more weight. In fact, of course, each PGM is far more likely to reach its target than unguided ballistic rounds, and PGM launchers need not return fire shot for shot to win engagements. The contrary position may be more accurate: PGMs reduce the amount of materiel which must be brought to the battle. Cf. Seymour J. Deitchman, *New Technology and Military Power: General Purpose Military Forces for the 1980s and Beyond* (Boulder, Colo.: Westview Press, 1979), p. 76.

18. Colin S. Gray, "Theater Nuclear Weapons: Doctrines and Postures," *World Politics*, 1975/76, p. 300.

19. Jeffrey Record, *U.S. Nuclear Weapons in Europe: Issues and Alternatives* (Washington, D.C.: Brookings Institution, 1974), pp. 8-18. See also SIPRI, *Tactical Nuclear Weapons: European Perspectives* (London: Taylor and Francis, 1978), pp. 1-64.

20. Martin J. Hillenbrand, "NATO and Western Security in an Era of Transition," *International Security*, Fall 1977, p. 19.

21. Christopher Makins, "European Security and the Theater Nuclear Balance," *Arms Control Today*, December 1978, p. 1.

22. Jane M.O. Sharp, "Is European Security Negotiable?" in Derek Leehaert, ed., *European Security: Prospects for the 1980s* (Lexington, Mass.: Heath, 1979), pp. 280-83.

23. For recent analyses of the worsening US-European relations, see Stanley Hoffmann, "The Western Alliance: Drift or Harmony?" *International Security*, Fall 1981, pp. 105-125; Philip Windsor, *Germany and the Western Alliance: Lessons from the 1980 Crises*, Adelphi Paper No. 170 (London: IISS, Autumn 1981); Pierre Lellouche, "Europe and Her Defense," and Josef Joffe, "European-American Relations: The Enduring Crisis," *Foreign Affairs*, Spring 1981, pp. 818-851.

24. Catherine McArdle Kelleher, "The Present as Prologue: Europe and Theater Nuclear Modernization," *International Security*, Spring 1981, p. 158.

25. "The END Campaign," *Bulletin of Atomic Scientists*, December 1980, pp. 1, 54; Center for Defense Information (CDI), *Nuclear War in Europe: Documents* (Washington, D.C., 1981); *CDI Conference on Nuclear War in Europe: Press Clippings* (Washington, D.C., 1981).

26. Precisely because the European movement represents such a "convergence of different concerns, fears and aspirations on a single issue," Stanley Hoffmann maintains, it "offers more emotion and passion than hard-headed analysis." Hoffmann, "NATO and Nuclear Weapons: Reasons and Unreason," *Foreign Affairs*, Winter 1981/82, p. 328.

27. *London Times*, 3 October 1980; *London Observer*, 15 November 1981; Lawrence Freedman, "Britain: The First Ex-Nuclear Power?" *International Security*, Fall 1981, pp. 99-100. E.P. Thompson himself has said that his objective is "to move semi-autonomy within the bloc and not necessarily to have a withdrawal from NATO." *FAS Public Interest Report*, December 1981, p. 7.

28. David C. Elliot, *Decision at Brussels: The Politics of Nuclear Forces* (Santa Monica, Calif.: California Seminar on International Security and Foreign Policy, August 1981), pp. 31-32; Mozes W.A. Weers, "The Nuclear Debate in the Netherlands," *Strategic Review*, Spring 1981, p. 70. See also Philip P. Everts, "Reviving Unilateralism: Report on a Campaign for Nuclear Disarmament in the Netherlands," *Bulletin of Peace Proposals*, 1980, pp. 40-56.

29. Johan J. Holst, "Norway's Search for a Nordpolitik," *Foreign Affairs*, Fall 1981, p. 74; Elliot, p. 37. See also Sverre Lodgaard, "A Nuclear Weapon Free Zone in the North? A Reappraisal," *Bulletin of Peace Proposals*, 1980, pp. 33-39.

30. Klaas G. de Vries, *Draft General Report on Alliance Security Issues*, Military Committee, North Atlantic Assembly (November 1980); "Nuclear Weapons in Europe: A Report from the Arms Control Association Conference," *Arms Control Today*, November 1981, p. 1.

31. *Los Angeles Times*, 1 November 1981.

32. Louis Monntbatten, "A Military Commander Surveys the Nuclear Arms Race," *International Security*, Winter 1979/80, pp. 3-4; "The Neutron Bomb: Reactions from Europe," *Bulletin of Atomic Scientists*, October 1981, p. 9.

33. Solly Zuckerman, *Nuclear Illusion and Reality* (New York: Viking Press, 1982), p. 145; *Los Angeles Times*, 1 November 1981.

34. Lawrence Freedman, *Arms Control in Europe*, Chatham House Paper No. 11 (London: Royal Institute of International Affairs, 1981), esp. pp. 37-47; Freedman, "A Critique of the END Campaign," *Bulletin of Atomic Scientists*, December 1981, pp. 38-42; Freedman, "NATO Myths," *Foreign Policy*, Winter 1981/82, pp. 48-68; Gregory Treverton, "Nuclear Weapons and the 'Gray Area,'" *Foreign Affairs*, Summer 1979, pp. 1075-89; Treverton, *Nuclear Weapons in Europe*, Adelphi Paper No. 168 (London: IISS, Summer 1981), pp. 11-14.

35. "French Defense: Speech by Yvon Bourges, 27 August 1979," *Survival*, January/February 1980, p. 40.
36. D. Bruce Marshall, "The Evolving French Strategic Debate," *Strategic Review*, Spring 1980, pp. 62-64; David S. Yost, "The French Defense Debate," *Survival*, January/February 1981, pp. 19-28; Marshall, "Mitterand's Defense Policies: The Early Signals," *Strategic Review*, Fall 1981, pp. 45-49; Samuel F. Wells, Jr., "The Mitterand Challenge," *Foreign Policy*, Fall 1981, pp. 58-61, 64.
37. Pierre M. Gallois, "French Defense Planning: The Future in the Past," *International Security*, Fall 1976, p. 25; Yost, pp. 22-23.
38. The chief spokesman of this group is Manfred Wornier, Bundestag Defense Committee chairman and jet pilot in the Luftwaffe Reserve. See his "NATO Defenses and Tactical Nuclear Weapons," *Strategic Review*, Fall 1977, pp. 11-18.
39. See, for example, Federal Ministry of Defense, *White Paper 1975-1976: The Security of the FRG and the Development of the Federal Armed Forces* (Bonn: Press and Information Office, 1976), pp. 20-23.
40. Helmut Schmidt, *Defense or Retaliation* (New York: Praeger, 1962), pp. 5, 100-103. See also Charles N. Davidson, "Tactical Nuclear Defense: The West German View," *Parameters*, 1974, pp. 47-57.
41. Hans Gunther Brauch, "The Enhanced Radiation Warhead: A West German Perspective," *Arms Control Today*, June 1978, p. 3.
42. Harold A. Feiveson, "The Dilemma of Theater Nuclear Weapons," *World Politics*, 1981, p. 285.
43. Kelleher, p. 157.
44. Alton Frye, "Nuclear Weapons in Europe: No Exit from Ambivalence," *Survival*, May/June 1980, pp. 98-106. For an early positive assessment of what PGMs might mean to Europe, see Edward B. Atkeson, "Precision Guided Munitions: Implications for Detente," *Parameters*, 1976, pp. 75-87.
45. Christoph Bertram, "European Security and the German Problem," *International Security*, Winter 1979/80, p. 112.
46. US Army Field Manual, *Operations FM 100-5* (Department of the Army, 1 July 1976), pp. 10-1-9.
47. Frye, p. 104.
48. Congressional Budget Office, *Planning U.S. General Purpose Forces: The Theater Nuclear Forces* (Washington: January 1977), pp. 39-40.
49. Sidney D. Drell and Richard L. Garwin, "Basing the MX Missile: A Better Idea," *Technology Review* May/June 1981, pp. 20-29.
50. Record, p. 35.

Peter D. Zimmerman of Louisiana State University, holds a Ph.D. in physics from Stanford and is a Lieutenant Commander in the Naval Reserve. G. Allen Greb, who holds a Ph.D. in history from the University of California at San Diego, is a research associate in that university's program on science, technology, and public affairs. Both authors have written extensively on issues related to nuclear weapons.



A word that won't leave the naval vocabulary
Whether the time is 1862 or 1982:

Blockade

Charleston Blockade: The Journals of John B. Marchand, 1861-1862, tells in one commanding officer's words what it is like to be ready constantly for action which can come at any time, but almost never does.

Edited with commentary by Craig L. Symonds

287 pages, paperback. \$3.00 from the Government Printing Office.

The Naval War College Press, 1976.

About Officers, USN

by

Richard E. Stockwell

ア

WARRANT

He did his duty
While looking through thick lenses
Of experience.

X

ENSIGN

Too many forgot
Their first years and pushed their rank
In his face daily.

リ

力

JG

One-half stripe but a
Long step up, up from the one
Stripe kindergarten.

合

衆

LIEUTENANT

Most years, it meant that
His rank was recognition
He knew a few things.

固

海

LT.-COMMANDER

Competence, or luck,
Or both, he sweated out his
Duty and future.

軍

COMMANDER

First time with cap that
Told the observer that he
Had paid his sea dues.

将

CAPTAIN

Survivor of the
Selection boards, he watched his
Duty and a star.



COMMODORE

Few were fortunate
 To escape the plateau that
 Separated them.

校

に

REAR ADMIRAL

Two stars and golden
 Sleeves were heavy with duty
 And thoughts of three stars.

よ

VICE-ADMIRAL

More service time was
 Past than remained to think and
 Look for one last rank.

る

階

ADMIRAL

Duty years left him
 Steered at the abysmal drop
 Of retirement.

級

RETIRED(USN)

Puffing pipe and mind,
 Gazing out to sea, he looked
 For his memories.

認

識

This sequence of poems was written in American-Haiku, a format developed from the traditional Japanese haiku poetry form.