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*The Citizen Soldier and
National Service*

Rangle of attack

The ability to perceive—better still to anticipate—change has always been important to the military profession, increasingly so as warfare has become more technologically complex. Where air power was involved, this ability or the lack thereof has generally meant the difference between victory and defeat.

The acerbic and frequently quoted observation of the Italian pioneer of air power, Giulio Douhet, makes the point well: "Victory favors those who anticipate changes in the character of war, not those who wait to adapt themselves to change." Can we doubt that this maxim, published in 1921, applies today to the dominance of space?

Within this context, the role of the *Review* is clear. Vigorous debate and the free exchange of ideas enhance both timeliness of perception and quality of analysis.

In our efforts to anticipate change, we will continue trends established under the previous editors. We will lean a bit less toward management and more in the direction of professionalism and leadership—toward "officership," to use the term recently surfaced by General Bennie L. Davis, Commander of Air Training Command. Our editorial stance will turn increasingly in the direction of concrete problems of tactical employment, toward "war fighting," to paraphrase the charter given the USAF Combined Air Warfare Course in 1977 by then Chief of Staff General David C. Jones.

The change will be as much one of altered perception as of shifting emphasis: War-fighting capabilities depend on personnel management, logistics, military justice and medicine, communications, and a host of other technical requirements; they are underwritten by fiscal planning and force structuring. Recruiting and retention do not fit neatly into this scheme, yet are problems of pivotal importance. Our lead article by Professor Morris Janowitz highlights our concern with this crucial area.

Nothing is as consistent as the pragmatic inconsistencies in even the most carefully worked out frame of reference. We will continue to publish articles in all the areas mentioned above and more. The final determinant will be, as it always has been, the timeliness and quality of the offerings of our contributors, an area where the *Review* is well favored. There is, nevertheless, increasing concern within the military community, and the Air Force in particular, over questions of weaponry, strategy, and tactics—the nuts and bolts of the military profession. There has been rapid change in all these areas over the past few years, more than we, with our attention focused on the final spasms of the Vietnam War, at first realized.

The *Review* will continue to provide a forum in which the nature and rate of change within the profession of arms and the United States Air Force can be described, analyzed, debated—and perhaps anticipated. That will not change.

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articles

departments

National service is an institutional procedure which would contribute to the educational needs of the young and assist in dealing with the difficult economic and social problems of an advanced industrial society.

THE CITIZEN SOLDIER
AND NATIONAL SERVICE

DR. MORRIS JANOWITZ

I N one important aspect, the history of the U.S. military establishment can be written as a history of compromise between policies designed to strengthen professional "standing" forces and policies emphasizing the citizen-soldier concept. The citizen-soldier concept has traditionally been embodied in the colonial militia, state and national guard formations, federal conscription, and the Reserves. But the end of conscription on 30 June 1973 and the introduction of an all-volunteer professional military represented a drastic break in traditional reliance on the citizen soldier. For the first time in U.S. history, the President, with congressional approval, brought into being an expanded all-volunteer professional force during a period of no combat operations. This force was conceived to meet continuing military requirements under the U.S. strategy of deterrence.

Although the idea of an all-volunteer force represents a radical departure from the tradition of the citizen soldier, my thesis is that the citizen soldier is still an important element of the all-volunteer concept. In fact, only by clarifying the potentials of the citizen soldier can the all-volunteer force recruit sufficient numbers of qualified

personnel to meet its needs in a period of increased recruiting difficulties. For the long-term, a system of national service suggests the appropriate format for military service in a democratic society pursuing a strategy of deterrence.

One might consider initially that a strategy of deterrence precludes the short-term service of citizen soldiers because such a strategy requires a military organized more as a force in-being and less as a mobilization cadre; that is, it requires personnel already in place or available for immediate mobilization and deployment. Nevertheless, there is still an extensive need for persons with two- to four-year assignments. Important semiskilled and even unskilled tasks in each service can be performed by persons with limited tours of duty, and even some vital combat assignments can be filled efficiently by persons who serve for only two years. Short-term service is also a form of effective career recruitment. Many men and women are prepared to try short tours of duty to determine whether the military meets their needs, and short tours enable them to take honorable exits without stigma.

There are many measures of personnel turnover, and available data on turnover in the military establishment are limited. However, the typical or modal length of service for military personnel under the all-volunteer concept appears no longer than the average period of service under conscription. The fact that some 400,000 men and women (one-fifth of the total) enter and leave the active-duty forces each year hardly means that present-day services are not stable, professional formations akin to the standing forces of the eighteenth century.

The first step in this analysis is to identify the persistent elements of the citizen-soldier concept; that is, to think of the citizen soldier as an analytic category. The second step is to determine common elements in the all-volunteer concept and the citizen-soldier format. And the third step is to outline alternative policies that can strengthen the citizen-soldier component

of the contemporary U.S. military. In terms of policy analysis, one can view the current all-volunteer force as a transition to national military and civilian service. Furthermore, the expected decline in the size of the manpower pool of 18-year-olds in the coming decade necessitates creative approaches in dealing with the increased difficulties of military recruiting.

National military and civilian service can be viewed as a modern version of the citizen-soldier concept to assist the military in recruitment and as a social device for dealing with a wide range of societal problems. It would be an institutional procedure that could be structured to deal with difficult ideological problems and with imperfections in the American educational system. The extension of academic education to the college level has had serious dysfunctional consequences for the socialization of young people. In excessively separating the "world of school" from the "world of work," the system has made it difficult for young people to mature and make realistic career decisions. National service would broaden learning experiences leading to adult responsibilities. At the same time, national service would be a device for dealing with specific social and economic problems of an advanced industrial society. Short-term, labor-intensive work without prior elaborate training is very effective in a variety of educational, community, and welfare activities. Just as the military requires a constant flow of short-term personnel, many civilian tasks can be effectively performed by people who do not define the tasks as life careers. In this fundamental sense, the military and the civilian components of national service converge, and we have an enlarged concept of the citizen soldier.

WHAT are the common elements in the American concept of the citizen solider? As applied to the militia, the conscript military, and the associated Reserve forces, the concept is characterized by three significant

dimensions: obligatory service, universality or a pervasive element of universality, and essential legitimacy by democratic political standards.

obligatory service

Militia service and conscript service mean obligatory service or, more bluntly, compulsory service. But the essential point is that obligatory service stands in juxtaposition to the voluntary decision to offer one's service. The contemporary all-volunteer system depends on an elaborate system of monetary incentives to ensure a competitive and "fair market" value for military personnel.

Obligatory systems differ from voluntary systems in the social groups that are recruited. However, obligatory systems always contain escape mechanisms for particular persons and groups. The military depended on various systems of obligatory service and conscription during the American Revolution and the U.S. Civil War, but they were very loose systems. Of course, the institutionalization of conscription during World War I eliminated an important escape mechanism, the hiring of substitutes. But new exemptions have developed. For example, contemporary systems more explicitly recognize conscientious objection, specific skill categories, and family position. The important point is that the legitimacy of a militia or a conscript military declines if the public views the escape mechanisms as extensive, arbitrary, or distorted.

universal service

As applied to the militia and to the conscript force, the citizen-soldier concept implies a strong emphasis on universal service. Both the American Revolution and the French Revolution dramatized the theme of the "nation in arms." In this sense, they introduced a dimension of military service in sharp contrast to feudal practices and the practice of absolute monarchs with standing armies. And the principle of

universality of service inevitably led to larger and more destructive military establishments.

The concept of universality applies to service both as an officer and as an enlisted person, but, of course, in a different fashion. As applied to officers, universal service means that entrance into the officer corps is no longer the monopoly of aristocrats. In the American colonial setting and in the French Revolution, the negative image of hereditary European aristocracy and open recruitment of militia officers undermined the aristocratic model. Although the ideal was not fully practiced in revolutionary France and the United States, it broadened the base for recruiting the officer corps. At the enlisted level, universality of service means that every citizen is eligible for military service, that is, eligible to be armed and obliged to serve.

However, even as a political ideal in the past, universality did not originally mean that the total population was eligible and obliged to serve. Special groups—low-status and marginal groups or potentially hostile individuals—were excluded. Universality extended to actual or potential citizens, and citizenship and military service were exclusively men's worlds. As citizenship rights were extended to excluded groups, military service was made more and more socially inclusive.

Particularly important for the citizen-soldier concept has been the issue of age groupings. The militia held that the widest range of the male population would at least be enrolled for service. Conscription was fashioned on the ideals of the militia, but it explicitly acknowledged age limitations. For both the militia and the conscript military, universality meant priority of service for certain age groups on the basis of physical prowess and the pressure of military needs. Interestingly, exemption by age in the past did not, in general, undermine the legitimacy of conscription.

Once the categories of eligible age have been defined by law, each deviation from the principle of universality tends to weaken the legiti-

macy of the citizen-soldier concept. For example, a crucial problem arises when military needs require only a portion of an eligible category. Who shall serve when all members of a particular age group are deemed unnecessary? This is an almost insoluble problem. Such nations as France and Sweden have emphasized the importance of maintaining maximum universal service, and they have sought to fashion their military institutions to accommodate relative universality. On the other hand, the pressure of cost-benefit analysis in the United States has led to a tendency to increase the scope of exemptions; thus, the legitimacy of conscription has been weakened.

The citizen-soldier concept applies in varying degrees to Reserve units, particularly reservists who are trained while conscripts are clearly part of the citizen-soldier category. During the Vietnam period, the political choice was to mobilize only limited numbers of Reserves. Many people who entered the Reserves were deliberate in their intent to avoid combat duty; thus, the legitimacy of the Reserves as citizen soldiers suffered temporarily. However, the fact that reservists are part-time soldiers has helped to reaffirm their citizen-soldier status.

legitimacy by democratic standards

The third dimension of the citizen-soldier concept, essential legitimacy by democratic standards, is based on obligatory and universal service; it does not exclude legitimacy and a strong element of popular support. Such support is most easily gained for military units on the basis of local self-defense, but, no doubt, some militia formations have functioned primarily through negative sanctions and organizational pressure. Likewise, conscription has sometimes been enforced on the basis of passive compliance without the extension of citizen rights. Such forms of conscription are not compatible with the ideals and realities of the citizen-soldier concept. One can refer to conscripting citizens in contrast to conscripting subjects, but the latter action does not conform to the citizen-soldier concept. Only a society that accepts important components of democratic practice or strives to achieve political democracy can effectively implement the citizen-soldier concept by conscription.

Various political regimes in the past have conscripted subjects — Prussian, czarist, Austro-Hungarian, and Imperial Japanese. And, in the more recent period, one must, of course, add the Soviet Union. In fact, there are more instances of subject conscription than citizen-soldier conscription.

For the United States, the research literature is replete with instances in which the American public has opposed conscription, especially during the Civil War. And individual efforts to avoid conscript service have never ceased. But the legitimacy and acceptance of conscription in the United States and other Western nations reached a high point during World War I and World War II. However, in light of the sacrifices accepted by the citizenry, conscription, at the least, must be considered a remarkable social invention. The introduction of nuclear weapons brought a decline in popular acceptance of conscription, but even this threshold of military technology did not thwart the extensive but declining use of conscription among Western political democracies. The reintroduction and persistence of conscription in the Federal Republic of Germany exemplifies the self-perpetuation of fundamental institutions, given the continuity of nation-states and international conflict.

The crux of the dimension of legitimacy is the political definition of military service by conscripts. For conscription to be legitimate by democratic standards, military service must not deprive the individual of his basic political rights. Even professional cadres are citizens, although they must behave under extensive self-imposed restrictions to avoid partisan affiliations that might lead to conflicts with civilian political leaders. And the conscription of subjects is not without certain legitimacy, but it is

National service — circa 1933

During the depression years of the early thirties, national service was a fact of U.S. life in a way it has not been since. The Civilian Conservation Corps (CCC) was an aspect of Franklin D. Roosevelt's New Deal program that involved indigent young men of the nation in rural conservation and reclamation work, often in the national parks and forests around the country. CCC Camp F-7 at Jackson Hole, Wyoming, commanded by Captain John K. Rice (at left), messed and billeted men working in the recently established Grand Teton National Park. Needless to say, the ambience was more imposing than the accommodations.

not democratic legitimacy. It is the legitimacy that derives from the prerogatives of ruling elites to extract service from their subjects. Under the citizen-soldier concept, however, civilian leaders persist in their concern that the rights of soldiers as citizens are not needlessly infringed. These leaders must be particularly alert to ensure that soldiers are free to inform themselves of political developments in civil society and that they are allowed to exercise their rights in voting for political leaders.

Since the end of World War I, Western democracies have effectively expanded the political and legal rights of military personnel on active duty. Perhaps the most dramatic and extreme case is the Federal Republic of Germany, where military personnel on active duty can run for elective office. Practices vary from one nation to another, but the essential element is that the legitimacy of military service is grounded in recognition of the soldier's political and legal rights as a citizen.

Thus, we can identify the broad outlines of the citizen-soldier concept, which represents an admixture of military requirements and political definitions imposed by the leaders of the larger society. And we can think of obligatory service and universal service as dimensions that take directly into account the forms and pressures of military organization. But we must give special emphasis to legitimacy, and we mean legitimacy in a democratic political context.

Finally, the citizen-soldier concept not only provides a formula for civilian political control and political legitimacy of the military but also makes an important contribution to military effectiveness. The arguments are well known. To the extent that the concept draws on a representative segment of civilian society, it mobilizes the broad range of skills and aptitudes required for a modern military establishment. If the all-volunteer force is heavily weighted with personnel from socially deprived backgrounds, the military does not have access to all available human resources that it can acquire through conscription.

Furthermore, the logic of the citizen-soldier concept rests not only on the premise that the military has important concentrations of positions that can be filled by persons who acquire their skills in civilian society but also on the parallel premise that the military has important concentrations of positions that can be filled by persons with limited training. Equally important is the perception that a variety of military training, including combat training, can best be accomplished by personnel who have acquired adequate educational backgrounds in civilian life. In broader terms adequate educational backgrounds make for more effective military performance, and the citizen-soldier concept is a device for recruiting persons with appropriate educational backgrounds.

Personnel Turnover in the All-Volunteer Force

To what extent does the contemporary all-volunteer force contain elements of the citizen-soldier concept? Answering this question involves a review of data on career patterns, especially personnel turnover. In fact, high personnel turnover in the all-volunteer force is a critical indicator of elements commonly associated with the citizen-soldier model.

The military establishment that evolved at the end of conscription does not conform to the model projected, anticipated, and desired by experts in manpower analysis. They believed that they could fashion a stable military in terms of overall numbers and low personnel turnover. Neither result has been realized.

In fact, from 30 June 1973 to 30 June 1978, the overall manpower level had declined, and it was accompanied by a high rate of turnover, despite sharply increased pay levels. Amazing as it may appear, one must entertain the possibility that we have comparable and even higher rates of turnover under the all-volunteer concept than under conscription. Thus, the planners' hopes for reduced training costs and increased efficiency through less turnover have come to naught.

Basically, the planners did not take into consideration a wide range of complicated structural factors that contribute to personnel turnover in any military organization—conscript or all-volunteer. In addition, the need for a flexible retirement system has been increasingly recognized in the military, both to meet personnel needs and reduce retirement costs. Of course, such a system would permit six-to-twelve-year tours of duty with pension rights and would further increase turnover.

As I see it, personnel turnover is not necessarily or automatically a negative phenomenon. It can represent effective recruitment for a military establishment that seeks to maintain its linkages with civilian society and wishes to mobilize skills, aptitudes, and sentiments representing a broad segment of that society. It can also contribute to recruitment for the Reserves. The military that wishes to maintain at least some of the citizen-soldier perspective acknowledges the realities and benefits of meaningful turnover.

Although some active-duty turnover has been disguised in the overall decrease in the force since 1973, there has been a sharp decline in Reserve force levels. For instance, Department of Defense expects that by 1982 the strength of the Individual Ready Reserve will be approximately 11 percent of its 1972 level. To state the issue differently, the percentage of personnel turnover would have been higher if the force had not been reduced in size, and there would have been a need to recruit more personnel.

In assessing personnel turnover, we are dealing fundamentally with the continuity of powerful structural factors that have not been modified by the end of the draft and the introduction of monetary incentives. The basic issue is whether increases in retention rates are offsetting increases in attrition before the completion of the first term. Sources of information indicate that this is not the case to any noteworthy extent. One must emphasize that the average length of service for officers and enlisted personnel is a wholly inadequate measure of turnover because it excludes from the data base everyone who has left the military establishment.

An examination of trends in officer retention and turnover shows that all three military services have attempted to stabilize the officer corps by increasing the concentration of academy graduates in the active-duty force. This trend began in the post-World War II period with the establishment of the U.S. Air Force Academy and with marked additions in the size of the student bodies at the U.S. Military Academy and the U.S. Naval Academy. The period also saw extensions in the obligated tours of duty for academy graduates. These policies have not had much effect, since attrition has kept pace with enrollments, but one must emphasize that a portion of this attrition is not undesirable.

Basically, these rates of separation reflect the instability of career interests among young people in contemporary society. Many young men and women are not able to make enduring career choices when they graduate from high school. Thus, the withdrawal of cadets from the service academies is the equivalent of changes in major fields of study at civilian universities. In addition, many cadets postpone changes in their career choices until they have completed their obligated tours of duty. And thereafter, attrition continues year after year until officers gradually change their career goals and decide to complete the required 20 years for a pension.

This high turnover of officer personnel reflects at least two basic structural features. One feature is the marked career distinction between military academy graduates and ROTC graduates; the other is the rank hierarchy and the system of promotion up or selection out. The officer personnel system has not shifted its policies to articulate with a force that would be based on a lower rate of turnover.

The ROTC has, in effect, altered its mission from recruitment and training of Reserve officers to procurement of active-duty officers. ROTC officers have relatively short obligated

tours of duty, during which they can recognize their prospects for promotion and full military careers. In fact, the increased numbers of academy graduates in the active-duty force only intensify career competition and earlier resignations by ROTC graduates. Second, the rank structure and the system of selection up-or-out serves by design to increase officer turnover and separation. The crucial point is that an important segment of the officer corps with technical, administrative, and operational skills required by the military would be prepared to remain on active duty without competing directly for promotion. The up-or-out system militates against this opportunity and renders it impossible.

Personnel turnover is also extensive in the enlisted force even though the two-year conscription tour of duty was eliminated on the assumption that three- and four-year tours would improve the retention rates. Two structural factors contribute to the dilemma. One is that rates of reenlistment are critical. Although these rates vary considerably from service to service, they are not high enough to have any marked effect on turnover. They are low, in part, because recruits at the end of the first term either demonstrate a low capacity for promotion or wish to leave the service. The other factor is the very high rate of attrition during the first term of service. In the all-volunteer force, this attrition has reached a level of 35 to 40 percent and represents separation primarily at the initiative of individual commanders. The military services, like the academies, are dealing with instability in occupational choices among high school graduates and, to an even greater extent, among people who fail to complete high school and lack personal qualifications.

One can construct a more adequate turnover measure indicating the survival rate of first-term volunteers; that is, individuals who remain on active duty after four years of service. This measure includes attrition plus failure to reenlist either because of lack of interest or lack of qualifications for reenlistment. It should be noted that a stark pattern has persisted through-

out most of the period of the all-volunteer force.

For the Army, only 13.5 percent of the people who entered the service in fiscal year 1971 remained on active duty as of 30 June 1975. Of the new recruits in fiscal year 1973, the figure had risen to only 17.4 percent by 30 June 1977, indicating very little decrease in personnel turnover. The figure of 17.4 percent or, conversely, a turnover measure of 82.6 percent is, indeed, very high. Only the Marines had higher turnover since the survival percentage was lower, 13.9 percent. The Air Force had lower turnover, but even its figures are noteworthy. For new recruits who entered the service in fiscal year 1973 when the Air Force could be very selective, the number still on active duty stood at no more than 28.9 percent as of 30 June 1977. In short, even in the Air Force, 70 percent of new personnel had left after a tour of four years. Thus, all of the available data point in one direction: the all-volunteer force presents a configuration of personnel turnover similar to the turnover encountered under conscription after World War II—a pattern with elements of the citizen soldier.*

Motives and Self-Conceptions

A close examination reveals changes in the motives and self-conceptions of people who enter the Armed Forces of the United States under the all-volunteer format. Obviously, the end of the draft has meant the elimination of the reluctant conscript who merely served a tour of duty as a matter of course without much reference to his attitudes. From the point of view of the contemporary military, the all-volunteer concept has eliminated the initially reluctant conscript who decided while in service to make the military a career. This development may point up a crucial loss in dedicated personnel.

*This extensive turnover in the enlisted ranks is accompanied by some limited aging and prolonged retention in the career-oriented enlisted ranks. The variation by service is striking and conforms to expectations. The standard measure is the percentage of the active-duty enlisted career force with more than four years of service. In fiscal year 1967, 31.3 percent had more than four years of service; by 1977, the figure had grown to 41.4 percent. In fiscal year 1977, the Air Force had the highest figure with more than four years of service, 53.5 percent. On the other hand, the Marine Corps had the lowest figure, 25.7 percent.

Despite these profound changes, a strong feature of continuity characterizes the attitudes of the new recruits, both officer and enlisted personnel. For the time being, the attitudes and self-concepts of the force in-being have not become extensively "militarized" although there is some evidence of increased homogeneity and a stronger "absolutist" outlook. The contemporary attitude patterns of the military, in effect, converge with the patterns of the larger society. These attitudes remain compatible with and receptive to a gradual shift toward a national service format and a modern version of the citizen-soldier perspective if such a format should ever become national policy.

Unfortunately, sufficient data are not available to analyze these changes although there is an obvious basis for probing them. Thus, I must proceed without adequate documentation, since the massive machinery of social research in the armed forces avoids the study of in-depth self-conceptions. We must not rely too heavily on superficial and stereotyped responses generated by paper-and-pencil tests although such data have some utility. The services have, indeed, sponsored some important civilian-administered surveys, but these surveys cannot be effectively compared with attitude patterns under conscription, since adequate data are not available for earlier periods. Moreover, the motives of men and women reveal themselves slowly and indirectly. Therefore, I must incorporate impressions and the flow of pointed observations that reach me from Fellows of the Inter-University Seminar on active duty.

When I studied officers in the 1950s, I cited four motivational patterns that I believe still characterize officer attitudes: tradition or, more precisely, family and social inheritance; desire for education, expertise, and social development; previous experience in a military setting, including a strong interest in an active outdoor life; and boyhood ambition.

In the 1970s, monetary incentives probably play a more significant role in these mature patterns. In fact, many career officers report some

dissatisfaction with their standard of living, or, rather, they are concerned with the problem of eroded benefits. In part, new officers entering the U.S. Armed Forces are exposed to a strong emphasis on economic incentives, since Congress and civilian leaders in the Department of Defense believe that these incentives are primary career considerations. But officers on active duty find themselves in an environment that does not stress economic rewards as the basis for effective performance and achievements. The military officer wants good pay and fringe benefits, but he still likes to think of himself as a person in the service of the state.* Thus, in the simplest terms, career military personnel hardly think of themselves as mercenaries, that is, as "hired guns." In fact, most military personnel — both officers and noncommissioned officers — bridle at the word "mercenaries," reflecting their sensitivity to the issue of economic motivation, which, they believe, is insufficient to account for their behavior.

This is not an obvious, meaningless, or trivial observation. It reflects a common sense of identity that officers and noncommissioned officers have developed and perpetuated. Thus, new recruits still enter a military managed by officers who think of themselves as professionals, a situation similar to that during the conscription era.

The motives of officers for entering and remaining on active duty are accompanied by a striking missionary zeal. Military officers strongly believe that they are engaged in a special class of tasks required for the collective good as opposed to individual self-interest. Frustration in one's immediate assignment, discontent with bureaucratic procedures, and family tensions weaken or eliminate this missionary sense. Blocked promotion can be especially devastat-

*It is also true that career military personnel, both officer and enlisted, are fiercely competitive and strive endlessly for promotion. In the early nineteenth century, Alexis de Tocqueville noted this trait of the military in democratic societies. Professional officers in democratic societies do not enjoy high status in civilian society. Although officers of the aristocratic mold derive their high status from their civilian origins and position, professional officers in democratic societies must be judged by their military rank, and, therefore, they struggle ceaselessly for higher rank.

ing. But despite the many sources of stress, a strong missionary zeal is still a persistent trait among professional officers.

In this connection, I find no evidence of major increases in self-conceptions that one must call "careerist," especially among new officers. I believe that the military, like any other large organization, has had significant concentrations of people who viewed the service as just a job or as a place to practice a specialized profession. Perhaps the concentration of "careerists" has increased somewhat; if such is the case, the same trends have no doubt taken place in civilian institutions.

Furthermore, professional military officers, like civilian professionals, are definitely changing their life-styles, and these changes are not related to the end of conscription. Military personnel particularly desire greater personal privacy, increased personal autonomy, and more regularized work hours, except in emergencies. But there is no reason to believe that such preferences and even demands make the officer more "careerist." Of more importance, perhaps, is the fact that the all-volunteer military tends to distribute its workload unevenly, in part, because of the nature of military assignments and command responsibilities. Some officers feel that they are underemployed or, more to the point, that they are engaged in trivial or unproductive work. This is especially the case among new officers without command assignments. On the other hand, a minority are consumed under the pressure of their assignments, but this state of affairs is likely to persist. Most officers adjust to and accept these conditions, but others tend to leave the service and thereby contribute to turnover.

The motivation of enlisted recruits also shows continuity with the recent past. Of course, the extensive recruitment of marginal personnel results in a strong concentration of individuals who just drift into the military: they make the decision to enlist without deliberate calculation or clear motives. And they are the people who just as casually drift out. In his analysis of reasons offered by recruits for enlisting in the Army in 1971 and 1977, Gilbert Badillo found strong elements of continuity. Skill training and educational benefits, the prospect of a career, and the desire for personal maturity ranked high during both periods. By 1977, the financial rewards of a military tour of duty had obviously become increasingly important, and many persons joined to learn skills, to receive educational assistance, or to grow and mature. I am also fully aware that many young men enlist on negative impulses based on a perceived lack of personal competence, inability to find civilian jobs, or previous failures. But many young persons in such positions do not enlist. They seek alternative solutions to their problems or merely rely on social welfare until they are older. The labor market is then more inclined to accept them because they are older.

However, one must consider an additional factor. A larger number of new enlisted recruits, including many of the most uncertain and most diversely motivated persons, view enlistment as something special. They feel that they are entering a different, noncivilian organization with a special task. They are attracted to the societal goals pursued by the armed forces, and they are beguiled by the military purpose.

This motive may not be dominant; indeed, it seldom is dominant. And it is certainly not the sole motive, but its presence is observable. The day-to-day real-life situation in the armed forces may extinguish these vague feelings more often than strengthen them. In 1976, a service-wide sample of male enlisted personnel in all the services (with the rank of E-3/E-4) were asked to agree or disagree with the statement, "Doing the job the military does is both necessary and important." Despite the limited educational background and marginality of enlisted military recruits, fewer than 10 percent disagreed. Only 25 percent of the recruits strongly agreed with the statement. Even if it is all too faint, this is a residue of the citizen-soldier's persistent motives. To the extent that the routines and frustrations of military life weaken

these motives, the officer corps has failed in one of its essential civic tasks.

For both officer and enlisted personnel, I have stressed continuity not only in personnel practices but also in self-concepts that reflect the survival of the citizen-soldier concept. But I must point out that, even in the short period of the expanded all-volunteer force, the anticipated trends in the ideologies of career personnel are beginning to manifest themselves. Jerald G. Bachman, John D. Blair, and David R. Segal have evaluated the available systematic research on this issue in *The All-Volunteer Force: A Study of Ideology in the Military*. They conclude that "we failed to find a clear and uniform promilitary stance among the military men as a whole." In short, the military continues to reflect the pluralism of the larger society, in part because of the presence of short-term officer and enlisted personnel, the modern equivalents of citizen soldiers. But, with the passage of time, "those who had career interests in the military were, on the average, enthusiastically promilitary along virtually every dimension."

A Modern View of the Citizen Soldier

Our investigation of personnel turnover and the motives that stimulate volunteer service leads directly back to the essential dimensions of the citizen soldier: obligatory service, universality, and legitimacy. If these three dimensions are applied directly and mechanically to the contemporary military establishment, it appears that the citizen-soldier concept has indeed atrophied. But our analysis points to important survivals and, in fact, adaptations. For both officers and enlisted personnel, the sheer volume of rotation is the precondition for the relevance of the "citizen-soldier" concept. In policy terms, the first 10 to 20 years of the all-volunteer force can be a transitional period for fashioning new forms of the citizen-soldier concept.

No doubt, the dimension of obligatory service represents the most profound issue in adapting the citizen-soldier role to the contemporary

setting. The policies and standards of the modern, all-volunteer military, in effect, reject the peacetime application of obligatory service. But the distinction between peacetime and wartime is weakened, if not eliminated, under the strategy of deterrence. The force in-being is paramount in the day-to-day management of international relations. Moreover, one need not accept the doctrine of a "short war" to recognize that the active-duty force and Reserve elements that could be immediately deployed would determine the outcome of a conventional war in Central Europe.

The standard of obligatory service is linked to the standard of universal service. The fact that only a portion of eligible members in a new age group is required for military service helped to undermine the legitimacy of selective service. This reality stands as a barrier to the efforts of those people who seek to revive conscription on a fair, selective basis. In the end, a system of national service combining military- and civilian-based tasks can modernize the traditional ideals of obligation and universality.

To what extent does the present all-volunteer system with its high personnel turnover involve an extensive segment of the youth population? In very rough figures, I estimate that one of every three eligible 18-year-olds is presently being recruited. The next logical question is just how many more would be involved if national service were a reality.*

One should bear in mind that the size of the 18-year-old group will gradually decrease until the male component will total only 1.61 million by 1992. On the other hand, educational and medical requirements for civilian components of national service would not be as exacting as current military standards. National service would probably involve two to three times the number of males currently enlisting; the inclusion of females, of course, would greatly expand the number of eligibles. These figures demonstrate that the volunteer force can be considered as a form of transition, incomplete and

* Approximately 2,140,000 males reached 18 in 1978; 400,000 were recruited, including those who were somewhat older

implicit, to national service. In fact, the personnel structure of the armed services is potentially congruent with national service and the citizen-soldier format. Perhaps the most important change would be the introduction of a two-year enlistment period for people who enter the armed forces under national service.

The figures do not include existing civilian national service enterprises and related full-time youth job training programs. The federal government sponsors national civilian service opportunities through the Peace Corps, Volunteers in Service to America (VISTA), and the Teacher Corps. In addition, the U.S. Forest Service, the National Park Service, and the Young Adult Conservation Corps administer modest but related programs.

Present full-time federal vocational training programs involve significant numbers of young people in efforts that resemble the national service format. In addition to the Job Corps, various youth training programs administered by the Comprehensive Employment Training Act and by the Youth Employment Demonstration Projects Act include arranged employment in community programs and, especially, in governmental agencies. At least one million additional young men and women participate in such programs, some of which are of very short duration. In effect, 400,000 to 500,000 persons are probably involved in activities equivalent to national service.

Still another form of student behavior might also be adapted for national service. Each year, tens of thousands of students take a year off from their undergraduate studies or wait a year before they enter professional or graduate school. I am not referring to students who take breaks because of financial pressure but only to those who report that they need diversion from their educational routine, time to "find themselves," or time to explore the real world. In my estimate, at least five percent of college students make such decisions each year. This orientation suggests positive youth support for national service.

Surveys indicate that popular opinion is much more supportive of national service in various forms than are national legislators. Congressional leaders, no doubt, are aware of the powerful lobbies that oppose national service, especially educational and social welfare lobbies. To be economically feasible and relevant to career development, national service should not merely be added to current periods required to complete education programs. Some modification of existing levels would be necessary, but it is difficult to anticipate vigorous initiatives by educational authorities to this end. Trade unions are opposed to the idea simply because civilian service would offer only nominal pay, and national legislators are fearful of the difficulties involved in setting up a new federal bureaucracy. Further, resistance comes from many military planners who believe that such a system would not produce additional high-quality recruits or more socially representative recruits.

A body of research literature supports two observations concerning the ability of national service to produce additional military manpower. First, under most proposals for national service, the military option would be a tour of duty of two rather than three years. The difference between two and three years is psychologically very great for a young man or woman. Second, national service would have greater financial rewards for military as compared with civilian service. Civilian service would result in nominal monetary compensation, but the military option would give national service recruits meaningful educational benefits rather than competitive market wages. College-bound young people oriented toward careers in the military reject a purely financial or "mercenary" definition of their short-term military tours; they are more disposed to "exchange" military service for educational benefits, both post-high school vocational training and college assistance. It is not feasible to reduce sharply, or even meaningfully, the pay scale of career-oriented military personnel, but one can anticipate that

national service personnel would probably become important components of the active-duty military list.*

At this point, it is necessary to recognize the vast administrative complexities and barriers to the implementation of any national service system. However, these problems would be less important than the political and moral issues involved in obligatory service and in the degree of universality that would result. One can argue that implementation of the citizen-soldier concept through national service would require obligatory national service. But an obligatory system that strives for universality would still need to permit exemptions similar to the exemptions from the military and conscription. The joint application of health and educational exemptions could be reasonably achieved, but the range of tasks to be performed in civilian national service would greatly limit the number of medical exemptions. Presumably, both military and civilian national service organizations would include remedial educational components.

Since obligatory service does not require total participation, acceptable forms of exemption would be necessary. The United States does not require a tyranny of the majority. One crucial group would consist of conscientious objectors. In the modern world, conscientious objection includes opposition on both religious and secular (that is, political) grounds. Clearly, the availability of civilian service as an alternative would reduce conscientious opposition, especially since civilian service could be provided in privately

administered organizations. However, some groups would still oppose any involvement in national service, and exemption would be necessary for these groups on the grounds of both religious and secular conscience. But other difficult categories of young persons would oppose national service because of extensive drug culture or criminal perspectives. National service cannot be considered a national reformatory system. Like the citizen-soldier concept and conscription, it must be based, paradoxically, on a high degree of voluntarism and popular acceptance.

National service is not designed to produce a moral regeneration in the United States. The purpose of national service is to organize and mobilize the positive sentiments and values that already exist in the youth population. These feelings and aspirations, though hardly universal, are stronger than the adult population recognizes, and they are strong enough to support gradually expanding programs of national service.

The last criterion of the citizen soldier — legitimate service by democratic standards — involves both long-standing and new components. The philosophical and political opponents of conscription in the 1960s introduced a new argument grounded in laissez-faire economics. According to Milton Friedman, conscription was unfair because it was hidden tax, and he argued, with considerable effect, that persons were not paid their full economic worth when they were conscripted. In my view, it is impossible to ascertain a person's "full economic worth" when he seeks to defend his nation-state by force of arms and faces the prospect of death, but I shall not press that point. No doubt, mercenaries have market value, but, as I have indicated, that mentality has not taken hold in the U.S. military. The essential issue is that conscription cannot be reduced to the status of an unfair or hidden tax. It is an obligation of citizenship transcending monetary considerations, for a society cannot exist exclusively on the basis of monetary exchange. Under national service,

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*In February 1979, Representative Paul N. McCloskey, Jr., introduced a bill that would deal directly with the military versus the civilian option. The high points of the proposed legislation were the following:

1. At age 17, every man and woman would be required to register at his or her local placement center.

2. Each individual would have four major options:

(a) volunteer for two years of military service, with a guarantee of 36 months of educational and training benefits (approximately 4 million individuals become 18 each year, and the Armed Forces require about 650,000 new enlistees annually);

(b) volunteer for six months of military service, followed by five and one-half years of Reserve obligation;

(c) give one year of civilian service in a community or environmental capacity, including forestry conservation, work with the retarded, aged, or handicapped, and possibly seasonal farm labor when needed; or

(d) join a lottery pool, become eligible for two years of conscript service between the ages of 18 and 24, and receive 18 months of educational or training benefits.

participants would be paid less than "market" wages. Even if national service is considered a tax, it is a tax that must be paid, and the idea of obligatory and universal service makes it more equitable and more legitimate.

But the argument about conscription as an economic arrangement is much too narrow to deal with the persistent questions relating to the obligations of citizenship and the effectiveness and responsibility of the military establishment. The ideal of the citizen soldier and national service is only one type of societal obligation that derives from citizenship. It is a means by which an individual reaffirms his membership in a national society and, at the same time, contributes to his own well-being. In the contemporary context, some sources argued that duties related to community defense and, correspondingly, defense of the ecological environment must augment the obligation of military defense. Neither military defense, community defense, nor environmental defense depends on monetary exchanges alone. Therefore, national service is a continuity and an extension of the citizenship obligation linked to military service.

THE essential legitimacy of any national service system that combines civilian and military duties rests on the guarantees and realities that participants will not be deprived of appropriate civil and political rights while they perform their duties. If the contemporary military, reinforced by civilian court review, can operate on such a basis, the counterpart for civilian military service should be feasible.

On the positive side, participants in national service must be assured of a personally rewarding experience because of the worthwhile tasks performed. It is also essential to reaffirm the tradition of the citizen soldier that service on behalf of the nation-state, in and of itself, is a mark of citizenship. Unfortunately, I estimate that ten years of planning, experimenting, and training would be necessary to develop a meaningful national service even if we started in earnest tomorrow. But, since we will not start tomorrow, we must ensure the success of the all-volunteer force and perpetuate the ideal of the citizen soldier as the first steps in an effective transition to national service.

Chicago, Illinois

First Lieutenant John W. Jenson, USAF, has been selected by the Air University Review Awards Committee to receive the annual award for writing the outstanding article to appear in the *Review* during fiscal year 1979. His article, "Nuclear Strategy: Differences in Soviet and American Thinking,"was previously designated outstanding in the March-April 1979 issue. The other bimonthly winners for the past year were Major Donald J. Alberts, USAF, and Captain Leroy Mock, USAF, "Increased Air-to-Air Specialization Training: An Alternative," November-December 1978; Lieutenant Colonel David MacIsaac, USAF, "Master at Arms: Clausewitz in Full View," January-February 1979; Donald L. Clark of Montana State University, "Who Are Those Guys?" May-June 1979; Dr. Donald M. Snow of the University of Alabama at Tuscaloosa, "Strategic Implications of Enhanced Radiation Weapons: A Preliminary Analysis," July-August 1979; and Dr. Herman L. Gilster of the Boeing Aerospace Company, Seattle, Washington, "On War, Time, and the Principle of Substitution," September-October 1979.

J OHN L. SULLIVAN, bareknuckle champion of the world, used to boast, "I can whip any sonofabitch in the house," but he met his match in the back room of a Boston bar when a bookkeeper called his bluff.

"How did you beat him?" customers clamored.
"Simple," said the accountant. "I led with Pawn to Queen Four."

Every kind of competition, you see, has its own canons. Force cannot succeed if the rules call for fraud or finesse. That dichotomy causes great difficulty for U.S. decision-makers, who pay lip service to Principles of War, but have failed to enumerate Principles of Deterrence, which are quite different.[1] The whole field of deterrent theory in fact has lain fallow since the early 1960s, when the last seminal studies on the subject appeared.[2]

Accordingly, this country still lacks any systematic way to shape schemes for nuclear deterrence, which has been our dominant national security objective for nearly 35 years. Precepts for preventing conventional conflicts and insurgencies have been similarly plagued since the 1960s, when it first became apparent that even limited strife with the Soviet Union, its clients, or other associates conceivably could skyrocket beyond U.S. control.

A checklist of principles therefore could serve a practical purpose, if consciously considered by senior U.S. strategists who prepare and implement concepts.

Deterrent Goals

Deterrence is a strategy for peace, not war, designed primarily to persuade opponents that aggression of any kind is the least attractive of all alternatives.[3]

Preventive powers ideally should protect principal protagonists and partners across

PRINCIPLES OF DETERRENCE

JOHN M. COLLINS

DONT TREAD ON ME

— Fair warning posted on forerunners of the U.S. flag, 1775

THE PRINCIPLES OF DETERRENCE

The application of a codified set of analytical categories to the study of war has been an established tool of the staff officer, pedagogue, and student of military affairs for generations. The Principles of War, derived from principles expounded by Jomini and Clausewitz, were codified by the British pioneer of armored warfare, General J. F. C. Fuller, in the British Field Service Regulations of 1923. They have served military commanders and planners well as a quick and effective checklist of missed opportunities and overlooked options.

We should not make too much of this; understanding the Principles of War and understanding war are not necessarily one and the same. Alexander the Great would probably have been unimpressed to learn that in leading his Companions in a charge straight for the Persian King of Kings at Arbela, he was using the principles of Offensive and Objective to perfection. It is even less likely that the desperation of Parmenion, commander of Alexander's hard-pressed left wing, would have been alleviated by the knowledge that his hopelessly outnumbered situation represented a brilliant application of Economy of Effort. In the annals of national security, there is no more successful proponent of Objective than Cato, the Roman senator who began all his speeches, regardless of subject or timing, with the phrase "Carthage must be destroyed." And he continued the practice until Carthage was in fact destroyed. Had Cato known, he probably would not have cared.

The Principles of War, nevertheless, have proved themselves as an aid to logical analysis and sound planning. It is consequently surprising that no codified Principles of Deterrence have been expounded. This is particularly surprising in light of the central importance of deterrence to Air Force planning since World War II; the motto of the Strategic Air Command, "Peace Is Our Profession," comes immediately to mind.

This is not to imply that deterrence has not been thoroughly analyzed, taken apart and put back together. To the contrary, few subjects have received more scholarly attention. Nevertheless, with the single exception of an earlier, tentative listing by then Colonels Robert H. Reed, Stuart W. Bowen, Robert W. Kennedy, William H. L. Mullins, John L. Piotrowski, and Leonard J. Siegert in the May-June 1975 issue of this journal, there has been no such formulation.

John Collins's article therefore does double duty, both analyzing deterrence within the context of today's world situation and advancing developed and codified Principles of Deterrence. To our knowledge, this is a first.

THE EDITOR

the entire spectrum of political, economic, technological, social, paramilitary, and military warfare, preferably before conflict occurs, but during its conduct if required to contain escalation and conclude hostilities on acceptable terms. (See Figure 1.)

Secondary applications seek to discourage friends and the unaffiliated from pursuing courses of action that would impact adversely on important programs or plans. Allies, for example, sometimes switch sides unless incentives to the contrary convince them otherwise. They

also can start wars that run counter to the interests of consorts or expand conflicts that confederates try to confine. A fifth Arab-Israeli conflict, for example, could have far-reaching economic (or even military) consequences of a negative nature for the United States, if triggered by Tel Aviv.

Conflict Cause

Deterrent concepts and supporting postures must take constant cognizance of war-causing conditions. Combinations that counter one set successfully collapse when confronted with others. (See Figure 2.)[4]

Preemptive and preventive armed conflicts of traditional types can transpire because the deterring power is becoming too strong. Deterrees attack while present advantages still permit or to preclude a position that portends unacceptable peril. Combat can also occur when deterrent powers are too weak, if they inspire undue optimism on the part of opponents or encourage enemy inclinations to accept calculated risks.

Figure 1. Categories of conflict

Time to Deter	Deterrent Target
Prewar	Military conflict
	Strategic nuclear
	general
	limited
	Theater nuclear
	Conventional
	global
	regional
	Insurgency
	Nonmilitary conflict
	political warfare
	economic warfare
	technological warfare
	Blackmail
	military
	nonmilitary
Intrawar	Escalation
	increased scope
	increased intensity

Conditions to Deter	Cause of Deterrent Collapse
Preemptive war Preventive war	Deterrer becoming too strong
Enemy optimism Calculated risks	Deterrer too weak
Miscalculation Accidental war Catalytic war Irrational acts	Deterrer's strength irrelevant

Figure 2. Causes of conflict

Dangers double when some deterrent components are shaky and others simultaneously are impressively strong. The situation in Central Europe serves as one illustration.

Soviet tanks very likely will lose leverage in the early-to-mid-1980s, when NATO's precision-guided munitions are perfected and the next generation of antitank missiles solves technological problems that presently reduce effectiveness in forests, smoke, and fog. Moscow must decide whether to use its highly touted force preemptively, before being figuratively outflanked, or forfeit the politico-military benefits that massed armor now provides. Two corollary factors could encourage the Kremlin to take such a chance: NATO's continued lack of any shield against ballistic missiles and king-sized loopholes in battlefield air defense.

Strength or weakness is almost inconsequential when it comes to scotching most enemy miscalculations, accidents, irrational acts, and catalytic collisions touched off intentionally by third countries. Such catastrophes can occur under any condition at any plateau in the conflict spectrum.

Deterrent Properties

Deterrence induces powers to dissuade, not coerce or compel. Psychological pressure is its

prime property; opposing intentions are its principal target. Rival capacities remain physically untouched.[5]

Three characteristics are clearly quintessential: threats of punishment or promises of reward, connected capabilities, and unqualified inclinations to carry through in the clutch.

Precisely what makes any deterrent ploy fare effectively or founder is difficult to prove, but one conclusion is certain: concepts that work well in particular circumstances will not work at all in others. (See Figure 3.)

Fear of punishment, not promise of reward, is most likely to keep foreign armed forces from riding roughshod. Military power is especially persuasive when coupled with clear intent to inflict frightful wounds if attackers leave no alternative. Partners can amplify the deterrent potential of directly imperiled principals.

Revolutions arising from dissatisfaction with domestic deficiencies demand a different approach to deterrence. Armed services and police can stifle subversion for some unspecified period, particularly in closed societies, but positive steps to improve the people's life-style provide a better solution.[6] Allies may advise, and perhaps help maintain a military shield behind which political, economic, and social programs can prosper, but local leaders in the long run must sink or swim on their own.

Whether carrots, sticks, or some mixture would most likely discourage undesirable nonmilitary deeds depends on a complex skein of interrelationships between deterrer and deterree. Muscle and other manifestations of material might are by no means the only measure.

Take crippling embargoes as one case in point. Targeted parties might deter such aggression by threatening to seize stocks from tormentors, if they possessed sufficient military strength and the commodities concerned were nonperishable metals, like titanium. Countersanctions

Figure 3. Deterrent properties delineated

Deed to be deterred	Primary Deterrent Properties*			
	Persuasive power	Capabilities	Intentions	Principal applicant
Armed external aggression				
Strategic nuclear war *Theater nuclear war* *Conventional war*	Punishment	Military	Fight	Imperiled power and/or partners
Insurgency	Reward	Nonmilitary	Counter causes of domestic discontent	Imperiled power
Unarmed external aggression				
Political coercion *Economic coercion* *Technological attack*	Dealer's Choice			Imperiled power and/or partners

*Deterrent properties usually consist of combinations. This summary stresses typical primary input.

serve well as preventives when each side possesses supplies essential to the other and outside sources are insufficient or can be stopped.

Neither precondition would prevail, however, if Persian Gulf petroleum producers put pressure on the United States by turning off their taps. U.S. force could easily defeat indigenous defenders while seizing oil fields, but success would produce a Pyrrhic victory if saboteurs smashed facilities or set them on fire in the process. Promised punishment, in that perspective, would lose a lot of "pizzazz." So would economic sanctions, since the countries concerned need U.S. goods and services less than we need oil. Enticement probably would appear more attractive than intimidation for deterrent purposes, if such problems really arose.

Principles of Deterrence

Principles of War, as tools for tacticians and strategists, have been tested for 30 centuries.[7] Principles of Deterrence proposed in these pages are predicated on unproven theories developed during the past 30 years.

Precepts in those two categories overlap in some instances and are opposites in others. (See Figure 4.) The Principle of Objective (sometimes called Purpose) is implicitly shared but does not show on the deterrent side, since the preventive aim is self-evident. Neither do Unity of Command and Simplicity, which could be included on both lists.

All other Principles of Deterrence are different. The following sequence of presentation was selected to silhouette interdependence, not priorities: preparedness, nonprovocation, prudence, publicity, credibility, uncertainty, paradox, independence, change, and flexibility.

None of those norms are immutable, like Bernoullian numbers and Boyle's law of gases, where conditions and conclusions are solidly linked. Not every principle is appropriate for every occasion, and a few in fact conflict.

Still, Principles of Deterrence can serve as a capital checklist to assist sound judgment by architects and appraisers of national security concepts and plans. Users simply should recognize that no two requirements are quite alike and apply the list accordingly.

Principle of Preparedness

Nothing encourages power grabbers or opportunists quite as conclusively as prospective opponents with their guards down. Perpetual preparedness is one price of peace.

Aggressors who choose the time, place, and initial character of conflict can tolerate low force levels and lax readiness standards until the time comes to strike. No such luxury is allowable in target countries that are open to sneak attacks. Long-range plans and programs, however impressive, provide a poor deterrent if they spurn incremental improvements in present posture while waiting for seven-league strides.[8]

U.S. strategists have been blind to the Principle of Preparedness for approximately 200 years. The country has escaped unscathed thus far, but but its citizens have not. The "Battered Bastards of Bataan," for example, spilled their blood to buy time while we "pulled ourselves up by our bootstraps" early in World War II. Maimed vet-

Figure 4. Principles of Deterrence compared with Principles of War

Principles of Deterrence	Principles of War*
Preparedness	Objective
Nonprovocation	Offensive
Prudence	Mass
Publicity	Economy of Force
Credibility	Maneuver
Uncertainty	Unity of Command
Paradox	Security
Independence	Surprise
Change	Simplicity
Flexibility	

*U.S. Principles of War are shown for comparative purposes. The Navy and Air Force substitute Cooperation or Coordination for Unity of Command. Principles espoused by other countries differ substantially in some instances.

Note: Alignment of the two lists is unrelated.

erans and tombstones in national cemeteries bear mute testimony to many other instances.

Minor lapses in preventive measures might be merely unfortunate even today, but major ones may prove fatal.

Principle of Nonprovocation

Preventive and preemptive wars are instigated deliberately because national decision-makers believe that war now is preferable to war later. Differences deal mainly with degrees of premeditation. Preventive wars result from long-range planning. Preemptive wars are triggered on the spur of the moment, to attenuate the effects of imminent enemy attack.

The Principle of Nonprovocation, which promotes stability, dampens those proclivities, but deterrent strategists have much more latitude than is generally realized because not all pugnacious postures prompt enemy attacks. "Anticipatory retaliation," as a rule of thumb, rarely occurs unless chances of success exceed penalties for failure.

Preventive strikes against the Soviet Union were a popular subject for public contemplation by many of America's senior military men and civilian scholars during dark days in the 1950s, when Moscow was amassing assured destruction capabilities against the United States.[9] The Soviets, however, sweat it out because the practical balance of nuclear power left them little to gain and everything to lose from preemption.

Insecure forces that must strike first or face ruin create truly desperate dangers that deterrence may fail. They tempt opponents to take a chance on preemption or compel possessors to beat foes to the draw if they believe their position is becoming too precarious.[10]

Principle of Prudence

Sound deterrence confronts foes with irrefutable indications that net gains will be less or net losses more than they could expect by refraining from

some given move. Maximizing the enemy's expected costs, however, may not always be consistent with minimizing dangers on the friendly side if,[11] for any reason, preventive steps should fail.[12]

The Principle of Prudence, a close counterpart of the Principle of War called Security, introduces discretion into deterrent strategy.

Some theorists contend that deterrence and defense occasionally are incompatible. U.S. assured destruction concepts rely entirely on powers to pulverize aggressors with a second strike, not protect ourselves, on the premise that mutual vulnerability best preserves the peace by making survival impossible in a full-scale U.S./Soviet war.

Skeptics score conclusions of that sort for being oversimplistic. They subscribe to the assumption that no standoff is eternally certain.[13] Deterrence and defense should consistently be seen as inseparable, since one disputant or another will always find a way to shift the strategic balance in his favor.

The Principle of Prudence is bound to neither brief. It simply states that any strategy which cleaves to deterrent concepts that exclude defense should be subject to close scrutiny.

Principle of Publicity

Neither fear of punishment nor promise of reward is possible if the deterring power keeps its capabilities a secret. That requirement is directly contrapuntal to the Principle of War called Surprise.

Deterrers must, therefore, make important decisions concerning *what* intentions and capabilities they should communicate to deterrees, and *how* they should seek to get the message through.[14]

Selecting proper courses from the smorgasbord of options is a complex process. Incentives can be conveyed directly or indirectly, verbally or nonverbally, officially or unofficially, formally or informally, explicitly or implicitly, publicly or privately, clearly or ambiguously. Terms can

be general or specific. Representations can be relayed once or repeated.

Each choice has intrinsic strengths and weaknesses. Official pronouncements, deliberately prepared and delivered by top political dignitaries in some formal forum, for example, generally carry greater weight than off-the-cuff pronouncements at press conferences. Correspondence leaked at lower levels, without clear links to key leaders, leaves greater latitude for give and take, but the impact in turn will very likely be less pronounced. Public speeches that commit a country's prestige commonly provide a more potent deterrent than pledges made in private. Demonstrations are more convincing than dialogue.

The mission in each case is to fashion the best balance between deterree's belief and deterrer's flexibility.

Principle of Credibility

Prospects of reward or punishment serve deterrent purposes if the likelihood that they would be applied appears plausible. Credibility increases that prospect from possible to probable in the opinion of opponents, *provided* incentives are neither insufficient nor too intense.

Persuasive powers, as a general rule, expand in direct proportion to pressures employed, until they reach some unspecified point beyond which potential brickbats or benefits begin to strain belief.

The United States, for example, once counted on threats of massive nuclear retaliation as a cure-all for low-level conflicts, but that simplistic strategy, calculated to get a "bigger bang for each buck," was bankrupt from the beginning. Opponents who specialized in psychological warfare, subversion, and insurgency scored consistently without tripping nuclear triggers. Our promised response was simply out of proportion to piecemeal provocations.

The dearth of homeland defense makes U.S. assured destruction capabilities a dubious deterrent today against any Soviet sin short of full-scale nuclear strikes on U.S. cities, despite contrary contentions by Defense Secretary Harold Brown.[16] Historical precedents suggest that survival of the state surpasses all other priorities. Threats that risk suicide for anything less strain credibility. The Code of *Bushido*, which caused Japanese soldiers to cast themselves into the sea rather than surrender at Saipan, worked well at the lowest level. It became barren, however, when one nuclear bomb burst over Hiroshima and another over Nagasaki, because national survival, not personal safety, was at issue.

Principle of Uncertainty

Uncertainty is the fallback position if credibility flags or fails. Deterrence then depends primarily on deterree doubts concerning all kinds of complications.[17]

Subjective and changeable states of mind called intentions are obvious sources of uncertainty. They make the input of opponents and interested third (fourth and fifth) parties perilous or impossible to predict. Unanswered questions about capabilities on either side can also give deterrees pause, particularly when imponderables could create critical gaps between expectations and performance. A successful Soviet first strike against U.S. "sitting duck" missiles in silos, for example, may soon be duck soup from a technical standpoint, but any decision to shoot would still be difficult because the Kremlin could never be sure its systems would work precisely as planned or that we would not launch on warning.

Bluster can sometimes cause opponents to back off, but is risky business even for professionals. Habitual bluff as a substitute for solid abilities is a born loser; so is deterrence that bans bluff under any conditions. The best combination inspires and intensifies doubts on a selective basis.[18]

The "rationality of irrationality" comes into play when deterrent strategists consciously strive to strengthen uncertainty with promises of pun-

ishment or reward that would cost dearly if they had to implement them.[19] Unequivocal commitments coupled with automatic responses are fairly common. Feigned lunacy can lend credibility to illogical concepts that leave national leaders little choice when the chips are down. A recent track record spotted with unpredictable acts makes madness even more plausible.

Fatal consequences, however, are the possible penalty for failure. Conflict is sure to occur if *both* sides press brinkmanship to its limits in attempts to drive hard bargains, believing the other will back down.[20]

Principle of Paradox

Peace, paradoxically, can occasionally be best assured by war, if drawing the line in one place forestalls evil elsewhere.

"Active" deterrence to prevent future wars or expansion of conflicts in progress often discourages overconfidence in foes and keeps friends from becoming disheartened. President Truman had that in mind when he chose to fight for Korea in 1950.[21]

President Johnson took a solid stand in Southeast Asia during the next decade, partly to prevent the so-called domino theory from taking an unpredictable toll. Failure to follow through effectively when the showdown came suggests that his fears were well-founded: the Soviet Union and its proxies still encourage, sponsor, and support subversive insurgencies around the world, with promise of success at a price they are willing to pay.

There is an additional paradox: the deterrent value of defending any objective may vary inversely with its intrinsic importance to the offended party. Determined response to aggression where low-level interests are involved often suggests to foes that further efforts would be unprofitable.[22]

Payoffs are most impressive when active response shows opponents that they stand to lose by being belligerent, not just break even when compelled to stop. There is, however, a final paradox. The use of armed force or other coercive power may achieve future deterrent ends, *even if it fails*, provided steps taken inform foes that ill-gotten gains from aggression will incur excessive expense.

Principle of Independence

Collective security systems are centered on common interests. Allies and associates strengthen deterrence as long as so doing serves important purposes of the partners concerned. When shared incentives cease, so do coalitions. Affiliates, in fact, sometimes touch off troubles instead of constrain them. Consequently, no country should count on cooperation under all conditions.

Many NATO members preached patience and moderation when massive retaliation first surfaced as America's deterrent doctrine, fearing that impulsive employment of nuclear weapons would lay waste to the lands they yearned to preserve. Those apprehensions turned inside out when Soviet abilities to strike U.S. territory startled the Western world. French President Charles de Gaulle, anticipating that event, formulated the force de frappe in the 1950s precisely because he suspected that the United States would scarcely sacrifice its cities in a nuclear exchange to save NATO Europe from a Soviet assault.[23]

Any deterrent plan or program that depends on cooperation by competitors probably is doomed to fail. That truth seems self-evident, but woolly-minded wishful thinking may replace pragmatism in the most enlightened societies.

The dogma of mutual assured destruction, for example, makes long-term common sense only if *both* sides subscribe to the concept, which is not the case. U.S. and Soviet vulnerabilities seem much less mutual than they did in the last decade. A gap of disputed proportions grows because Soviet leaders promote protection for their people and production base while U.S. leaders do not.

Principle of Change

Strategists who stamp deterrent plans "complete" and stash them on the shelf are asking for unpleasant surprises.

Approaches that produced success in the past should not be transferred from one time period to another without very precise appreciation for changes taking place in the interim. Concepts and supporting force postures are just as tough to transplant from place to place, unless the situation in one locale is pertinent to the others.

Take the case of tactical nuclear weapons, which were practical U.S. tools when first deployed in the 1950s. Assorted U.S. delivery systems were specifically designed for carefully controlled counterforce combat in congested Central Europe, where collateral damage and casualties are a crucial concern.

Their deterrent value, however, depends on abilities to *use* them effectively at acceptable costs. Massive retaliation could still clamp a lid on local escalation in the 1950s but would cripple our unprotected society if we "pulled the plug" today.

Credibility, therefore, declined dramatically as soon as U.S. big bombs and missiles became decoupled. NATO in the new environment has little to gain and much to lose if it has to unleash the theater nuclear genie. War would take place largely on its home territory. Soviet saturation attacks could be expected in the heat of battle. So could fallout from surface bursts, against

which the Warsaw Pact is better protected than Western Europe. Soviet strikes against ports, airfields, supply points, and command centers could be executed surgically with emerging missiles, like MIRVed SS-20s.

Talk about tactical nuclear options as a substitute for conventional strength thus is much less convincing than it was many years ago.

Principle of Flexibility

Preferred concepts and capabilities, however fruitful they seem, may prove fallible.[24] The Principle of Flexibility, therefore, fosters optional solutions to important problems and acts as a beacon to strategists bent on putting too many eggs in any deterrent basket.[25]

Bear in mind that Tyrannosaurus rex, the most menacing monster the world has ever seen, was a victim of overspecialization. His only known survivors are found in museums.

STRATEGY, in some respects, is like research and development. Phase I in each case produces basic theories and concepts. Phase II, which applies those tools to practical problems, falls flat if Phase I fizzles.

Security specialists in the United States need easy access to fundamentals that could assist their search for faultless deterrence across the conflict spectrum. This compilation of principles, which provides nothing new except the package, seeks to simplify their quest.

Alexandria, Virginia

Notes

1. Six colonels in a study group formed by the Air Force Chief of Staff seem to have compiled the only public list of deterrent principles. Their product was published as Colonel Robert H. Reed, USAF, "On Deterrence: A Broadened Perspective," *Air University Review*, May-June 1975, pp. 2-17. Collaborators included Colonels Stuart W. Bowen, Robert W. Kennedy, William H. L. (Moon) Mullins, John L. Piotrowski, and Leonard J. Siegert.

2. Sources for this essay depend primarily on the works of writers who expounded deterrent concepts during the nascence of U.S. nuclear strategy, as most of the other footnotes will show.

3. Types of deterrence, tailored to achieve different purposes, are discussed by Herman Kahn in *On Thermonuclear War* (Princeton, New Jersey: Princeton

University Press, 1960), pp. 285-87; *Thinking about the Unthinkable* (New York: Horizon Press, 1962), pp. 111-16, 122-23, 158; and *On Escalation: Metaphors and Scenarios* (New York: Praeger, 1965), pp. 281-84.

4. Geoffrey Blainey, *The Causes of War* (New York: The Free Press, 1973), p. 278, probes problems of peace. See also *The Future of Conflict*, edited by John J. McIntyre (Washington: National Defense University Press, 1979), 186 pages.

5. Several studies summarize the essence of deterrence. See especially Y. Harkabi, *Nuclear War and Nuclear Peace*, 1963 (Jerusalem: Israel Program for Scientific Translations, 1966), pp. 9-40, 124-33; Morton A. Kaplan, "The Calculus of Deterrence," *World Politics*, October 1958, pp. 20-44; William W. Kaufmann, "The Requirements of Deterrence," a chapter in *Military Policy and*

National Security, edited by Kaufmann (Princeton, New Jersey: Princeton University Press, 1956), pp. 12-38; Glenn H. Snyder, *Deterrence and Defense Toward a Theory of National Security* (Princeton, New Jersey: Princeton University Press, 1961), pp. 3-51.

6. Deterrent concepts open to counterinsurgents during the incubation stage of any insurrection are enumerated by David Galula in *Counterinsurgency Warfare Theory and Practice* (New York: Praeger, 1964). See especially pp. 64-69.

7. Principles of War are presented in John M. Collins, *Grand Strategy Principles and Practices* (Annapolis, Maryland: U.S. Naval Institute Press, 1973), pp. 22-28.

8. Henry A. Kissinger, *The Necessity for Choice* (New York: Doubleday and Company, Inc., 1962), p. 26.

9. Successive U.S. presidents professed a second-strike policy in the 1950s, but "Nuke the Russians before they nuke us" was a popular slogan among many admirals and generals. Astute civilians published serious studies of the subject. See, for example, Samuel P. Huntington, "To Choose Peace or War: Is There a Place for Preventive War in American Policy?" U.S. Naval Institute *Proceedings*, April 1957, pp. 359-69.

10. Thomas C. Schelling describes the "Dynamics of Mutual Alarm" in Chapter 6 of *Arms and Influence* (New Haven, Connecticut: Yale University Press, 1966), especially pp. 224-48.

11. Mathematical models of cost-gain ratios are displayed and discussed in Glenn H. Snyder, *Deterrence and Defense*, pp. 16-24.

12. U.S. Admiral J. C. Wylie, seeking to set the foundations for a general theory of strategy, started with four assumptions. The first was cited as follows: "Despite whatever efforts there may be to prevent it, there may be war." *Military Strategy* (New Brunswick, New Jersey: Rutgers University Press, 1967), pp. 78-79.

13. Herman Kahn forecast unfortunate consequences if any U.S. president "convinces the Soviets that he means what he says when he says that 'war is preposterous.' I suspect that many in the West are guilty of the worst kind of wishful thinking when, in discussing deterrence, they identify the unpleasant with the impossible." *On Thermonuclear War*, p. 286.

14. Y. Harkabi devotes Chapter 9 in *Nuclear War and Nuclear Peace* to "Communication of the Threat," pp. 124-31. His coverage concerns nuclear deterrence, but principles apply equally to other preventive concepts. Many examples are contained in Chapter 5, "Declaratory Policy and Force Demonstrations," of Snyder's *Deterrence and Defense*, pp. 239-58.

15. Harkabi summarizes the essence of credibility in *Nuclear War and Nuclear Peace*, pp. 28-35: "For a threat to deter it must be credible, but not every credible threat deters. . . . As the threat of punishment increases in severity or violence, its deterrent value will grow. . . . As the threat increases in severity, the feasibility of its implementation will decrease. . . . Thus, as the threat of violence increases, its credibility decreases."

16. Defense Secretary Harold Brown, testifying before the Senate Foreign Relations Committee, indirectly refuted recent statements by former Secretary of State Henry A. Kissinger, who told NATO allies they should not count unequivocally on a U.S. "nuclear umbrella." Brown declared that massive retaliation remains a realistic option, despite risks to U.S. territory, because defeat in Western Europe would directly threaten U.S. "vital interest." Robert G. Kaiser, "'Door Open' to Boost Defense Spending in '80s, Brown Says," *Washington Post*, September 20, 1979, p. A-2.

17. Herman Kahn christened uncertainty "the residual fear of war" in *Thinking about the Unthinkable*, p. 129. Kissinger expanded that perspective in *Necessity for Choice*, pp. 53-58. "The threat that leaves something to chance" occupies a full chapter in Thomas Schelling's treatise on *The Strategy of Conflict* (Cambridge, Massachusetts: Harvard University Press, 1960), pp. 187-203.

18. John McDonald plumbed the business of bluffing in *Strategy in Poker, Business, and War* (New York: W. W. Norton & Company, Inc., 1950), pp. 28-34, 70-74.

19. Herman Kahn describes "the rationality of irrationality" in *On Thermonuclear War*, pp. 6-7, 24-27.

20. Bertrand Russell postulates that if one party were willing to run great risks and the other was not, the former would win every war of nerves. "We are, therefore, faced, quite inevitably, with the choice between brinkmanship and surrender." He explores that theme in *Common Sense and Nuclear Warfare* (New York: Simon and Schuster, 1959), pp. 30-31.

21. President Truman, for example, "let it be known that we considered the Korean situation vital as a symbol of strength and determination of the West. Firmness now would be the only way to deter new actions in other parts of the world." Harry S. Truman, *Years of Trial and Hope* (New York: Doubleday and Company, 1956), pp. 339-40.

22. Snyder discusses active deterrence in a section entitled "Strategic Value and Deterrent Value," *Deterrence and Defense*, pp. 33-40.

23. General Charles de Gaulle, *Discours et Messages*, Tome 2 (Paris: Plon), pp. 524-25.

24. "The player who plans for only one strategy runs a great risk simply because his opponent soon detects . . . and counters it. The requirement is for a spectrum of strategies that . . . by intent and design can be applied in unforeseen situations. Planning for uncertainty is not as dangerous as it might seem; there is, after all, some order" in human affairs. "Planning for certitude," however, "is the greatest of all . . . mistakes." J. C. Wylie, *Military Strategy*, p. 85.

25. U.S. strategists inexplicably exclude Flexibility from the Principles of War and pay fearsome penalties. Figure 4 shows Flexibility on that list as well as with Principles of Deterrence to indicate the desired overlap.

Professionalism: That substance which, when possessed by subordinates, allows. . . management to suffice for leadership.

Anonymous, Spring 1975
Reported by Captain Joe Gilbert
Nakhon Phanom Royal Thai Air Base
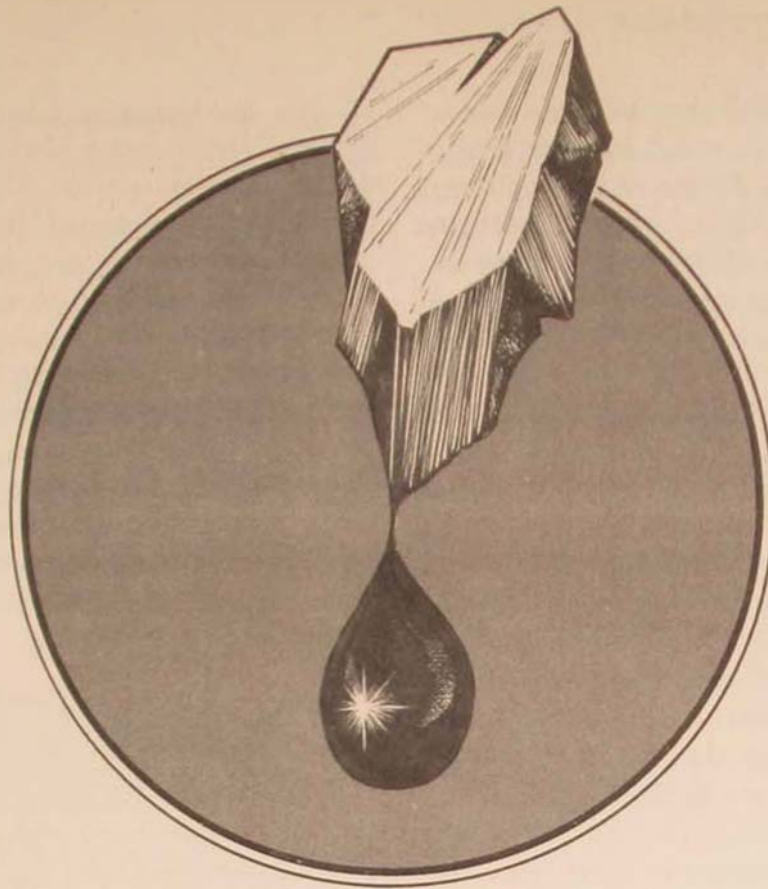
STRAW-COLORED GOLD

jet fuel from rocks

RICHARD EARL HANSEN

ON a bright Ohio morning on 18 June 1975, a crew headed by Lieutenant General James T. Stewart took special care to prepare T-39 03491, for an early morning departure. The crew chief, Master Sergeant J. Reed, had seen to the preflight activities to include filling the tanks with 935 gallons of jet fuel. At 0833, General Stewart and the other pilot, Lieutenant Colonel O. H. Bradley, lifted the white-over-gray Sabreliner into the sky and pointed the bird on a course from Wright-Patterson AFB to their destination, Carswell AFB, Texas, at Fort Worth.[1] A routine operation? It would seem so because everything went as planned, and they touched down at Carswell without incident at 1055 local time. What was unusual that day was that the JP-4 they burned in their engines was made from rocks. Oil

shale from Colorado had been made to give up the crude oil locked in it, and it was then refined into a JP-4 type fuel. As far as can be determined, it was the first flight by a turbine engine aircraft burning fuel made from oil shale rocks.

This flight was an important milestone in the Aero-Propulsion Laboratory's Aviation Turbine Fuel Program. The Air Force Aero-Propulsion Laboratory (AFAPL) and its Fuels Branch have been designated prime for aviation turbine fuels for all the services by the Department of Defense (DOD). This Wright-Patterson AFB unit, in a long-range program by DOD and the National Aeronautics and Space Administration (NASA), had completed with this flight one of the preliminary phases of the synthetic fuels research program.[2] The fuel was derived from a shale crude oil produced by Paraho, Inc., in Colorado; the Gary Western Refinery, also in Colorado, refined the crude to JP-4 properties. The Aero-Propulsion Laboratory then processed this product to a fully qualified JP-4 fuel, including blending of an anti-icing additive and a corrosion inhibitor. Extensive testing, including engine evaluation, was conducted by the laboratory with the aid of the fuel quality control arm of the Air Force Logistics Command. This preparation was very painstaking, not the routine bulk fuel handling at all. In fact, much of the fuel was filtered for purity by manual methods, gallon by gallon. Yet this is not so important as the fact that the fuel was some of the first produced from a source that is abundant within the continental United States.

The oil shale deposits of the Green River formations in Colorado, Utah, and Wyoming are believed capable of supplying a significant portion of the energy needs of the United States. The U.S. Coast and Geodetic Survey has estimated that these formations contain the equivalent of nearly two trillion barrels of crude oil. Of these, about 600 billion barrels are believed to be in high-grade deposits containing 25 gallons (roughly a half barrel) of raw shale oil per ton of rock.[3] The present rate of use of petroleum by the U.S. is 6.6 billion barrels yearly and going

up. But also going up is the percentage of that gigantic consumption that comes from unpredictable foreign sources. The year 1977 saw the percentage of imported crude oil and refined products rise to 45 percent on an ever-rising course. It is not hard to see, then, that if the technology for unlocking the oil from these shale deposits is brought to an economically viable level, the U.S. will have an important contribution to its growing energy needs in the years ahead. High among these needs are those for defense, and military fuels were among the first to be extracted from these rocks.

The Honorable John Patrick Walsh gave this highly portentous warning:

> There are a number of interrelated aspects to the heavy dependence of the industrialized countries on imported hydrocarbons. The most serious of these is the vulnerability of supply. In the event of major power hostilities, the U.S.S.R. ostensibly would endeavor to cut the oil flow at its sources or to interdict tanker passage. Either would be difficult to prevent. Safeguarding the lengthy sea-lanes to Western Europe, Japan, and the United States would be a formidable task in the face of Soviet submarines, surface ships, and bombers. This is not an acceptable situation from a national security viewpoint.[4]

Ambassador Walsh speaks with the knowledge of a scholar and a background of experience as the U.S. ambassador to the oil-rich country of Kuwait on the Persian Gulf.

To growing admonitions regarding the fragile conditions surrounding U.S. dependence on foreign oil, former Secretary of the Air Force John C. Stetson said that "before the end of the next decade, the Soviet Union itself will be forced to look outside its borders, if it is to meet its growing oil needs in any economically feasible way."[5] Speaking of the geopolitical imperatives inherent in this situation, he also stated that "the prospect of obtaining low-cost Persian Gulf crude oil by threat or by military force, and then denying it to the free world certainly has occurred to them." Regarding interdiction of the oil lines of communication to which Ambassador Walsh also referred, Mr. Stetson added.

"Equally disturbing is the potential threat to the sea lanes and strategic approaches to the Persian Gulf."[6]

Interruption, by whatever means, of the continuous stream of tankers that bring petroleum to the United States could have serious consequences for the U.S. and its free world friends in the period just ahead. Projection of military power and sustained air operations, if called for by the Chief Executive and Congress in support of national objectives, could be seriously ham-pered or even precluded if supplies of turbine fuels had to come exclusively or mainly from U.S. domestic sources. For these and other reasons, it seems imperative that the Air Force and the Defense Department give maximum support in the form of policy, money, and manpower to relieve this potential fuel problem.

Growing numbers of research scientists in government and industry have been put on the project by the Department of Defense, Department of Energy, and the Air Force, and they are

The Air Force Aero-Propulsion Laboratory's flight of 18 June 1975, headed by Lieutenant General James T. Stewart, was an important milestone in the laboratory's Aviation Turbine Fuel Program. The truck conspicuously labeled "shale oil" is shown fueling the T-39 that General Stewart flew from Wright-Patterson AFB, Ohio, to Carswell AFB, Texas.

increasing their efforts to solve this problem for the defense of the country. The flight of USAF T-39 03491 successfully demonstrated one milestone along the road to providing a measure of self-sufficiency in jet fuel. Other milestones have been reached since that event in 1975. However, there is still a very long way to go, and thought should be given to accelerating the process.

Response to the need for domestic sources of aviation jet fuels was initiated in 1974 in a program of the Air Force Systems Command's Aero-Propulsion Laboratory at Wright-Patterson. Since that activity had been given prime responsibility for aviation turbine fuels within DOD, an Aviation Turbine Fuels Technology Program was begun to define the properties of jet fuels that would lead to adequate availability and acceptable cost.[7] In this program two approaches are being pursued. The first is to relax specifications to reduce the level of processing required on conventional petroleum crudes as well as on the lower quality crudes we will have to use very soon. Second is to investigate the acceptability of fuel produced from alternate sources such as coal, oil shale, and tar sands to meet such new and relaxed specifications.

A T this point, it is necessary to review the possibilities for alternative jet fuel sources, principally coal liquefaction and oil shale conversion to refinable liquids.[8] Let us examine briefly these two possible sources of feedstocks for jet fuel refining.

For many years coal liquefaction had held out promise as one solution to the petroleum problem. Actually, in Germany during World War II, the Luftwaffe operated on fuel from liquefied coal. SASOL has been operating a liquefaction plant since 1955 in the Union of South Africa, producing 9000 barrels of oil per day plus other chemicals and fuels at an efficiency of 35 percent in converting coal to useful products. U.S. engineers are aiming for a much higher efficiency of 60 to 70 percent to make the

process economically feasible. Since the U.S. has massive coal reserves and one ton of coal can yield one to three barrels of oil, a huge, largely untapped source is waiting. Many U.S. firms got involved in the early seventies, but optimistic expectations have become less sanguine as the research proceeds. The high cost of plant construction (with as much as a $1 billion price tag on a plant to produce 50,000 barrels of crude-type oil) and the concomitant high price per barrel of the refined jet fuel product that is not competitive today are major deterrents. With uncertainties on the future pricing of petroleum crudes by the Organization of Petroleum Exporting Countries (OPEC) nations, as well as the pricing of synthetics in the face of a meandering national oil policy, plus environmental protests against the strip-mining, air, and water pollution associated with the process, firms in the industry are reluctant to commit the large investments of risk capital required. Also, Aero-Propulsion Laboratory research has found the use of coal liquids as raw material for refining jet fuel to be less suitable than other sources.

Oil shale, according to Inform, Inc., contains neither oil nor shale but is a mixture of marlstone rock and an organic substance called kerogen. This kerogen was formed in much the same way that crude oil was formed; i.e., sediments from lakes some 50 million years old were pressurized underground. When heated in a retort, the kerogen decomposes into an oil-like liquid. This untreated liquor contains high concentrations of nitrogen compounds, oil-soluble arsenic (a catalyst poison), nickel, iron, sulfur, oxygen, and reduced levels of hydrogen compared to the average petroleum crudes. Adjusting these levels requires costly processing, but the technology exists.

Estimates are that from 25 to 42 gallons of such crude can be squeezed out of each ton of oil shale rock. Considering there are some 25,000 square miles at the juncture of Colorado, Utah, and Wyoming underlaid with thick strata of the substance, one begins to realize the size of the resource and understand why so much emphasis

is being directed toward finding economical ways to unlock the oil contained in it. There are many different processes used to accomplish this unlocking, but, in general, they are of two principal kinds.

These two extracting processes are the above-ground retorting method and the in situ or below-ground method. In the surface process, the rock is strip-mined or taken from underground shafts and carried to a large furnace called a retort, where it is heated by oil or gas to above 900°F. At this temperature the kerogen is converted into oil and some residuals. The spent rock must be disposed of in an environmentally acceptable manner. Much water is used in the refining process, part of it to dispose of prodigious quantities of waste rock. The oil shale region is generally water-deficient, and it would be a major undertaking to bring and store water for large-scale processing.

In the below-ground in situ retorting method, the oil shale is left in the ground. Holes, shafts, or chambers are made in the rock formations, the oil shale is broken up by explosives, pressurized water, or mechanical means; then this rubble is ignited underground. Air or oxygen is pumped in to support the combustion at a controlled rate. The portion of the kerogen that is not used as fuel for the combustion is converted by the heat to oil, which is pumped to the surface. The in situ process is more economical of water, and the waste rock disposal problem is diminished. Some contamination of ground waters may result, requiring special treatment.

Air Force Aero-Propulsion Laboratory initiated a joint USAF/NASA-funded contract with Exxon Research and Engineering in 1974[9] to consider alternative domestic hydrocarbon resources that could be used as the raw material liquids in the refining of jet fuel. In these experiments, hydrocarbon feedstocks produced from three shale conversion processes and two coal liquefaction methods were distilled and hydrotreated. Both coal and shale liquids are deficient in hydrogen atoms that would make them similar to petroleum crude.

"Hydrotreating" is the term used for the hydrogenation process. Hydrotreating is very costly and energy consuming. It is expected to become more so unless a cheap way is found to liberate hydrogen. The conditions of refining of these liquids such as catalysts, temperatures, and pressures were varied. Results showed that all three shale oils produced jet fuel within current specifications by hydrotreating at lower pressures (cheaper) than the two coal liquids. In addition, the coal products were highly naphthenic since they contain very little paraffins to start with. Thus, they can be expected to give some unusual burner can effects as well as smoke emissions. The conclusions of the Exxon study were that, of the two, oil shale is economically and technically closer to commercialization and produces a final product that more nearly resembles petroleum-derived jet fuels than do the coal liquids.

In order to determine the most critical turbine fuel specifications, the relaxation of which would have a beneficial impact on availability, an AFAPL study was contracted for with Bonner and Moore Associates, Inc.[10] Additionally, they would estimate the effect, if any, that these relaxed specifications would have on the refining industry's willingness to offer jet fuel for sale. Bonner and Moore made an industry survey, the results of which indicate that increases in availability of 20 percent could be realized by relaxing the freezing point and final boiling point. Some assumptions had to be made on the availability of crude, refinery costing procedures, and what effects increased proportions of jet fuel would have on other refinery products in the run. Increases of 28 percent could be gained by relaxing the aromatic content, smoke point, freezing point, and final boiling point under the same assumptions.

AFAPL is conducting studies in-house and through contract to determine the effects on engine components of turbine fuel property variations. Two elements that a future fuel will have in different proportions from the present JP-4 are hydrogen and nitrogen. Future

feedstocks such as heavy crudes, shale and coal liquids, and tar sands are all lower in hydrogen and higher in nitrogen content. They also contain traces of metals that have to be processed out. In the Wright-Patterson labs, tests are in progress to determine the effects of varied amounts of hydrogen and nitrogen on combustors (burner cans in the turbine engines). Typical data from these tests show that significant increases in combustor liner temperature (usually associated with reduced life) due to the more luminous flame are produced as hydrogen content is decreased. Higher temperatures generally result in higher smoke numbers. Nitrogen in the fuel results in undesirable emissions and other effects with increases in the nitrogen content.

Three types of burner cans associated with older, current, and new engines are involved, each of which requires fuel of certain properties for best performance and optimum life. General Electric Company,[11] under two FY77 contracts, explored the effects that varied hydrogen content, volatility, aromatic type, and end boiling point have on the performance and life of the low pressure (J79) and the full annular type (F101) burner cans. In an FY78 contract, the high-pressure-type burner can combustor was evaluated by General Electric.

During FY78, a Fuel/Engine/Airframe Optimization Study was initiated.[12] The study will first determine the limits to which fuel specifications can be altered without detrimental effects to any Air Force mission or aircraft as well as effects on the cost and availability of such fuels. Second, efforts will be directed toward setting the properties of such fuel so as to minimize life-cycle costs of affected Air Force aircraft and systems. AFAPL engineers expect that the end result will be a tradeoff with fuel properties, cost, and availability on one side and aircraft system life-cycle costs and modification expenses on the other. The results of this study will provide guidelines for an Aviation Turbine Fuel Technology Advanced Development Program set for FY79.

The advanced development program is tailored to provide an interim fuel specification within three years for a fuel that is expected to resemble JP-8 in its properties. Such a fuel might closely resemble the one analyzed in the accompanying table. The program has a timetable that runs through 1990, with significant milestones in 1980-81 and 1985. AFAPL does not expect to bring forth a major change in fuel specifications for ten years by current timetables. These expectations seem very conservative to the layman, but there are limits to the time compression that can be made in necessary laboratory procedures, engine test runs, and flight tests. AFAPL experts state that a validated fuel specification will ensure confidence in the projected use of fuel processed from petroleum and from alternate energy sources with respect to engine performance, compatibility with combustion and fuel system components/elements, and the level of harmful emissions. When national priorities are more fully spelled out, one would hope that timetables that favorably meet the world situation will be established.

So far the United States has had only pilot plant operations in the production of crude oil from the oil shale rocks of Colorado, Utah, and Wyoming. Those trillions of potential barrels of oil still await the first full-scale processing plant. The huge efforts required in developing the mining or in situ extraction have not yet been expanded to full operational size, which is

*Projected Specifications for
a Future Jet Fuel Compared with JP-4*

	JP-4 (Mid-figures)	Future Fuel (Mid-figures)
Fuel boiling point—max	465°F	600°F
Flash point —min/max	−10°F	90-130°F
Freezing point—max	−72°F	−50°F
Net heat of combustion—min	18,700 BTU/#	18,300 BTU/#
Aromatics—max by vol	12.5%	35%
Nitrogen wt—max	not stated	0.005%
Hydrogen wt—max	14.5%	13%

Source: Air Force Aero-Propulsion Laboratory

normally stated in terms of many plants of 50,000-barrel-a-day production. These huge mining, materials handling, and crude processing ventures require large commitments of risk capital from investors and companies, which need assurance that they will receive a satisfactory return on their dollar investments. Currently 80 percent of the oil shale lands are still owned by the U.S. government and held up by the Department of the Interior Bureau of Land Management. Prodigious amounts of water are said to be needed for these processes as well as environmentally satisfactory solutions to the problem of waste rock disposal. For this, water must be diverted to the area and impoundments constructed. So far, these requirements are only under study.

By way of contrast, our Canadian neighbors have not been unduly inhibited by the huge investments of engineering talent and necessary capital. They have plunged in to develop their special resource. The comparable hard-to-recover tar sand deposits in Alberta along the Athabasca River cover some 30,000 square miles and consist of thick black concentrations of oil tar locked in sand and clay. Estimates of this resource (similar but not the same as ours) run to 300 billion barrels of recoverable crude. Canadian firms began construction of major projects in 1964 and have been producing at the rate of 75,000 barrels daily from these tar sand mines. Associated Press reports that expansion of these extracting operations is now under way

with a $2.1 billion investment.[13] About a dozen other firms are also actively developing the extraction of crude from their tar sands.

In light of our current need to import 45 percent of our oil,[14] such a commitment by the United States to the development of a similar domestic resource in our oil shale deposits is of critical dimensions. National defense requirements to mount and sustain air operations in support of U.S. foreign interests and treaties will certainly require indigenous sources of jet fuel if foreign oil is interdicted. The oil shale deposits hold promise of filling that need, at least in part, were they to be fully developed.

Secretary of the Air Force Stetson urged action of a timely nature in this direction:

> The U.S. must develop technologies for the economical production of synthetic crude oil and its conversion to jet fuel. A primary objective of this effort should be to ensure an adequate domestic source of aircraft fuel for military operations. At present, synthetic oil production is an expensive process compared to conventional oil production. *We should be willing to pay some premium* to get synthetic crude into production and to gain experience with the process. We need to do this now, because some day we won't have cheap natural crude oil. Depletion of our domestic natural petroleum supply is only a matter of time; *then synthetic oil will become our only secure source of petroleum.*[15]

Perhaps it will not be identified by its straw color like JP-4, but it will be as precious as gold to the security and well-being of the country, this jet fuel from rocks.

Prattville, Alabama

Notes

1. Marc P. Dunham, Deputy Director, AF Aero-Propulsion Laboratory, Wright-Patterson AFB, Ohio, Information for Brigadier General Hendricks, 18 June 1975, Subject: "World's First Flight on a Jet Fuel Produced from Shale Oil" from files of AFAPL.

2. Ibid.

3. These figures compare with other sources and are among those used in a paper presented at the American Petroleum Institute Refining Department, 43rd Midyear Meeting, "Conserving Petroleum — New Feedstocks and Fuels for Refineries," May 10, 1978, Toronto, Canada, by R. F. Sullivan, B. E. Strangeland, and H. A. Frumkin of Chevron Research Company and C. W. Samuel of Chevron USA. Pre-Print No. 25-78, American Petroleum Institute, Washington, D.C.

4. See "The Energy Problem in a Global Setting," *Air University Review*, July-August 1977, pp. 2-14.

5. John C. Stetson, in a speech to the Irongate Chapter of the Air Force Association on 7 December 1977 News Release No. 977, USAF Secretary of the Air Force Office of Information, pp. 5-6.

6. Ibid., p. 6.

7. A. V. Churchill, C. L. Delaney, and H. R. Lander, AFAPL, "Future Aviation Turbine Fuels," Paper No. 78-268, presented at the American Institute of Aeronautics and Astronautics 16th Aerospace Sciences Meeting, Huntsville, Alabama, January 16-18, 1978, p. 2.

8. See Stewart H. Herman and James S. Cannon, *Energy Futures: Industry and the New Technologies* (New York: Inform, 1976), pp. 405-15. The book gives an excellent description of these processes.

9. Churchill, Delaney, and Lander, pp. 2-3.

10. Ibid., pp. 3-4.

11. Ibid., p. 5.

12. Ibid.

13. "$2.1 Billion Oil-Mining Venture Set for Canada," *New York Times*, July 25, 1978, p. 10.

14. Churchill, Delaney, and Lander, p. 1.

15. Stetson, p. 8. Emphasis added.

WHY
ARE WE
IN SPACE?

Neil P. Ruzic

HAD COLUMBUS speculated on the future he might have envisioned bigger, faster sailing ships or even ships without sails, headed straight across the ocean sea. But they would have remained boats. A less conservative contemporary, Leonardo da Vinci, might have forecast a future including airplanes, for he was known to have designed flying machines modeled after birds.

But neither of these imaginative men nor even their third brilliant contemporary, Copernicus, who reasoned that the earth is a moving planet, could have speculated that ships might fly between the planets and beyond the solar system at speeds approaching the velocity of light. For one thing, these pioneers of the early Sixteenth Century had no appropriate engines, computers, or technology as we know it. For another, they did not know what space was composed of or how fast light traveled, if indeed it did.

Now that the space age is reality, our imaginations soar ahead of us from a broader base of knowledge. There is a new renaissance here for the partaking, an awakening from one-world thinking that has modeled our plans and our ambitions throughout history. Today we envision black holes, extraterrestrials, and even a healthier, happier life on earth.

And we envision these exciting, worthwhile phenomena not as science fictioners did during the first half of this century, as impossible-but-fun playthings, ethereal maidens lingering in the jungle gardens of Venus, or a declining race of wise Martians roaming red deserts. Now that we know Venus is hot enough to melt tin and that pockmarked Mars resembles the moon more than a living planet, we can set our sights for truer, more significant, even more exciting treasures. After all, while the important reasons why we are in space may have been understated, it should be obvious that if there were no space capability neither could we have sent satellites to orbit the earth, men to the moon, robots to the planets, nor could we seriously contemplate the next era of humanity spread across this and other solar systems. In other words, if there had been no space effort, we could not have gotten into space—a simplistic statement and yet one that, remarkably, often seems forgotten.

WHY do we go to space? Certainly not simply because it is there. Maggots in rotting meat are there, too, but few people feel an overwhelming urge to explore them. We want to go to space because it is man's finest nature to explore for potential beauty. Now that we already have explored the earth, we literally seek new worlds. What finer gift to leave for future generations than the legacy of exploration? If we improve our lot on the old world in the process of exploring space, as has been done, then these improvements should be regarded as a by-product and not the primary reason for spacefaring.

All of us have some of the lingering curiosity of Columbus or Copernicus within us. We are invigorated by exploration. We feel a churning in the pit of our stomachs when we consider stepping forth on another world. Will it be different from our own planet? How will it be similar? What is over the horizon? Some infuse that feeling of excitement by riding roller coasters, or gambling, or taking drugs, or in countless other ways. Scientists, explorers, and adventurers get it by extrapolating from the known, by reaching out and grabbing the unknown to render it better known. In the process they make it part of themselves, just as a loved one becomes part of yourself once love is shared.

If all this sounds like an emotional plea for space travel, then thank God we have emotions to shape our intellectual efforts. Without passion, we would be poor indeed, little better than nth-generation computers coldly calculating their calculations, endlessly answering endless questions. But while our motivator remains romantic, intellectual achievement becomes the tool of our passion. To go to space we first had to improve our science and technology. To improve
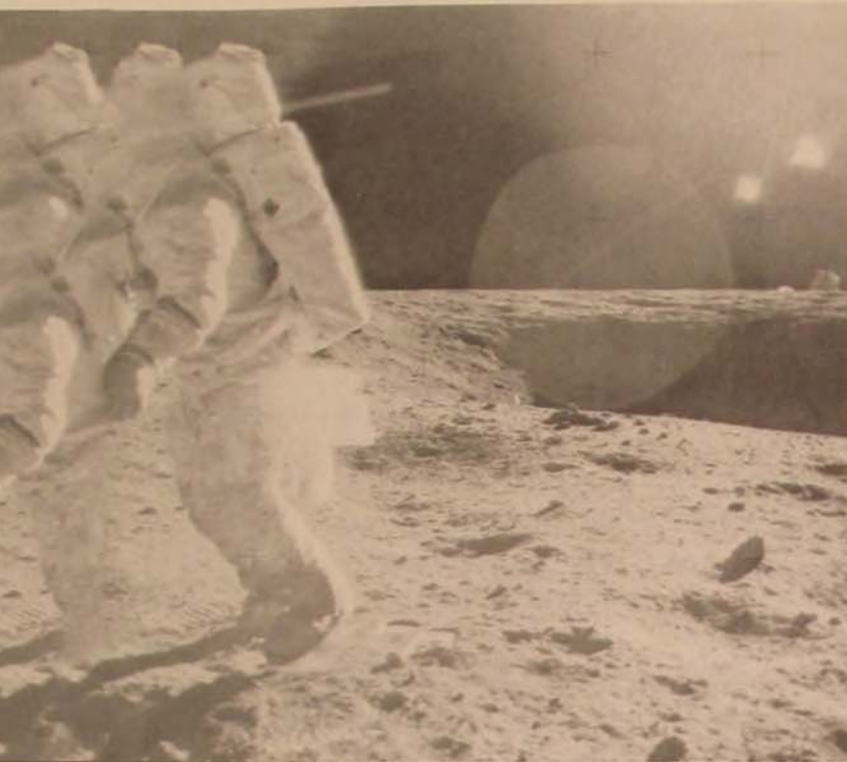
Moon exploration

During the sixties we first saw men land on the moon. Saturn V vehicle (left) lifted off from Launch Complex 39-A on the nation's second manned lunar landing mission. . . . The heavens became a part of man's world as we watched the space-suited men of Apollo 12. Astronaut Alan L. Bean (above, left) "floats" along the lunar surface. . . . A moon fragment, enlarged here 3300 times, was among the fine lunar material collected by the Apollo 11 astronauts on this first step onto the moon.

our technology we had to pay for it, and to pay for it we had to explain it.

Unfortunately, the explanation was ill-considered. It was too shallow, too mechanistic. Now, after 20 years, at the very time when space goals should be broadened, we find ourselves with a declining budget for space and an apathetic public.

During the sixties when the aerospace industry was implementing the President's decision to land men on the moon by the end of the decade, it is doubtful whether anyone directing any important phase of the gigantic space program truly thought our entire technology was being improved just to go the Russians one better. Few space leaders bothered with such transient thoughts, but the public was not informed

of their legitimate goals. There were those in government or in the space program who feared the public would not support a "moondoggle" that had as its purpose just getting to another world. There were others who had no time to explain and still others, probably, who had not themselves considered why. The mass media, so used to skin-deep explanations of anything remotely scientific or complex, gave the public the impression it should support the Apollo program because the Soviets might get to the moon first and shoot rockets at us or prevent us from landing, or worse, that the space program was justified on the basis of Teflon frying pans and better gadgets. There was talk from the military of "high ground" and intercontinental missiles. There was talk, closer to reality but still

too amorphous to mean much, of total capability and technological leadership to earn the respect of the world.

Then, suddenly, we were there: almost half of all of us on earth, some 1.5 billion people, riveted to our television sets seeing men on the moon. Never before in history had so many human minds been concentrated at the same time on *any* activity. It was a fantastic, utterly unprecedented opportunity to explain why the space age was worthwhile and important and what our objectives were on the moon of tomorrow and beyond. Instead, we watched two space-suited figures take pictures of each other and of an aluminum American flag nonfluttering in the nonatmosphere. We sat fascinated while they loped around in the unearthly sixth gravity of our closest heavenly body. We learned in minute detail how they got there, the size of the rockets compared with the Washington Monument, the thrust of the great engines, and the return routing.

Not a word was heard about "why are we in space?"

Here on earth, when our political, social, and religious leaders saw our blue planet televised from the moon, the fact that it was finite, beautiful, and a single object instead of 145 distinct nations overpowered them. They said it forced them to realize that we are all in this spaceship earth together!

Had these political, social, and religious leaders never seen a model of the earth — a contour globe, perhaps — where the thin red lines between nations are gone? Couldn't they have gained those profound insights from their grammar-school geography lessons?

Meanwhile the Vietnam War continued. Neil, Buzz, and Mike were replaced by the regular prime time shows. People settled back and said how nice it was that our clean-cut American boys were the first to walk with a giant step on the moon. And the government slowly turned down the space effort to a simmer.

I do not blame the government. The failure of the space planners themselves and, by example, the press to explain the space program to the public or, worse, to explain it on the basis of either showing up the Russians or for military reasons or frying pans was the failure to trust the common American to spend a few of his tax pennies a year on something intellectually exciting.

The Reasons for Space

Many reasons exist for going to space — all of them better than what we are told. Put quite simply and roughly in order of chronology, they are the following:

• To orbit satellites for improved communications, weather forecasting, navigation, resource monitoring, and other such purposes.

• To reap the by-product of space technology by transferring innovations and methods to many areas of industry and medicine.

• To compare other planets with the earth and to study the sun so we can better understand the origin and workings of earth and its dwindling mineral reserves.

• To explore the universe to determine, among many other things, whether life or even other intelligences exist elsewhere.

• To create a focal point for a new intellectual renaissance that will improve the wealth, health, and happiness of all of the people on earth.

Could there be more worthwhile purposes for any human endeavor?

Even after a fledgling 20 years of space activities, we can point to significant accomplishments by considering what the world would be like if we were not in space. That is somewhat like imagining an alternate history if Columbus had not come along when he did. Wouldn't prosperity in Europe or Asia eventually have led to better oceangoing ships that would have discovered the new world as they roamed farther and farther from home? We can only surmise that such a sequence would have taken place at some point by someone.

Likewise, it is inconceivable that space will

not be explored sooner or later by some nation. Thus, the benefits listed will accrue to the country that builds and utilizes its space capability.

Like it or not, civilization started down a new path with Columbus. Today the space age is carving out another new epoch, as significant at least as the Great Age of Exploration or the Renaissance or the Industrial Revolution. Implications of the spread of humanity across the galaxies, or the eventual contact with other sentient beings, or the understanding of man's purpose in the universe are not just exciting — they are staggering.

None of that has happened yet. But all of it is possible now, and impossible without a space effort. It has been five centuries since Columbus ventured forth toward his new destiny, but only two decades since the space age began. And yet there are already some profound benefits that this totally new age of exploration has brought to mankind. To understand these benefits more clearly, consider what our civilization would be like had there been no space program. In addition to the excitement of space exploration, consider the economy, computers, communications, weather forecasting, energy, food and water, housing, human health, science, and the alternate future of a simpler life.

consider money

Had there been no space effort, we would not have spent some $80 billion that might have gone for other purposes. But on the other hand, we would not have stimulated the economy and in so doing returned to it as much as $1 trillion over those 20 years! That is the astounding finding of several economists' studies of the space program. One researcher measured the results of specific, existing space-spawned industries such as cryogenics, gas turbines, and integrated circuits. Another made econometric models of the spreading effect of high-technology endeavors, of which the space program is clearly the largest.

The investment in space has such an enormous

payoff because it spreads to a wide variety of industries. Achieving higher industrial output — and lower inflation — is inevitable through space technology, according to the econometric division of Chase Manhattan Bank, because of the growth of labor productivity.

Productivity growth means that less labor is needed per unit of output. As less labor is required, costs decline. As costs decline, prices decrease and consumers' real income rises, which then leads to greater purchases of goods and services and improved mass production that lowers unit costs still further. The size of the labor force can then increase through greater job opportunities and spread across many businesses in many industries, old and new.

These economic spin-offs do not occur right away, though. They become significant after about five years. The U.S. growth in output per man-hour actually has dropped behind that of other industrial countries because of a slowdown in the last 25 years of investment in new U.S. technology. A revitalized space investment is part of a larger emphasis on industrial growth that must be made if the U.S. is to solve its economic problems of inflation, balance of payments, and dwindling technological leadership.

consider computers

So quickly, yet so subtly, have computers of all kinds entered our lives that it is difficult to imagine what the world would be like without them. If we assume that population growth remained at least as great without a space program as it has been, our entire banking and credit system would be bogged down under a morass of detail. Without the integrated circuits pioneered for the space program, millions of clerks would work at slow hand calculators, laboriously figuring individual invoices and other business forms. Management information, such as inventory or production control data, which now is flashed from retail stores to warehouses, would be the costly guesswork of yesteryear. Printing, especially typesetting, would be far slower. The lack
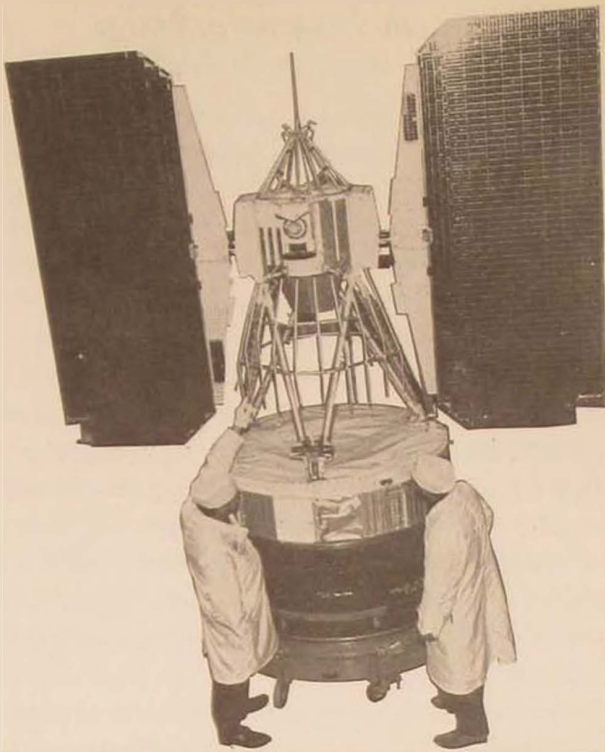
Satellites are now relied on heavily as sources of meteorological information. In 1966 Nimbus spacecraft technicians (left) made final adjustments to NASA's newest 935-pound weather satellite.... On 4 October 1960 the world's first active communications satellite, Courier IB, was put into orbit by a two-stage Thor-Able Star missile launched from Cape Canaveral. The 500-pound satellite, shown being installed in the missile nose cone below, looked as if it had escaped from a discotheque.
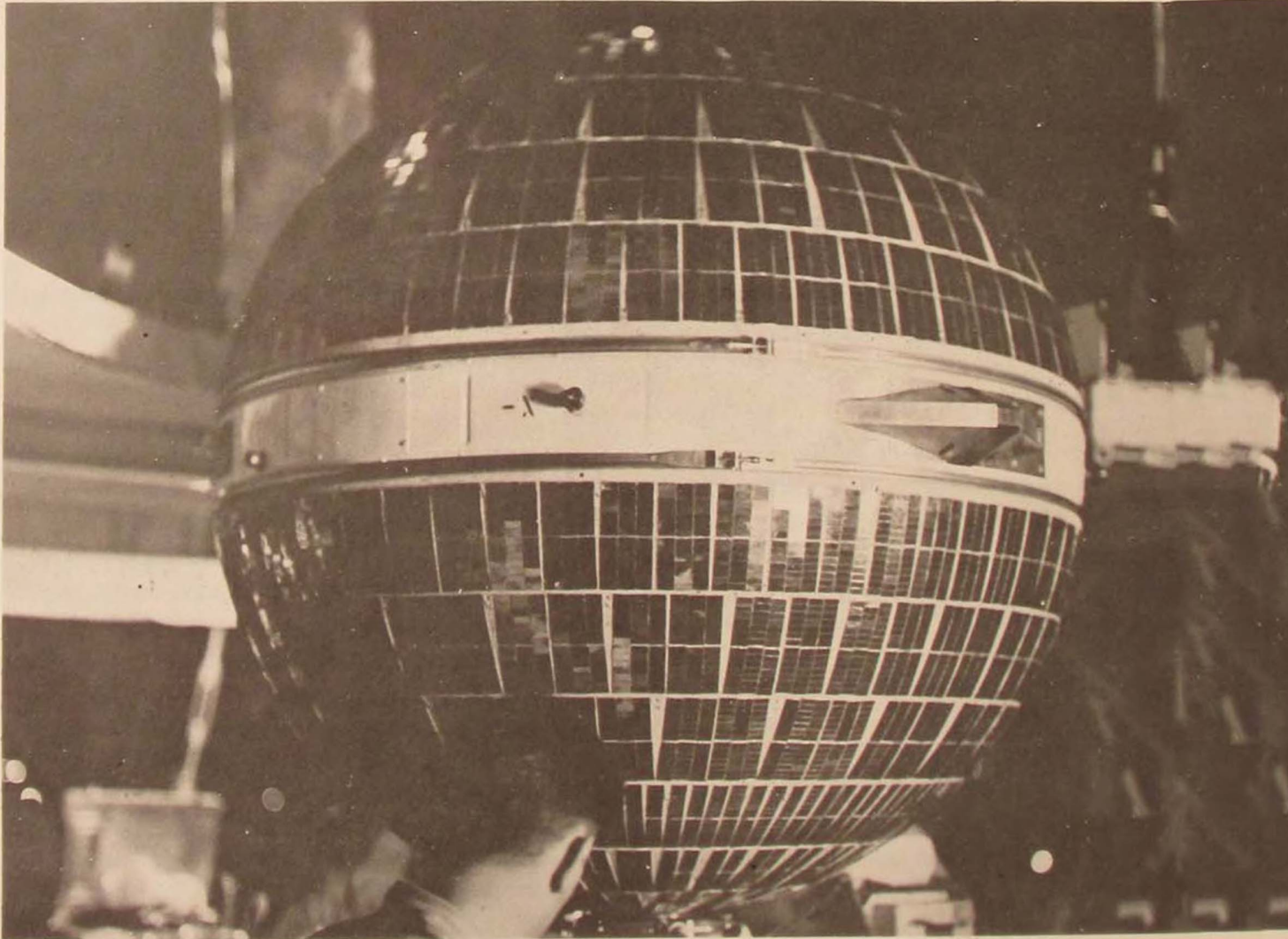
of instantaneous coast-to-coast reservation systems would have retarded the dramatic growth of the airline industry.

Engineers would take hundreds of hours to perform tasks that today take minutes. The great scientific discoveries of the past two decades, in antibiotics and contraceptives, in pulsars and astrophysics, in the chemistry of new materials, in the fundamental knowledge that, in turn, spurs tomorrow's progress — all would have proceeded, if at all, on a much lower level of awareness.

Largely as a result of the space stimulus to computer technology, computers are taking over more and more jobs. Computers have even entered the household with some 150,000 microcomputers already sold for home use. "Someday they'll be as standard as the telephone," according to one of the firms that makes them.

That may be exaggerated, but sales of microcomputers are expected to exceed three times that number in the next 12 months. They are being used to answer personal correspondence, cross-index journals, keep a log of people talked to on ham radio, dim and brighten living room lights, open and close the drapes, balance the checkbook, keep track of investment portfolios, update the Christmas card list, collate menus, play electronic games, report on water seepage in the basement, and lock the front door at night!

consider communications

Space is a legitimate goal not only for finding new worlds but also for satellites to improve communications here on earth. We would not see Olympic games live from overseas, the Pope's coronation at the Vatican, or President Carter's European visits. International television by satellite may seem of small importance, but remember that other countries also see what we are doing and how our society works. Overseas news broadcasts exert an educational pressure, a force toward international understanding.

More specific education by satellite is offered by the Applications Technology and the new Communications Technology satellites that broadcast directly from orbit to TV sets in rural communities. Experimental direct-broadcast satellites have televised emergency medical treatment to Eskimos and similarly isolated peoples. Hundreds of millions of others leading substandard existences in Africa and elsewhere can become educated through this unique mechanism. In fact, the Indian government, after participating in an experiment in which the broadcast satellites beamed instructional television programs to some 5000 villages, viewed satellite education as the *only* way to conquer India's widespread illiteracy.

In advanced nations, especially the United States, business efficiency would suffer without the extraordinary capacity and economy of overseas satellite telephone circuits and space-spawned computers. As a result, we probably would be more nationalistic and isolated in business than we are today. It follows, then, that there would be less of an opportunity to progress beyond the limits of our shores either in terms of world trade or world harmony.

consider weather forecasting

Due to weather satellites and numerical weather prediction, the 24-hour forecasts of today are as accurate as the 12-hour forecasts issued 15 years ago — correct 84 percent of the time. The prognosis for 15 years hence is for five-day average forecasts with similar accuracy. A five-day forecast that is 84 percent accurate would save $5.5 billion a year in the U.S. alone and about $15 billion annually over the entire world.

Even now the weather watchers help prevent crop failures, lost construction time, and ship and airplane accidents. Today's satellite system of weather watchers provides pictures of cloud cover over the globe both day and night. Satellites contribute significantly to our ability to discover and track hurricanes, thus helping save lives and property.

If we had no satellites, a storm could begin

unobserved in the tropical seas and sweep into an inhabited coastal zone without warning. That used to happen regularly. At the turn of the century, a hurricane took 5000 lives in Texas; another killed 4000 in the Caribbean in 1928. Some 1500 lives were lost in 1959 when a hurricane ravished Mexico. Contrast those figures with the satellite-watched storm that became Hurricane Agnes in 1972: 118 persons died, most from flooding after the storm subsided.

Another example is the recent Hurricane David. One of the most persistent storms to hit North America in modern times, David was spotted in embryo stage by satellite. Its erratic progress up the chain of the Antilles to Puerto Rico was tracked until a clear path toward the Florida coast was established. Since the affected areas received warnings well in advance of impact, loss of life was comparatively minimal despite 150-mile-per-hour winds.

Similar stories can be told of forest fires and floods, whose devastation has been reduced significantly both by satellite watch and space-spawned scientific monitoring instruments.

It is true that you could do much of this with airplanes instead of satellites. You also could conduct business without duplicating machines or computers or build large buildings by hand as the pyramids were built. But *would* you do so to the same extent? Technological innovation not only satisfies the needs of the time but also creates new needs that existed before only in miniature. Thus, electrostatic copying has transformed the business habits of millions, and the introduction of cranes and bulldozers has made highways, bridges, and giant dams feasible. In the case of weather observations, constantly piecing together aircraft weather photos to form a hemisphere-wide mosaic every few hours would be prohibitively expensive.

Perhaps the greatest contribution that the new space age has brought is the understanding and capability that we can now handle global problems on a global scale. Accurate long-range weather forecasting, much less weather control, is feasible only when the planet is viewed as a whole. The same global approach is beginning to help solve mankind's pressing problems in food, pollution, communications, education, and energy.

consider energy

Earth is not a closed system in which everything is recycled, like water falling as rain and evaporated to clouds. The earth is open to space and, therefore, fueled by the sun. Space technology, not surprisingly, has made its greatest contribution to alternate energy sources in the field of solar energy.

Solar photovoltaic cells routinely provide electric power aboard spacecraft. These cells that convert sunlight directly to electricity are now being introduced, along with solar collectors to heat water, in uses that range from providing energy in remote areas to heating and cooling homes.

Solar cells are also seriously being considered for "powersats," giant solar power satellites from which energy in the form of microwaves would be beamed to subscribing nations and reconverted to electricity on the ground. Solar power is an alternative long-range answer to the energy shortage because it cannot spill, explode, contaminate, irradiate, strip the ground cover, or pollute — and it is inexhaustible.

Space technology also has contributed to conventional energy sources. Without many of the 750 satellites now operational around the globe — of which 375 are U.S. — oil exploration would be more limited, air and water pollution more difficult to monitor, and population censuses harder to make.

The Alaskan pipeline might still be in the courts as environmentalists sought ways to protect the tundra from pipe ruptures that seemed inevitable. It was the heat pipe, first pioneered aboard spacecraft, that finally settled the problem and led to the law permitting construction of the oil pipeline. Heat pipes, thin verticle tubes along the length of the oil line, keep the permafrost frozen to prevent frost-heaving from break-

In 1970 NASA awarded Lockheed Missiles and Space Company a contract to design and test the largest array of solar collectors. The sheet of photovoltaic cells, towering high above a Lockheed employee, converts solar energy into electricity.
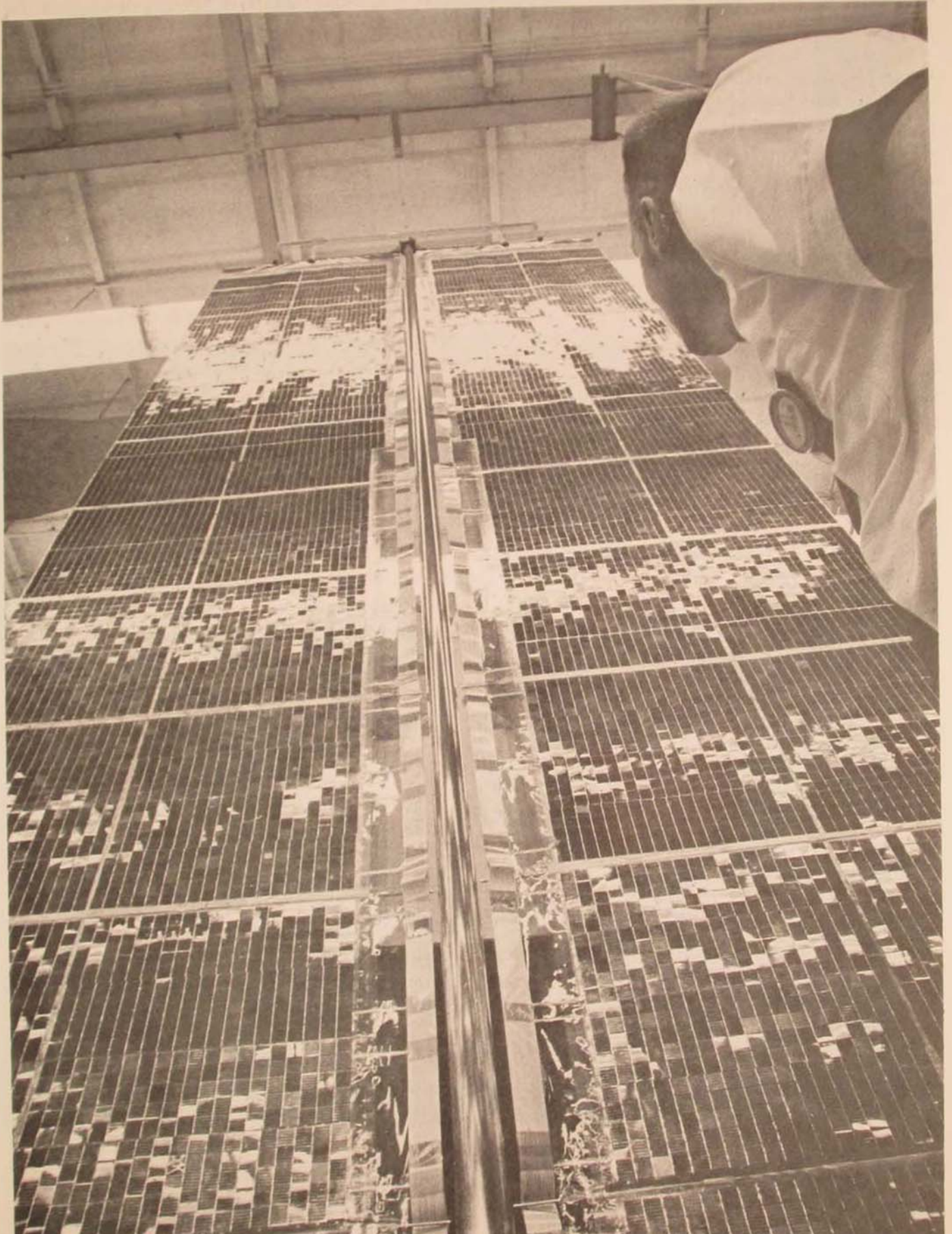
ing the big pipeline and spewing oil over the countryside. Similar heat pipes also transfer waste heat from chimney flues in homes and factories.

consider food and water

Crop planning would have remained a primitive pursuit without space technology. Land satellites (or "landsats") today carry crop-imaging sensors designed to discriminate among various types of vegetation. For instance, the satellite can "see" wheat and measure its extent and condition, including disease. Worldwide food and timber resources thus can be predicted with the accuracy necessary to feed and house a hungry, growing world.

Among the myriad purposes of our landsats is the monitoring of freshwater supplies. Man currently extracts fresh water from only about a hundredth of one percent of the total global supply. Satellites not only help find thousands of temporary small lakes in the Southwest U.S., but they make it possible to locate subsurface water supplies near cities or areas in need of irrigation. Recently, a satellite tracked a freshwater iceberg as big as Rhode Island from its Antarctic home along the east coast of South America.

By necessity, the satellite food and water watch also becomes a watch for the conditions in which destructive insects breed. For instance, in order to eradicate the livestock-devastating screwworm in the U.S. and now in Mexico, billions of the sterile male insects are dropped in the infested regions to mate with females, thereby eliminating offspring. Satellites pinpoint precise locations within the vast geographical areas involved; without them, thousands of additional communication links would have to be constructed to do the same job. In fact, the task would be so enormous that it probably would not have been undertaken if it were not for satellites.

consider housing

Many household products and the construction of homes have been improved through the deliberate attempt to transfer space technology. For instance, thin, flat electric wires originally devised for spacecraft are replacing between-the-wall bulky cables in several demonstration buildings. Both baseboard flat wires for homes and under-the-carpet wires are being tested in an attempt to lower costs through reduced installation time.

Wall panels for some prefab homes are also a space spin-off. They resulted from high-performance plastics developed for rocket casings and liquid-hydrogen containers. The plastic panels now save more than 15 percent of the cost of conventional prefab panels.

A fireproof "tripolymer" plastic first developed to protect spacecraft fuel lines and tanks has been adapted for home insulation. The material forms a charred crust when burned and extinguishes flame.

These and other materials and techniques have been employed by the National Aeronautics and Space Administration in The Energy Conservation House (TECH) now on display at the Langley Research Center in Virginia. The house also partially reclaims waste water, utilizes the emergency electrical system that lighted Skylab, and has a security system spun off from an ultrasonic, pen-sized transmitter. Heating is supplied by solar collectors and a nighttime radiator using a heat pump. A computer-directed system heats or cools only the rooms actually in use at any given time.

While many of these devices have not yet reached the general market, a surprising number of well-known household products also are space spin-offs. For instance, if it were not for the space program, we would not have those high-energy, button-sized batteries for cameras and hearing aids or the larger nickel-cadmium batteries that power portable tools and sports equipment. Nor would we have a variety of new fire-retardant materials now finding their way into clothing, curtains, and carpets. Electric motors in our vacuum cleaners, electric shavers, and movie cameras would burn out quicker without the dry space lubricants they contain,

Skylab scanners

The magnified detector assembly of the Skylab multi-spectral scanner (right). These individual sensors measure the earth's light energy in 13 portions of the visible and infrared spectrum, aiding the study of crops, mineral resources, etc. . . . Skylab astronaut Paul J. Weitz replaces a detector package on the S-192 multispectral scanner while a technician observes.
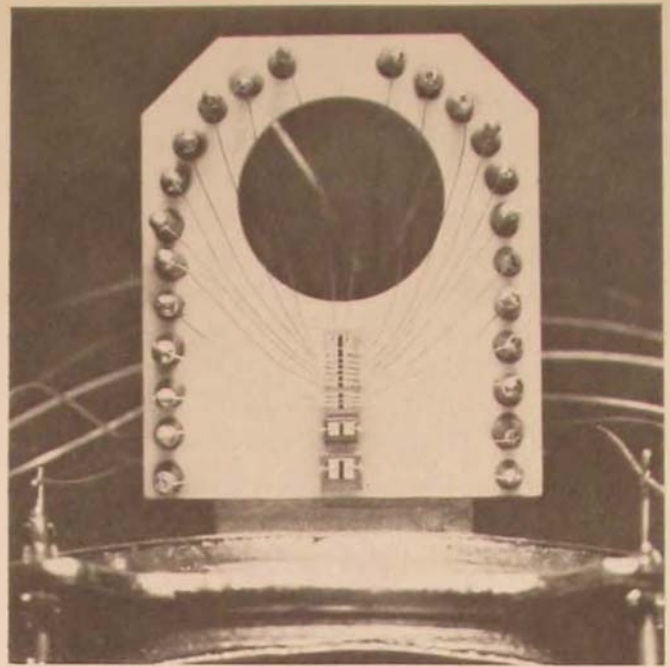
lubricants devised first to work in the vacuum of space. Digital quartz-crystal clocks and light-emitting-diode watches, which have the accuracy of a minute a year, would not be here either without space technology — they were developed originally for the Apollo moon missions.

consider health

Without a space program, we would be poorer by several thousand medical instruments, ranging from cardiac pacemakers to devices for the detection of drug overdose.

Most medical research prior to the space effort focused on curing illnesses; comparatively little work was done on studying the healthy human body. Innovations in space medicine began with remote acquisition, monitoring, and interpretation of physiological processes during flight. As such, the space effort has given the medical profession a better understanding of how a healthy man functions as well as the tools for studying the human body.

With that beginning, numerous transfers of space technology to medical devices and health-care systems have been deliberately made. Probably the best known space spin-off to health is the cardiac pacemaker, an outgrowth of miniaturized solid-state circuitry developed for spacecraft where a multitude of instruments and devices had to be crammed into small volumes. Until recently some 30,000 Americans who wear pacemakers had to undergo surgery about every 22 months when their batteries ran down. But now a new NASA-assisted innovation of the original space-spawned pacemaker recharges the instrument's batteries through the skin by inductance. A patient simply wears a charger vest for an hour or so a week to recharge his pacemaker.

Another heart disease benefit from the space program is the "Telecare" emergency system. Since more than 60 percent of deaths resulting from heart attacks occur within an hour after the attack, it makes sense to utilize the ambulance time for diagnosis and treatment. What

better way to do this than to adapt the system originally designed to monitor the astronauts' heart actions? The principal Telecare component is an electrocardiogram display and telemetry system. The unit allows firemen or others trained as paramedics to send vital heart data to the hospital in seconds so doctors can begin treatment even before the patient arrives.

consider science

While the foregoing benefits of our space effort are tangible, dramatic progress can come only from an improvement in our understanding of nature. Copernicus, Newton, Lavoisier, Faraday, Einstein, and the other great explorers of the unknown throughout the ages knew this. But a reverse current has begun to flow into our modern world—to which science has contributed so much—and many people often lose sight of the benefits to be gained by unraveling nature's secrets. Instead, they turn to false values, such as astrology (now enjoying its greatest popularity), or denigrate science for the havoc it has reaped on the world. These people forget that science and technology are neutral. It is the use to which we put them that is suspect.

For thousands of years man behaved as though he would forever remain on the surface of this planet. Suddenly, in the brief geologic span of a few decades, airplanes and then spacecraft irrevocably altered the need for such behavior. The famous Club of Rome's study of world dynamics at the Massachusetts Institute of Technology, "The Limits to Growth," projected catastrophic collapse based on that now archaic trendline. But what the MIT study really reveals is that we cannot continue forever without seeking raw materials from beyond the planet earth. "The Limits to Growth" thus becomes the best argument yet advanced for why we are in space.

Not only do infinite sources of raw materials and infinite worlds await man's expansion into space, but the corollary pursuit of space goals generates innovations in virtually all fields of science and technology. Without the space pro-

gram our understanding of new alloys, plastics, pure metals, and composites would be stilted. Vacuum technology, the science of ultracold called "cryogenics," superconductivity in which electrons seem to flow in a circuit forever, and the physics of "plasmas," the fourth state of matter besides solids, liquids, and gases—all would be in their infancy. Instead, they are viable disciplines already contributing to human progress.

Without the space effort, our knowledge of the earth and other planets would have remained limited. The six manned lunar missions, supplemented by robot probes to the planets, have advanced the earth sciences through a new field of "comparative planetology." As our planet runs out of oil and other minerals, the new knowledge of how the earth functions as compared with other planets could not come at a better time.

Man's view of creation has been altered significantly as a result of both space astronomy and the Apollo flights. We have seen "superclusters" of galaxies bound together by a hot and tenuous gas. We have proved Einstein's theories that radio signals between earth and spacecraft will be slowed as they pass the sun. We have discovered a disc-star in the process of forming its own planets and have altered our theories of how planets are born.

Closer to home, we now know that the old theories of the moon's being captured by the earth or formed by a splitting of the protoearth are too simple. A new theory of atmospheric fission is emerging, in which the moon was formed from a hot earth atmosphere many times more massive than the moon. The surprising revelations that anorthosite, an igneous rock rare on earth, is one of the principal lunar rocks, that the moon is layered, that both meteoritic impact and volcanism formed the craters, that the moon contains a small liquid core of molten rock that magnetized surface stones brought back by the astronauts—all these and countless other discoveries about our closest neighbor in space would have remained unknown and hardly guessed at if man had not grabbed at his chance to leave the earth.

Similarly, planetary probes now have stretched mankind's influence through the asteroid belt beyond Mars and across the billion miles from Jupiter to Saturn. The Pioneers are continuing out to the orbit of Pluto and then, beyond the solar system, to interstellar space. Without the Mariners, Pioneers, Vikings, and now the Voyagers, we would not know that the polar caps of Mars are simple ice instead of frozen carbon dioxide, that great dust storms sweep a cratered surface, or that real riverbeds are etched into the now-dry ground. We would not know that the magnetic field of Jupiter, unlike the earth's, is created by currents deep within the starlike planet or that Jupiter's magnetic tail extends to Saturn. We would not have discovered the five or more rings of Uranus.

Solar, x-ray, and above-atmosphere astronomy would be virtually nonexistent without the space program. We would not know about the Van Allen belts or the wind of protons streaming from the sun. Nor would we now be devising self-propelled spaceships powered with gigantic solar sails. We would not be launching sounding rockets to probe the northern lights. We may have found the quasars and pulsars — the ultradense starlike bodies that are the most revolutionary astronomical discoveries since Kepler — but our attempts to explain them would be even more difficult.

Obviously, if we were not in space, we would have no chance of encountering life beyond the earth. And we would not have seen the awakening of scientific interest, the space-bought second Renaissance that inevitably must change and integrate our sciences, our philosophies, and even our religions. This, too, is why we are in space.

ONE view of history is that all of the benefits brought by the space program in improved communications, health, and so on would have occurred anyway but in a different

time sequence. We will never know the answer to that, but it seems reasonable, at least for terrestrial benefits. Yet even here it is important to realize that the space program has helped to shorten the time lag between invention and its application. Whereas we once went through a protracted 10- to 15-year testing and development period—for instance, for hybrid corn or penicillin—the time lag has shrunk now to only a few years.

Another, more widely held opinion is that a simpler kind of life—one without the consideration of men from other worlds, satellites, computers, integrated circuits, astronomical discoveries, better transportation, longer healthier lives, or more advanced science—would be all right and that space technology is just another gadget making our lives and neuroses more complex.

The desire to resist the disorder of change is an understandable human aspiration, but to attempt to resolve the disorder by returning to "the simple life" is ostrichlike in the extreme. First of all, lower standards of living create societal pressures that lead to dissatisfaction and economic imbalances such as depression, riots, or even war. Our money spent on space technology has been returned many times over by the benefits and spin-offs discussed—so much so that space research is probably the best large-scale financial investment ever made.

Another reason for choosing technological progress over reduced complexity of life is the reality that you are always better off knowing something—be it an enlarging Sahara desert or the fact that pulsars exist in space—than not knowing it. You can cope only with the known.

The knowledge brought by the space program has fostered an attitude that we no longer have, to put up with major world problems such as energy or food shortages, widespread epidemics, or masses of uneducated people. In this sense, space technology is helping to end provincialism, even as it opens the doors to a literal cosmopolitanism. For, ultimately, the only way to extend man's knowledge of the universe is to venture forth from the earth. And the only way to do that is in a spaceship. This is true both for the observational knowledge to be gained of distant stars through orbital telescopes and the exploratory knowledge of the objects in our own solar system.

LIFE without a space program would deny our civilization and future generations the most effective of all mechanisms to accumulate and apply new knowledge on a vast scale. Do not assume that life *without* a space program would be merely the same as life *before* the space program. Overpopulation pressures would continue to push against the sides of our finite earth. The need for national defense would be at least as great. Illness and starvation, earthquakes and hurricanes would recur, possibly with even greater devastation. All of these and the other afflictions mankind suffers would be with us still and doubtless would be worse but with one important difference. Without the space program we would have neither the intellectual resources nor the technological base to deal with them.

National Space Institute
Arlington, Virginia
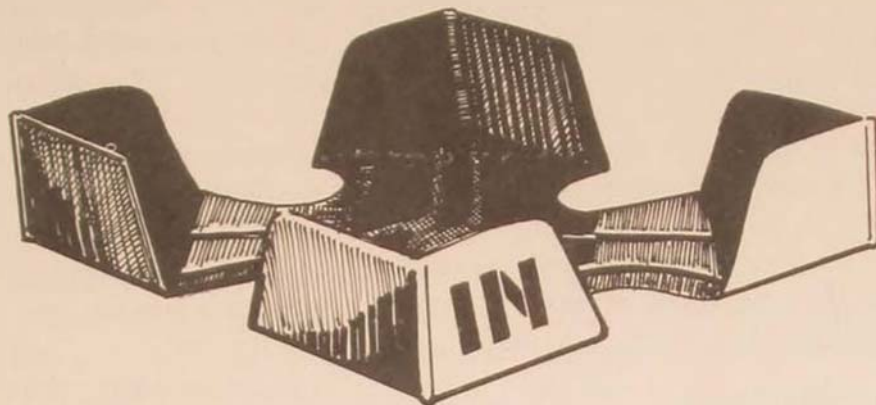
LONG-RANGE PLANNING
a new beginning

LIEUTENANT COLONEL ALAN GROPMAN

V ICTOR HUGO was right: nothing in this world is so powerful as an idea whose time has come. In today's Pentagon that idea is long-range planning, for a number of sound and compelling reasons. By the summer of 1978, segments of all the service staffs and many officials in the Department of Defense (DOD) were lamenting the lack of the long-term view in military planning and programming. Two services organized ad hoc groups to study the benefits to be obtained from institutionalizing long-range planning within their staffs. The Air Force was first into the arena with a twenty-officer study group chartered by Secretary John C. Stetson; the Navy followed suit several months later with a smaller effort. The secretary asked his long-range planning study group to:

 • examine the feasibility of adopting big business long-range planning techniques;

 • recommend an institutionalized long-range planning process, should corporate long-term planning practices appear adoptable;

 • offer perspectives on the future world — twenty years out — in which the Air Force will operate; and

• recommend strategy alternatives for meeting future threats and opportunities.

Because the chartered examination of long-range planning processes led to a reorganization of the Air Staff and the establishment of a Deputy Director for Long-Range Planning within the Directorate of Plans, this article will concentrate on the first two tasks of Mr. Stetson's charter.

Before the first of the year, a brigadier general was selected as the new Deputy Director, and he was assigned more than thirty staff officers to assist him in this new beginning. The other services had taken interest in the ninety-day study effort and are now monitoring the activities of the new unit; so is the rest of the Air Staff because this is the first time the Headquarters has had a formally integrated, permanent organization charged with long-range planning.

What is long-range planning, and why is it needed?

Defining long-range planning turned out to be more of an effort than the study group had imagined. Planning horizons differ widely in the corporate world, and long-range planning for some business front-runners was short-term operational planning for others. Nothing esoteric or mystical was found about long-range planning nor did it yield to any common description. The working definition that the study group eventually settled on is as follows:

> Long-range planning is the systematic process of formulating objectives and developing strategy and resource allocation alternatives for reaching them.
>
> Intrinsic to the process is a system for dealing with the implications, in an uncertain future, of presently considered alternatives.

Objectives formulation is axiomatic to any long-range planning process; hence, the lack of well-articulated and thoroughly understood goals is one sure sign that such a process is absent. Once objectives are established, the formal staff organization can proceed with creating strategy paths to goal satisfaction. The critical part of that process, and its real payoff, is determining the future implications of the alternatives offered by the staff.

Organizations should plan in order to avoid, to cope with, or to beat threats; in order to exploit opportunities; and to shape the future world—always with the focus on goals. Yet without formal goal and strategy development and systematic treatment of the future consequences of strategy options, the staff and its leadership might remain tied eternally to the present and could lose the future to those who plan for it. The tyranny of the in-basket (which drives managers to focus on the present) must be overcome, and defeating that tyrant is made less likely by the fact that today's difficulties are easier to grasp than tomorrow's less well-defined ones. Future problems become more elusive yet, moreover, as one tries to project further and further.

If the long-term view is not adopted, however, improvements will probably be always on the margin, future forces may be well prepared to fight the last war, and tomorrow may be mortgaged to today (or, even worse, to yesterday).

Neither the Air Force nor the Defense Department has systematically defined its long-term objectives or methodically identified the long-range implications of present decisions. Readers who cannot think of equipment purchases (or cancellations), base openings (or closings), research emphasis (or lack thereof), or personnel policies (or voids) that were made without apparent regard for the future are either inexperienced or just not thinking. In these days of seemingly ever-tighter budgets, we may no longer have the resources to recover from quantum mistakes. We need to establish a process that forces the future to intrude on the present, and long-range planning will accomplish this.

past efforts

In the past, Air Force long-range planning has never been well defined and has nearly always been attempted by ad hoc groups (such as in Toward New Horizons, New Horizons II, and the more recent Long Range Capability Objec-

tives encounters). Sometimes those in the Air Staff responsible for concept formulation took up on their own (or were assigned as an extra duty) the long-range planning function. In no case, however, were such past groups or their products tied into the formal planning apparatus, nor were they formally or informally assigned more than a fraction of the long-range planning process. Frequently past groups concentrated on the pursuit of fruitful technological challenges or the delineation of likely future capability shortfalls. Neither of these facets nor their combination addresses more than a small part of the process.

the challenge

What is needed is a process for translating the senior leaders' clearly stated objectives into coherent strategies. Once suitable strategies are being formulated and analyzed, the foresight and willingness to make sufficient funds available for well-considered investment must sooner or later emerge. Without leaders of vision, however, the military could become almost imperceptibly weaker, year by year, because of an entirely natural reluctance to accept short-term degradation in readiness in order to build for the future. In today's climate of fiscal stringency, readiness and modernization are components of a zero sum game. The demand on the military leadership is seen to be even greater when one realizes that future threats can never be made as vivid as the current military situation. Military leaders quite properly want to deter war on their watch and to win if deterrence fails. Long-range planning requires a leader with the wisdom of a prophet; and, perhaps even more than that, a prophet's necessarily thick skin. The latter is required because a prophet is seldom honored "in his own country." That is the challenge of long-range planning.

business techniques are not totally suitable

The study group learned that the services do long-range planning much as it is practiced by corporations and that big business has as much to learn from the Air Force as vice versa. Which is not to say that there is nothing to be learned from business planning processes. What most corporations call long-range planning is close to what the military calls programming. Few businesses seem to have planning processes formally separated from programming because costs intrude on the process at every point. But the military cannot permit costs to dominate the planning process: the Air Force and the other services have vast and awesome responsibilities and must often develop unique capabilities, sometimes without regard to cost (and never with regard to profit), to deter war or to win if deterrence fails. The complexity of military planning and operations, furthermore, transcends by a wide margin the programmatic acquisition and profit dimensions of business. The myriad of uncertainties confronting military planners, moreover, greatly exceed those of business enterprises. In short, few corporations are as large as the Air Force, and those that are larger are not so complicated. And none have the same pressures and complex dilemmas that face Air Force planners and leaders. Perhaps because of the difficulties facing the military, DOD has developed the formal planning-programming-budgeting system, a vehicle superior to almost everything the study group explored in the business world.

This was certainly true in terms of time horizons. Of the corporations that consider themselves in the long-range planning game, most (about 75 percent) plan (really program) no further than we do in the Five Year Defense Plan or Program Objective Memoranda (POMs). Very few carry the process as far as the Air Force Objective Force, and practically none as far as the Extended Planning Annex. One front-runner, Texas Instruments, has a long-range planning horizon of three years. American giants like General Motors, IBM, and Ford have a five to seven year horizon. Only utility companies routinely plan further into the future than the military and not much further at that.

The dissatisfaction with the existing Pentagon approach, nonetheless, was too abundant to ignore, and the fact that corporations planned (or programmed) no further than the Air Force was no comfort. The study group was aware that there was no existing process by which the future was routinely and explicitly made a part of the planning equation, and business was investigated for its methods of making the future, near-term as it usually was, influence the present.

business treatment of the future

The study group learned that businesses which do long-range planning divide into two broad groupings. A minority could be called scenario builders: they try to forecast a comprehensive view of the future (or a range of views), note their shortcomings when measured against the future world(s), and shape strategies for redressing their insufficiencies. The programming philosophy is characteristic of such companies because there is little if any planning to reshape the future nor any deliberate look at different future missions. Most such companies are satisfied that they can react early to looming threats or exploit distant opportunities.

Many other companies, however, consider scenario building barren. They do not try to create coherent snapshots of the future world that will be believable to a majority of decision-makers. They try, instead, to determine the long-term consequences of alternative near-term decisions in an attempt to choose the best when measured against the long-range goals of the company leadership. Such companies study the future but ask their questions first and let the decision alternatives drive much of the research. A weather-eye is kept to warn of threats to the company's existence or to inform of dramatic opportunities for exploitation, but always within the context of company objectives.

In trying to determine the relative merits of these approaches, the study group first experimented with scenario building. It found that the future was very slippery indeed. It seemed that the study group was subject almost daily to challenge by that morning's *Washington Post*. The further into the future the group pushed the horizon, the more tortured became the assumptions, the more hedged became the projections, the less clear-cut became the scenario, until the forecasters became convinced that they could make no scenario simultaneously believable to enough of the decision-makers to make any difference. The benefits of such an approach appeared marginal when measured against the enormous efforts expended.

The group was nonetheless more certain than ever that the future had to be examined and that the horizon had to be scanned for harbingers of change if future threats were to be met or bested and future opportunities seized. The consensus of the study group, however, was that the weight of emphasis in future study had to be placed on trying to determine the long-term consequences of current decision alternatives. Even there, part of the data used to accomplish that task comes from scanning the future environment.

Brought down to the mundane—if the Air Force is considering building a system to replace one that is aging, planners must ask: What objectives will it help meet in the future? Should the Air Force continue with (or will it be able to accomplish) the mission performed by the system through the end of its useful life cycle? Will there be resources to build the new system when it emerges from the blueprints? Will there be fuel to operate it? Will there be a force able to maintain and fly it? Will there be an enemy to fly it against? Will there be allies to support it, bases to fly it from and recover it on? Considering that it takes ten years or more of gestation, will there be money in future budgets to purchase it? What will have to be given up to acquire it? What research and development opportunities will be lost over the entire cycle because this system is chosen? What other goals may be threatened if we choose a system to satisfy a specific objective? Successful corporations place

the highest emphasis in their long-range planning processes in seeking answers to such questions.

business strategic planning practices

How do businesses go about answering such questions? In the first place, the company chief executive calls for answers. Successful long-range planning in business is characterized by the active participation in the planning process of the company chief. Business long-range planning, which front-running corporations choose to call "strategic planning," proceeds through a top-down approach. The long-range, or strategic, portion of the company plan is developed by the senior official(s) in concert with a small long-range planning staff. This portion of the plan is very definitely the boss's statement and not one simply prepared for his signature.

The study group visited three multibillion-dollar-per-year corporations and found that their chief executives had daily contact with the strategic planning staffs during the trimester in which the long-term plan is formulated. This is to ensure that the company's future direction remains in the hands of those responsible to the stockholders. The main product of the interaction of the planners with the chief is guidance, usually in the form of a memorandum, to key individuals in the firm. It establishes objectives, orients the entire planning cycle (with the future at the front end, and not the back), and sets the broad financial limits within which operational planners are to propose alternative strategies to meet company goals. The chief insisted that operational or short-range plans were to be in harmony with the long-range guidance, and the company president continued to meet with the long-range planners out of cycle to ensure that the process remained on track. Guidance produced with the participation of the company president is almost ensured adherence.

Readers familiar with the Department of Defense might consider the Consolidated Guidance (CG) satisfactory for such purposes, but it is not.

First of all there is no Air Force counterpart to make explicit those areas left ambiguous or open to interpretation, nor does the CG contain any comprehensive set of Air Force goals. Most significantly, the CG is a relatively short-term programming document in which the future does weigh heavily. It comprises relatively near-term programmatic guidance and is insufficient for Air Force long-range planning.

dealing with uncertainty

Even with a coherent and usable set of goals to guide strategic planning, the process is still difficult because alternatives have to be evaluated in the face of uncertainty. The further into the future the organization plans, the greater the problem. Corporations differ widely in their methods for dealing with uncertainty. Some choose elaborate computer models that make a dynamic simulation of the company for the entire strategic planning period to assist in making choices between complex alternatives. Others employ advanced decision analytic techniques, some of which border on the mystical. Evaluating alternatives in the face of uncertainty is probably the core difficulty with today's military planning process and led up to the chartering of the study group. Apparently, decisions are made late in the POM process on bases other than the best for the long-term. Choosing the alternative with the best future implications presumes some type of modeling or analysis on which to base judgments. At present, the Mission Area Analysis (MAA) process uses a model that might be adapted for these purposes, but that process prioritizes alternatives within mission categories and not across them. Once the MAA process is capable of providing priorities across the mission areas, the Air Force will be able to construct a more rational POM.

a useful military time horizon

Mission Area Analysis searches fifteen years into the future for mission capability shortfalls, and

that appears to be a rational planning horizon for forecasting. Time horizons used in business were instructive: they suited the companies for which they were designed, and the comparisons made earlier with the services were not necessarily invidious ones. Three years is probably adequate for Texas Instruments because of the expected shelf life of its products and the short product development time. The development period is so long for defense systems, however, that our environmental scanning and planning must be pushed out much further. One of the difficulties here is that intelligence estimates go no further into the future than ten years, and the threat at the end of the estimated decade is inevitably uncertain. While some things are surely knowable beyond ten years, the threat, for which we must prepare, is not completely predictable. Yet, even without a firm threat projection, we know of our eternal interests as a country, and these form the basis for enduring national goals or objectives unaffected by changes in political administrations or short-term perturbations in allied or adversary politics.

The nature of enduring national military objectives irrespective of the threat is only one reason for the Air Force to choose a time horizon greater than the five to seven years observed in most industries. If such a short planning period were adopted—given the extremely lengthy development times for military products —one would never be able to factor expected gains from new acquisitions into the military planning equation. With a time horizon shorter than the probable development time, only the burdensome development costs would be visible in planning and not the future mission enhancements being purchased. With a planning horizon too short, it is difficult, indeed, to see how any new equipment would ever be purchased since the relative economy of modification is irresistible unless one folds in the expected quantum improvements purchased with totally new systems. Probably the most important reason for long-range planning is that it permits the timely acquisition of new equipment to better accomplish missions that are themselves realistic elements of strategies constructed to meet objectives.

The study group suggested a fifteen-year forward scan for harbingers of change and trends that outline threats, opportunities, and uncertainties that face the future Air Force. A thirty-year projection (or more) of costs seemed also to be useful in identifying financial bow waves.

FINALLY, the look into the future, the formulation of meaningful objectives, the creative costing of systems, the answering of numerous questions regarding future implications of alternative decisions—all are important because the long-range planning process itself is more important than its product. It is a guaranteed device for evading the tyranny of the in-basket and for providing a mind-set that always asks for the implications of the decision alternatives. When one hears discussions over decision alternatives, one will know that long-range planning is institutionalized whether or not products carry that name. The long-range planning process ensures that the future intrudes on the present.

The Air Force has recently formed an organization to bring the future into the board and council room, and, if nurtured, the long-range planning process will improve tomorrow's Air Force.

Hq USAF
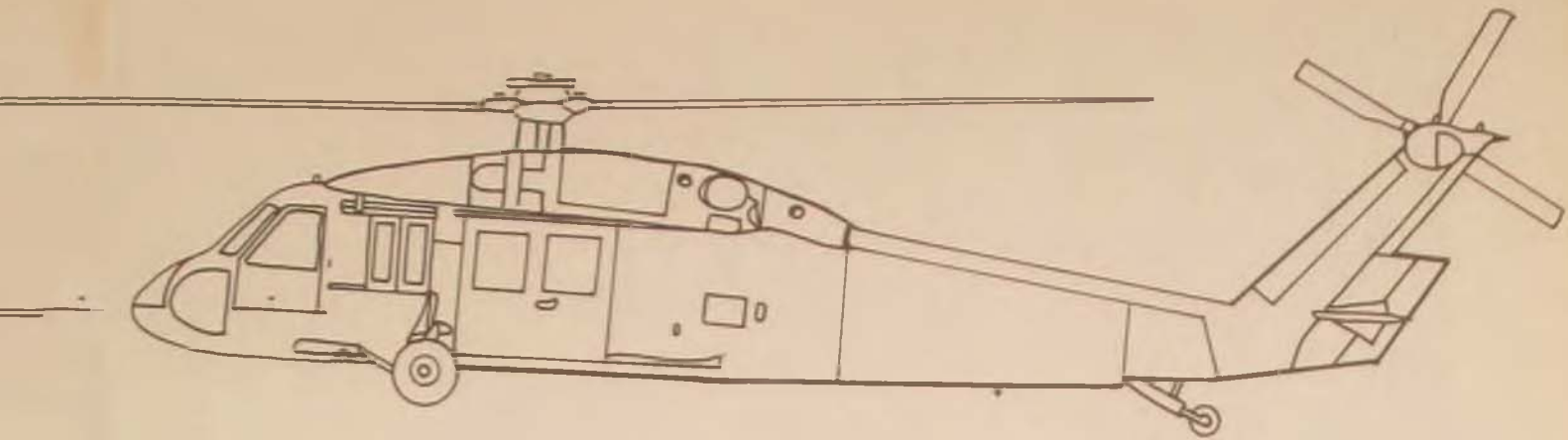
WHAT'S NEW IN ARMY AVIATION?

LIEUTENANT COLONEL WILLIAM D. SIURU, JR.

F ROM each of the major wars of this century have come one or
two technological breakthroughs that have had a significant im-
pact on changing the conduct of war. World War I gave us the
tank and first use of the airplane. World War II introduced air power
and nuclear weapons. Probably the greatest contribution stemming
from the Southeast Asia campaign was the use of the helicopter in
combat.

In Southeast Asia, the U.S. Army learned significant lessons about
helicopter tactics and also determined what features it wanted in the
next generation of combat choppers. Using this experience along with
projections about the future combat arena, the Army is developing two
new weapon systems: the utility tactical transport aircraft system
(UTTAS) and the advanced attack helicopter (AAH).

The UTTAS, or Black Hawk as it is now called, is designed to be a
tactical transport for troops and supplies and for combat support opera-
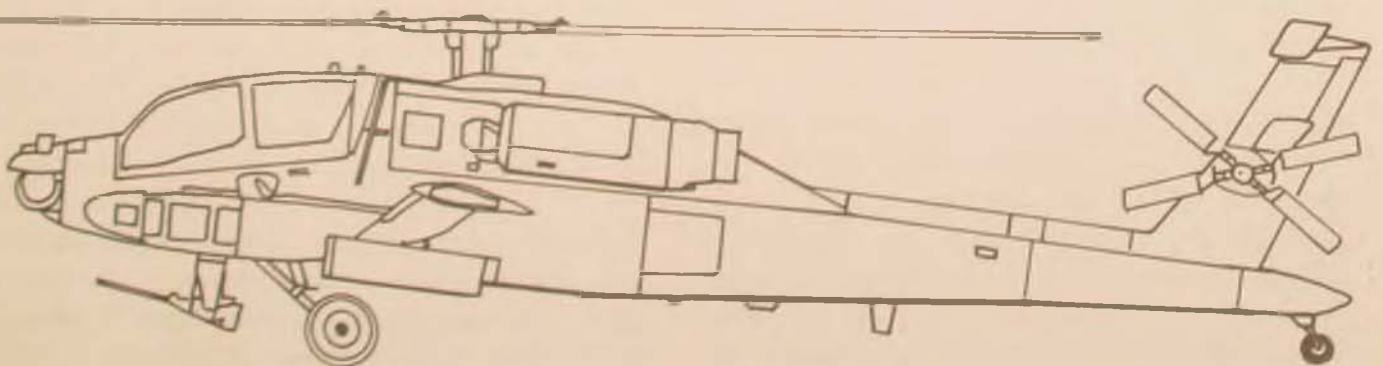
A heavily armored Hughes YAH-64 advanced attack helicopter fires 2.75-inch unguided, folding fin rockets in Army development and testing. These rockets come with a variety of warheads but are intended for use mainly against personnel and other "soft" targets. . . . The YAH-64 is intended by the Army to be a major antiarmor weapon system. Two YAH-64s (facing page) are shown in nap-of-the-earth flight with subwinglet pods designed to carry the HELLFIRE guided antitank missile. The flat windshield panels reduce solar canopy glint and render the helicopter less vulnerable to visual detection.

tions. The AAH is primarily a tank killer but also can be used in an armed escort or fire support role. They are much more than just replacements for current transports and attack ships, namely the UH-1 Huey and the AH-1S Cobra-TOW. They have been designed from the ground up specifically to meet future military requirements and to exploit fully the full potential of the helicopter in combat.

Although both craft have the flexibility to perform a wide variety of missions to support the Army's global responsibility, the primary driver behind the design of both is the mid-intensity battlefield situation found in Europe. Thus performance, survivability, ability to operate under night and adverse weather conditions, and maintainability/reliability were key considerations.

There are two aspects to survivability: First, avoid detection and second, if detected, make the craft invulnerable to destruction by enemy action. Survivability is an especially crucial issue in the European environment, where the anti-helicopter threat is increasing both in quantity and sophistication. Since most of Europe is shrouded either by clouds or darkness 70 percent of the time, a fair weather, daytime-only capa-

bility is of little value. High reliability and ease of maintenance are not only needed to ensure a high level of availability but also ensure low life-cycle costs. Subsequently, we will see how the Black Hawk and AAH satisfy these requirements, but first let us look at a brief description of the two.

the UTTAS or UH-60A

The UH-60A Black Hawk is the Army's first true squad-carrying helicopter. It is capable of carrying a full eleven-man fighting team and all their associated combat gear, as well as a three-man flight crew. Now the Army has the ability to deposit an entire squad onto the battlefield as an integral team ready and equipped for combat. The UH-1 did not have this capability. In this combat assault mode, the Black Hawk has a useful capacity of almost 6000 pounds, which includes the 2600-pound, fully equipped squad and sufficient fuel for a 300-nautical-mile round trip. In front-line duty, the UH-60A can also be used to extract troops, replace and resupply troops, and reposition units.

The Black Hawk will also be used for aero-

medical evacuation and administrative transport of command, medical, and maintenance personnel. As an air ambulance, it can be used to carry four litters, attending medical personnel, and life-sustaining equipment. The UH-60A can lift up to 8000 pounds suspended from an external sling.

The Black Hawk can cruise at over 145 knots and has a maximum flight speed of 165 knots. Its normal mission endurance is over 2¼ hours and thus has a range in excess of 300 nautical miles. The UH-60A has a service ceiling of 5000 feet and a vertical rate of climb of over 450 feet per minute.

While primarily a troop transport, it does carry two M-60 weapons that fire 7.62-mm

UH-60A helicopters move along the Sikorsky production line at the plant in Stratford, Connecticut (facing page). The UH-60A Black Hawk was designed to carry an entire infantry squad of eleven men in its basic version and is intended to be the Army's standard assault helicopter . . . . The UH-60A Black Hawk, shown here in flight, was designed with particular attention to ease of maintenance and ability to resist battle damage. The tilted tail rotor increases lift by several hundred pounds. . . . The General Electric T700 turboshaft engine (bottom), the power plant of both the YAH-64 and UH-60A, was designed with careful attention to reliability and ease of maintenance in the field. It represents a quantum improvement in power to weight ratio over helicopter engines currently in widespread use.
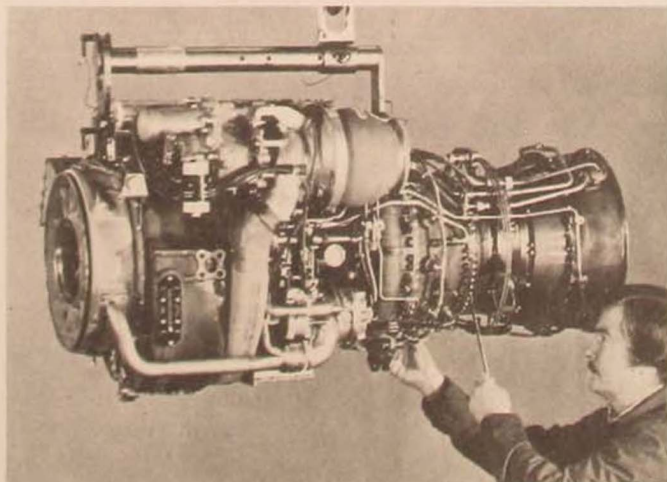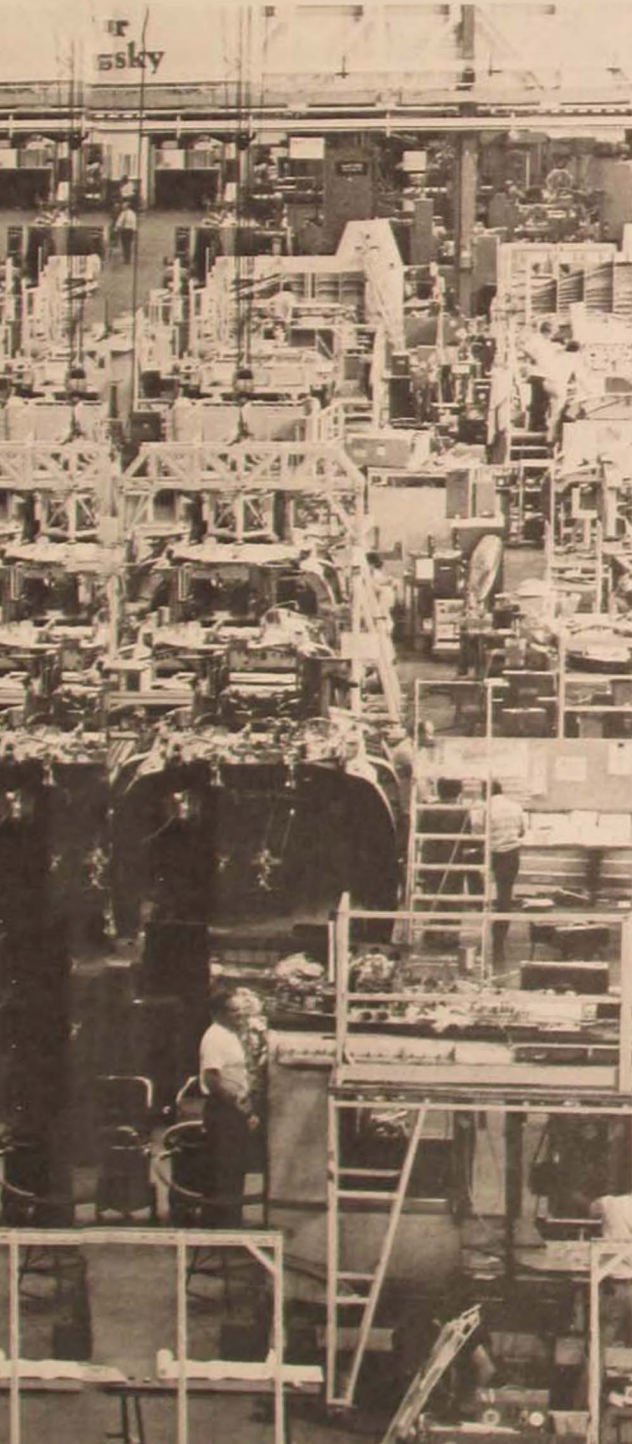
rounds. A total of 1100 rounds is carried for defensive and fire suppression purposes. Having the latest in rotary wing avionics, it can fly to the operational area under instrument conditions and, once in the operational theater, can deposit its load of troops or cargo whether it be daytime or nighttime.

the AAH or YAH-64

The AAH represents a significant improvement over the very capable AH-1S Cobra-TOW and can operate under more demanding altitude, weather, and temperature conditions. Of the two, the AAH is more reliable and more survivable against future expected threats. It is also easier to maintain, and, more important, it carries some very capable weapon systems. While its primary mission is antiarmor, it can also be used to escort troop choppers to the battle zone, protect truck convoys, and, if needed, it can be used for scouting and reconnaissance. In essence, the YAH-64 is an aerial extension of the firepower traditionally provided by tanks, antiarmor weapons, artillery, and infantry weapons.

The AAH has a two-man crew. A copilot/gunner rides in the front seat. The pilot is in the rear seat for more precise control, especially when flying nap-of-the-earth (NOE). The YAH-60 weighs nearly 14,000 pounds when loaded with crew, fuel, and weaponry for a normal mission. However, it is capable of carrying almost 4000 pounds of additional weight.

The AAH has the performance needed to survive in combat. It can cruise at 146 knots and has a maximum forward speed of nearly 200 knots. It can travel at 45 knots either sideward or backward. It can climb at a rate of 880 feet per minute vertically or at 3500 feet per minute in a forward flight climb. While its primary mission configuration calls for an endurance of 1.8 hours, by trading payload for fuel, its endurance can be increased to 2.6 hours. It can even be ferried over a distance of 880 nautical miles.

The YAH-64 carries a wide assortment of sophisticated weaponry. First of all there are the sixteen HELLFIRE missiles that can be carried in four-rail launchers mounted on the aircraft's winglets. The HELLFIRE uses a laser designated guidance system in which the target is illuminated by a laser beam, and the missile rides the beam to the target. The target can be illuminated by the gunner/copilot, by a scout on the ground, or even from a remotely piloted vehicle (RPV). This represents a significant improvement over the TOW missile equipped AH-1S Cobra-TOW. The TOW missile must be controlled directly by the launching aircraft, since it gets its command through wires unreeled from the launch platform. Thus, the TOW launcher must remain exposed and vulnerable to enemy fire all the while the missile is in flight. With the HELLFIRE, the AAH can launch the missile and then hide or take evasive action, provided the target is being illuminated by another source.

The second weapon on the AAH is the 30-mm, XM-230 chain gun. This externally powered, single barrel gun is capable of firing any size burst from a single shot up at 620 rounds per minute. As many as 1200 rounds can be carried in the ammunition drum. The chain gun weighs a mere 110 pounds, provides low air drag because of its small size, and is simple to build and maintain, having less than 150 parts. The XM-230 can fire either the high-explosive or armor-piercing rounds that are standard within NATO. It can also fire a dual purpose round that is effective simultaneously against armored vehicles and personnel. The weapon is accurate up to 3 kilometers and can be fired using the AAH's fire control system or a crew member's helmet-mounted gunsight.

The third weapon system carried by the AAH is the standard 2.75-inch Folding Fin Aerial Rocket (FFAR). This free-flight rocket can be equipped with a variety of payloads, including antipersonnel, shaped charge, high explosive, smoke, illumination, and chaff payloads. The AAH can carry as many as 76 FFARs in four winglet-mounted dispensers.

Besides having the latest in avionics gear for flight under all types of conditions, the AAH has a very sophisticated visionics system that allows it to deliver its weapons on target accurately. The key components include the Target Acquisition and Designation System (TADS), the Pilot Night Vision System (PNVS), the Integrated Helmet and Display Sight System (IHADSS), video recording and playback equipment, and a Fire Control Computer (FCC).

The TADS and PNVS provide the crew the capability to detect, recognize, and engage enemy targets at standoff ranges during the day or night and in adverse weather conditions. The TADS is used in conjunction with all three of the AAH's weapon systems. It can provide target acquisition and weapon pointing information using either its laser range finder and tracker or its infrared and TV sensors. The TADS laser designator is used to illuminate the target for the HELLFIRE. All information acquired by the TADS is fed into the Fire Control Computer, the brains of the weapon's delivery system. It accepts data from the TADS and other instruments and sensors on the AAH, computes trajectories, and issues firing and guidance commands. The FCC is capable of controlling either the HELLFIRE and chain gun or the FFARs and chain gun simultaneously.

the T700-GE-700 engine

The gas turbine has been found to be the most effective power plant for military helicopters from a weight, reliability, and maintainability standpoint. However, because of the relatively small size of the engines used in helicopters, turbine-powered machines have suffered somewhat when it comes to fuel economy. With the T700 engine, even this deficiency has been overcome. The 1500 horsepower T700 will power not only the Black Hawk and the AAH but a slightly more powerful version will be used in the Navy's new Light Airborne Multi-purpose System (LAMPS) antisubmarine warfare helicopter. The engine is also used in the Bell

214ST, a twin-engined version of the Huey built for Iran. In all these applications two engines are installed to give an additional margin of safety and ability to complete a mission.

The T700 engine, while producing 10 percent more horsepower than the engines used in the Huey and AH-1S Cobra-TOW, is 40 percent lighter, weighing slightly over 400 pounds. The T700 uses 20 to 30 percent less fuel than its predecessors.

survivability and vulnerability

The foremost goal for both the Black Hawk and AAH, when it comes to survivability, is to be able to reach the target, perform the mission, and return home undetected. The current threat scenario allows detection visually, audibly, or by radar or infrared signature. The primary means these two craft have for avoiding detection is superior nap-of-the-earth performance. That is, the ability to fly among trees, popping up to perform its mission, and then returning nearer the earth where visual, radar, and infrared detection is more difficult, if not impossible.

In addition to superior NOE performance, both craft have several features that reduce detectability. Both have suppression devices that cool the hot exhaust gases from the turbine engines before they are exhausted to the atmosphere, for the exhaust plume is the primary source of infrared radiation. Radar signatures are reduced by controlling the shape of the fuselage and through proper attention to the engine inlet screening and rotor head. In addition, both craft have black boxes that provide a warning when enemy radar is beamed at them. They also have means to jam enemy detection systems, by dispensing flares and chaff, for example.

While the characteristic sound of a chopper can never be eliminated, it can be definitely reduced by careful design of the main and tail rotors. For example, the tail rotor of the AAH has its four blades not spaced perpendicular to one another purposely to reduce tail rotor noise. Visual detection can be reduced by low re-
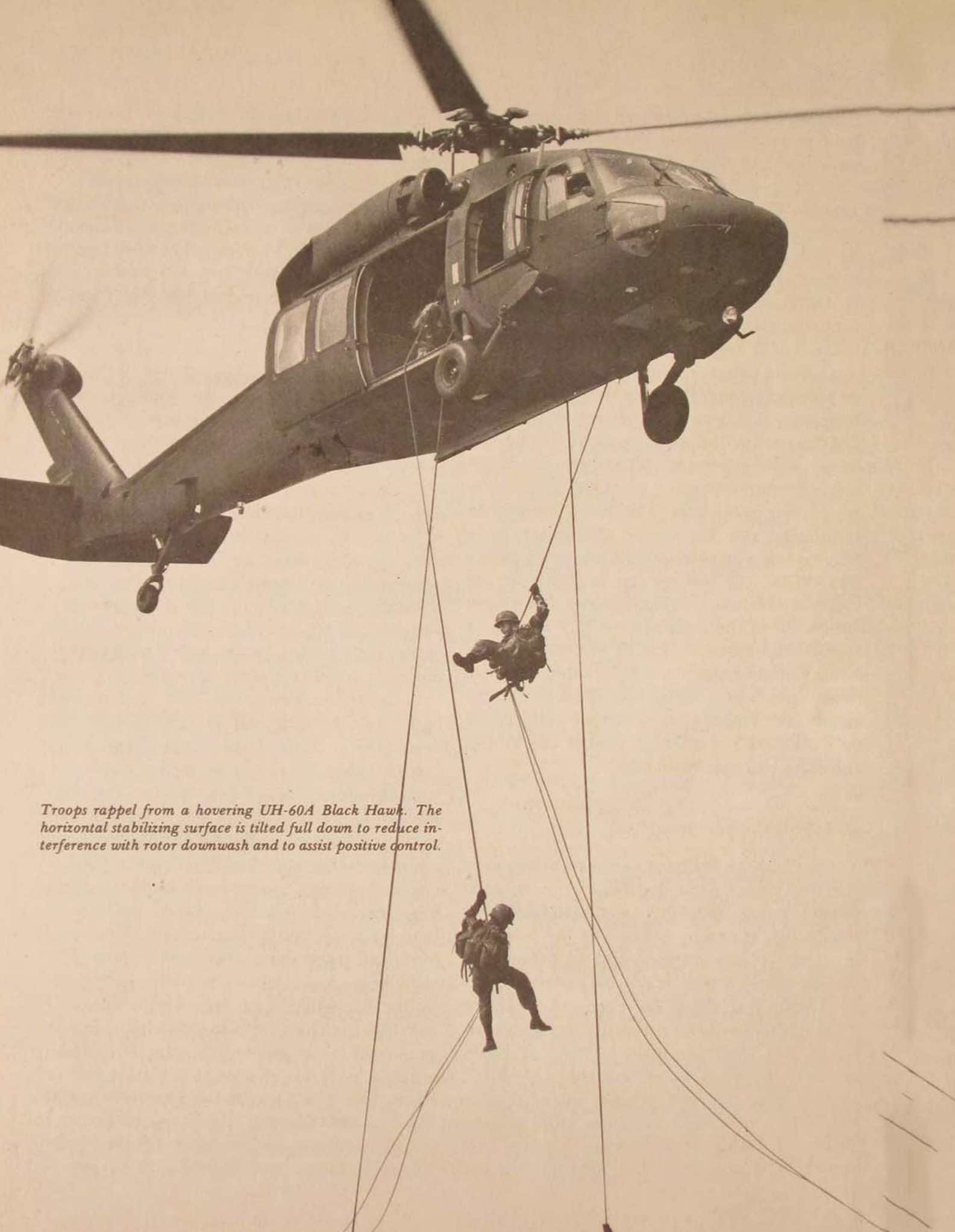
Troops rappel from a hovering UH-60A Black Hawk. The horizontal stabilizing surface is tilted full down to reduce interference with rotor downwash and to assist positive control.

flectance and camouflage paint. In the case of the AAH, the nearly flat canopy glass goes a long way toward preventing reflections that could give away the aircraft's location.

But even if the Black Hawk and AAH are detected, they are designed to survive small arms fire. The Black Hawk is totally invulnerable to 7.62-mm rounds and has minimum vulnerability to 12.7-mm and 23-mm projectiles while in forward flight. The AAH can totally withstand the 12.7-mm threat and has minimum vulnerability to 23-mm high energy incendiary (HEI) rounds during hover and forward flight. The AAH has more stringent vulnerability requirements since it will have to operate in a more hostile environment.

Let us look at how these airplanes attain their high degree of survivability. From experience in Southeast Asia, the primary reasons for mission aborts, crashes, and forced landings were damage to engines, flight controls, and lubrication systems, or crew injuries.

The twin engines of the UH-60A and YAH-64 provide good single engine performance, which means that the craft can get home even if it loses one engine. The widely separated engines on both choppers reduce the chance that both engines are knocked out. The T700 engine uses suction type fuel delivery rather than fuel pumps at the fuel tanks. Thus, if the fuel line is severed, fuel is not pumped into the air creating a fire hazard; instead the fuel lines are sucked dry. The self-sealing fuel tanks can survive a hit from a 23-mm HEI round.

The transmissions are designed to run 30 minutes without lubrication, and tests have demonstrated that they can actually run for up to an hour without any oil. The tail rotors are designed to shift automatically to the maximum thrust position if the controls are hit. Even if the tail rotor is shot away, the large vertical tails will provide sufficient stability in forward flight to ensure survivability. The main rotor blades of both craft can survive a hit from a 23-mm weapon and still function well enough to get home. The flight controls themselves have re-

dundant mechanical, electrical, and hydraulic systems.

In both the Black Hawk and AAH, crew survivability is increased by lightweight boron-carbide armor which can defeat 12.7-mm fire. The windshield and instrument panel of the UH-60A are made of a material that reduces spalling, a source of many casualties. On the AAH, the two crewmen are separated by a clear blast fragment shield; if a 23-mm HEI round penetrates one compartment, the other crewman would be unaffected. All in all, studies and tests have shown that only 10 percent of the Black Hawk is vulnerable to 23-mm ammunition, and less than 5 percent of the AAH would fail to meet this threat.

Finally, there is the matter of crash survivability. Both choppers are designed to give maximum crew protection in case of a crash. In fact, both helicopters are among the most crash-survivable aircraft ever built. For example, they are designed to let the crew walk away from a 2500-foot-per-minute vertical descent, and the critical fuel tanks are capable of sustaining drops of up to 3900 feet per minute. Crash survivability is given special attention in the Black Hawk because of its troop-carrying mission. There are special crashworthy seats for both the crew and passengers. The cabin structure is designed to retain the engines and transmissions, to prevent them from crashing down into the cabin under high crash loads; and the fuselage is especially rigid, to prevent parallelogramming that could result in the jamming of doors and windows preventing escape. The location for the landing gears was picked so that during a crash they would not penetrate the cabin or fuel cells. Electrical lines are excluded from the bottom of the fuselage, to prevent severing during a slide along the ground and thus causing sparks that could set off a fire.

maintainability and reliability

Because maintenance accounts for a significant portion of the life-cycle costs of any complex

military weapon system and because when an aircraft is out of commission for repairs it is not available to fight, considerable thought went into the design of the Black Hawk and AAH to achieve helicopters with high reliability and which require a minimum of maintenance. These goals are met by using components with high mean-time-between-failure rates, incorporating features that make it easy to repair and remove components, eliminating the need to replace components at preset periodic intervals, and by having an on-board Fault Detection/Location System.

The high reliability of these two aircraft is achieved by making their designs as simple as possible and by derating, that is, operating components much below their fatigue failure limits. Most important, though, their reliability is attributable to the very low vibration levels found on the UTTAS and AAH. For example, there is no single component having an expected life of less than 4500 hours for the Black Hawk and 5000 hours for the AAH. When all the thousands of components are put together, the overall mean-time-to-failure for the Black Hawk is projected to be 4.5 hours and 3.4 hours for the AAH. Here a failure is defined as any malfunction, even a burned out light bulb. If we talk about only those failures that would cause a mission abort, then the mean-time-to-failure goes up to 76 hours for the Black Hawk and 20 hours for the AAH. The more sophisticated mission equipment and more stringent mission requirements of the AAH account for its lesser reliability. The basic airframe of both aircraft are essentially equivalent in reliability.

The T700 engine is a perfect example of the ease of maintenance found in these two aircraft. It requires about 15 minutes to replace any of the two dozen flightline replaceable accessories, and all field maintenance can be done using only ten standard tools found in any mechanic's toolbox. The engine itself can be easily removed from the aircraft. During the YAH-64 flight test program, two men demonstrated that they could remove an engine in only 25 minutes. Since the engine is composed of only five separate modules, once it is out of the aircraft, the faulty module can be replaced and the engine reinstalled. Replacement of all five modules takes only about an hour and a half.

The AAH main transmission can be removed without having to touch any part of the rotor system. Other examples of the attention to detail that results in low maintenance costs include built-in work platforms and aircraft-mounted cranes that have essentially eliminated the need for workstands. All these features have reduced the maintenance man-hours per flying hour to 2.8 for the Black Hawk, a markedly low figure for a helicopter. The AAH requires about six man-hours per flying hour because it is a more complex aircraft flying a more sophisticated mission.

uses and deployment

Current plans call for buying 1107 Black Hawks, the first production aircraft having been delivered in August of 1978. The total procurement of Black Hawks will take some eight years.

As a rough comparison of the capability of the UH-60A versus the UH-1, a combat lift company with 15 Black Hawks can provide the same lift capability as 23 UH-1s. Additionally, the cost of operating a UH-60A will be approximately the same as for one Huey, even though the UTTAS is more complex and with two engines uses more fuel.

While the decision has been made as to the configuration and contractor for the AAH, full-scale production will not take place until mid-1981. During the intervening period some minor deficiences found during the test program will be corrected, but the bulk of the time and effort will be spent on developing and testing the mission equipment. The pacing items will be the Target Acquisition and Designation System and the Pilot Night Vision System. First the TADS/PNVS must be selected from designs proposed by two competing contractors. A major factor in this selection will be the results of actual test-

ing of the two competitive designs of the AAH. The selection will be followed by extensive testing and engineering to ensure that the final AAH configuration is ready to be put into the hands of the operational pilot.

The AAH should be operational in the mid-1980s with the main deployment in Europe, taking its place alongside the AH-1S Cobra-TOW with its TOW missile. A total of over 500 AAHs is planned.

The question often arises, do we need both the AAH and the Air Force A-10? The answer is a definite yes since they serve distinctly different missions. The A-10 provides close air support in the form of air attacks against hostile targets that are near friendly forces, but it is not under the direct control of the ground commander. The AAH, on the other hand, will be directly controlled by the ground commander and will be used as a homogeneous component of the ground forces. The AAH performs the same tasks as the more conventional artillery, tank, and infantry weapons, but with greater firepower and mobility. The AAH and A-10 complement but do not duplicate the capabilities of one another.

One of the primary factors governing the size of these two new helicopters is being able to transport them in the USAF's C-130, C-141, and C-5A aircraft. Not only must they be transportable, but one must also be able to disassemble them for flight and reassemble them for action in a minimum amount of time. For example, one Black Hawk can be carried in a C-130, two in a C-141, and six to eight in the C-5A. To prepare the Black Hawk for air shipment, the rotor mast is lowered, the main and tail rotors are folded, and the tail section itself is folded. All of this, including loading into the aircraft, takes about two hours. To put everything back together at the end of the trip takes slightly more than two hours. Both aircraft can be ferried over long distances, over 800 nautical miles. This means that if air transportation becomes critical both aircraft could be ferried to Europe, since the longest leg across the Atlantic is not quite 800 nautical miles.

Many lessons have been learned about the use of helicopters in war since the first choppers were employed on the battlefield in the waning days of World War II. The Army has found the missions for which the helicopter is best suited and has refined helicopter tactics. With the advent of the Black Hawk and advanced attack helicopter, the U.S. Army will have helicopters that were designed from the ground up to be fighting vehicles.

West Point, New York

Bibliography

Bauer, Daniel R. Major "Tank Killer" *Armor* May-June, 1977
Butler, John K., Captain. "UTTAS." *Armor* May-June 1977
Funk, David L. Lieutenant Colonel, "The Advanced Attack Helicopter Challenge." *Armor* January-February 1978.

Gormont, Ronald E. and Wolfe, Robert A. "The U.S. Army UTTAS and AAH Programs." Paper presented to the AGARD Rotorcraft Design Symposium, Moffett Field, California, May 1977.
Wolfe, Robert A. "Army UTTAS Program." Society of Automotive Engineers, Paper No. 770952.
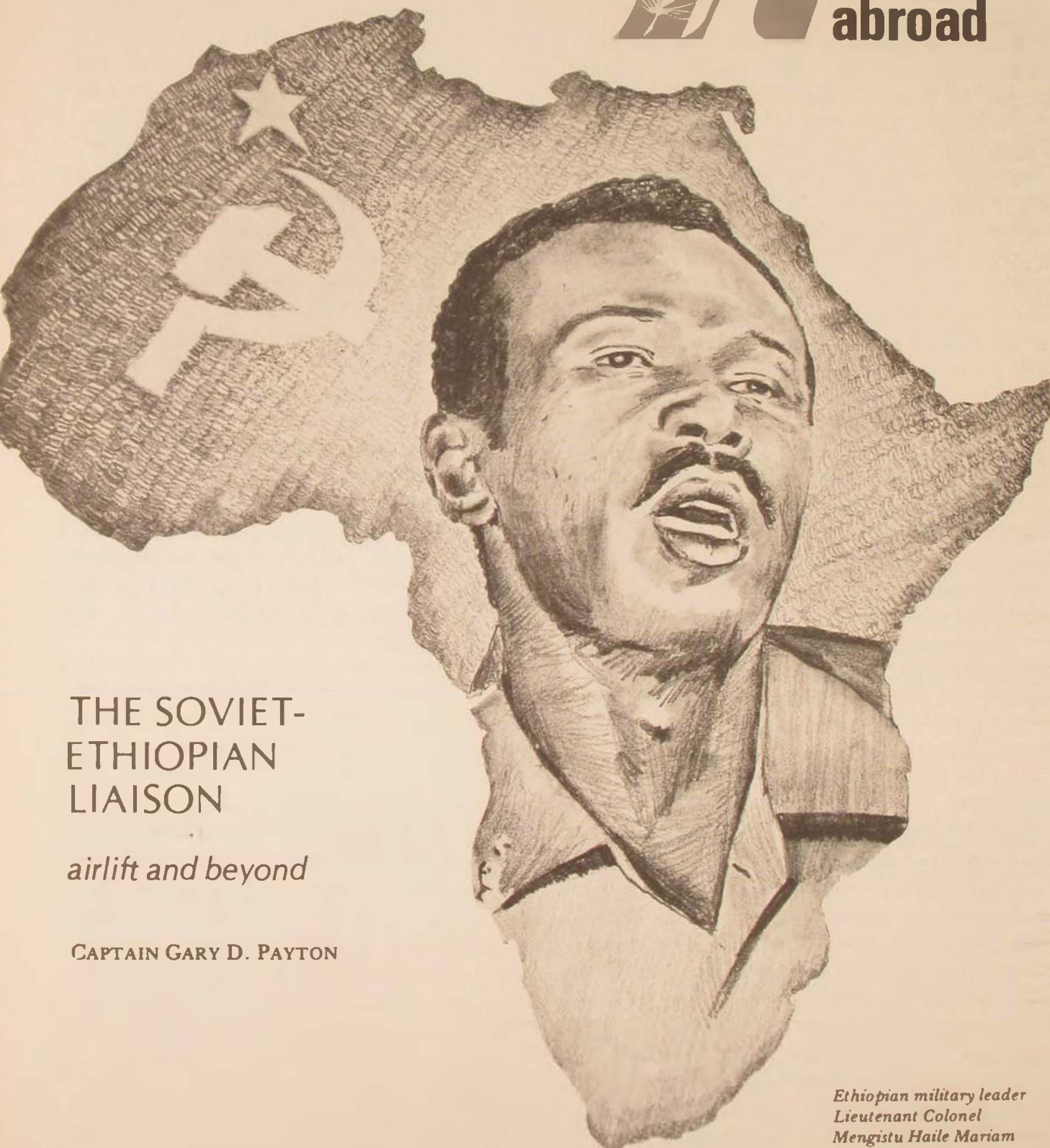
THE SOVIET-ETHIOPIAN LIAISON

airlift and beyond

Captain Gary D. Payton

*Ethiopian military leader
Lieutenant Colonel
Mengistu Haile Mariam*

ON the night of 28 November 1977, the Soviet Union launched a major military airlift of arms and materiel bound for the Horn of Africa.[1] In succeeding weeks the U.S.S.R. employed An-12 (NATO Cub) and An-22 (NATO Cock) transport aircraft along with sea-going cargo vessels to deliver an estimated $1 billion in fighter-bombers, tanks, artillery, and ammunition to the Ethiopian regime of Lieutenant Colonel Mengistu Haile Mariam. Mengistu's armies were staggering in the Ogaden desert under the attack of Somali-backed rebels, trying to capture territory claimed by the Mogadiscio government as part of a "Greater Somalia." Although this resupply campaign did not rival the scale of the 1973 effort to rearm the Arab states in the wake of the October War, it was highlighted by the speed of Soviet reaction and the morale boost it provided the beleaguered Ethiopian army. As a result of the weapons supplied by the U.S.S.R. and the augmentation of Mengistu's forces by Cuban combat soldiers and Soviet technicians and advisors, Ethiopia mounted a successful counteroffensive to regain the Ogaden in February and March of 1978.

These recent events clearly demonstrate the ability of the U.S.S.R. to project military force abroad in order to achieve foreign policy objectives. In the short-term this episode affirms the foresight of those military planners of the 1960s who recognized the requirement of the Soviet armed forces to be globally mobile. In the long-term the Ethiopian liaison marks the logical conclusion of a Soviet foreign policy process driven by ideological, geopolitical, and systemic needs. In response to four basic questions, this article will examine *how* U.S.S.R. military doctrine and capability have grown to accomplish this task, *what* the Soviet-Ethiopian relationship has been over time, *why* this new political and military affiliation has developed, and *where* the relationship may lead.

How?

The military force responsible for success in Ethiopia did not materialize overnight to meet this specific crisis. It had been carefully and capably constructed over the last decade to fill a void in the otherwise potent armor of Soviet offensive forces. In repeated post-World War II episodes, Soviet military leaders had witnessed demonstrations of U.S. ability to project military force abroad. They could not help being impressed by America's air and sealift capability to respond to crises in Berlin (1948), Korea (1950), Lebanon (1958), the Dominican Republic and Vietnam (1965). This final example was the most spectacular. In 100 days the United States moved 100,000 men to a locale 10,000 miles from our borders with relative ease of transport and without substantially reducing our troop commitments elsewhere in the world.[2] If the Soviet Union were truly to become a world power, its military had to achieve a force mix capable of projecting power around the globe.

In his concise account of how Soviet military strategists developed their mobility concept, Colonel William F. Scott, former U.S. Air Attaché in Moscow, has argued that the Soviet armed forces are firmly dedicated to the defense of those socialist countries traditionally allied with the U.S.S.R. This defensive dedication has now been extended to progressive socialist regimes in the Third World. As the new doctrine slowly emerged from the Academy of Science's research institutes and the General Staff, the announced emphasis on the role of the military changed. Leonid Brezhnev asserted in 1971 at the 24th Party Congress that "the Soviet Armed Forces are prepared *to repel* an enemy attack, no matter from where it comes."[3] Yet by 1974 this previous characterization, based on defense of the homeland, was modified by the Minister of Defense, Marshal Andrey Grechko, to affirm that:

> At the present stage the historic function of the Soviet Armed Forces is not restricted merely to their function in defending our Motherland and the other socialist countries. In its foreign policy activity the Soviet state actively purposefully opposes the export of counter-revolution and the policy of oppression, supports the national-liberation struggle, and *resolutely resists imperialist aggression in*

whatever distant region of our planet it may appear.[4]

The shift in emphasis to an aggressive defense of progressive forces no matter where they reside has been called ". . . probably the most significant Soviet pronouncement on international affairs made thus far in the 1970s."[5] Yet until 1977 there had been only limited foreign demonstration of this doctrinal change. Prior to 1977 the most significant projection of force into sub-Saharan Africa was the support provided Angola in 1975 and 1976. At that time the U.S.S.R. ferried Cuban combat troops to Angola via Aeroflot (Soviet national airline) aircraft and troop ships and supplied military hardware to the floundering government of Dr. Agostinho Neto. The Soviet assistance proved to be but a foreshadowing of events in Ethiopia, however.

Development of the military hardware to implement this new policy has been fully documented in recent years. Through a sustained program to upgrade the Soviet navy and expand and modernize the Soviet air force, the U.S.S.R. now possesses the military capability to influence international events on a worldwide scale. Most relevant to the Ethiopian adventure is the proven ability of the An-12 Cub and the An-22 Cock to "surge" arms and materiel to a location thousands of miles from the Soviet homeland. As demonstrated in late 1977, the Soviet air force can respond in rapid fashion to meet the crisis needs of the nation's client states. By coupling its air and sealift capacity, the Soviet military has demonstrated once more that it maintains a force with proven global reach.

What?

The roots of Russian interest in Ethiopia run far deeper than the recent emergency. Drawn by the prospects of uniting the Orthodox world, Russian czars beginning with Peter the Great sought to curry favor with the feudal aristocracy of Abyssinia. This interaction was later highlighted by the exchange of ambassadors in the 1880s as Czar Alexander III tried to influence the imperial court of Ethiopian Emperor Menelik II. In an overlooked footnote to Russian history, Slavophile officials under Alexander viewed the Horn as a logical location for a Russian colony during the years that the European powers were partitioning the African continent. To that end, the small colony of New Moscow was established in the present state of Djibouti in 1889.[6] Though the handful of hearty adventurers ultimately returned to Russia, the importance of the Strait of Bab al-Mandab continued to be recognized by military strategists.

Not to be outdone by the Western powers, who were allocating the spoils of World War II, Stalin attempted to acquire a United Nations trusteeship over the Red Sea colony of Eritrea or Italian Somalia in 1945 and 1946. But, despite his diplomatic jockeying, Stalin came away empty-handed as the territories were kept within the Western sphere of influence.[7]

When Ethiopia signed a military assistance agreement in 1953 with the United States, Soviet interest in Ethiopia was effectively checked for twenty years. During this period U.S. military personnel trained and equipped thousands of Ethiopian regulars in the conduct of conventional and counterinsurgency warfare. In return, the United States operated a sophisticated communication facility at Kagnew Station in the Eritrean capital of Asmara. All of these factors changed, however, with the demise of Emperor Haile Selassie I in a "creeping coup" of 1974. The radical Provisional Military Administrative Council, or Dirgue, espoused their belief in Marxism-Leninism as the only method of bringing true social reform to Ethiopia. As the Dirgue grew increasingly hostile in its denunciation of the United States, relations between the two states cooled. When the U.S. refused to supply additional war materiel requested by the Addis regime, the military council looked elsewhere for support.

Faced with growing dissent in the Ethiopian provinces, a hostile Somali government across the Ogaden border, and a continuing armed liberation movement in Eritrea, the Dirgue

turned to the U.S.S.R. for military assistance. In December 1976 Ethiopian military leaders signed an arms agreement in Moscow assuring a renewed flow of modern weapons.

Had the scenario continued on a "peaceful" course, it is possible that Soviet military assistance would have flowed into Ethiopia via routinely scheduled air and sea deliveries. The arms buildup would have been progressive. Some Soviet technicians would have been required for training and weapons familiarization, but no massive resupply effort could be foreseen. Ethiopia would be just another sub-Saharan state undergoing a periodic flirtation with the Soviet Union and the African brand of Marxism.

But external factors precluded this "peaceful" scenario. In July 1977 the Western Somali Liberation Front, backed by regular Somali forces, mounted an offensive against the Ogaden Province of Ethiopia. In rapid order the Somalis rolled back the Ethiopian army and by October had captured one-third of the nation's territory. This action, coupled with the military successes of the Eritrean "freedom fighters," placed Colonel Mengistu in a desperate situation. The vital rail link connecting the central highlands with the port facilities of Massawa and Assab were harassed by Eritrean guerrillas. If Mengistu were to survive this crisis and continue the Ethiopian revolution, drastic measures had to be taken. Those drastic measures took the form of the airlift of arms and materiel from the Soviet Union and the infusion of thousands of Cuban combat soldiers to assist in the Ogaden battle.

The critical nature of Mengistu's situation was illustrated by the actions of his Soviet and Cuban supporters. In the sixty days after the airlift began, fifty flights were flown from bases in southern Russia to the Ethiopian capital.[8] Soviet pilots reportedly filed false reports with air traffic controllers along the routes to mask the nature of their missions and the on-board cargo. To relieve the strain placed on the Cuban air force, which was contributing pilots for the Ogaden conflict, it was reported that as many as 30 Soviet air defense pilots were transferred to Cuba

to fly MiG-21 interceptor missions.[9] Finally, not trusting its monetary and manpower investment to the direction of Ethiopian commanders, Moscow assigned General Vasiliy I. Petrov, Deputy Commander in Chief of Soviet Ground Forces, to coordinate the counteroffensive against Somalia.[10]

The airlift transferred crated MiG-21 fighters, self-propelled artillery, and modern battle tanks from supply depots across the southern regions of the U.S.S.R. In particular, war materiel stored near the Central Asian city of Tashkent was flown to the combat theater.

Though some Cuban soldiers flew into Ethiopia directly from Havana, hundreds of troops were shuttled across Africa from garrisons in Angola. To this end the existing fleet of Ethiopian airline Boeing 707s proved most useful.[11] Not configured for cargo, these aircraft served as "people haulers" in the cross continent hop.

Why?

By itself, Mengistu's plight may not have been sufficient cause to generate the kind of Soviet response that followed. The crisis did, however, present the *opportunity* for the U.S.S.R. to reassert its presence on the Horn of Africa. Only days before the airlift began, President Muhammad Siad Barre ejected Soviet military advisors from Somalia, closed the port facility of Berbera to the Soviet navy, and abrogated the three-year-old Treaty of Friendship and Cooperation. While it is doubtful that Politburo and Ministry of Defense officials had fully assessed the impact of this action, the Somali episode undoubtedly influenced the decision to initiate the airlift. Yet to justify a $1 billion resupply effort, significant factors beyond Mengistu's battle losses and the Somali expulsion had to be at work.[12]

ideology and doctrine

The ruling elite of the Soviet Union and Ethiopia profess their dedication to Marxism-Leninism. One Western analyst has suggested

that the aging Soviet leadership was greatly inspired by the revolutionary zeal of Mengistu and his cohorts. This view implies that the U.S.S.R. sees the Ethiopian military regime as a fledgling Marxist government dedicated to the destruction of the feudal aristocracy and intent on land reform and the continuation of an Ethiopian class struggle. Soviet Foreign Minister Andrey Gromyko has reportedly described the Dirgue leadership as "young revolutionaries for whom the Soviets would do much."[13]

Beyond any shared ideology lies the doctrinal commitment to assist friendly governments in

tion of African Unity position regarding the inviolability of colonial borders and indicated that they were firmly supporting an established principle in African international relations.

geopolitics

Despite the moral tone of these arguments, they offer little substantive rationale to explain the 1977 airlift. This ideological posturing only serves to confuse the more basic motives of Soviet foreign policy. In a recent presentation former Secretary of State Henry Kissinger dismissed the
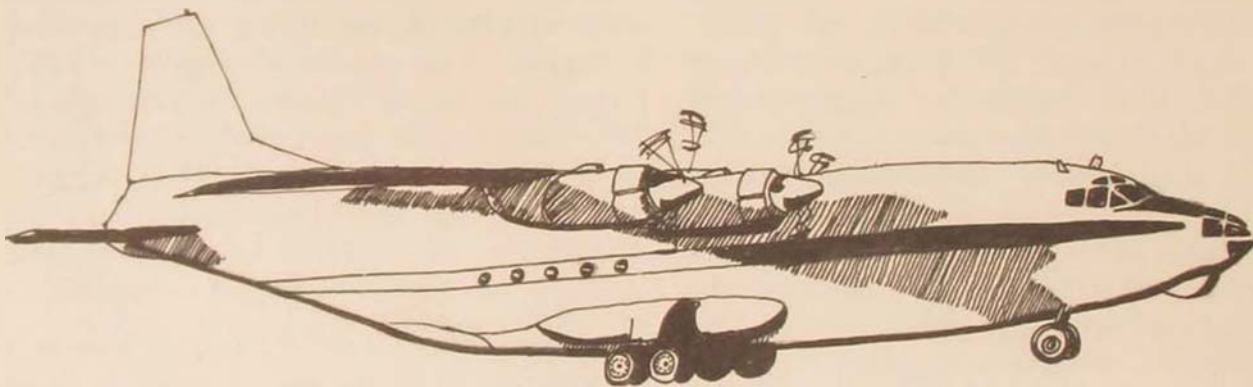
Antonov An-12 Cub

repelling foreign aggression. The new Soviet constitution, accepted by the Supreme Soviet in 1977, "virtually enshrines the Brezhnev doctrine by committing the Soviet state to 'strengthening the position of world socialism and supporting the struggle of peoples for national liberation.' "[14] It further guarantees the "inviolability of borders" and the "territorial integrity of states." Throughout the Ogaden war, the U.S.S.R. stressed that its support to the Dirgue was based on an Ethiopian request for military assistance to repel the Somali invaders. The Soviets repeatedly affirmed the Organiza-

unselfish" response of the U.S.S.R. to the Ethiopian appeal for assistance and stated that their motives were strictly geopolitical. The Soviet Union, he asserted, was trying "to outflank the Middle East, to demonstrate that the US cannot protect its friends, to raise doubts in Saudi Arabia, right across the Red Sea, in Egypt, in the Sudan, in Iran."[15]

During a March 1977 visit to the Horn of Africa, Cuba's Fidel Castro met in Aden with the leaders of Ethiopia and Somalia. Castro's intention was to gain acceptance for a Soviet scheme to create a loose confederation of states on the

Horn. The concept of confederation would unite the "Marxist" governments of Ethiopia, South Yemen, and Somalia, thereby creating a powerful geographic block surrounding the Strait of Bab al-Mandab.[16] Both Moscow and Havana miscalculated the historic animosity between the Ethiopians and the Somalis, and the July eruption of the Ogaden war effectively scuttled all hope for the confederation.

Events in northeast Africa during November 1977 were the cause of extreme concern for the Kremlin leadership. Besides the Somali eviction and the state of Ethiopia's Ogaden battle, the

Moscow has been embittered with Sadat's independent actions. Support to Ethiopia can in part be interpreted as a further attempt to isolate Sadat by bolstering another Red Sea "Marxist" regime.

Perhaps the most touted explanation for the intervention on the Horn of Africa is the Soviet desire to control the sea lines of communication in the northwest Indian Ocean. Clearly a sizable military force based in Ethiopia would be in a position to disrupt the shipping routes carrying crude oil to Western Europe and the Americas. Likewise, this military force (naval and air)
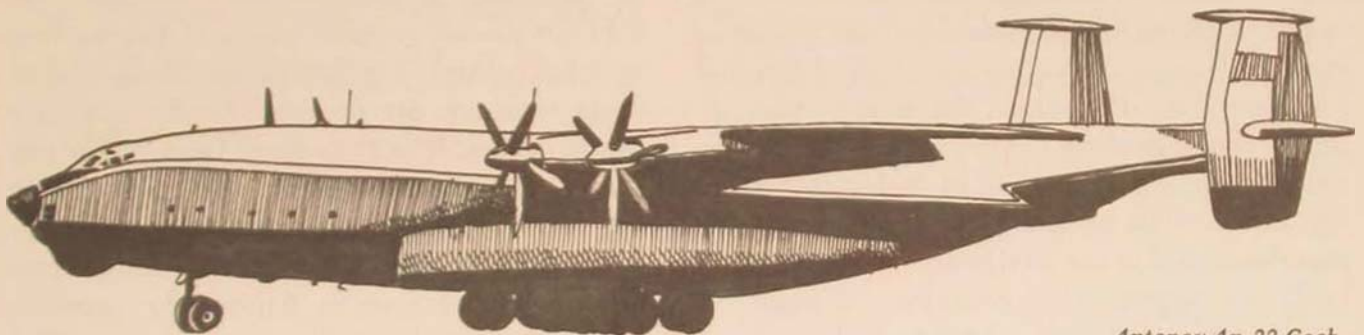
Antonov An-22 Cock

dramatic diplomatic maneuvers of Egypt's President Anwar Sadat brought into serious question the Soviet Union's future policy in the Middle East. Had Sadat's 19 November journey to Jerusalem resulted in the immediate resolution of long-standing Arab-Israeli strife, Soviet leverage on its remaining Arab allies might have been markedly reduced.

These Middle Eastern events may have been a significant factor in the decision to launch the Ethiopian airlift on 28 November. Since the 1972 explusion of military personnel from Egypt and the renouncement of a $4 billion debt,

could serve to diminish the threat of U.S. submarine-launched ballistic missiles which may be operating in the Persian Gulf. Despite the array of proponents of this view, the fact remains that if the U.S.S.R. severed these sea lines it would be committing an act of war that could escalate into a major military confrontation. If the act were conducted in isolation, the American reaction would presumably be swift and powerful. If the act were conducted as an immediate prelude to general war, the relative importance of the Horn of Africa would be greatly diminished. Attention would quickly turn to the European

theater and focus on NATO and Warsaw Pact forces. While the international waterways adjacent to this region may serve as a genuine pressure point to threaten Western nations, once armed conflict has begun the strategic importance of the Horn of Africa may quickly be forgotten.

political legitimation

Neither ideology nor geopolitics provides a completely satisfactory explanation of Soviet motives in northeast Africa. To gain more insight into the rationale behind the events, one must carefully view the state of Soviet domestic politics in the era of détente. Historian Richard Pipes in testifying before the Senate Armed Services Committee has suggested that the Soviet political system requires crises in order to sustain itself.[17] Because the ruling elite lacks a popular mandate from the people, the regime must appear to be protecting the population from internal and external enemies in order to remain legitimate. This need for political legitimation manifests itself in the foreign sector in the exploitation of targets of opportunity. Through the use of a strategic airlift, the Soviet Union assured the survival of a new-born "Marxist" state despite the combined efforts of "Western imperialists." The stabilization of Mengistu's regime can therefore be offered to the people of the nation as another positive step taken by the ruling elite of the Communist party to defend socialism against foreign aggression.

For the last thirty years, the United States has represented in the eyes of the Soviet leadership all the evils inherent in the capitalist system. During this time the repeated confrontations between the U.S. and the U.S.S.R. have provided ample opportunities to be manipulated by the Soviet elite to serve its purposes. The era of détente has brought relative calm to superpower relations. With that calm the number of external crises that could be exploited was reduced. But the need to affirm the legitimacy of the party continues. It now appears that the

Soviet Union has focused on the Third World as the next arena to provide the necessary "proofs of victory." This systemic need for turmoil is a basic characteristic of the Soviet political process. In spite of détente, demonstrations of the "superiority" of the Soviet state will always be required. It is a logical conclusion, then, that a regular and recurring feature of East-West relations in the 1980s will be episodes of support similar to that seen in the Soviet-Ethiopian liaison.

Where Now?

As 1978 drew to a close, the full impact of Soviet intervention in Ethiopia became clearer. With the weapons provided by the U.S.S.R. and the guidance of Cuban military advisors, the Ethiopian army wrested much of Eritrea from its rebel holders. The November offensive effectively returned the province to the control of Addis Ababa. The U.S. State Department concluded that the Ethiopian gains resulted from the overwhelming arms superiority enjoyed by the government forces.[18] This, then, is the lesson of the Soviet-Ethiopian liaison: By providing massive amounts of military equipment to one side of a sputtering military conflict, the U.S.S.R. can tip the balance of power to achieve Moscow's political objective. Indeed, without Soviet arms Mengistu's ability to remain in power was questionable. He had been challenged simultaneously by internal political disorder, the Eritrean liberation movement, and the Somali insurgency. Between September 1977 and June 1978 no fewer than nine assassination attempts were made on his life.[19] Now, however, his shaky regime has been stabilized through Soviet military assistance.

In the tradition of Soviet/Third World relationships, Moscow signed a Treaty of Friendship and Cooperation with Ethiopia on 20 November 1978. This treaty served to replace the one abrogated by Somalia the year before. It now complements those signed by the African states of Angola (1975) and Mozambique (1977). But can

the U.S.S.R. genuinely assist Ethiopia in improving its economy and better the life of the people? True, the Soviet Union now possesses adequate strength to project military force abroad, but what happens after the political objectives are achieved? The Soviet economic model does not provide a viable alternative for developing nations. The U.S.S.R. may inject massive amounts of military hardware to achieve battlefield success, but in the long-term it fails to satisfy the genuine needs of the client state.

Washington, D.C.

Notes

1. Don Oberdorfer, "The Superpowers and Africa's Horn," *Washington Post*, March 5, 1978, p. A10.

2. Morton Schwartz, *The Foreign Policy of the USSR: Domestic Factors* (Encino, California: Dickenson Publishing Co., 1975), pp. 42-46.

3. William F. Scott, "The USSR's Growing Global Mobility," *Air Force Magazine*, March 1977, p. 57, quoting Leonid Brezhnev.

4. Ibid., p. 57, quoting Andrey Grechko. Emphasis added.

5. Ibid.

6. Edward T. Wilson, *Russia and Africa before World War II* (New York: Holmes and Meier, 1974), p. 52.

7. Alvin Z. Rubinstein, *Red Star on the Nile: The Soviet-Egyptian Influence Relationship since the June War* (Princeton, New Jersey: Princeton University Press, 1977), p. 3.

8. Bonner Day, "Soviet Airlift to Ethiopia," *Air Force Magazine*, September 1978, p. 55.

9. *Aviation Week & Space Technology*, March 6, 1978, p. 9.

10. Bernard Gwertzman, "U.S. Cautions Soviet Its Action in Africa May Hurt Relations," *New York Times*, February 26, 1978, p. 1.

11. Roland Evans and Robert Novak, "Africa: Will Carter Move Too Late?" *Washington Post*, March 2, 1978, p. A23.

12. For a discussion by this author of the Soviet-Somali liaison see "Soviet Military Presence Abroad: The Lessons of Somalia," *Military Review*, January 1979, pp. 67-77.

13. Kevin Klose, "Ethiopians' Zeal Said to Captivate Kremlin Leaders," *Washington Post*, November 16, 1977.

14. Peter Vanneman and Marlin James, "Soviet Thrust into the Horn of Africa: The Next Targets," *Strategic Review*, Spring 1978, pp. 58-59.

15. "Moscow's Geopolitics," *Time*, May 8, 1978, p. 37.

16. John Darnton, "Turnabout in Africa: Somali Ouster Completes Shift of Soviet Role," *New York Times*, November 15, 1977, p. 8.

17. U.S., Congress, Senate, Committee on Armed Services, *Hearings before the Subcommittee on SALT*, 91st Cong., 2d sess., 1970.

18. "Ethiopia's Eritrea Gains Attributed to Soviet Aid," *New York Times*, December 1, 1978, p. A5.

19. "Ethiopia Tells of 9 Tries on Mengistu's Life," *New York Times*, June 29, 1978.

I've thought a lot about change, and change for change is always worse. Not only it is not better, it's worse.

Changes are for the worse. The only thing that is better, that's happened in my lifetime, is the invention of Scrabble.

Cleveland Amory in "PW Interviews,"
Publishers Weekly, September 10,
1979, p. 9

IS THERE *REALLY* A BETTER WAY TO WIN A WAR IN EUROPE?*

Major Charles W. Specht

I S it any longer possible for the North Atlantic Treaty Organization (NATO) to win a war against the vast Warsaw Pact forces? Should the United States consider major increases in military spending to close the quantitative gap? Or should it accept the reality of continuing, relative weakness and develop a qualitatively new strategy to offset quantitative disadvantages?

William S. Lind and Lieutenant General Raymond B. Furlong, then Commander of Air University (ATC), have recently addressed this latter alternative.[1] Neither Mr. Lind nor General Fur-

long discounts the need to modernize existing military hardware, but both men draw on military history and the ideas of Air Force Colonel John Boyd and British military theorist B. H. Liddell Hart to explore alternatives to current U.S. strategy. Mr. Lind and General Furlong both seek ways of winning a war without directly confronting opposing forces that have insurmountable advantages in military resources. However, they apparently forget that not since the eighteenth century have commanders won wars by *avoiding* battles. The history of warfare since the French Revolution and Napoleon supports Clausewitz's dictum that "the destruction

of the enemy is what always matters most."[2] NATO can accomplish this objective only through substantial improvement in its existing military capability.

In his analysis of air-to-air combat, Colonel Boyd concluded that the success of the F-86 during the Korean War was due to its ability to proceed from one individual maneuver to another maneuver more rapidly than the MiG-15. Thus, the United States pilots were able to keep the enemy off balance by operating within his ability to receive information, process it, and then act on it. Such tactics succeeded because the enemy became so psychologically confused and disorganized that he could no longer fight effectively.[3]

In building on Colonel Boyd's theory, Lind identifies the doctrine of firepower/attrition and the doctrine of maneuver as two basic doctrines for ground force operations:

> Both employ the same elements, fire and maneuver, but firepower/attrition doctrine uses maneuver primarily as a way to transport and position firepower so that firepower can physically destroy the enemy by attrition. According to firepower/attrition doctrine, the object of military action is *physical destruction of the enemy*. This is not the object of maneuver doctrine, where *firepower is used only when necessary to create opportunities for maneuver*. Maneuver doctrine's object is to break the spirit and will of the enemy command by creating surprising and dangerous operational or strategic situations.[4]

Mr. Lind maintains that modern military history demonstrates the superiority of maneuver doctrine over firepower/attrition doctrine. And he criticizes Army Field Manual 100-5, *Operations*, because it requires Army movement and reinforcement to counter the strengths of Warsaw Pact forces rather than exploit their weaknesses.[5] For example, the Army intends to destroy large numbers of Soviet tanks, but Lind considers this strategy a mistake. That is, Soviet commanders *expect* to lose tanks, but they are psychologically dependent on the support provided by their artillery. Lind proposes that NATO tactical air power should destroy Soviet

artillery and that NATO strategy should be revised to exploit other Soviet vulnerabilities.[6]

General Furlong's position is similar to Mr. Lind's in some respects. However, General Furlong takes a more balanced and tentative view and seems much less certain that he has discovered a magic formula for NATO victory. He states that "classical strategy alone, while it is a worthwhile subject for study, cannot form the basis for the tasks our nation now faces. . . . We can no longer rely on raw strength and must now turn to brainpower."[7] In borrowing from Liddell Hart, General Furlong suggests that strategy has as its principal objective the mind of the enemy commander and that this objective can be accomplished either through destruction or disorganization. The principle of disorganization "seeks to disorient the enemy by presenting incomplete and inaccurate data; to disrupt operations to generate confusion, disorder, panic, and chaos; and, through these actions, to shatter cohesion and cause paralysis and collapse."[8] General Furlong prefers a strategy of disorganization similar to the strategy used in guerrilla warfare and in the battle of France in 1940 when German Field Marshal Heinz Guderian fought and defeated French forces without destroying them. General Furlong calls for the development of new strategies and, thus, implicitly criticizes Army Field Manual 100-5.[9]

The ideas expressed by Mr. Lind and General Furlong reflect Liddell Hart's concept of the indirect approach in the use of military force: avoid enemy strengths, exploit his weaknesses, and emphasize the psychological aspects of war rather than physical destruction.[10] Lind refers to this approach as the "natural partner" of maneuver doctrine.[11] Although such tactics are obvious *aids* to victory, they fail to recognize adequately that firepower/attrition is still the deciding factor in modern warfare. The indirect approach can serve only as a *means* to this objective; it is not itself the objective, as Lind seems to indicate. One need not distort Clausewitz's classical dictum to affirm his validity in modern warfare. The primary objective of land battle

is destruction of the enemy's military force. The victorious force can then occupy territory to impose its will on the enemy population. Thus, maneuver and the indirect approach are only *means* to accomplish the classic objective of destruction.

In their analyses of history, Mr. Lind and General Furlong at times seem to misinterpret modern military history. For example, Professor Russell Weigley has shown that Sherman's march through Georgia was not an application of the indirect approach to defeat the South but rather an extension of Grant's strategy of annihilation. The march was a *means* to attrite the South's forces.[12] Weigley thus shows that, in this instance, Liddell Hart confused means and ends, and I believe that Mr. Lind and General Furlong have committed similar mistakes in their analyses. For instance, General Furlong points out that guerrilla warfare emphasizes the use of strengths against weaknesses and the avoidance of battle, but he fails to recognize that it also relies on attrition of the enemy's armed forces for final victory.[13] Mao Tse-tung ultimately defeated the Chinese Nationalists and General Vo Nguyen Giap defeated the French forces in Indochina through conventional warfare.

World War I also shows the necessity of confronting the enemy's strengths. Even if the peripheral actions in Gallipoli, Greece, Mesopotamia, and Palestine had been effective, the Allies would still have found it necessary to defeat the Germans on the Western Front. Even the withdrawal of Russia in 1917 did not eliminate the need for such a confrontation.

The experience of World War II leads to similar questions. The Germans came dangerously near to winning the Battle of Britian through the attrition of British pilots. If German fighters had been allowed to seek out and destroy British fighters well in advance of German bombers in the same manner that escorting American fighters engaged German fighters after January 1944, the Germans would have destroyed Royal Air Force resistance. Thus, contrary to Mr. Lind's view, the German decision not to exert a sus-

tained effort against radars and the fighter command and control network was not a critical factor in the eventual German defeat.[14] The Germans lost the battle not because they failed to use the indirect approach but because they failed to make the attrition of British pilots their primary objective.

Furthermore, Mr. Lind seems to forget that the fight for France was a battle, and the battle might have been decisive if the Germans had rapidly closed on Dunkirk to attrite the remaining French and British forces. Blitzkrieg maneuvers won the battle; failure to annihilate may have lost the war.

Mr. Lind states: "Some military authorities believe that Germany could have beaten the Soviet Union had the maneuver doctrine not been abandoned after 1941 on Hitler's orders in favor of a policy of holding ground."[15] Although military historians agree that German effectiveness declined largely because of Hitler's ineptness, they offer no strong support for the conclusion that Germany would have defeated Russia. Furthermore, this optimistic judgment in support of maneuver doctrine fails to consider such unique historical circumstances as Russia's lack of preparedness, Stalin's refusal to believe that Germany had attacked, and his purges of the Russian officer corps in the late 1930s. These circumstances militate against drawing parallels between the Eastern Front in World War II and the current situation in Central Europe.

The Germans lost World War II because of the attrition they suffered in the Battle of Britain, North Africa, Russia, the air battle over Germany, and the second battle of France. And the thrust in the central Pacific under Admiral Nimitz was an extremely effective application of the indirect approach, but the *United States Strategic Bombing Survey* concludes that the Japanese were ultimately defeated through attrition. A combination of sea mining, submarine warfare, surface blockading, conventional bombing, and nuclear weapons (instant attrition) led to the collapse of Japan. The indirect approach was *not* responsible for victory in

World War II. Blitzkrieg warfare on land and sea *failed* as an effective alternative to the prolonged carnage of World War I.

Therefore, the United States should not rely on a strategy based on the indirect approach, the doctrine of maneuver, and the mind of the commander as a panacea to the Warsaw Pact threat in Europe. In the first place, the Federal Republic of Germany would not support such a strategy. Mr. Lind states that the "holding of territory is not of prime importance" in maneuver doctrine, but the German Minister of Defense insists that the "defence of the Federal Republic of Germany must be conducted as far forward as possible, that is to say immediately at the intra-German and Czechoslovak borders."[16] And, contrary to Mr. Lind's contention, war is not just a "psychological contest." It is thus simplistic and dangerous to hold that the "task facing us at this time [is] the task of rendering our opponent's material strength *irrelevant to the outcome of the battle.*"[17] NATO forces must destroy Warsaw Pact forces in the event of a European war. Adoption of the proposed strategy would not only fail to bring victory, it would also weaken the inclination to develop the military capability necessary to prevail in future decisive military confrontations.

Travis AFB, California

Notes

1. See "Military Doctrine, Force Structure, and the Defense Decision-Making Process," *Air University Review*, May-June 1979, pp. 21-27, hereafter referred to as "Military Doctrine"; and "Strategymaking for the 1980's," *PARAMETERS*, Journal of the US Army War College, March 1979, pp. 9-16, hereafter referred to as "Strategymaking."

2. Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (Princeton, New Jersey: Princeton University Press, 1976), p. 577

3. William S. Lind, "Toward a New Understanding of War," in *ACSC Readings and Seminars*, vol. 11 (Maxwell AFB, Alabama: Air University/ATC, 1979), pp. 134-35.

4. Lind, "Military Doctrine," p. 22. Emphasis added.

5. Lind, "Some Doctrinal Questions for the United States Army," *Military Review*, March 1977, pp. 54-65.

6. Lind, "Toward a New Understanding of War," pp. 137-38.

7. Furlong, "Strategymaking," p. 9.

8. Ibid., pp. 14-15.

9. Ibid., pp. 9, 14-15.

10. B. H. Liddell Hart, *Strategy*, second revised edition (New York: Praeger, 1967).

11. Lind, "Some Doctrinal Questions for the United States Army," p. 60

12. Russell F. Weigley, "U.S. Strategic Legacy for Land Warfare," in *ACSC Readings and Seminars*, vol. 11 (Maxwell AFB, Alabama: Air University/ATC, 1979), pp. 190-94

13. Furlong, "Strategymaking," p. 14.

14. Address by William S. Lind to the Air Command and Staff College, 1 February 1979

15. Lind, "Some Doctrinal Questions for the United States Army," p. 60.

16. Georg Leber, "Principles Underlying German Defence Policy," *NATO Review*, April 1976, p. 9.

17. Lind, "Toward a New Understanding of War," pp. 138-39. Emphasis added.

A RESPONSE

WILLIAM S. LIND

I APPRECIATE the thought Major Specht has devoted to the conceptual issues John Boyd, General Furlong, and I, among others, have raised. While Specht has not produced an effective critique of the maneuver concept, he has provided something almost as useful in furthering the debate: a catalogue of misperceptions, misperceptions which, I suspect, are not uncommon.

• *Misperception 1:* Maneuver warfare is an excuse for cutting the defense budget.

Major Specht sets up a dichotomy between increasing defense resources and adopting a maneuver concept of war. This is a straw man. While we can improve net effectiveness by adopting a maneuver concept even within current force levels, doing so would not necessarily argue for or against increases in defense resources. In fact, until we have reformed our doctrine and force structure, we cannot determine what our

total resource needs will be: they may be greater than today, or they may be less.

I cannot help suspecting that Major Specht's linking of maneuver doctrine with opposition to defense budget increases betrays a not uncommon prejudice among military officers: civilian defense theorists ("those civilian pukes") are all antimilitary in their motives, and their only goal is cutting the defense budget. This is not only a misperception, it is a dangerous perception. It reinforces the already debilitating "we-they" division between uniformed and civilian personnel. It can push civilians who have a genuine concern with military effectiveness into the camp of the budgeteers and the emotionally antimilitary. It can isolate the theorists, many of whom today are civilians, from the practitioners. To put it gently, it is not a very useful attitude.

• *Misperception 2:* Destruction means blowing things up.

Major Specht weaves his argument around the need for destroying the enemy's forces. I do not disagree with that. His misperception is that destruction means physical destruction — killing and wounding troops, blowing up equipment, shooting down aircraft, etc. Major Specht seems to be a prisoner of the "body-count" approach to warfare.

To be sure, destruction can mean physical destruction, but that is not the objective. The objective is the destruction of the enemy's forces as active, effective fighting forces, and that can be achieved in many ways other than physical destruction. It can be achieved on the battlefield itself by inducing surrender (prisoners vice kills); it can be achieved in a campaign by bypassing enemy forces; it can be achieved in a war by paralyzing the enemy's government so that his forces cease to be active and effective. All these means of destroying the enemy's forces are tools of maneuver warfare.

• *Misperception 3:* Maneuver warfare is a magical force multiplier.

Major Specht claims I present maneuver warfare as a "magic formula for NATO victory," a device that completely negates the quantitative

balance. I make no such claims. As I stated in my paper "Toward a New Understanding of War," "The quantitative balance is seldom totally irrelevant to the outcome of a conflict, especially when the opponents are roughly equal in deployed military technology."[1]

Maneuver warfare is the best bet for a force that must fight outnumbered, and historically it has often enabled an outnumbered force to win. But it is not a complete substitute for numbers. In fact, if NATO is to implement a maneuver strategy, it will require more ground combat units, not fewer. This does not necessarily mean larger total forces; better use of European reservists coupled with a reorganization of the U.S. Army to improve the teeth-to-tail ratio (currently the lowest among major powers) can provide a significant increase in combat units.

What a maneuver strategy does offer is an opportunity to use the increased forces we need in an effective manner. Merely adding more troops or planes to the current strategy does not offer decisively greater effectiveness. The inherent weaknesses of a linear, firepower-oriented defense cannot be overcome without more forces than we could conceivably add.

The best comment on the current strategy and deployments was offered by Napoleon. When his staff presented him with a plan for a cordon defense of France, with units spread out along the borders and no operational reserve, he asked, "What is it for? To prevent smuggling?"

misperceptions of facts

The misperceptions of historical facts are numerous, including the following:

• "Not since the eighteenth century have commanders won wars by *avoiding* battles." Take a look at the island-hopping strategy in the Pacific during World War II.

• "Thus, maneuver and the indirect approach are only *means* to accomplish the classic objective of destruction." Have we so quickly forgotten Vietnam? North Vietnam never physically

destroyed our forces; it *did* compel the United States to withdraw.

• "Even if the peripheral actions in Gallipoli, Greece, Mesopotamia, and Palestine had been effective, the Allies would still have found it necessary to defeat the Germans on the Western Front." In fact, the Allied advance from Salonika was an important contributor to Ludendorff's decision to recommend an armistice. The overall German weakness was due in large part to the blockade, an element of indirect strategy, which severely damaged morale on the home front and, ultimately, in the Army.

• "Mr. Lind seems to forget that the fight for France was a *battle*. . . ." In relation to France, it was a war; it resulted in the surrender of the French nation. The implication that the Germans failed on the strategic level is quite correct; while German tactics and operations were generally superior throughout the war, German strategy and grand strategy were abysmal. The concepts reflected in German tactics and operations were not applied on the higher levels.

• "This optimistic judgment in support of maneuver doctrine fails to consider such unique historical circumstances as Russia's lack of preparedness." Specific weaknesses are usually unique; the existence of weaknesses which maneuver can exploit are common. Could a maneuver doctrine today exploit weaknesses such as Soviet concern about the reliability of its Warsaw Pact allies or the centralized nature of Soviet military decision-making?

• "The *United States Strategic Bombing Survey* concludes that the Japanese were ultimately defeated through attrition." The survey neglects, among many other things, the way U.S. island-hopping *avoided* the attrition warfare on which Japan counted and the psychological effect on Japanese decision-makers of Russia's entry into the conflict.

• "The Federal Republic of Germany would not support such a [maneuver] strategy." The Federal Republic will not support an abandonment of forward defense, but it might support supplementing forward defense with strong operational reserves for a war of maneuver in the event the forward defense is breached (which it will be, as the German military is well aware). Indeed, German plans suggest a possible shift from forward defense to mobile defense after the first few days, unless the conflict goes nuclear. German and other European attitudes about conventional defense are changing rapidly, in reflection of growing recognition of the meaning of strategic parity.

AGAIN, Major Specht has made a valuable contribution to the debate. He has done what too few Air Force officers take the time to do — he has thought about an issue and written about it. There is no shame in making mistakes; we all make mistakes. Zero defects equals zero progress. It is only by making misconceptions public that they become subject to correction and the dialectical process moves forward.

Alexandria, Virginia

Note

1. William S. Lind, "Toward a New Understanding of War," in *ACSC Readings and Seminars*, vol. 11 (Maxwell AFB, Alabama: Air University/ATC, 1979), p. 151.

A RESPONSE

DR. RUSSELL F. WEIGLEY

AM somewhat at a loss to decide what course is appropriate, since Major Specht's article "Is There *Really* a Better Way to Win a War in Europe?" does not take issue with anything I have said in print nor even with my views generally. I see much merit in William Lind's stimulating criticisms of current military policy, but on the issues that Specht raises and where he criticizes Lind, I am with Specht and not with Lind.

So I will simply write a few lines clarifying my position.

Specht mentions me in his article only to say that according to me, Liddell Hart misinterpreted Sherman, and Sherman was not the apostle of the indirect approach that Liddell Hart makes him out to be. My position is still the same one on Sherman that Specht accepts and commends.

In a larger way, I think Specht is right in arguing that the destruction of enemy forces remains the only sure road to victory in war. One of the conclusions that I share with General U. S. Grant, the pivotal figure in my *American Way of War*, is that modern armies and states are too resilient to be defeated by psychological means alone; their destruction must be more literal. So, while I believe that Bill Lind often offers fruitful suggestions—such as his idea that it would be more effective for NATO tactical air power to make Soviet artillery rather than tanks a primary target — I heartily agree with Specht on the issue of means and ends: with Specht's conclusion that "maneuver and the indirect approach are only *means* to accomplish the classic objective of destruction."

Perhaps it has been my criticisms of the new edition of the Army's Field Manual 100-5, such as those I voiced at the October 1977 meeting of the Inter-University Seminar on Armed Forces and Society, that have gotten me associated with Bill Lind. Without accepting Lind's theory of maneuver as more than a means to a strategic end, I agree completely with him in the sort of criticisms of Field Manual 100-5 that he advances in his *Air University Review* article.[1] I agree completely because, like Lind, I think Field Manual 100-5 embraces neither firepower/attrition doctrine nor maneuver doctrine; indeed, it offers no clear doctrine at all.

I also believe that while Field Manual 100-5 opens with the observation that the United States cannot again count on the superiority of resources it enjoyed over its enemies in World War II, the rest of the text does not consistently take this observation to heart. I think that tacitly falling back on the expectation of restaging World War II is all the worse because our military doctrine was not as clear as it might have been in that war either, and one consequence was that in large part we had to rely simply on overwhelming material resources to win. Our World War II strategy aimed clearly enough at the classic objective of destruction. But we lacked consistent tactical and operational doctrine to implement that strategy in ground war. Instead, though we then had the most mobile army in the world, we did not use our mobility either for an indirect approach as a means to destruction or consistently to concentrate our military power for a direct approach. Instead, our armies in Europe moved unimaginatively forward on a broad front, with neither indirectness nor concentrated power, and I believe the war was prolonged unduly as a result.

Philadelphia, Pennsylvania

Note

1. William S. Lind, "Military Doctrine, Force Structure, and the Defense Decision Making Process," *Air University Review*, May-June 1979, pp. 21-27.

A RESPONSE

LIEUTENANT GENERAL
RAYMOND B. FURLONG, USAF (Ret)

MAJOR Charles W. Specht has demolished the premise that one can win a war ". . . without directly confronting opposing forces that have insurmountable advantages in military resources." Fortunately I did not offer that premise nor, do I believe, did Mr. Lind. The crux of the argument lies in the difference between annihilation and attrition — and concepts to advance the chosen objective — not between accepting and avoiding battle.

Much of Major Specht's argument has the ring of the American way of war as seen by Professor Russell Weigley — annihilation, e.g., "The destruction of the enemy is what always matters most"; ". . . [The Germans'] failure to annihilate [the remaining French and British forces at Dunkirk]may have lost the war." (Specht, pp. 74-75, 76) He even casts an admiring glance at the strategies that produced the carnage of World War I. If annihilation is the objective, then I agree that we must take extraordinary measures to close the quantitative gap, assuming of course that the Warsaw Pact would permit this to occur. If one retains this objective and cannot close the gap, there is a basis for substantial force reduction. If we cannot prevail with forces now provided, we can be equally unsuccessful with much smaller forces. In any case the quantitative gap could not be closed in less than five years, more likely ten, if ever; for that reason alone I suggest we need to find a way to do the best we can with what we have. Since both Major Specht and I agree that we cannot now attain the objective of annihilation, we are both left with the objective of attrition. Clausewitz, our mutual source, offers some ideas.

Indeed, Clausewitz does hold that "the fighting forces must be *destroyed*; that is, they must be *put in such a condition that they can no longer carry on the fight*. Whenever we use the phrase 'destruction of the enemy's forces' this alone is what we mean."[1] I suggest that there is commonality between this view and Mr. Lind's ". . . rending our opponent's materiel strength irrelevant to the outcome of the battle." Indeed, this is precisely the result that the North Vietnamese obtained: our forces were put in such a condition (domestic pressures) that they could no longer carry on the fight. Our materiel strength, always vastly superior, was irrelevant to the outcome of the battle. Major Specht states that the North Vietnamese relied on attrition. He offers other

examples of how one might successfully use attrition, e.g., British pilots, defeat of Japan, Sherman, etc. He does not make clear why he finds the concepts of "disorganization" or "maneuver" as inconsistent with attrition.

Major Specht is troubled by the contention that war is a "psychological contest." Clausewitz had no trouble with this thought, ". . . the war, . . . cannot be considered to have ended so long as the enemy's *will* has not been broken . . . The personalities of statesmen and soldiers are such important factors that in war above all it is vital not to underrate them."[2] Indeed, the very object of attrition warfare is to persuade the enemy that the price of war exceeds the price of peace. Only with successful annihilation can one ignore the mind of the commander, for only this result denies the enemy the option to continue.

Major Specht and I agree that we cannot win a war without directly confronting the enemy. In context I believe he agrees with my premise that we cannot, or need not, seek the objective of annihilation but rather can succeed with an objective of attrition to *"put the enemy in such a condition that they can no longer carry on the fight."*[3] In seeking this objective, I offered the concept of "disorganization"; Mr. Lind has offered "maneuver." Major Specht finds both defective. Given the existing quantitative disadvantage and the improbability of its short-term reversal, I reassert that "we can no longer rely on raw strength and must now turn to brainpower."[4] I await the presentation of Major Specht's alternative concepts.

Montgomery, Alabama

Notes

1. Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (Princeton, New Jersey: Princeton University Press, 1976), p. 90.
2. Ibid., pp. 90, 94
3. Ibid., p. 90
4. Lieutenant General Raymond B. Furlong, "Strategymaking for the 1980's," *PARAMETERS*, Journal of the US Army War College, March 1979, p. 9.

THE EMPEROR'S ~~CLOTHES~~ CLOSE AIR SUPPORT

GROUP CAPTAIN IAN MADELIN, RAF

T HERE is a cautionary tale which appears in children's books called "The Emperor's New Clothes." In it an emperor famed for his sartorial extravagance is persuaded to order a set of garments finer and more splendid than any ever seen before. These garments are costly; their price goes up even further while they are being made, and the emperor has to dig deep into the royal treasury to pay for them — in the process committing his chamberlain and his ministers to the purchase. The catch is that the garments do not exist, but the artful tailors who are supposed to be making them have let it be known that only those who are wise can see them. Eventually the emperor shows off his finery in a grand procession, parading through the streets of his capital with nothing on. His subjects gaze on in wonder, each of them persuaded by the reactions of the rest of the crowd of the splendor of the emperor's new clothes.

But what has this tale to do with close air support? Well, let us forget the emperor for a while and see. First, what is close air support? In official parlance it is: . . . air attacks, requested by the ground commander, against hostile targets which are in close proximity to friendly forces and which need the detailed integration of each air mission with the fire and movement of those forces.*

This is a definition with which most of us are familiar. As definitions go it is quite a good one: clear, understandable, and seeming to leave

*This is a paraphrase of the definitions in a number of sources: TACM 2-1 ATP 33, AAFCE Manual 802.

nothing in doubt. But perhaps it is too good, for its air of certainty inclines us to accept it without question, hardly noticing that it masks a number of uncertainties and begs a number of questions. My purpose here will go beyond formal definition to take a more careful look at close air support (CAS) and see what it really is in simple, everyday terms. And since we intend to take nothing for granted, we shall begin at the beginning.

THERE is a war on. The army commander in one sector of the front is in a pitched battle with the enemy. The situation at this level is always a confusing one; everything is on the move, and most things are out of sight. It is difficult for a commander to know from minute to minute the position of his own troops; the position of the enemy and, in particular, their strength and intentions are often a matter of conjecture. Our ground commander is totally involved with the battle at hand. He well knows that it is a part of a larger battle and that it is supported by other echelons which reach out and back from the battlefield. But his concern is with his own segment of the enemy and with enemy targets in his area of contact. To deal with these, he has a range of weapons: machine guns, mortars, artillery, antitank and antiaircraft guided missiles, and possibly his own armour. But he could use more; that goes without saying. And he has access to more in close air support, so he calls for it. Wouldn't you?

His request for air support, if it can get through, is transmitted by radio to an air support operations center (ASOC) at a higher level of command. The ASOC is dealing with a number of similar requests and, for reasons which may already be apparent, always more requests than it can grant. The ASOC's job is to allocate the ground attack aircraft according to priorities, and that is a very hard judgment to make at this level. Understandably, each requesting commander thinks his own needs are paramount. (We shall ignore for the moment the fact

that even he may be unsure of the true priority of targets within his own sector, let alone their importance in relation to the rest of the battle.) The ASOCs eventually allocate their precious ground attack aircraft to tasks. Each task accepted displaces a number of others that have to be turned down. Thus the ground commander cannot count on his request being granted, and even when it is he cannot be sure that the aircraft will get through or be successful.

There is now a wait while the mission is passed on to the fighter squadron, the pilot is briefed, and he flies to the area where he is required. (We shall have to assume that the ground commander desists from using his own weapons while he is waiting, notwithstanding the threat that this target poses for him.) This wait is typically 30 to 90 minutes, accepting that it could be less but has been known to be more. Steps have been taken to shorten it, but beyond a certain point this can be done only at self-defeating cost. For example, one remedy which has been tried is to keep a number of CAS aircraft continuously in the air, armed up and waiting to be tasked. But measures like this are highly inefficient and, despite the lavish use of resources, still do not entirely eliminate the waiting time. The point is that it is in the nature of this operation that there will be a delay. Aircraft, unlike the ground commander's own weapons, do not have immediate response. This is simply one of their characteristics and has to be accepted. (Indeed, the whole subject of weapon characteristics is often overlooked here. All weapons have characteristics, and the trick in each case is to exploit the positive ones and avoid situations that call for the negative ones.)

Eventually our CAS aircraft arrive in the vicinity of the battle — let us say a pair of them. They are flying low and fast. Rushing past beneath them is open countryside. Possibly there are evident signs of battle, possibly not. Where in this vast expanse is the target? Well, what kind of target are they looking for? In all probability it will be isolated, because if the enemy has any sense he will not mass his forces once in

contact. It will be small — a tank as seen from an aircraft is very small — and it may be on the move. It will not be exposed and may even be camouflaged or hidden by smoke, perhaps self-generated. Our aircraft cannot reconnoiter the battlefield or they will be shot down. In any case they could not locate this kind of target unaided, so they stand off to get a briefing from a forward air controller (FAC). If the FAC is back where the aircraft are, he will not be able to see the target either; for this reason he is forward and generally on the ground. From here he may be able to see the target (though if that is so, we shall forbear to ask why he has not done something about it himself). But from the ground his view is still limited so it is now increasingly the practice for him to be airborne. At first FACs flew in light aircraft, but they got shot down. So they graduated to faster piston aircraft, then to older jet aircraft like the F-100, then even to current aircraft like the pair we still have standing off awaiting instructions, and with whom the airborne FAC would now be sharing identical problems. We shall not belabor this progression except to note that the target on the ground seems to be attracting a luxurious amount of our attention and resources. Furthermore, it has become the subject of an incredibly cumbersome set of procedures. If simplicity is an unwritten principle of war, we are already violating it with a vengeance.

Our aircraft holding off are now in touch with the FAC, wherever he is, and are being briefed by radio. (Note to the enemy: no jamming please while this critical briefing is going on.) Eventually the fighters set course for the battle zone with a precalculated heading and distance to run to bring them to a point from where they may be able to see the target. This point will be about three to five miles out to allow for last-second realignment to bring the sights to bear, plus a distance equal to the release range of the weapons.

What chance do the attackers have of seeing the target in time? Many trials have been conducted to assess this, and the results can be summed up in a single word. The chances are negligible. (Readers who doubt this may check the archives for themselves.) The FAC might therefore improve upon his verbal briefing by marking the target, perhaps with smoke or in the near future with a laser beam. If the smoke is literally on the target and is not obscured by the dense pall already hanging overhead, and if the target, recognizing that it has been marked, obligingly stays put while it is being attacked — given all this, then smoke can be effective. But a question arises. If the FAC is in a position to fire smoke or a laser at the target and hit it, why does he not avail himself of something with more punch, like an antitank guided missile, for example? This is an awkward question and, as with some of the preceding ones, we shall delicately step around it in order to press on with the business at hand.

At last our pair of aircraft flash into view. At this point they are very vulnerable. They are having to hold a steady aim while committed to weapon delivery and will probably have pulled up for a dive attack. (We might add that if they do not pull up but just fly through, as for a low-level delivery of a retarded weapon, their vulnerability will decrease but their chance of spotting a typical battlefield target becomes virtually nil.) We now have a blurred, menacing impression of attacking aircraft, diving for the kill in such close proximity to our own troops that only the pilot in the cockpit can see precisely where his aircraft is aiming. The air defenses of both sides, surface-to-air missiles and antiaircraft artillery, fire off in unison. If the experience of recent wars is any guide, the aircraft have almost as much chance of being hit by their own troops as by the enemy. But wait a minute. What happened to the requirement for detailed integration with the fire of their own forces stipulated in our definition? Unfortunately, the only watertight integration that would work at this stage would be to place such stringent restrictions on the rules of engagement of our own air defenses that we might as well not have any.

Let us assume though that our pilots are

having a lucky day. They find the target, launch their weapons at it, pull out unscathed, and fly back to base. Leaving the target well and truly destroyed? Well, not exactly. Weapons-effect calculations show that with expected accuracies, if two aircraft each fire four pods of armour-piercing rockets at a single tank, they have a 50 percent chance of destroying it. That is another way of saying that the tank has an even chance of getting away. Of course, the estimate will vary with accuracy, type of weapon, number of attackers, etc., and this example is offered purely to give the reader some idea of the probabilities. But our calculation ignores all the other imponderables touched on previously. These are cumulative and independent of weapon type and accuracy but have just as significant an influence on the end result. When all the factors are multiplied together, we have to accept that the chance of a successful outcome is slim, the loss rate could be high, the resources we have invested are considerable, and the exchange rate is exorbitant.

B Y this point any soldier reading the article is becoming uneasy, maybe even indignant. The Air Force is about to let him down, talking its way out of a commitment and leaving him to face the enemy single-handed while it goes off to fight private wars of its own. Not so. But there are far more profitable ways of using our aircraft to help the Army than close air support. We need to think again about the principle of weapon characteristics. The Army's own weapons are immediate, responsive, continuous, all-weather, day/night, and cheaper than aircraft. In general they have short range, cannot be quickly redeployed, and while they are extremely accurate against line of sight and known targets, they are less so against indirect targets whose precise locations may be uncertain. Aircraft on the other hand are not as responsive, not as accurate, and not as destructive against hard, point targets. They are scarce, costly, and highly vulnerable — especially in places where

the enemy's air defenses are intensive and alerted. In their favour they have surprise, an over-the-horizon capability, and enormous flexibility in their arc of employment. It follows that if we are to exploit all these characteristics to best advantage we should in principle rely on the Army's integral weapons for the contact battle and task the ground attack aircraft against battlefield targets in the enemy's rear, which the Army cannot so easily deal with itself.*

A number of advantages now accrue to us. First, we can wreak more havoc among the enemy's second echelon targets. The contact battle depends entirely on the lifelines which support it from the rear. The enemy cannot be allowed to operate these lifelines with impunity. Anything that can be done to impede and disrupt them will weaken the enemy's strength in the front line just as surely as attacks directed against the front line itself. Just as surely, but more efficiently. Targets in this area could include road and rail movement, river crossings, vehicle parks, headquarters, signals units, assembly areas, forward administrative areas, POL (petroleum, oil, and lubricants) and ammunition storage, and so on. There is no problem now of disentangling the enemy's troops from our own, for out here everything beneath is fair game. These targets could range up to 100 kilometers behind the front line (less than eight minutes' flying time), and target priorities should still be decided by the ground commander. Our attacks will have a twofold effect: in addition to destroying enemy targets we force the enemy to use concealment and dispersion and a degree of circumspection that will harass and slow him down in areas where his needs rely heavily on freedom of movement.

Second, by increasing the area over which we operate we force the enemy to spread his air

*It would be naïve of us at this point not to acknowledge the quite unhelpful influence of interservice rivalries on this issue, and terms like "Army weapons" and "Air Force weapons" have acquired emotive and divisive overtones. The real issue is simply one of choosing the best weapons for the job. The conflict is with the enemy, not among ourselves. These are all "our" weapons, and aside from the needs of objective description, we should have sense enough to see them in that light

defenses, thereby complicating command and control, reducing intensity, and reducing our vulnerability. There is an inverse square law in effect here, and the greater the area over which we range the more this dispersion works in our favour. True, our aircraft must still cross the front line, but they need not do so at points of known enemy concentration. Furthermore, as long as we were doing close air support, the enemy knew where to mass his defenses to best advantage. Without the certainty of close air support he no longer knows where they should be sited. In the event, many will be in the wrong places and, in a continuous attempt to rectify this, a portion will always be on the move. Those left at the front line will probably take a greater toll of their own aircraft than of ours.

This brings us to a final and very significant point. If our aircraft are usually not operating over our own forward troops, the Army's surface-to-air defenses could often be given virtually carte blanche rules of engagement. Imagine the vast increase in their effectiveness if, for most of the time, they were free to fire at nearly every fixed-wing aircraft making attacks in their sector. Remember that the enemy's attempts at close air support will be dogged by the same inefficiencies as would have affected our own; perhaps more so because our own troops, being in the defense, will have the benefit of better concealment. The exchange rate would swing hard in our favour, and with the accuracy of today's air defense weapons, enemy losses could be devastating.

There is one important caveat. The above considerations will apply as a general rule to the tactic of close air support. We must recognize though that there will be exceptions, situations where the use of ground attack aircraft in close support may be vital. Such situations might be, for example, an enemy breakthrough in a weakly defended front or the support of particular ground units which for one reason or another are lacking their own combat support firepower. And we have left out of the account some other atypical situations like Vietnam and the British use of close air support in the Radfan campaign of the Aden Protectorate. But these cases will be the exception, not the rule.

IN CONCLUSION we return to our starting point. What now of the emperor? We have examined his raiment very closely, the warp and the weft. We cannot say that it is nonexistent, but we have to admit that the fabric is rather threadbare. Yet it is expensive, certainly not worth the money, and hardly suits the purpose for which he is buying it. But we have suggested other ways in which his investment could be turned to good advantage. Let us hope we can catch his attention before it is too late. For one day the emperor might have to go to war. And while his delusions may work for himself and even for some of his courtiers, we cannot believe that his enemies will be so indulgent.

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WHAT IS TO BE DONE?

DR. GEORGE W. COLLINS

DESPITE efforts to ameliorate international tensions, the results often have been questionable. Dr. Robert L. Pfaltzgraff, Jr., of the Fletcher School of Law and Diplomacy, Tufts University, asserts that "at no time since World War II has the West faced greater threats to its institutions, values, and economies," and that the most serious threat is "the growth of Soviet military power and political influence."[1] In this regard, each of the books discussed here has some connection with American institutions concerned with international security and American defense issues.

Anyone seeking an understanding of contemporary economic problems will find Klaus Knorr and Frank N. Trager's *Economic Issues and National Security* a good primer. In *The Geopolitics of the Nuclear Era*, Colin S. Gray examines economic and security issues but more single-mindedly focuses on military-economic problems posed to the West by the Soviet Union. Both of these books were sponsored by the National Strategy Information Center.[2] *Nuclear Weapons and World Politics* by David C. Gompert et al. is sponsored by the Council on Foreign Relations, whose 1980s Project set to work a number of study groups on world problems relevant to the next decade.[3] The authors concentrate on the question of minimizing or eliminating the dangers of nuclear confrontation.
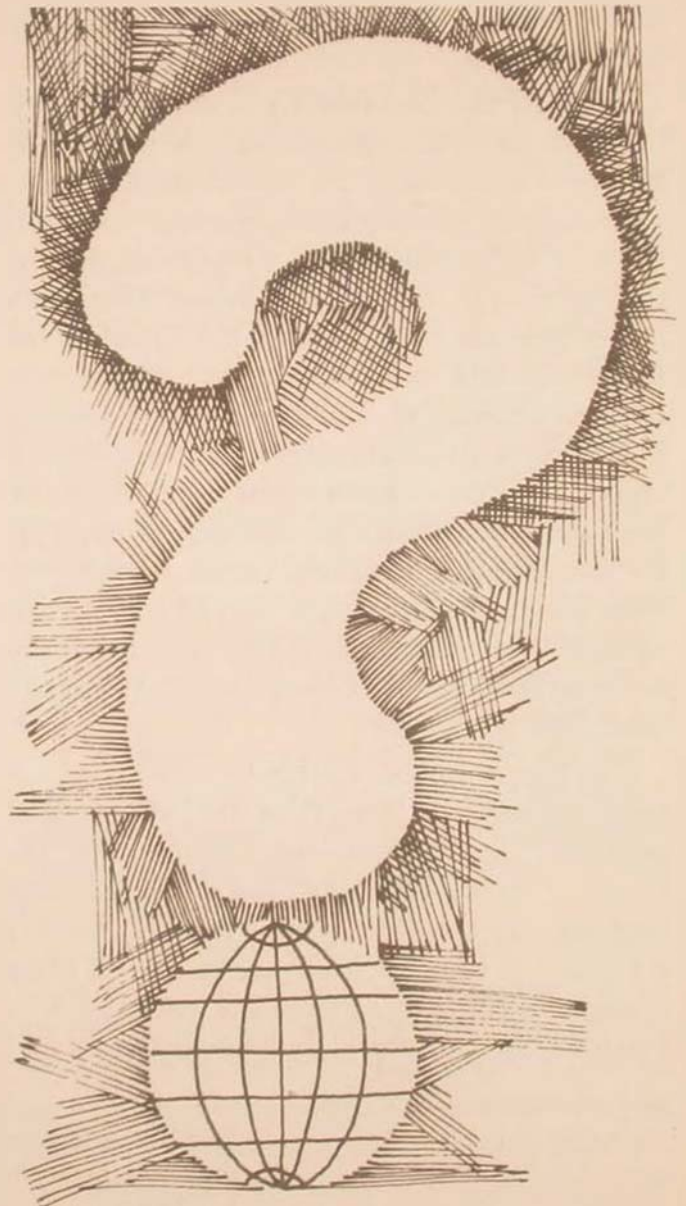
In *Economic Issues and National Security*,[†] Klaus Knorr and Frank Trager state that today's foreign policies are determined more by external than internal pressures, and it is in this context that they examine both economic and security affairs. Moreover, they are convinced that the intimate relationship between economic issues and national security has not received sufficient recognition. To address these matters, editors Knorr and Trager have assembled chapters contributed by eight scholars, all but one of whom are American academicians in the fields of government or politics; the exception is Hanns Maull, a German, who is the European Secretary of the Trilateral Commission located in Paris.

The first two chapters, by Knorr and Robert Gilpin respectively, present a macroeconomic historical appraisal of the world's economic systems. Gilpin discusses the origin and nature of the existing interdependent world economy and the rise of Great Britain to economic dominance in the nineteenth century and the United States in the twentieth century. Knorr provides a more detailed account of America's belated assumption of economic leadership after World War II and of the principal financial and economic institutions established at that time to regulate the international economy: the General Agreement on Tariffs and Trade (GATT), the International Monetary Fund (IMF), and the International Bank for Reconstruction and Development (World Bank).

The fundamental contemporary economic issue discussed by several of the writers, and especially by Gilpin, is the confrontation between a "market economy" and a "mobilization exchange" system. The existing market economy is defined as a system involving "a market place wherein goods and services are exchanged to maximize the returns to individual buyers and sellers" and which "is not subordinate to society or the state." (p. 21) However, that interdependent market economy which fueled the industrialization of the West and helped create the modern democracies is now confronted by serious external and internal challenges.

Externally, the challenge comes from communism and from the economic nationalism of the less developed nations in particular. Both of these practice a mobilization exchange featuring state control of the exchange of goods and services — a control designed "to advance the security and power of the dominant elite" and, warns Gilpin, "the primary goal of exchange is to enhance the war-making capability of the state." (p. 21)

Western individualistic capitalism is also subject to attack from within. The pluralistic democratic principles of these nations encourage sociopolitical pressures on the government from business associations, labor unions, minorities, and a wide spectrum of lobbying interests including competing governmental agencies. Together these forces act to restrict the free operation of the market economy by their demands for governmental action to redress economic differences.

Other topics of special interest are economic interdependence, the relationship of industry, technology, and military power, and oil and food as instruments of power.

No nation of any size, it is contended, is totally self-sufficient, and all are forced to participate in international trade. Of the ranking powers only China and Russia have a limited requirement for imports, but, even for them, that is only a relative independence as their appetite for Western technology increases. The economic interdependence of nations affords them the opportunity either for cooperation or conflict with their trading partners. Governments must choose, states Clark Murdock, whether they wish

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to intervene actively in market activities or remain aloof and impotent. (That limited choice of options recalls the precepts of nineteenth-century Social Darwinism, which postulated that a nation must compete to survive; and Secretary of State John Foster Dulles's dictum that rejected "neutralism" and demanded that states stand up and be counted.)

While economic power itself cannot be equated with military strength, Klaus Knorr reminds us that the levels of industrialization and technology are major factors of that strength inasmuch as they are indicative of a society's ability to produce and use modern weapons.

Knorr discusses the mechanics of economic coercion and the difficulty of applying it effectively. He declares that three factors are essential. First, a nation must be able to control the supply and distribution of a commodity. Second, that commodity must be sorely needed by the other nation. And finally, the needing nation must decide that it is more costly to accept the denial of the commodity than it would be to comply with the coercer's demands. Knorr believes that economic coercion is most successful in confrontation situations where the issue is not vital enough to warrant military action.

Chapters by Hanns Maull and Cheryl Christensen analyze the coercive use of oil and food. Maull notes that the impact of the Organization of Petroleum Exporting Countries (OPEC) embargo of 1973-74 was less drastic than anticipated because of the oil producers' inability to control tanker, pipeline, and refinery production. Nevertheless, he concludes that because of the world's energy requirements oil will continue to play an important role in international affairs. Maull is doubtful that a counterembargo of foodstuffs would have been an effective means for altering OPEC policy. And while Christensen notes the advantageous position of the United States in regard to food production from 1960 to 1975 when it produced an average of 12 percent of the world's wheat and 25 percent of the total grain, like Knorr, she concludes that food is a difficult commodity to use for economic coercion. Moreover, she observes that today the United States is in a less favorable position to use food coercively since new laws have drastically reduced the amount of public food stocks. She further concludes that except under the most dire emergencies, the United States should use its foodstuffs magnanimously.

Throughout this book there are references to the weaknesses of the American political system where power is fragmented and decentralized both privately and governmentally. Beyond setting macroeconomic policy, for example, Stephen D. Krasner observes that the government has little institutional capacity to intervene in the economic market — thus the difficulties that exist in regulating wage-price levels and the inadequacy of "jawboning." Similarly, the politico-economic restraints of domestic interests have led to limited foreign policy parameters in developing economic relations with the Soviets and in dealing with the energy crisis.

The editors and authors of *Economic Issues and National Security* are to be complimented for a well-written and organized collection of articles with a minimum of economic or political jargon. Knorr and Trager have done an exceptional job in interrelating the various topics and points of view. Too frequently in such collections there is much redundancy with no recognition that similar data and ideas have been used in several of the selections. However, in this book there is little of that except where it is pertinent, and there the writers invariably note the context and place where such material previously was used. If there is any objection to the writing, it is to the overenumeration of supporting factors, principles, elements, etc., which too often give a Lawrence Welk beat to the text, i.e., "a one-and-a-two-and-a — ."

One puts this book aside with a sense of apprehension for the future that perhaps is best expressed in Gilpin's warning that "the growing importance of the economic factor in international relations . . . suggest[s] the increasing politicization of international economic relations. . . . This situation, if carried to its logical ex-

treme, would be the transformation of all economies into mobilization economies." (p. 63) The key question is, as stated by Knorr and others, Can the democratic capitalist societies muster sufficient political will for the actions necessary to retain the market economy?

For the development of a broad perspective of the world scene, Colin S. Gray recommends the study of geopolitics.[†] Dr. Gray, now associated with the Hudson Institute, formerly taught at universities in Great Britain and Canada and was a staff member of the International Institute for Strategic Studies. He recommends the study of geopolitics because it will enable one to "understand trends and historical continuities" rather than being misled by more dramatic but less significant events. As a working definition of geopolitics he uses Saul B. Cohen's: "the relation of international political power to the geographical setting."[4] And for Gray the crucial geographic realities are the spatial relationships of the powers and the West's requirements for access to the world's physical resources. Gray regrets that because of the false, propagandist *Geopolitik* of the Nazis, geopolitics has been mistakenly slighted as a scholarly discipline and the works of notable and pertinent theorists like Sir Halford Mackinder and Nicholas J. Spykman are ignored.

Gray makes a pessimistic appraisal of the West's position in the global arena. "We are at the mid-stage of a shift in relative power and influence to the Soviet Union that is of historic proportions," and it is "the most pressing, dangerous, and potentially fatal fact of the real world." (p. 3) He considers it foolish to ascribe any serious interest in stable international relations to the Soviets as there is no apparent limit to their appetite; instead, the West must gird for a difficult, permanent struggle.

To support these contentions Gray argues as follows. First, Marxism-Leninism has by its very nature a conflict-oriented concept of international relations which holds that all nonsocialist regimes are enemies of the Soviet Union. Second, the struggle for power is a fundamental feature of international relations and is, in essence, a duel for world dominance between the "Heartland" and "Insular" powers. And in that duel the principal pawn is the "Rimlands" of Eurasia-Africa and the adjacent waters, for, in Spykman's dictum, "Who controls the rimland rules Eurasia; who rules Eurasia controls the destinies of the world." (p. 27) In the initial concept of Mackinder, this was a contest between Eurasian land power (possibly a Russian-German combination) and British sea power. Today, according to Gray, the Soviets and the Americans are the protagonists.

It is in this context that Gray believes the growth of Soviet military power and the nation's intervention into the affairs of Africa, the Middle East, and elsewhere must be evaluated. Soviet rimland bases now threaten the Cape route, which is "the energy lifeline of Western Europe," and recent Soviet worldwide naval exercises such as "Okean-75" demonstrate the vulnerability of NATO's western flank. The denial of Soviet control of Western Europe is imperative. If the Soviets achieve domination of the Eurasian-African rimland, the United States might physically survive, but it would be forced to abandon its liberal, democratic ways for "a fortress discipline and illiberal fortress practices." (p. 58)

Thus, the main problem confronting the United States is not the negotiation of SALT or multilateral force reduction (MFR) but to address security issues on a global basis. The only rational foreign policy for the United States, says Gray, is the containment of the Soviet Union within the Heartland, i.e., within its present boundaries and traditional sphere of influence.

[†]Colin S. Gray, *The Geopolitics of the Nuclear Era: Heartland, Rimlands, and the Technological Revolution* (New York: Crane, Russak & Co., 1977, $4.50 hardback, $2.95 paperback), 70 pages.

The United States needs to muster its political will to prevent Soviet world domination.

*N*UCLEAR *Weapons and World Politics*† by David C. Gompert et al. is one of the studies sponsored by the Council on Foreign Relations. The council plans eventually to publish more than twenty of these 1980s Project Studies. In this volume each author presents and analyzes a "nuclear regime," and Franklin C. Miller contributes an appendix summarizing nuclear strategy, weapons development, and existing nuclear arsenals. The nuclear regimes are defined as systems of international commitments, national military forces, and doctrines "that together govern the role of nuclear weapons in war, peace, and diplomacy." Two of the nuclear regimes deal with the existing nuclear scenario, another contemplates limitations in the number and role of nuclear weapons, while the fourth proposes ways to eliminate all such weapons.

The tone of *Nuclear Weapons and World Politics* differs markedly from Colin Gray's. Although the critical nature of the U.S.-U.S.S.R. rivalry is recognized by Gompert, it is viewed as traditional great power competitiveness rather than as an ideological clash between good and evil. There is some apprehension expressed about Soviet ambition and policy, but the general position is that the two superpowers are interested in détente and that their military postures are basically defense-oriented. In addition, the writers stress the development of better international and Soviet-American cooperation.

Principal issues examined include mutual assured destruction (MAD), proliferation, and the escalation of nonnuclear warfare. The authors' views differ significantly. Nevertheless, there is general consensus that MAD is essential for international stability in the next decade and, therefore, strategic defenses should be limited so

as not to place it in jeopardy; that silo-based missiles will become vulnerable in a few years; and that submarine-launched ballistic missiles (SLBMs) are the best deterrent weapons. There also is agreement that while the present international stability may be tilted either by technological or political change, the latter is the more dangerous likelihood.

I found Richard Garwin's design for a nuclear regime the most debatable. He agrees that nuclear weapons are here to stay, but he wishes to limit their use to deterrence or retaliation. For greater international stability, he recommends that the United States continue to seek international commitments for nuclear reductions but, if that fails, that it make unilateral reductions! (Elsewhere in the book Gompert states that "we simply do not know if Moscow *needs* to be deterred. Ironically, accepting nuclear inferiority and terminating the threat of escalation might be the best way to find out. . . ." (p. 330) Garwin argues that an American strategic force of SLBMs, bombers, cruise missiles launched from cargo-type aircraft, and a small number of silo-based intercontinental ballistic missiles (ICBMs) would provide sufficient assured deterrence. In addition, forward-based strategic and tactical nuclear weapon systems should be removed. He denies that the removal of those forward-based nuclear forces would endanger NATO, whose defense actually depends on America's ICBMs.

Garwin also contends that United States conventional forces need strengthening but that they should emphasize defensive weapons such as mines and precision guided and cruise missiles. Furthermore, as a means to retard proliferation, this nation should take the lead in limiting the development of new nuclear weapons and in adopting a policy of no use of nuclear weapons against nonnuclear states.

Should the United States unilaterally adopt these policies, Garwin declares, it would gain the

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† David C. Gompert, Michael Mandelbaum, Richard L. Garwin, John H. Barton, *Nuclear Weapons and World Politics: Alternatives for the Future* (New York: McGraw-Hill, 1977, $6.95), 370 pages.

support of most nations, and the Soviet Union would probably follow the example. Not only would these policies reduce the danger of direct Soviet-American confrontation but also both powers would be able to redirect their attention to the defense of nonnuclear nations. Garwin concludes that a nuclear regime as described is superior to the present situation and that it can be achieved in the 1980s.

The sections of this book are well coordinated. Each author presents his arguments and comments on the advantages and disadvantages of his nuclear regime vis-à-vis the others discussed. David Gompert, in addition to his section on the possible strategic deterioration of the present nuclear regime, presents introductory and concluding chapters to assist the reader in evaluating the interrelated problems of nuclear weapons and world politics.

TOGETHER, these books provide considerable insight into the complexities of contemporary international affairs and the problems of shaping an effective American security policy to cope with the situation. For twenty years a basic tenet of American policy was the containment of communism and of the Soviet Union in particular. George Kennan provided the concept,[5] and President Truman dramatized it on 12 March 1947 when he declared that "it must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or by outside pressures." Not until 1969, when the Nixon Doctrine was enunciated, did the United States step back in principle from Truman's declaration of the nation's readiness to intervene against Communist aggression. But then President Nixon announced that times had changed, America's allies were stronger, many states had thrown off colonialism, and, although the Communist World was still hostile, it was divided. Henceforth, said Nixon, United States policy would be to help defend its allies and others whose survival was vital, but in other cases aid would be limited as deemed appropriate by America, particularly in regard to providing manpower for foreign wars.

Under Presidents Nixon and Ford came the shift to a policy of détente, which was formalized with the establishment of friendlier relations with the People's Republic of China, the nuclear arms agreements with the Soviets, and the Helsinki accord of 1975. In the 1972 SALT and the 1974 Vladivostok agreements, the United States sanctioned the concept of "strategic sufficiency" previously advanced by President Eisenhower.

The outcome of the American involvement in Southeast Asia forcibly demonstrated the necessity for caution before militarily intervening in distant wars where the issues are not vital to the national interest and where military commitment may escalate into a major war. The American response to the Angolan and Ethiopian-Somalian conflicts indicates that that lesson and the Nixon Doctrine have been taken to heart. In both of the latter conflicts, despite Soviet advisers and military equipment and Cuban troops, the United States refused to commit itself militarily. The main issue for Americans was not the containment of communism but whether the outcome was vital to other American interests — and the decision was that it was not.

NOT only is the mutual mistrust of the United States and the Soviet Union unabated but peace has become more fragile because of regional and racial conflict, nuclear proliferation, and North-South economic confrontation. Nor have many of the newly independent nations found peace or stability in their emergence from colonialism: Africans war with Africans, Arabs with Israelis and other Arabs, and Asians with Asians. The dream of universal interest in global security that was a guiding principle in the establishment of the United Nations has faded. The question is, notes Pfaltzgraff, "What is to be done?" That is the issue facing the Carter administration and the American people.

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Notes

1. Robert L. Pfaltzgraff, Jr., "The American-Soviet Relationship in Global Perspective," in John E. Endicott and Roy W. Stafford, Jr., editors, *American Defense Policy* (Johns Hopkins University Press, 1977).

2. For a review of the interests of the National Strategy Information Center and many of its publications, see Lieutenant Colonel David R. Mets, "Watching the Pendulum Swing: A Look at the Works of the National Strategy Information Center," *Air University Review*, September-October 1977, pp. 85-100.

3. The council is even better known for its long-time sponsorship of the distinguished journal *Foreign Affairs*.

4. Gray cites Saul B. Cohen, *Geography and Politics in a Divided World* (London: Methuen, 1964), p. 24.

5. The debate continues as to what Kennan meant the policy of containment to be. See *Foreign Affairs*, July 1977 and January 1978, and the Society for Historians of American Foreign Relations *Newsletter*, March and June 1978.

WAR, POLITICS, AND GRAND STRATEGY IN THE PACIFIC, 1941-1945

DR. CRAIG SYMONDS

THE Japanese attack on Pearl Harbor on 7 December 1941 was one of those rare occasions in which the course of human events was dramatically changed in a single moment. It ended American neutrality in the European war and initiated the war in the Pacific. Shortly thereafter, the fall of Hong Kong and Singapore not only ended British preeminence in the eastern Pacific but signaled the end of the British Empire in the Far East. The inevitable defeat of Japan meant the end of the Japanese Empire as well, and the consequent emergence of the United States, which filled the postwar power vacuum and took up the burden of a *Pax Americana*. Thus, for these three great nations — Japan, Britain, and the United States — Pearl Harbor and the ensuing war was a crucial turning point. It should not be surprising, however, that the lessons of that war have differed for historians of each nation.

The central question for Japanese historians has been Why? Why did Japan's ruling military elite commit its people to such devastation, and, even more fundamentally, why did Japan in 1941 find itself ruled by army officers so reckless as to advocate such a commitment? For Americans, to whom the Pacific war was a crusade, histories of the war seemed to call less for introspection and more for dramatic storytelling. It was, after all, not only a story of initial setbacks and great peril but also of ultimate triumph. For British historians, the Pacific war produced elements of both experiences: ultimate victory in partnership with the United States but also the end of British dominance in the Far East. To the ruling masters of both outdated empires, the Pacific war brought painful and unwelcome realizations. For Americans, those realizations would come much later. These varying viewpoints are evident in a spate of recent books about the Pacific war.

At Pearl Harbor, the empire of Japan committed political suicide. It was not a sudden death, but it was violent. The motives that impelled this small island nation to take such a drastic and irrevocable step have been analyzed by American and Japanese historians ever since, but never with the depth of feeling and self-critical analysis of Saburo Ienaga's *The Pacific War*, which has become available to American readers in an English language edition translated by Frank Baldwin.† Ienaga's bitter account, first

†Saburo Ienaga, *The Pacific War, World War II and the Japanese, 1931-1945*, translated by Frank Baldwin (New York: Pantheon Books, 1978, $10.00), 316 pages.

printed in Japan ten years ago, casts new light — and new shadows — on that conflict and should lead American historians to a little self-analysis of their own.

Ienaga's history of the war is really a historical essay, and to appreciate its significance one must understand its role in Japanese historiography of the war. Japanese histories published in the first few years after 1945 clearly accepted Japan's culpability for the war. But in the early 1950s, thanks mainly to American efforts to recast Japan as a Western ally against Asian communism, a new tone crept into Japanese accounts. The war was depicted as a noble and honorable, if ultimately hopeless, struggle against overwhelming odds — a struggle which was forced on Japan by circumstances. A twelve-volume history, *Hiroku dai Toa senshi*, published in 1953, described the war as gallant and heroic and was characterized by a virulent anti-Chinese racism similar to that which was dominant in Japan during the war. Then, in 1964 Ueyama Shumpei's *Dai Toa Senso no imi* (The Meaning of the Greater East Asian War) offered the interpretation that Japan's expansion in the 1930s and early 1940s was an attempt to liberate Asia from Western dominance.

To Ienaga, this trend in historical analysis was both tragic and dangerous. He feared that "nostalgia and time" were "eroding the reality of the war." (p. 254) To explode that nostalgia, Ienaga exposes the war as neither noble nor redeemed by any motive save greed. He attacks Shumpei's claim that Japan's goal was to "liberate" Asians from Western domination. The goal of the greater East Asia Sphere was not "Co-Prosperity" at all, he argues, but exploitation. This is clear not only because of Japan's exploitive economic policies, which might otherwise be attributed to wartime expediency, but also because of Japan's blatant racial policies that held Koreans, Chinese, Vietnamese, Burmese, Malayans, and Filipinos to be inferior racial types. Japanese treatment of the Chinese, for example, was generally as conscienceless and occasionally more violent than Western treatment. For Asians, liberation by the Japanese was a change from bad to worse. The argument that the Japanese aided Asian self-rule was a justification thought up after the fact to excuse the inexcusable.

Ienaga also attacks the assertion that Japanese forces fought heroically and nobly against the American onslaught. A key chapter in the book entitled "The Horrors of War" details the barbarities committed by soldiers of the Japanese Imperial Army against prisoners, civilians, and even against each other. According to Ienaga, "The atrocities committed by the Imperial Army and Navy attest to the moral degeneration of the ruling elite." (p. 190) Japan's ruling military elite was certainly morally bankrupt, and Ienaga offers no excuse for them. But the real culprit here, as throughout the book, is the war itself. Ienaga emphasizes the darker aspects of war: the death, maiming, and terror of the bombing raids. Rather than directly criticize Americans for their use of unrestricted submarine warfare or for dropping the atomic bombs, he blames these atrocities — like those committed by Imperial forces — on the war itself. In the final analysis, all the "horrors of war" are only more eloquent testimony against the militaristic policymakers who initiated the conflict in 1931.

Ienaga's essay, therefore, is less a military history than a social comment. The militarists in Japan were able to conduct their wicked policy, he says, because the government sponsored patriotic propaganda and stifled criticism. Children were taught patriotic slogans in elementary schools and learned to read from texts that exalted Japanese military achievements. Ienaga feels compelled to remind the generation of the 1960s, to which he addresses himself, of the dangers of such a policy, for he fears that the United States ("the new aggressor in Asia") may be using Japan for its own ambitious and morally bankrupt purposes. His goal, clearly, is to firm up Japan's resolve to remain neutral and unarmed.

For those more interested in the

military activities of the Pacific war, two new books by American historians shed light on that aspect of the war. The first, a popular history by Duane Schultz,† concerns the defense of Wake Island in the first weeks after Pearl Harbor. Ienaga would no doubt object to the tone of this book, for it is a paean to the heroism and determination of the garrison of Wake Island. Schultz succeeds in capturing the heady mood of those desperate days when the only good news from the Pacific was that Wake Island was still holding out. Though it offers no new information, it is a readable, well-paced narrative.

A longer and more scholarly offering is Paul Dull's battle history of the Japanese Imperial Navy.†† Dull, a former Marine Corps officer and Asian scholar at the University of Oregon, is one of the few Americans to have made extensive use of the Japanese operational records stored on 260 microfilm reels in the United States Naval Historical Center. Having mined this voluminous source, Dull pieced together a detailed account of the surface battles of the Japanese Imperial Navy. Dull's title is explicitly accurate: His book is a "battle history."

The easiest thing in the world for a reviewer to do is to criticize the "book not written," but it is impossible not to express disappointment that a man with Dull's unique expertise did not go beyond the chronological blow-by-blow of naval actions. He does a superb job of describing *what* happened, but often leaves one wondering *why*. The Japanese admirals who planned and executed Imperial naval battles remain faceless names without personalities. In fairness, Dull does make an effort to explain Admiral Ozawa's apparent brashness in the Battle of the Philippine Sea — he had been lied to by the Japanese commandant on Guam about the strength of Japanese air power on that island — and he

offers a sympathetic analysis of Admiral Kurita's stunning decision to retreat after closing Leyte Gulf. But these are the exceptions. Nevertheless, Dull's contribution is original, and his book should prove a useful reference work for future historians of the Pacific war, as well as a useful companion piece to Samuel Eliot Morison's *History of United States Naval Operations in World War II*.

Dull's central theme is that personnel and material attrition had made Japanese victory impossible by late 1942. To this end, the series of naval actions in the Solomon Sea during the Battle for Guadalcanal was critical. The Japanese Combined Fleet, though frequently victorious in these battles, was bled in much the same way that the Confederate Army was bled by its victories in the American Civil War (my comparison, not Dull's). Nevertheless, Japanese leaders were incapable of facing reality and ending their hopeless war.

On this point, Ienaga agrees with Dull. The determination to fight on for a lost and bankrupt cause, he argues, was "a defense strategy worthy of little boys playing samurai; the military were as dangerous as they were ridiculous." (p. 230) General Mutaguchi Yukiya, commander of the 15th Army, personifies this spirit. Invading India, he sent inadequately prepared, poorly armed men against a superior army, and, when defeated, he refused to authorize a retreat and instead ordered his men to hold and fight. According to Ienaga, "This ridiculous offensive was a miniature version of the Pacific War." (p. 147)

Both Ienaga and Dull argue the point — perhaps somewhat academic by now — that Japan did not *intend* to strike at Pearl Harbor without a declaration of war. A diplomatic announcement was supposed to have preceded the attack by a half hour; that it was delayed was an acci-

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†Duane Schultz, *Wake Island, the Heroic, Gallant Fight* (New York: St. Martin's Press, 1978, $8.95), 247 pages, appendixes.

††Paul S. Dull, *A Battle History of the Imperial Japanese Navy: 1941-1945* (Annapolis: U.S. Naval Institute, 1978, $23.95), 342 pages, appendixes.

dent of history. Yet this fine point is of questionable importance since the decision for war had been made as early as 6 September. Japan's military leaders waited until December only to be certain that their own preparations were complete and that Germany would, indeed, defeat Russia. If they had waited a few weeks more, the success of Zhukov's counterattack (launched 6 December) might have led them to reconsider. But it is doubtful, for, as Ienaga himself points out clearly, army leaders had lost touch with reality.

One last point of comparison is deserving of comment. Ienaga dates the Pacific war from 1931 and claims that the attack on Pearl Harbor a decade later was a lineal development of the war in China, which for the Japanese was the central theater. Both Schultz and Dull, indeed most American historians, date the war from December 1941. This is perhaps natural, but Ienaga's argument is compelling. It was the Japanese involvement in China that strained their resources so severely as to lead army leaders to urge an attack to the south and a war against England, Holland, and the United States. To Ienaga the diplomatic negotiations were not critical because the diplomats had lost control of the situation — indeed, had lost it in 1937 and never regained it.

B Y contrast, diplomacy is the central theme of Christopher Thorne's *Allies of a Kind,*† a sequel to his *The Limits of Foreign Policy; The· West, The League, and The Far Eastern Crisis of 1931-1933.* As in that book, Thorne has undertaken meticulous research in preparing this volume. Unfortunately, he also has a tendency to repeat himself, and his prose is at times tedious.

Frequently overlooked in histories of the war in the Pacific is the fact that more than two powers were involved. By 1945, Japan was at war with more than fifty nations — half the world. The United States was thus the leader of an enormous grand alliance. Of course, since the United States contributed most of the troops and weapons, it could unilaterally determine strategy on its own. Indeed, the most serious strategy arguments about the Pacific theater took place between the American Army and Navy: between MacArthur and Nimitz within the theater and between Marshall and King in Washington. But the United States did have allies, Britain being by far the most important. The relationship between Britain and the United States as it concerned the war in the Pacific is the subject of Thorne's book.

It was an unequal partnership. Britain was painfully aware of its dependence on the United States, a dependence which Thorne infers was unfortunate, for the underlying theme of Thorne's book is that the British were thoroughly realistic about the political situation in the Far East whereas the Americans were not. Thorne, who is himself British, contends that the British grew tired of America's facile idealism, especially since the United States could not be counted on to back up its high-minded phrases with action. According to Thorne, America's Far East policy was characterized by "a singular blend of evangelicalism, political calculation, benevolent paternalism and crude self interest." (p. 23) Roosevelt's China policy, for example, was "ill-conceived, inefficient, and irresponsible," especially when compared to "Whitehall's positive approach." (pp. 174, 196)

Much of Thorne's criticism of American policy is no doubt deserved. What is less certain is his claim that British policymakers were any more far-sighted or realistic. He insists, for example, that the British recognized Chiang for the charlatan that he was, doubted that his defeat would mean Japanese victory, and knew that

Chiang was hoarding weapons for the postwar and showdown with the Communists. Perhaps so. But Thorne also claims that Britain had no desire to maintain any special interests of its own in the postwar era. The British were willing, even eager, to surrender their special privileges in Asia, and they delayed doing so only because they did not want to encourage the impression that they were acting out of weakness. "Many Americans," he writes, "would have been surprised to learn of the degree of willingness over the surrender of extraterritoriality that existed in London." (p. 195) Indeed.

Most likely, American attitudes about British postwar intentions derived from Churchill who, Thorne suggests, was not generally really representative of British views. Churchill was an imperialist and a racist, a holdover from the Romantic era. There is little doubt that maintenance of the British Empire was a primary goal of his policy. But Churchill was not Britain. Indeed, "Churchill formed a major obstacle to the development and approval of plans concerning imperial territories after the war." (p. 716) Churchill notwithstanding, the Pacific war was a British defeat. They lost first to the Japanese at Hong Kong and Singapore and then to the Americans in the political haggling that accompanied the wartime alliance. They have never recovered.

By anyone's criteria, the Pacific war was a world event of the first magnitude. It destroyed the two empires that had shared naval dominance in the western Pacific for half a century; the Japanese Empire died with a bang, the British Empire with a whimper. Consequently, Ienaga and Thorne regret that the war had to be fought at all. For Schultz and Dull, the only regret is that the American victory was not quicker and less costly. Americans are not introspective about the Pacific war; we have instead become introspective about Vietnam, and we now ask questions similar to those which concerned Ienaga and Thorne about the Pacific war: Why did it happen? The answer to this question, however, awaits another generation of historians.

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ANNOUNCEMENT AND CORRECTION

Regrettably, an error crept into Lieutenant Colonel John J. Kohout's review of Alistair Horne's *A Savage War of Peace: Algeria 1954-1962* in our September-October issue. The abbreviation OAS, used quite properly by Colonel Kohout as the acronym for *Organisation de l'Armée Secrète*, the right-wing French secret army organization, became Organization of American States during the editorial process. The editor apologizes for any confusion this cross-cultural gaffe may have caused.

Consequently, we take particular pleasure in announcing that Colonel Kohout's article in our July-August 1979 issue, "A Post B-1 Look at the Manned Strategic Bomber," was excerpted in the Autumn 1979 issue of the Smithsonian Institution's distinguished *Wilson Quarterly*. We share his pleasure in announcing this honor.

YEAR ZERO:
THE WORLD IN 1945

Dr. Earl Ziemke

TO the Germans, who were in the bottom of the pit, defeated and destitute, 1945 was *Jahr Null*, Year Zero. The British were hungry and nearly bankrupt. The liberated peoples on the Continent were yet more hungry, and whether they were bankrupt or not was immaterial, especially for those under Soviet occupation. The peoples of the Soviet Union were probably the worst off. They had endured four years of wartime privation and were faced with more of the same. Americans, indeed, were different. They had the highest standard of living in the world — not just then but ever — and the Fords in their future were about to become realities along with television and supermarkets.

Nevertheless, 1945 was Year Zero for everyone who lived through World War II or has been born since. The war was the *the war* of the century, to date at least, and probably of all time. Other wars may have been equally or more consequential, the Persian Wars of the fourth century B.C., or the Punic Wars, for instance, maybe even the Thirty Years War and World War I. As a matter of fact, it can be argued that the second of the world wars was essentially a rematch in which the contestants tried to better the scores they had made in the first. Certainly Hitler saw it that way, as did Roosevelt and Churchill, and Stalin did, too, on matters of territory. They all got more than they anticipated, though: destruction of life and property on a scale never before seen and problems that would be nowhere near being solved more than a generation later. The war would cast a long shadow. In 1945 the world entered the postwar period, and no one to this day can say when or how it will emerge.

John Lukacs lived through Year Zero in his native country, Hungary. He has since become a professional historian in the United States. In these two circumstances lies the genesis of the book *1945: Year Zero,*[†] which undertakes to combine conventional history with what Lukacs calls autohistory. The latter, Lukacs maintains, differs from an autobiography in that its sole purpose is to let the reader know the writer's relationship to his subject. Lukacs's autohistory discloses that he rejects Marxism of any kind, disdains Depression-born American liberalism, and regards the Soviet Union with cold detachment.

It would probably not be very unfair to say that the whole book is a kind of autohistory, a flashback in the life of his times rather than a systematic study, an account of the way things were as John Lukacs saw them then and sees them now. And the picture is a dismal one of a world emerging from war into a murky future in the hands of four men: Churchill, an ineffectual relic of the Victorian era; Stalin, who had the outlook of a Russian peasant and was a slave to his own insecurity; Roosevelt, who died too early and took too long doing it; and Truman, a great president ill-served by his advisors.

Like Truman, the United States was great, holding the preponderance of real power in the world and not disinclined to use it in the general best interest; but the American people, too, were

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[†] John Lukacs, *1945: Year Zero* (Garden City, New York: Doubleday and Company, 1978, $8.95), 322 pages.

badly served by bureaucrats and politicians entrenched behind barricades of liberal clichés. And they were brainwashed — some years before the word itself came into existence — by the liberal press. Believing it was being progressive, the country made massive misjudgments, particularly concerning the Soviet Union, and, what was just as bad, began to spawn a radical mix of anticommunism and isolationism that would eventually become McCarthyism. Consequently, neither the people nor their leaders were disposed to take up the challenge of 1945 and fashion a new world. The result was what Lukacs calls a "state of protracted continuity" in which much goes on without producing a real change, an endless chewing of the same piece of bubble gum.

The world does seem to have gotten stuck in 1945. Many things ended in that year: the European state system and the balance of power; the threat of fascism and the quarantine on communism; the dream of a war to end all wars; and, ironically, perhaps warfare as it had been practiced until then. These and more left behind problems that have not been solved, but the world has gone thirty-four years without another major war and in the majority of those has experienced unprecedented economic prosperity.

What made 1945 Year Zero was, after all, the six years of war that preceded it. The war changed the world and did so, as wars are likely to do, in ways no one could predict or control. And it has stayed with us as much as its aftereffects. For most of those who were in it, it was the biggest, though seldom the most pleasant, experience of their lives. Those who were not, and no doubt also many who were, seem to want to return to it vicariously; hence, the republication in paperback of General Omar N. Bradley's 1951 memoir, *A Soldier's Story,*† one of many and one of the best in that genre.

BRADLEY'S is a simpler world than Lukacs's, which may go a good way toward explaining its attraction. Lukacs, of course, might say it was Bradley and his like who were simple or, at least, found it politic to appear to be so. Lukacs cross-examines the past from a distance of three decades. Bradley, writing closer to the events, deals with it as it was. To take one example, Lukacs asks, "What would have happened if the Americans and not the Russians had arrived in Berlin and in Prague at the end of the war? The postwar realities of Europe, and of the world, may have been different." Bradley says, "When Eisenhower asked me what I thought it might cost us to break through from the Elbe to Berlin, I estimated 100,000 casualties. 'A pretty stiff price to pay for a prestige objective,' I said, 'especially when we've got to fall back and let the other fellow take over.'" Prague, Bradley indicates, would have been easier, but "Because Czechoslovakia had already been earmarked for liberation by the Red Army, we were not to advance beyond Pilsen, a few miles inside the border." Simple? Perhaps. But would the alternative have been better? Taking Berlin and Prague would probably not have made all that big a difference. They would have had to be part of a much more extensive, costly, and dangerous enterprise.

Reading Bradley puts Year Zero into another perspective. Operation Overlord, in which Bradley commanded First United States Army in the landing and on the beachhead and Twelfth Army Group from the breakout to the German surrender, was a truly remarkable undertaking. Only the United States could have put together the ground, air, and naval forces to carry an invasion force across a major water barrier and support it on an advance more than six hundred miles deep into enemy-held territory. Even so, there were hitches — a painfully slow breakout

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†Omar N. Bradley, *A Soldier's Story* (Chicago: Rand McNally and Company, 1978, $6.95), 618 pages.

from the beachhead in July 1944, motor fuel and ammunition droughts in September and October, and the Bulge in December. And, big as it was, Overlord was not the whole war. Before it began, the Soviet armies had for a year and a half been pushing the Germans back from Leningrad, Moscow, and Stalingrad on a front that at one time spanned over three thousand miles. At the end, Eisenhower had two million troops in Western Europe; the Russians had more like six million. The American troops wanted to go home, and most of them promptly did. The Soviet troops, no doubt, also wanted to go home, but nobody was listening to them. The United States had the atomic bomb. Specifically, it had three bombs, one that was tested in New Mexico in July 1945 and the two that were dropped on Japan in August, and it would not have more until late in the year. As a power, the United States undoubtedly stood head and shoulders above the Soviet Union, but, although it could not enforce a settlement completely satisfactory to itself, the Soviet Union did have the strength to secure a stalemate and prolong it indefinitely.

GERRIT ZIJLSTRA is neither a military professional like Bradley nor, like Lukacs, an academic historian. He is what an art critic would call a primitive, an unschooled craftsman. In fact, *Diary of an Air War* is not even a diary.[†] It is a chronology put together long after the events with which it is concerned, and, as such, it completely lacks the customary apparatus of source citations, except for one footnote. The bibliography is short and haphazard, the one outstanding work listed being the official U.S. Air Force history on which the author, no doubt, drew heavily.[1] (Incidentally, a more comprehensive chronology based on the official history has been published by the Air University.[2]) The only qualifications Zijlstra claims are a lifelong interest aroused when he saw the American bombers flying over his home in Holland as a boy during the war, a great deal of reading about the planes, and a desire to pay tribute to the men who flew them. The latter he has done. Whatever its deficiencies, this book gives as good a feel of what the air war was like for the Eighth and Ninth Air Forces as any that has been written.

A chronology is not a satisfactory vehicle for treatments of strategy, for instance, or policy, or the processes of decision-making, and these mostly are missing in the *Diary*. On the other hand, the day by day piling up of seemingly — and often actually — unrelated episodes, the sporadic flashes of drama that come unannounced and pass without an afterglance, and the routine bookkeeping inherent in a chronology can develop a remarkable impact. The form appears to be particularly suited to air warfare, which by nature tends to run on a daily cycle.

What strikes one most, particularly one who spent a good deal of time in unpleasant circumstances on the ground envying the aircrews who could do their work in a couple of hours and be home in time for a meal and a good night's sleep, is how dangerous it was. For the ground soldier, there usually was a chance that the crunch would come somewhere else; for those who flew in the bombers, the B-17 Flying Fortresses and B-24 Liberators especially, there hardly ever was. And the enemy was good at his business, too. He could pick off almost a whole wing of Fortresses left without fighter cover for twenty minutes or so, and the Liberators were, if anything, easier. A fighter pilot could count on his skill, a bomber crew on nothing, excepting, perhaps, luck. The majority would come back from the worst of missions, but there would always be the next mission, and the odds did not change all that much until late in the war. The P-47 Thunderbolts

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and the P-38 Lightnings helped, and the long-range P-51 Mustangs made a difference in the last year. On the other hand, German Me-262 jets shot down five Fortresses over Prague on 19 April 1945, three days after General Carl Spaatz had declared the victory in the strategic air war.

TRUE. In Year Zero, United States air power dominated the world's skies. The Eighth and Ninth Air Forces' contributions alone, however, had cost 5200 heavy bombers, 800 medium and light bombers, 4200 fighters, and 10,000 men.

A readable (in about two hours) wrap-up of the war is Edward Jablonski's *Pictorial History,* [†]

and not too many of the pictures are old stand-bys. Apropos Year Zero, Jablonski quotes General MacArthur who, in his message broadcast from the battleship *Missouri* after the Japanese surrender, said, "A new era is upon us. Even the lesson of victory itself brings with it profound concern, both for our future security and the survival of civilization." And so it has been.

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Notes

1. W. F. Craven and J. L. Cate, *The Army Air Forces in World War II* (Chicago: The University of Chicago Press, 1948-51).
2. Kit C. Carter and Robert Mueller, *The Army Air Forces in World War II, Combat Chronology, 1941-45* (Washington: Government Printing Office, 1973).

[†]Edward Jablonski, *A Pictorial History of the World War II Years* (Garden City, New York: Doubleday and Company, 1977, $12.50), 319 pages.

REFLECTIONS ON VIETNAM: THE LESSONS?

DR. JOE P. DUNN

Those who cannot remember the past are condemned to repeat it.

GEORGE SANTAYANA

NO event in American history has elicited so many didactic pages as has Vietnam. During the sixties and early seventies, a host of journalists, academics, politicos, participants, and protestors of the Vietnam War freely offered criticism, advice, and evaluation. Sages and seers from reactionary to radical proclaimed the lessons of Vietnam. The doves clearly out-weighed the hawks both in quantity and quality. Reflective of the era, an apocalyptic tone permeated much of the scholarship. Although some fine books emerged, much of the literature suffered from the maladies of "presentism" and "instant history." The doves tended toward moralism, myopia, and malapropism; but the hawks were guilty of equivalent sins. Official explanations, such as the periodic white papers, General Westmoreland and Admiral Sharp's *Report on the War in Vietnam* (1969) and the memoirs of Johnson, Nixon, Rostow, and others, exhibited

shallow self-justification. Polemics abound on both sides. The dispassionate, solid scholarship of Bernard Fall, Douglas Pike, Alexander Woodside, Allan Goodman, or Dennis Duncanson and temperate, balanced memoirs, such as Chester Cooper's *The Lost Crusade* (1970), were unfortunately few and far between.

It is still too early to propose definitive works on Vietnam; indeed the very notion is utopian. All historical events are infinitely complex, but Vietnam was more complex than most. The experience was a mosaic of conflicting truths, and each vignette was not a microcosm as many observers attempted to portray. The manifold historiography of the origins of the Cold War will not compare to that which will emerge on Vietnam in the next decade. Vietnam scholarship will follow generally the same evolution as did Cold War interpretations. The debate over the lessons will increase, but the passions of the earlier era will subside, and a more sophisticated analysis, a deeper appreciation of the complexity, will surface.

At present the first comprehensive summaries of the American experience in Indochina are appearing. Key memoirs — those of General Westmoreland, Nguyen Cao Ky, Admiral U. S. G. Sharp, Frank Snepp, William Colby, for example — are now in print. The mood of the nation is much different than in the previous decade. Domestic issues predominate. Watergate, inflation, jobs, taxes, and energy have shoved the trauma and scars of Vietnam into the past. The banter of liberal-conservative debate has replaced the agonized tones of the sixties' idealists and radicals. Solzhenitsyn's *Gulag*, Soviet abuse of human rights, and the unhappy fate of Cambodia and Vietnam today put the world situation in better perspective, evincing that America's self-abasement in the sixties was out of proportion to her sins. Soviet military ascendancy fosters a national security concern more legitimate

than the overblown specter in Indochina. The literature of this period reflects these changes in the national mood.

The four books considered here are products of the present stage of Vietnam historiography. The three surveys speak to an immediate need and attempt to fill a void; but their value is transient, and they will fade from view as better studies emerge. The monograph on the news media makes a significant, lasting contribution. All four focus on mistakes and lessons of the Vietnam experience.

*T*HE *Last Chopper,*[†] covering the 1963-1975 period, is the sequel to Weldon Brown's *Prelude to Disaster: The American Role in Vietnam, 1940-1963* (1975). Like its predecessor, the book is a repetitious, poorly written political narrative based on newspapers and limited secondary sources; it offers nothing new. Footnotes reflect a range of sources across the ideological spectrum; but many of the major works on Vietnam are absent from both notes and bibliography, and the author draws heavily from such marginal accounts as Alfred Steinberg's *Sam Johnson's Boy* (1968) and Ernest Gruening and Herbert W. Beaser's *Vietnam Folly* (1968). Brown portrays his position as middle of the road, and indeed he strikes out in all directions; but underlying his narrative is traditional cold war rhetoric, often in the starkest terms.

Brown considers American military involvement a mistake as the United States should not have become engaged in an area peripheral to our vital interests without strong United Nations and ally support. Assistance should have been limited to financial and technical aid and granted only in accord with the achievement of necessary political and social reforms. Vietnam

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[†]Weldon A. Brown, *The Last Chopper: The Denouement of the American Role in Vietnam, 1963-1975* (Port Washington, New York: Kennikat Press, 1976, $15.00), 371 pages.

looked to the United States rather than undertaking the internal action "necessary to save itself." Introduction of American combat troops and the assumption of the war effort allowed the tail to wag the dog. America cannot respond to every crisis unilaterally, the author explains, without bleeding herself dry.

Although Brown disdains American military involvement, he emphatically condemns the feeble and vacillating conduct of the war by Johnson and Nixon. Domestic political concerns rather than military necessities dominated Johnson; and Nixon, despite his talk of victory with honor, simply threw in the towel. "Vietnamization," Brown overstates, "was frankly a cover for our withdrawal before the tragedy fell upon all Indochina." Throughout, the author excoriates both Vietnamese and American lack of resolve and will. The book ends with an appeal for the free world to unite against communist expansion, concluding, "Who will be the last domino?"

The book has some merit. It attempts to fill a gap in current literature, and it provides a wealth of detail for the general reader. Some might call the study balanced, but this would be a superficial assessment. Essentially, the author introduces new clichés to replace old ones and substitutes rhetoric for analysis. In final appraisal, the book is mediocre.

Dave Richard Palmer's book[†] is more valuable although it, too, has limitations. The author, a Vietnam combat veteran who taught at West Point and the Vietnamese National Academy, admits that his work is preliminary, but he correctly maintains that some interim perspective is needed while awaiting more definitive accounts. It may be necessary to employ some of the lessons of Vietnam before more authoritative studies appear. Like Brown, Palmer relies on secondary sources, augmenting them with personal interviews and his own military experience.

The book concentrates on the American combat role and reflects the military's perspective: the frustration of fighting an unpopular, politically limited campaign. Historical background is brief with only 57 pages devoted to the pre-1965 period; however, the section is loaded with interesting observations. Palmer affords a new look at the 1963 Battle of Ap Bac and the interplay of the personalities involved, including the colorful and controversial Lieutenant Colonel John Paul Vann. Palmer is more critical of Vann than is David Halberstam's portrait in *The Making of a Quagmire* (1965) and *The Best and the Brightest* (1972). The author forcefully rejects Kennedy's goal of a Laotian-type settlement for Vietnam as an impossible and disastrous objective. Drawing on the prepublication manuscript of Tran Van Don's *Our Endless War* (1978), Palmer supplies new information on the coup against Diem. Finally, he emphasizes the importance of 1964 as a major turning point in the war's escalation. In 1964 North Vietnam stepped up the infiltration and authorized direct strikes against American troops. Palmer labels the latter a short-run "fatal miscalculation."

Palmer reproves Johnson — "whom history may well remember as our most reluctant and indecisive wartime commander-in-chief" — for his timid and wavering leadership. Like Brown, he scorns the policy of gradual response and Johnson's subordination of military logic to domestic politics. Palmer cites several poor Johnson decisions, all taken against Joint Chiefs of Staff counsel and objection: (1) restricting the bombing of the North, (2) rejecting legitimate troop requests for spurious reasons, (3) refusing to call up the reserves, (4) allowing Communist sanctuaries in Cambodia and Laos, and (5) excessive meddling in the tactical affairs of military commanders. The author relates several

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[†]Dave R. Palmer, *Summons of the Trumpet: U.S.-Vietnam in Perspective* (San Rafael, California: Presidio Press, 1978, $12.95), 304 pages.

interferences, including instances as trivial as ordering changes in operational code names. More extreme was Johnson's demand that the Joint Chiefs of Staff publicly pledge that Khe Sanh could be held. Palmer calls this "one of the most humiliating gestures any American political leader has ever inflicted on his military aids."

While Johnson was inadequate, Palmer portrays Westmoreland as the good soldier operating under severe restrictions "unheard of in military doctrine." The general's finest achievement came in logistics, building the physical and supply facilities to conduct the war effort. Notable feats included towing a steel pier from Charleston, South Carolina, through the Panama Canal, to Cam Ranh Bay; laying down functional runways and helicopter pads in hours; and construction of the vast complex of military bases across the country. However, the American logistics marvel had negative attributes as well. As the author explains, "Never in any war has any force been so munificently pampered." The American soldier was allowed and came to expect ". . . refrigerators, movies, ice cream, PXs, Red Cross girls, air conditioners, tape recorders, their own television and radio stations, free flights to Asian resort areas, service clubs, Bob Hope Christmas shows, hobby shops, and a host of other fringe benefits." While this opulence had some justification, it diverted manpower from the combat role and brought Westmoreland's personnel skills into question. Certainly it weakened his pleas for increased forces.

On the matter of manpower, Palmer is most critical of the combat policy of attrition. It was ineffective and demonstrated an appalling lack of any real strategy. Coupled with the Washington mandate to keep casualties to the barest minimum even at the cost of operational success, combat policy led to new infantry doctrine. Rather than close and destroy the enemy, infantry troops sought out the adversary and retreated to call in artillery and gunships. American and Army of Republic of Vietnam (ARVN) troops became wedded to technology and external firepower. Although an architect of this situation, Westmoreland in retrospect branded this "firebase psychosis" a dangerous defensive tactical policy that could prove disastrous in a future combat situation. He continued: "Our company and junior field grade officers and many of our non-commissioned officers, whose sum total of combat experience has been restricted to Vietnam, will require re-orientation to overcome such doctrinal narrowness."

The Nixon years receive cursory treatment, although the new president gets better marks than his predecessor. Palmer focuses on the Cambodian and Laotian incursions which, along with the mining of Haiphong harbor, he considered overdue. Coverage of the post-Paris accords period is terse and superficial. The book concludes with an emotional plea to absorb and apply the lessons of Vietnam. However, even after finishing the book, the reader is not totally sure what those lessons are.

ALL the uniformed services are in the process of writing multivolume histories of their Vietnam experience just as they did following World War II and Korea. Robert Whitlow's book[†] is the first of a projected nine-volume series by the Marine Corps History and Museums Division. The book is a narrative account, largely an overview of operations, covering the rather obscure period from 1954 to 1964 when the Marines grew from a single advisor to a 700-man advisory and combat support contingent. It relies basically on official government studies and reports, oral interviews, and written comments on the original manuscript by the Marine com-

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[†]Captain Robert H. Whitlow, USMCR, *U.S. Marines in Vietnam: The Advisory & Combat Assistance Era* (Washington, D.C.: Government Printing Office, 1977, $6.75), 190 pages.

manders in Vietnam. Particularly, it draws on two classified studies prepared in the mid sixties by the Marine Headquarters G-3 Historical Branch. In setting the groundwork, Whitlow devotes the first chapter to a brief geography, culture, and summary history of Vietnam, which are superficial by definition. Subjects then include the origins of Marine advisory assistance in the fifties, the counterinsurgency effort, the training of Vietnamese marines, introduction of a medium helicopter force — code name SHUFLY — the unit's operations in the Delta and later in I Corps, and the early Marine ground combat involvement.

Whitlow's study is a useful source of basic information and service perspective. The numerous photographs, excellent index, and helpful appendixes (including a chronology, glossary of Marine acronyms, tenures of Marine commanders, and a list of those who reviewed and commented on the original manuscript) enhance its usefulness. But the book has limitations. It reads too much like a unit history, the lowest form of military antiquarianism. The author's approach is too parochial and lacking in critical analysis. It will be interesting to see if subsequent volumes continue in this vein.

IN purpose, content, and quality, Peter Braestrup's *Big Story*[†] differs significantly from the other books reviewed here, for it has the potential to become a classic.[*] The journalists' outspoken role in Vietnam long will remain controversial. Kennedy and Johnson bridled at press and television independence and criticism; Nixon fumed and took measures to curtail embarrassing leaks. An extensive literature exists on the media's ability to shape attitudes toward

the conflict, but nothing approaches the magnitude of Braestrup's massive study.

Historians agree that the 1968 Tet offensive resulted in the worst defeat North Vietnam suffered in the long war. The administration and military stated this at the time. However, the American people received a much different picture, for the press portrayed the offensive as a decisive communist victory and an American-ARVN disaster. The erroneous impression helped topple an incumbent president and accelerated the process of American withdrawal from Indochina. How did the media err? Why did their quest for the true story go so far awry? Braestrup, who was the *Washington Post* Saigon station chief in 1968 and is now editor of *The Wilson Quarterly*, attempts to answer this difficult question. His book may inspire as much controversy as the subject with which it deals. He pulls no punches, names names, praises, admonishes, explains, and condemns. Nor does he spare himself in his critique. Braestrup rejects the hawks' charge that the media were uniformly hostile to the conflict and thus ideology jaundiced their objectivity. The fault, he demonstrates, is more complex and lay with the structures and practices of press and television journalists in Vietnam, the military's information services, and the whole nature of news production and dissemination in contemporary America.

Most · correspondents in Vietnam were not qualified for their positions as war reporters. They lacked military experience and did not comprehend the complexity of warfare. Although the country seemed inundated with journalists, individual bureaus were understaffed, and the constant demand for instant, simple, dramatic news led to hasty reports, superficial perspective, and overblown interpretive analysis. The fault lay not only with on-scene reporters but all the way up the news chain of command.

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[*]For a review of the unabridged version of *Big Story*, see Donald Bishop, "The Press and the Tet Offensive," *Air University Review*, November-December 1978, pp. 84-88.

[†]Peter Braestrup, *Big Story: How the American Press and Television Reported and Interpreted the Crisis of Tet 1968 in Vietnam and Washington*, abridged (New York: Doubleday, 1978, $8.95 paper), 606 pages.

Braestrup particularly blames senior news managers, who should have known better. Television was preoccupied with impact. The short, filmed vignette passed along as microcosm of the whole war became standard fare. Commentators felt compelled to pose as authorities, "dominating what they described." Their analysis was often highly speculative, telling viewers more than they knew or could know. The Tet press debacle was the culmination of a house built on sand.

This summary only hints at the breadth of Braestrup's monumental work. He is not entirely critical, for he devotes considerable space to the virtues of Vietnam journalism and the persons who distinguished themselves at various points along the way. He concludes that the Tet affair was an exception in American journalism; but it could happen again. For this reason the book should be a standard text in American journalism schools. But it is not a book for jour-

nalists alone; it speaks to the whole informed community, and is most valuable and fascinating reading from cover to cover.

WHAT of the lessons of the Vietnam experience? Of what value will they be in the future? Was not Vietnam unique, a confluence of circumstances, events, and history that could not happen again? Was not one of our prime mistakes the attempt to force the lessons of World War II and Korea on Vietnam? Will those lessons learned in Indochina be instructive in future crises in Europe, Africa, or Asia? Robert Pfaltzgraff has warned that the greatest lesson of Vietnam may be to be wary of lessons, and Hans Morgenthau speaks of the "unlessons" of the experience. But the historian can never remove the warning of Santayana from his conscience, and he should not.

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POTPOURRI

Luftwaffe Handbook 1939-1945 by Alfred Price. New York: Charles Scribner's Sons, 1977, 111 pages, illustrated, $6.95.

The purpose of Alfred Price's book is clearly defined in the preface: ". . . to produce a basic reference manual on the *Luftwaffe*, . . . [and give] an insight into the organization and working of that force." The author makes it clear that his volume is not a history or a substitute for a history of the Luftwaffe. Rather it should be used as a companion to such works — a reference book of basic terms and concepts. Mr. Price has achieved his purpose.

Following a brief description of the Luftwaffe's organization, Price devotes two chapters to the tactics used by German fighters and bombers during World War II. The tactics used by both day and night

fighter aircraft are discussed in general terms, and photographs of ground and airborne equipment are provided. In the section dealing with bomber tactics, the author contrasts the different techniques used for horizontal and dive bombing, ground attack, and antishipping.

Other topics discussed include airborne infantry operations, the pilot training program, and the flak arm. This last subject is particularly interesting, and the author covers it in some detail. Price feels that the flak arm consumed a large proportion of the Luftwaffe's resources (about 50 percent of all personnel), and although it was of great importance during the war, the flak arm has not received its fair share of coverage. He provides this coverage clearly and simply by describing the organization, weapons, and impact of the antiaircraft forces.

Concluding chapters deal with the V-1 "Buzz-bomb" (the V-2 is not discussed because it was under the operational control of the Army) and biographies of senior commanders. This last chapter is especially useful, giving short histories of fourteen of the most senior Luftwaffe officers including Goering, Milch, Udet, Sperrle, and Galland.

Two appendices are also attached: the first concerns aircraft unit identification markings and, the second, rank insignia. Throughout the book dozens of valuable photographs are provided. There is no index; however, the book is short and well organized so this is not a serious shortcoming. Unfortunately, there is no bibliography; such an addition would be appropriate and valuable for a work of this nature.

Overall, the book achieves its intended purpose. Price gives an excellent overview of the Luftwaffe's organization and mission elements during World War II. As pointed out, however, this book should be used as a reference work in conjunction with standard, more detailed histories of the Luftwaffe, not as a substitute for those histories.

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Hitler: The Pictorial Documentary of His Life by John Toland. New York: Doubleday, 1978, 205 pages, $14.95.

An increasing number of books attempt to grapple with the phenomenon of Hitler and Hitler's Germany. John Toland's biography *Adolf Hitler* addressed the man; this book presents pictorial coverage of Hitler's Germany. This volume, which serves as a supplement to the biography, graphically demonstrates what can happen when a country loses confidence in itself and turns its conscience over to a single, all-powerful source of authority. Toland acknowledges that he has purposefully selected photographs that run the gamut from the successes of Hitler's National Socialist Party to the horrors of the death camps. Even though predominantly photos, the book should not be considered a photo-essay, for the accompanying text is essential to an understanding of the photographs and their captions.

For those who enjoyed Toland's longer biography, this book is an excellent companion volume. For those who have not read the biography, it can serve as an abridgment. In either case, the book is recommended for those fascinated by Hitler — the man and his state.

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Scott of the Antarctic by Elspeth Huxley. New York: Atheneum, 1978, 287 pages, $12.95.

"There is a touch of Icarus," writes British novelist-historian Elspeth Huxley, "about many national heroes of the Western world. By such standards, Robert Falcon Scott qualifies for his place in this select company."

In an age when we think so little of man's astonishing accomplishments in exploration, it is both enlightening and inspiring to read of achievements which, only a century ago, were considered all but impossible. Just prior to the Great War, mankind had not yet set foot on either of the earth's extremities. The Polar Regions remained uninhabited, foreboding, and largely unexplored.

The dream of being the first to plant one's country's flag at the Pole no longer seems an aim worth dying for, suggests Huxley; but at the turn of this century, it seemed as noble an achievement and formidable a challenge as Armstrong's first bootprint on Tranquility Base. In the minds of Robert F. Scott and his mentor, Sir Clements Markham, a successful expedition to the Antarctic was not only a matter of geographic accomplishment but of national pride as well. Torn by depression and self-doubt, Scott, driven principally by pride, persisted in the quest to place his flag at the South Pole and do so ahead of others determined to get there first.

Huxley skillfully combines documentation from primary sources with personal impressions of the inhospitable environment in which Captain Scott and his crew lived and, tragically, died. Her command of both the language and the evidence enables the historian and nonprofessional alike to relive the excitement and frustration of Scott's adventure as well as the incredible horror of the story's conclusion.

Huxley's approach to this timeless adventure is considerably more lucid and scholarly than other recent volumes by such authors as Peter Brent and David Mountfield. Detailed descriptions of Markham's preparations for the voyages, including his selection

of Scott to command the expeditions, reflects a serious consideration and thorough familiarity with Scott's Cambridge memoirs and personal notes. In addition to her fresh insights, she presents at least a half dozen previously unpublished photographs of Scott and his expeditions.

Unfortunately, the book's binding is inferior to the quality of its content.

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The Universal Soldier edited by Martin Windrow and Frederick Wilkinson. London: Guinness Superlatives Ltd., 1971 (released, U.S.A. 1978, by Presidio Press, San Rafael), 264 pages, $12.45.

This book is a worthy addition to officers' bookshelves. Here are 15 touching vignettes describing common soldiering from A.D. 100 to 1945. All are beautifully illustrated with full-color drawings of the soliders described. Fighting, dying, smoking, and drinking are the ways of the soldier, interspersed with the chow line, a letter from home, long marches, and perpetual boredom. It is all here. To quote the editors, "the essentials of the trade have remained unchanged over nineteen centuries and more. . . . Potentially we are all soldiers. The book is about us."

T.M.K.

The American Spirit: United States History As Seen by Contemporaries, two vols., edited by Thomas A. Bailey. Lexington, Massachusetts: D.C. Heath, 1978, vol. I, 480 pages, maps, illustrations, index; vol. II, 571 pages, maps, illustrations, index, $8.95 each volume, paper.

Thomas A. Bailey, Byrne Professor of American History Emeritus at Stanford University, is an eminent scholar and prolific writer. He successfully designed *The American Spirit* to recapture the spirit and meaning of American history by focusing on personalities. In addition to publishing documents about the greats and near-greats of American history, he has also illuminated the lives of the not-so-great. We read not only about William Penn, the best known Quaker and founder of Pennsylvania, but also about Richard

Townsend, who came to the New World aboard the ship *Welcome* and at age 83 wrote his recollections of the Quaker colony.

Bailey constructed this two-volume reader to be used with his textbook, *The American Pageant: A History of the Republic*. In their chronological order, the volumes can also be used with other survey textbooks. Chapter prologues and the prefatory notes unify the volumes and enable the reader to understand the relationship between historical events and the documents. In prefatory notes, the editor raises issues that historians have discussed; he challenges the reader to find answers in the documents.

Despite a five-year interval between the third and fourth editions of this work, the promised bibliographic additions are quite disappointing. Not until chapter five does the editor offer a new bibliographic entry. Although many important works have recently been published that focus on the development of the New England town and Colonial life, those accounts were not cited. The editor added several entries to the bibliography of chapter 19, "The South and the Slave System," yet conspicuously omitted was Eugene D. Genovese's *Roll Jordan Roll: The World the Slaves Made* (1972).

Of the 52 chapters in this reader, 19 contain no new bibliographic entries, and 24 added only one new citation. In the only new chapter, "The Nixon-Ford-Carter Transition," the editor addressed the spasm of Watergate and its subsequent events — Ford's pardon of Nixon and Carter's pardon of almost all Vietnam-era draft evaders. In short, the most significant change between the third (1973) and fourth editions (1978) of *The American Spirit* is the price.

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After Leningrad: From the Caucasus to the Rhine by Elena Skrjabina, translated and edited by Norman Luxenburg. Carbondale, Illinois: Southern Illinois University Press, 1978, 190 pages, $10.95.

After Leningrad: From the Caucasus to the Rhine is a firsthand account (in the form of a diary that covers the period from 9 August 1942 to 25 March 1945) of a Russian mother who escaped the siege of Leningrad and managed to trek safely to a resort town in the Caucasus Mountains, thence with the retreating German army to a work camp on the Rhine,

near the city of Koblenz. Although purportedly offering a "carefully suppressed Russian perspective" of the final years of the war, *After Leningrad* presents a surprisingly sedate and relatively nonviolent odyssey. Indeed, it does describe the human side of wartime evacuations and life in a German work camp, but one is struck by the apparent abundance of food and material comforts available in Germany nearly to the end of the war. In one account, for example, from the entry of 24 November 1944, ". . . I noticed a line for the first time; the people were standing by the bakery for bread. It was the same thing at the meat shop. Until now there had never been anything like this, even though the war is now in its sixth year." For Elena Skrjabina, life in the German work camps, even for conscripted Russians, was not the gruesome experience we might imagine. As late as January 1944, she tells of the generosity of the plant cook at the factory to which she was assigned. "He is always supplying us with food, and in such quantity that I can bring sandwiches every day to the workers in the camp."

After Leningrad is an interesting account, if only for the sufferings and agonies of war that it does *not* depict. Perhaps therein lies its value — as a reminder that for many refugees of World War II (particularly the Russians), enemy occupation, collaboration, relocation, and even forced labor conscription were preferable to "liberation" by the Red Army.

The final entry of the diary ushers in a new life for Elena Skrjabina. On 25 March 1945 she wrote, ". . . soldiers in brown uniforms wearing round shiny helmets tore the door open. The Americans had arrived." Today, Elena is herself an American. She holds a doctorate in French and comparative literature from Syracuse University and is a Professor of Russian at the University of Iowa.

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Pimpernel Gold: How Norway Foiled the Nazis by Dorothy Baden-Powell. New York: St. Martin's Press, 1978, 207 pages, $10.00.

The title *Pimpernel Gold* clearly stamps Dorothy Baden-Powell's book as one of that patriotic/nationalistic genre of books popular during and shortly after World War II; its appearance nearly forty years later seems anachronistic. Yet she might have pulled it off were she a better storyteller. How the Norwegian national treasury (several tons of gold bullion) was spirited out of the country in 1940 is lauded in a Foreword by Sir Lawrence Collier, a former British Ambassador to Norway, as "a record of historical fact" that reads like "a first-class thriller." Alas, it is not, and it does not.

The author, Norwegian by birth, worked for Special Operations Executive (S.O.E.) during the war and claims personal knowledge of the event and to have done research in Norwegian, British, and German "official sources." The reader must take this assertion on faith since the book has neither footnotes nor bibliography, and there are indications that Ms. Baden-Powell has not done her homework. The German invasion and the futile stand by the surprised Norwegians and late-arriving Anglo-French form a backdrop for the tale of how a few intrepid citizen soldiers (the Olsen group) moved the gold north from Oslo by train and truck. They foiled attempts along the way by paratroopers and Gestapo to intercept them and eventually transferred the gold to warships bound for England, where it financed the government in exile. Although details of the invasion are well known, errors have nevertheless crept into this account. One extraordinary example will suffice: The author states that a "large number of German ships had been sunk by ancient and indifferently armed Norwegian vessels"; actually, the Germans suffered few losses, predominantly from shore battery fire and British naval action.

The book reads more like a fictional account of average artistry and imagination than like a scrupulous nonfiction narrative dealing with real happenings in time, place, and order. Characterization is superficial; the conversational narrative style is banal and unconvincing. The Norwegians talk in a caricature of an English accent. The old guards are international-class skiers skilled in unarmed combat. The Germans are wooden, popping up like targets in a shooting gallery to be dispatched by a combination of Norwegian guile (Olsen's men often wear German uniforms and speak German) and sharpshooting. Although their number is diminished by skirmishes and accidents, the Olsen group sees the treasury safe aboard waiting warships. Then they don their skis and whisk away into the fir forests to join the underground.

If you are over forty and the plot sounds familiar, you may recall that Errol Flynn played Captain Olsen and Helmut Dantine the para Major Heinrich Holst. Or was that *Darkness at Noon?* In any event, this is not the book that "every serious officer needs for his professional library."

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Executive Health: How to Recognize Health Danger Signals and Manage Stress Successfully by Philip Goldberg. New York: McGraw-Hill, 1978, 273 pages, $9.95.

Stress stalks our lives every day, on the flight line and in the boardroom. Before any self-therapy is possible, recognition of the condition is mandatory. Dr. Goldberg grimly outlines the signs and alarms so that each of us can recognize the stressful situations. In a world where bookstores are flooded with the "back to health" book bonanza, a new volume needs some particular merit to gain our notice and purchase. This volume is of value because before it sells you another executive exercise and diet plan, it demands that you examine your condition and assess your "stress quotient" and only then embark on stress-reducing. Highly recommended for the OER victim, the Air Staff workaholic, and all USAF "stress makers."

T.M.K.

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Neil P. Ruzic, a writer entrepreneur, is starting the Island for Science in the Bahamas to raise shrimp and seaweed, desalinate water with solar energy, screen marine organisms for pharmaceuticals, generate electricity by deltawing windmills, and explore other applications of science. He holds the first U.S. patent for a device to be used only on the moon and has written seven books on science applications. Mr Ruzic is founder of *Industrial Research* and other magazines and helped Wernher von Braun start the National Space Institute. He holds degrees in science, psychology, and journalism from Northwestern University.

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Joe P. Dunn (Ph.D., University of Missouri) is Assistant Professor of History and Politics and head of the International Affairs major at Converse College, Spartanburg, South Carolina. He has taught in Greece, Turkey, Germany, and Spain. Dr. Dunn has read papers at several historical conferences and published numerous book reviews in academic journals, including the *Review*.

The Air University Review Awards Committee has selected "On War, Time, and the Principle of Substitution" by Dr. Herman L. Gilster of the Boeing Aerospace Company, Seattle, Washington, as the outstanding article in the September-October 1979 issue of the *Review*.

attention

The *Air University Review* is the professional journal of the United States Air Force and serves as an open forum for exploratory discussion. Its purpose is to present innovative thinking concerning Air Force doctrine, strategy, tactics, and related national defense matters. The *Review* should not be construed as representing policies of the Department of Defense, the Air Force, Air Training Command, or Air University. Rather, the contents reflect the authors' ideas and do not necessarily bear official sanction. Thoughtful and informed contributions are always welcomed.

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