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the cover

Focus of our September-October issue is on the Military Airlift Command with emphasis on jet-age combat airlift, MAC's Reserve Forces, combat airlift training, and on significant results in weather modification for military operations. But another emphasis was inevitable in the receipt of General McConnell's last testament as Air Force Chief of Staff and the realization that General Estes, too, would retire on 1 August as MAC Commander. To both:

Ave atque vale!



**SOME
REFLECTIONS
ON A TOUR
OF DUTY**

GENERAL J. P. McCONNELL

*A little reflection makes a skeptic; a lot of reflection
makes a believer.*

—LOUIS PASTEUR

WHILE assembling some notes for this article, I ran across the cited quotation attributed to the famous nineteenth century chemist. Realizing that my comments would appear in the *Air University Review* barely a month after I had left office as the Air Force Chief of Staff, it occurred to me that Pasteur's thought would be a useful guide for writer and prospective reader alike.

It is hardly necessary for me to call attention to the flood of critical comment that has been directed toward a wide variety of governmental activities, particularly in the last year. I have often thought that much of this criticism has shown signs of what Pasteur would have called skepticism because it has been founded on much speculation, little fact, and far less reflection. I have no desire to be labeled a skeptic, nor can I see at this point in time any benefit that could result from critical comment by me on recent controversial events. Such events merit far deeper examination and "a lot of reflection"—by myself as well as others—before valid conclusions can be drawn. In this article, therefore, I shall discuss briefly some of my long-held views and convictions and make some observations on my recent tenure in office.

In looking back over the past few years, I recall vividly the personal distinction inherent in my nomination as Chief of Staff and confirmation by the Senate. Without question, the confidence and trust embodied in these actions represent the highest honors that have been bestowed on me during my lifetime. But symbols of honor are temporal, and, in my own mind at least, that initial sense of honor was fully matched by the deep sense of obligation and responsibility that I felt during my entire tour of duty.

During those early months of 1965, I, like others before me, had a base of experience through service as the Vice Chief of Staff under General Curtis E. LeMay. Although I occupied that position for less than a year, the experience proved beneficial for a number of reasons. One was the fact that I became intimately familiar with both joint and service issues of particular interest to the Air Force. More importantly, I gained what I regard as indispensable to a Chief of Staff: a thorough knowledge of the environment of government in which senior military officers must operate to fulfill their responsibilities. By "environment" I am referring not only to the division of authority among government officials and the procedures through which military proposals are considered but also to the policies and attitudes of the individuals who must become involved in the decision-making process.

I am confident that most of my readers are well informed on the legal and functional aspects of government operations and the procedural machinery involved in our system of decision-making as it pertains to national security. However, I am not as certain

that there is an equal degree of understanding about the nature of national security problems to be solved or the realistic roles of senior military officers in the process of decision-making at the national level.

In recent years there has been ample evidence that military professionals have accepted the idea that national problems involving security can no longer be rigidly identified as exclusively military, political, economic, or social in nature. Yet I have found some vestiges of an outdated belief that responsibility for solutions to such problems can and should be assigned to particular authorities and departments of government. From my own experience, I can readily testify that the major security issues facing the nation are too complex to be placed in exclusive categories or acted upon through a single instrument of national influence.

To illustrate this point, I need cite only the single example of the conflict in Southeast Asia as a many-sided problem that has affected practically every facet of national activity. There can be no doubt that this problem has conditioned the attitude of the entire nation. More to the point, the repercussions of nearly every official proposal or action with regard to military aspects of the problem have been felt throughout the political, economic, and social activities of government. As for my own activity as the Air Force Chief of Staff, it is no exaggeration to say that the war in Vietnam and related issues commanded the largest amount of my personal time and attention, both as a member of the Joint Chiefs of Staff and as the senior military officer responsible for the management of Air Force support for that conflict.

To return to the question concerning the roles of senior military officers in the decision-making process, I have been pleased to note among military professionals an increased understanding of the pertinent laws and directives. Here I am referring to the numerous documents that prescribe the relationship between the President, the Secretary of Defense, and the Chiefs of the military services as individuals and as members of the Joint Chiefs of Staff (JCS). At the same time I have felt that

this relationship has not always been fully and universally accepted as a practical reality when applied to a decision on a particular proposal or issue.

On a number of occasions in recent years I shared the disappointment of other military officers over unfavorable decisions on proposals which, after meticulous study and review of alternatives, appeared to be the most effective solutions to specific problems from a military point of view. But, as I indicated earlier, most of our national security problems have significant nonmilitary implications. In such cases, I found that the productive role of the JCS was to identify key factors that were vital from a military standpoint and to provide a number of suitable alternatives for the application of military power. It also was clear that alternatives which fully considered political and economic implications were more likely to be accorded attention in depth, since national authorities could choose the one which best solved the problem *as they saw it*. I believe that one of the more difficult realities for a military officer to accept is the fact that, in a modern governmental environment, a military solution to a problem may not be fully consistent with the broader objectives in the mind of the decision-maker.

A related point that merits additional understanding is the fact that senior military officers are not only advisers and advocates in the decision-making process, but they are also the agents for carrying out a decision once it is made. During my tenure in office I regarded a decision made by a duly constituted authority as *my* decision and one to be carried out to the best of my ability. I have always believed that responsive action must accompany recognition of authority, and as the Chief of Staff I frequently told members of the Air Staff and others that when a man in uniform felt that he could not support a decision of higher authority it was time to "turn in his suit."

AT THE TIME I entered office, the essential elements of the organized approach

to defense management as we know it today were well established. The process of developing and issuing strategic and logistic guidance under the Joint Strategic Planning System had been in existence for years, although it is true that relatively minor changes in that system were incorporated since 1965. Additionally, the Office of the Secretary of Defense had adopted a body of integrated management techniques now known collectively as the Planning-Programming-Budgeting System (PPBS). Notwithstanding its relatively recent arrival on the scene, the system itself was already a firmly established method of relating military requirements to forces and systems and their costs. I am confident that most readers of this journal are thoroughly familiar with the objectives and procedural aspects of these systems, and my comments here are intended merely to reflect my own views of their value in contributing to the total effort of the Department of Defense.

In general, I believe that the organized approach to defense management as it has evolved over recent years has served a useful and responsive purpose. Without question, the joint plans and documents have been instrumental in fulfilling the obligations of the Joint Chiefs of Staff to provide planning guidance for the armed forces and to submit the advice and recommendations of the JCS to the Secretary of Defense. I can think of no better way to bring together the results of military studies of factors which bear on national strategy and the collective judgments of responsible military leadership concerning actions required to implement that strategy.

Similarly, the modern approach to programming and budgeting has enabled us to examine proposals for changes in force structure with a greater degree of objectivity, to submit such proposals with more clearly defined substantiation, and to process decisions on those proposals in a more orderly fashion. Coupled with an improved data base, advanced data-processing equipment, and progressively more effective analytical techniques, the PPBS has given us an expeditious method of examining complex problems and a higher level of confidence in proposing alternative

solutions. Above all, these systems have enhanced our ability to communicate with most echelons of government, thus affording both the opportunities and the means for making constructive military inputs into the decision-making process.

With all its merits, the modern approach to defense management has both real and potential limitations. One is that the appropriateness of our proposals and the validity of decisions are still largely dependent on personal judgment. Our planning system, for example, remains tied to our ability to interpret facts as we believe they exist and to the accuracy of our projections of trends into a future over which we have little control. This problem is not new, but the translation of perceived threats and national policy into comprehensive strategies and supporting force structures is becoming more difficult—as well as crucial—as time goes on. In practical terms, we have not yet developed reliable techniques for answering the age-old questions, “Is this absolutely necessary?” and “How much is enough?”

A second limitation to our current managerial approach is the risk of using the tools of management as a substitute for strategic thought. In recent years, there has been evidence in some quarters of an attempt to fit the elements of future strategy into the same packages that were designed to facilitate the management of forces and systems. It is well recognized that the current inventory of forces was developed from concepts of defense posture and potential warfare that were commonly accepted in the fifties and early sixties. In following the established management procedure, we now categorize such forces into relatively distinct elements according to predetermined military missions.

It is true that such an approach facilitates a choice between weapon systems competing for the same preconceived mission and aids in defining the performance requirements of a system to accomplish that mission. But the resulting danger I see is a type of strategic thinking that limits the employment of military force to narrowly conceived, unrealistic concepts of warfare and that leads to the development of forces and systems with inflexible mission ca-

pabilities. I believe that the Air Force has demonstrated the value of a more flexible approach by interchanging with telling success the traditional roles of strategic and tactical aircraft in Southeast Asia.

Then, too, the integrated system of management depends on a planning input by individual elements that have specialized interests and competence. It is only natural for a specialist to look at a complex problem from a somewhat narrow point of view. As a result, there is an inherent risk that the specialist will give disproportionate weight to one segment of the problem and will devise alternatives and advocate courses of action which place his specialty in a prominent role as the driving force in solving the problem. The hazard of bias can occur in any system; to guard against it, advocacy must be balanced by perspective. In my opinion, the key to success in our whole approach to defense planning and management is not in the organizations and procedures that make up the system but in the attitudes and actions of the people in it. The system works if the people in it allow it to work.

On this score, it has been my experience that military personnel involved in defense management at the national level have been and are now both personally responsive and organizationally efficient in serving the purposes of the management system. The Joint Staff is competent and is fully meeting the demanding requirements of the JCS. I have found also that the individual service staffs have been equally effective in contributing to joint and unilateral service needs. As the Chief of Staff of the Air Force, I was particularly pleased with the quality of work produced by the Air Staff and the support I received from major commanders and their staff personnel. To me, this performance reflected not only a deep sense of dedication to the Air Force and full support of national policy but also a growth in understanding of national security issues and the need for handling them with sensitivity and skill.

IN PRESENTING some views on the progress of the Air Force in recent years, I

will forego a chronology of events and reiteration of force structure changes. Instead, I will focus on several factors that have had a significant influence on the pace and direction of Air Force affairs in the last four and one-half years.

When I entered office as the Chief of Staff in 1965, it was clearly evident that the strategic capabilities of the Air Force represented the strongest instrument of military power in the world. At the same time the Air Force, as well as all other elements of the Department of Defense, was well along in its progress under a strategic concept that emphasized ballistic missiles as the primary systems for nuclear deterrence and the growth of general-purpose forces as a means of providing a "flexible response" to a wider range of crises and conflicts. As was true under my immediate predecessors, the Air Force faced three major tasks: first, to maintain a strategic force capable of performing assured-destruction and damage-limiting missions as the basic elements of nuclear deterrence; second, to continue the improvement of tactical and airlift forces under an approved mid-range program; and third, to study long-range requirements and propose research and development efforts that we believed would be effective in fulfilling those requirements.

The decision to greatly expand our involvement in the Southeast Asia conflict, of course, added a fourth task which soon proved to be dominant. Without question, the fulfillment of immediate and continuing needs associated with combat operations in Vietnam has had a decided effect not only on Air Force affairs at top management levels but also on the posture of major air commands and operating elements throughout the world. The requirement for substantial reallocations of human, material, and monetary resources to support the war in Vietnam has placed severe restrictions on Air Force progress in other critical areas. In effect, we have been forced to adapt rather than change and to modify rather than modernize.

In spite of the obstacles created by wartime involvement, I believe that the Air Force has made significant progress in meeting a

During one of his tours of the combat zone in Vietnam while he was the Air Force Chief of Staff, General John P. McConnell pauses to talk with two officers of the Republic of Vietnam Air Force.



number of requirements arising from that conflict. The substantial improvement in tactical air control, the extensive modification of weapons and systems for increased effectiveness in all-weather and jungle environments, and the refinement of global and in-theater air transport services are just a few among many examples.

More important, Air Force experience in combat has reaffirmed our fundamental convictions concerning the effective use of air power. Particularly noteworthy, I think, has been the clear demonstration of the versatility of manned aircraft and the ability of man to adapt in the environment of battle.

THE EFFECTIVENESS of air power has always been a vital concern of the Air Force, and at this point I would like to bring up a related subject that has been very much on my mind. Throughout the latter years of my career and especially during my service as Chief of Staff, I became increasingly convinced of the requirement for more effective contributions by the military in the vital and continuing study and discussion of military strategy.

My basis for this statement is provided largely by the fact that since the Korean War, and over the past decade in particular, the public expressions of strategy have become dominated by the writings of civilian analysts. In making this point, I want to acknowledge, first of all, my respect for the contributions to our fund of knowledge on this subject by experts who have demonstrated a depth of understanding of strategic issues and the ability to take an objective position. This in no way alters the fact, however, that the views of such analysts can be fully productive only when considered by authorities and opinion-molders along with a complementary input of strategic analysis by the military.

In most of our day-to-day discussions of security matters, we are now giving the appearance of having outgrown the need for explaining the broad rationale of strategy in the context of current and future problems of national security. Judging from the scope of

some current statements on defense matters, we seem to be charged with an exclusive concern for the narrower issues—that is, the alignment of functions among the military services and the specific impact of that process on our development and procurement of needed systems and facilities.

I think it is fortunate for the country that the military did not succumb to this kind of mental torpor in the period immediately following World War II. The controversy about atomic weapons and the general-war/small-war assumptions for U.S. defense posture during the late forties served an important purpose. Lacking the stimulus which that controversy supplied, we could have gone into an extended and continuing period of crisis and conflict without benefit of many of the approaches to strategic planning that have since proved to be essentially sound.

In many respects, I believe that the military is suffering from at least a partial stagnation in strategic thinking today. For this reason, I want to present several of my basic viewpoints concerning the task of using military power in support of national objectives—if only to stimulate additional thought.

At the outset, I am convinced that the sole measure of effectiveness of a military strategy is and will continue to be its adequacy and appropriateness for supporting this country's basic objectives. To achieve those objectives, a succession of national administrations has pursued a policy of helping to create a world environment in which the rule of law is respected and in which the United States and other free nations can survive and prosper.

From my experience, a military strategy geared to such objectives must provide forces that our national leaders can employ as an aid in deterring or defeating aggression at *all* levels of conflict. Using military power in combination with political, economic, and other elements of national influence for this purpose is a complex undertaking. A sound strategy must justify confidence on the part of our national authorities that our military forces can operate effectively against the full range of threats and at acceptable levels of expenditure and risk.

I am convinced that our continued success in providing such forces will demand several key adjustments in our strategic concepts. I want to underscore the need for those adjustments by inviting attention to some widely held views of the threat that I feel to be at least partially in error.

One such view is the frequently expressed opinion that the prime threat is that of a massive nuclear attack from the Soviet Union. This is true in the sense that the Soviets now have the capability for such an attack. A continued deployment of Soviet intercontinental ballistic missiles (ICBM's), especially improved versions with multiple warheads, would enhance that capability in the future. It is also true that the potential consequences for us are so grave that we must continue to give first priority to deterring that threat. I do not believe, however, that such an attack is what the Soviets are most likely to undertake. Their more probable aim is to use their expanding strategic capabilities as leverage to allow themselves a broader range of initiatives in the field of diplomacy, military aid, and conventional operations.

It is for this reason that we should avoid a reaction to the Soviet strategic threat that makes us weak and vulnerable in other areas. For example, we do not want a kind of muscle-bound strategic power that is suitable only for use in the least likely event of all-out nuclear war.

Maintaining an unassailable capability for assured destruction of some fixed percentage of the Soviet population and industrial base is only part of the task. We should also seek to increase the flexibility of our strategic forces. This improvement is needed to give us credible options for responding to major confrontations that could involve a limited exchange of nuclear weapons. A failure to act on this problem could produce an operational gap that would make us vulnerable to limited coercive attacks.

There is still another popular misconception that I believe has obstructed to some degree the Air Force's full contribution to our national security posture. I have in mind the persistent and widespread tendency to regard

aerospace power as being primarily an instrument of full-scale nuclear attack. That identification has imposed a decided disadvantage on the Air Force because of the long and heated campaign against the concept of "massive retaliation." Further, in the aftermath of the "massive retaliation" controversy, there emerged the concept of "flexible response." This concept brought no special recognition for air power, because "flexible response" was considered to apply almost solely to the employment of general-purpose forces in land and sea actions at the lower levels of conflict. As will be recalled, that concept was developed in a time period prior to the Southeast Asia conflict, and the thinking behind it reflected a belief that ground action would be dominant in all conflicts below the nuclear level.

As an outgrowth of this logic, several trends have developed in the field of strategic planning that strike me as being counterproductive. The first of these trends has been the tendency to think of all conflict as being polarized into the two extremes of all-out nuclear war at one end of the spectrum and low-level conventional war at the other. Further, there has been a tendency to split up our interacting strategic and tactical elements to an extent that could leave us without the essential reinforcing strength that we require. In this regard, I reiterate my point made earlier that the mere grouping of forces and systems into convenient packages for programming and budgeting actions does not give us a reliable guide for developing strategies or for assigning operational tasks.

And, finally, we have seen an increasingly rigid classification of weapon systems according to either their strategic or tactical functions, thereby reducing the flexibility we need to attain a desired effect by the best available means. On this latter point, we should recognize that the improved performance and versatility of modern aerospace systems have made almost meaningless any attempt to classify them rigidly within strategic or tactical categories. As I emphasized before, the successful interchange of roles between heavy bombers and fighter-bombers in Southeast Asia indi-

cates that the artificial distinctions between so-called strategic and tactical systems should gradually disappear. I think it helps to clear up this confusion if we think in terms of targets that are tactical or strategic, rather than categorizing the weapon systems which might be used to attack those targets.

In proposing solutions for these specific problems, we should continue to build toward a posture of operative deterrence that not only closes the gaps in our war-fighting capability but also opens up opportunities for restoring greater meaning to the strategic objective of deterring aggression at all levels. I believe that we can best avoid all-out nuclear war by demonstrating a clear ability to prevail throughout the intermediate as well as the extreme ranges of conflict.

A posture that would improve our capability for selective retaliation against limited nuclear attacks has been and will continue to be opposed by some, particularly by those whose strategic thinking is confined to traditional patterns. But I believe that the underlying concept of operative deterrence has certain requisite merits. For one, it is pertinent to actual requirements and provides guidance for the application of military force. It also comes to grips with the projected range of threats, and it establishes a workable pattern of response. What is more to the point, I am convinced that it does these things better than the alternatives.

To be sure, we must continue to maintain and improve our forces for assured destruction. It should be recognized, however, that the utility of our current ballistic missile force is essentially limited to the role of nuclear deterrence or employment at the *highest* levels of warfare. This is true in spite of projected improvements in both land- and sea-based ballistic missiles. We therefore should also insure that additions to our strategic force give us a clearly visible means for projecting usable power in the lower ranges of conflict. These are some of the reasons why I have consistently recommended the development of an Advanced Manned Strategic Aircraft (AMSA).

Moreover, I believe that the massive and sophisticated threat posed by the Soviet Union

and by the growing capability of Communist China requires a wide range of closely related defense arrangements. In this regard, I maintain that the Air Force should continue to improve its active and passive defenses against bombers and standoff missiles and initiate active defensive measures against ICBM's and submarine-launched ballistic missiles (SLBM's).

To meet the bomber/standoff missile threat, we will require a balanced combination of systems, including an advanced interceptor and the Airborne Warning and Control System. These defenses should be closely tied in with the SAFEGUARD ABM program, which is designed to protect a portion of our Minuteman force, thereby helping to preserve the credibility of our deterrent.

In proceeding with SAFEGUARD, we should carry on the examination of additional concepts for missile defense. To me, the more promising outlook for the future is toward airborne systems that will be able to detect, track, intercept, and destroy hostile missiles during their boost or mid-course phases.

Despite the recent setback associated with the suspension of the Manned Orbiting Laboratory (MOL) program, the Air Force should advance in exploiting its opportunities for space defense and communications. In my opinion, a failure to do so would leave an operational gap that could be filled by our adversaries, with serious implications for our own national security.

In the category of tactical aircraft, the Air Force has compelling requirements for an advanced air-superiority fighter with unequaled performance for air-to-air combat and a specialized close-air-support aircraft to assist in fulfilling the Army's future requirements for this kind of support. The two types of aircraft now under consideration, together with the programmed inventory of modern tactical fighters, will constitute a family of general-purpose weapon systems that will go a long way toward meeting what I believe are the priority tactical requirements for the future.

Of course, there are many other subjects and areas of Air Force interest that merit comment here, but there is one that I consider to be important above all others. I am referring

to the human element as the most vital asset in our inventory of resources.

Since the beginning of my military career, I have witnessed the most dramatic changes in the quality of military personnel. No longer do we have squads of soldiers, sailors, and airmen manipulating machinery under the autocratic direction of bosses. We now have integrated teams of highly trained "warfare specialists" managed by highly qualified leaders. What has impressed me most about today's military men and women is not only their unprecedented level of education and skill but also their fortitude and high standards of moral responsibility in an environment of severe challenge. I am certain that these characteristics have been the underlying reasons for the remarkable accomplishments of the Air Force in recent years.

The global and complex threats which this nation is facing call for a military establish-

ment possessing the most advanced and sophisticated equipment that technology and industry can provide. But this equipment will be useless unless it is managed, operated, and maintained by a team of military professionals. It is this combination of superior equipment and people that now gives us an ability of sufficient scope, versatility, and quality to meet the demanding requirements of protecting the nation's security.

COMING BACK to Pasteur's observation that "a lot of reflection makes a believer," I hope it is apparent from these reflections on my military career that I am a believer indeed. I believe in this country's ideals, in our democratic form of government, in the vital mission of our military establishment, and, above all, in the ultimate success of this nation in leading the search for a peaceful and secure world.

Washington, D. C.

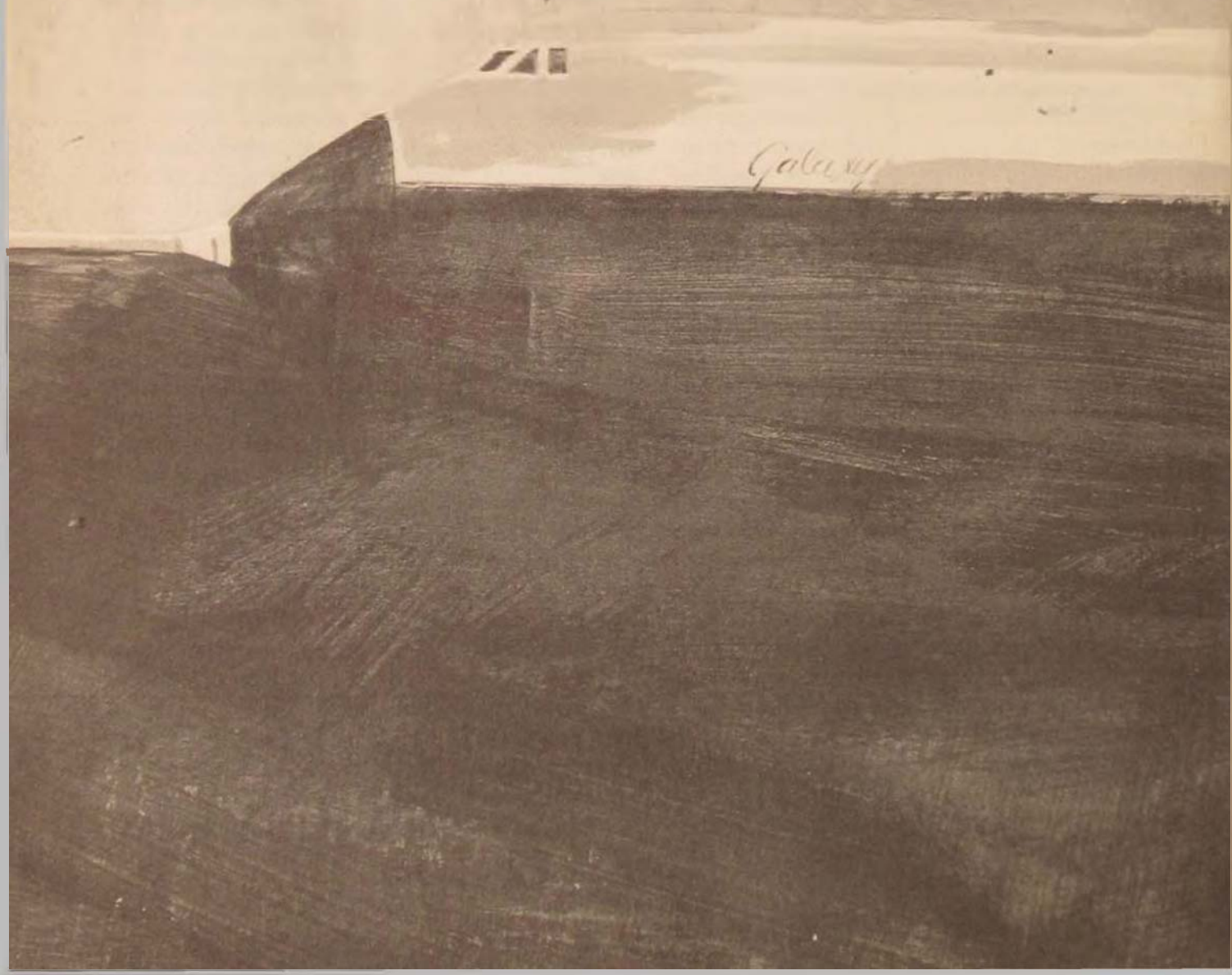


MODERN COMBAT AIRLIFT

GENERAL HOWELL M. ESTES, JR.

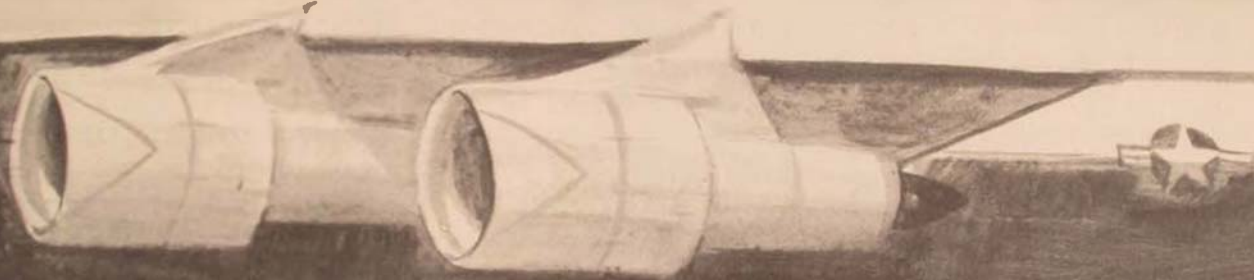
My mind was open and free to receive any new impressions, without having to struggle against the bias which a lifelong practice of routine operations cannot fail more or less to create.

Sir Henry Bessemer, F.R.S.—
An Autobiography



AMONG the foremost lessons learned by military practitioners throughout history has been the need to beware of lessons learned—especially when someone else has learned them.

There is a universal tendency to “learn” from every exercise and operation, as they reinforce the notions the learner holds dear. If we can force experience on us the same lesson two or three times, the inevitable next step is to proclaim: of course, axiomatic that . . .—which promptly forgets that “axiomatic” means, in fact, “you’ll just have to take my word



And so the proponent of almost any concept or piece of hardware can in time, if he is ingenious enough in deducing what he wants from experience, assert that his proposition is self-evident. But to say that a proposition is believed because it is self-evident is only to baptize the difficulty, as Poincaré remarked, not to solve it.

Thus, there is a tremendous premium on isolating the true and valid lessons of military experience from the greater body of narrow and self-serving traditions which, among other well-known anomalies, prescribed boots and spurs as part of the early flying uniform.

In mathematics, this sort of filtering problem is addressed by the "Theory of Groups," which seeks to determine those things that remain invariant under groups of transformations. Or, in broader terms, as Alfred North Whitehead put it: "To see what is general in what is particular, and what is permanent in what is transitory, is the aim of scientific thought."

The problem was well addressed in terms of the Army by its Chief of Staff, General William C. Westmoreland, during the course of an interview toward the end of 1968. "The Army must retain the experience we gained from our operations in Vietnam," he said, "and profit from the lessons learned."

"Yet," he added, significantly, "we must exercise caution in this application of experience, because our operation in the environment of Southeast Asia was unique. Many of the lessons learned have broad applications, but some do not. We must have an Army that is versatile enough to carry out its assigned mission in any terrain, in any climate, and against any enemy."

Put another way, the classic lesson turns out to be that there is, in the last analysis, *no* classic lesson—*except to be ready for anything, anywhere, at any time.*

The thesis advanced in this article is that modern combat airlift is fundamental to the strategic mobility by means of which our armed forces can maintain that kind of universal spatiotemporal readiness. The thesis will not be defended by a tortuously documented panoply of lessons learned—not because we in

the Military Airlift Command (MAC) are immune to the temptation but *because this kind of combat airlift does not exist anywhere* and cannot therefore be admitted into evidence.

It does not exist physically because the C-5 Galaxy is fundamental to the actuality and the operational C-5 force is still in the future. But even with the fully programmed force of C-141s and C-5s, modern combat airlift will not automatically spring into being. Combat airlift, as it will be described herein, is in its essence a *concept*—and a concept, in order to become a reality, must be thoroughly understood, supported, and proved.

The best we can hope to adduce, then, is that the revolution in airlift, which I described three and a half years ago in these pages,¹ is as much conceptual as technological and that certain conceptual conclusions flow from the technical antecedents with inevitable logic.

The technology detailed in the earlier article can be briefly summarized: The C-141 obviates many of the historic constraints upon airlift (in speed, range/payload trade-off, flexibility of employment, cubic capacity, loadability, self-sufficiency, terminal base requirements, fuel dependency, and direct operating cost) by virtue of its high speed (above 425 knots) and its range/payload options (up to 32 tons or 154 troops nonstop to Europe or nonstop from the West Coast to Tokyo with reduced payload). Requiring little more than 4000 feet of runway for takeoff or landing, the C-141 can use about 1850 airports around the world, greatly enhancing flexibility of employment. It is loaded straight-in from the rear, utilizing 463L Materials Handling System equipment, and incorporates a troop/cargo airdrop capability. It is not, however, an outsize carrier, being capable of lifting only 58 percent of current major items of Army divisional equipment.

Since that article was published, the C-141 has been tested for operations on landing mat surfaces and has proved to have quite promising flotation characteristics. Further work is being directed toward adapting the aircraft for primitive field conditions akin to the C-5's capability in that sort of environment.

Finally, from a productivity standpoint, the C-141 accomplishes approximately 10,000

The C-141 Starlifter has more than lived up to its early promise, having operated for nearly four years at 160 percent of its programmed peacetime rate. . . . It is rear-loaded, utilizing the 463L Materials Handling System.



ton-miles of work per hour, a factor-of-four improvement over the C-124, which it has virtually replaced.

What has become a great deal more certain since the 1966 article is that the C-141, having proved its great reliability and maintainability, can easily be flown many more hours a day than any of its piston or turboprop predecessors. Thus, its inherent productivity is greatly magnified in practical application; we have, in fact, been operating the C-141 force for more than three years at 160 percent of programmed peacetime rates. As a direct result, MAC-managed (active force plus military reserve and commercial augmentation) ton-mileage, on a worldwide basis, climbed from 2.29 billion in fiscal year 1965 to 7.47 billion in FY 1968, an increase of 226 percent. The reason for the forced acceleration was, of course, the war in Southeast Asia, and most of the increased production was focused in that direction. In FY 1965 we airlifted 136,000 tons of cargo and 595,000 troops and passengers throughout the entire Pacific Command. By FY 1968 the volumes to and from Southeast Asia alone had swelled to 595,000 tons and 1,900,000 troops/passengers—increases of 338 and 219 percent, respectively.

The 1966 article then described the C-5 technology. The basics were a speed of 440 to 470 knots, a productivity of more than 40,000 ton-miles per hour, payload capacity up to 132 tons (with mission options of 55 tons for 5500 nautical miles or 110 tons for 2700 nautical miles), troop/cargo airdrop capability, volumetric capacity of 35,000 cubic feet, drive-through loading and unloading (front and rear openings and kneeling landing gear), high-flotation characteristics for operation in primitive environments, high fuel capacity to eliminate support dependence upon the forward battle area, and low direct operating cost (estimated at the time to be 4½ cents per ton-mile, since refined to about 3½ cents).

An important key to this efficiency was the high-bypass-ratio TF-39 power plant. Its far-reaching impact was summed up in these words:

It is not too complicated a chain of reasoning to follow from single advancements in

materials or cooling methods, to double power at lower specific weight and one-third less specific fuel consumption, to the considerable payloads and ranges thereby made possible at lower cost, to the end result: a powerful amplification of the strategic range of military/diplomatic options available to the President for his enforcement of national policy goals. He is thus afforded more latitude for maneuver and more time for decision.

Since that was written, results of testing the first three C-5s have been encouraging. For one thing, they have demonstrated 2% less drag at cruise speed than the guarantee specifies, which translates into greater payloads over both long and short ranges. Takeoff and landing performance is also about 2% better than predicted. At an average gross weight of 532,000 pounds, the C-5 has landed in 1700 feet on asphalt and 2600 feet on dirt. Takeoff distance is 6860 feet at basic design weight, and less in the long-range configuration.

That being a summation of the technology, it may be seen that the C-5 and the C-141 mutually fill any gaps that the one or the other might singly leave exposed. The C-141 does its optimum work and reaches its highest efficiency in carrying high-density cargo and troops. The C-5, on the other hand, is singularly well suited, as it was designed to be, to accommodate the very large and bulky (although generally less dense) items of equipment that are organic to heavy combat divisions. Together these two aircraft provide the full potential for modern combat airlift.

WHAT, then, is modern combat airlift, and what conditions underwrite its necessity? In short, what conceptual conclusions flow with logical necessity from what technology has made possible? One answer, of course, is the broadening of statecraft's options as mentioned above with reference to the TF-39 power plant. But that is close to the surface, and the underlying need goes a great deal deeper.

To start digging, we might consider a statement by Admiral U. S. G. Sharp, made when he was Commander in Chief, Pacific:



The 94-minute maiden flight of the C-5A Galaxy at Marietta, Georgia, on 30 June 1968, was completely successful, justifying the great expectations for the world's largest aircraft. Although in flight deceptively like the C-141, the C-5A really represents a higher order of technology in many respects, notably the high-bypass-ratio power plants and the drive-through loading and unloading feature made possible by kneeling landing gear. . . . The 500,000-pound behemoth, which can carry more than half that weight in cargo, gets readied for the first flight.



It is [at] the first destination in an underdeveloped country that we run into trouble. Ports and airfields—if there are any—are so lacking in modern facilities that they cannot efficiently receive and redistribute the huge tonnages which our transportation system can deliver.

He then went on to point out that this problem was solved in Vietnam by a massive construction program—“a costly solution, but acceptable if the strategic concept calls for a gradual buildup over a protracted period of time.”

“But,” he asked at that point, “what about those situations when time is of the essence, when a rapid deployment of force could mean the difference between war and peace, when the success or failure of subsequent military operations is at stake, when there isn’t time to build ports and airfields?”

Admiral Sharp in those words captured the very essence, the irresistible rationale for a modern combat airlift capability. For I would submit that the time-dependent situation he postulated has the highest probability of occurrence and that a strategic concept of gradual buildup has always—an invariant under transformation—exacted a very high price.

Of course, one of the presumptive lessons learned after World War II was that there would never again be time to prepare—but for different reasons: the push button was going to replace the infantry as the Queen of Battle. We have seen, though, that the modes of warfare since 1945, contrary to any lessons that appear to have been taught, have all been of the “limited” type and have been staged by and large in the most remote and underdeveloped arenas of the globe.

SO WHAT, if anything, *has* remained invariant under transformation and deserves truly to be called axiomatic? In warfare, at least two maxims have retained their validity over the twenty-four centuries since they were enunciated by Sun Tzu: “The highest art is to win a war without battle,” and “There has never been a protracted war from which a country has benefited.”

To help prevent any type of war, if possible, and to help bring it to a swift conclusion if deterrence fails are the basic functions of a modern combat airlift force. Any other benefits that may accrue from such a force—and they can be shown to be numerous—flow from the nature of that primary capability and can in no sense be considered as deserving higher precedence in designing, exercising, and operating that force.

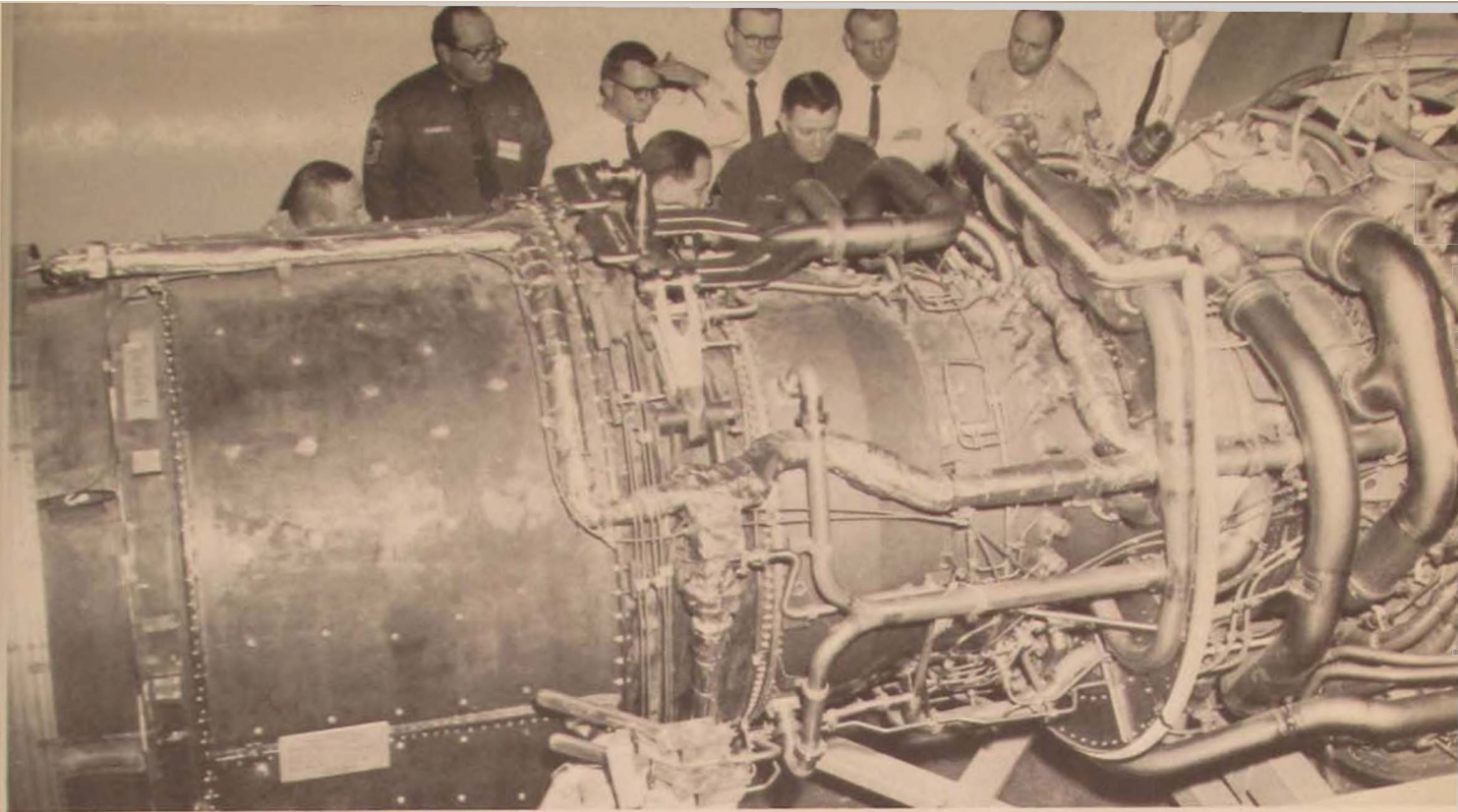
The role of modern combat airlift, then, is to airlift combat forces and all their battle equipment, in the size and mix required—with the greatest speed—to any point in the world, no matter how remote or primitive, where a threat arises or is likely to erupt.

The strategic airlift force must be so constituted and so geared as to perform this task, with the added possibility of having to deploy sizable forces in opposite directions simultaneously and keep them all resupplied until, if required, surface lines of communication are fully established and operating at capacity.

Derivatively, airlift also makes it possible to reduce stock levels in the theater of engagement, so that the troops, having arrived, can move quickly into action without having to delay for the cushion of a large stock buildup. Thus, fewer men and fewer supplies are needed to support the men and supplies in the combat force, and the ratio of combat troops to support personnel is thereby increased.

Given the capability to satisfy this maximum demand, the airlift force can with lesser effort operate jointly with sealift or prepositioned equipment or both, or in tandem with fast deployment logistic ships, once the initial rapid-reaction requirements have been fulfilled. But the basic requirement is invariant: to rush integral, combat-ready fighting forces anywhere, including the battle area itself, without a preliminary massing of logistics, within hours of the time a decision to commit has been taken; and to reinforce and sustain them for as long as airlift is the only practicable way to do it.

Regardless of transformations that have taken place through the ages, surprise and mass have been invariants in all military considerations. Maximum force deployed in mini-



Just as the C-5A dwarfs the C-141, so the TF-39 turbofan jet engine, power plant for the Galaxy, looms before flight engineers and jet-engine training instructors mastering its intricacies.

imum time achieves both. As long as minimum time is a factor, it must inevitably be recognized that an airplane covers as much distance in one hour as a ship can in a full day's sailing and that an aircraft, having arrived in the theater, can land or drop its troops and equipment directly in the battle area.

Thus, while airlift is certainly one element in the national defense transportation structure and can very effectively complement the more massive sealift capacity, it must again be emphasized that this is a derivative capability and a secondary role. This concept is by no means universally understood, and until it is understood—and applied—there will be no modern combat airlift in the ultimate sense of that term.

In his book *Nuclear Weapons and Foreign Policy* (1957), Dr. Henry A. Kissinger wrote with a high degree of perception:

Contemporaries are in a peculiarly difficult position to assess the nature of revolutions through which they are living. All previous experience will tempt them to integrate the new into what has come to seem familiar. They will have difficulty understanding that what is most taken

for granted may be most misleading because a new order of experience requires new ways of thinking about it. A revolution cannot be mastered until it develops the mode of thinking appropriate to it.

That may explain why the real revolution in airlift is not as thoroughly perceived and understood as it might be. Many think of the strategic airlift capability of the near and more distant future as being precisely what it has always been, except that there is more of it: in effect, merely a "brute force" quantitative expansion of something we had in World War II. What they do not realize is that the jet age and the technology that makes an aircraft like the C-5 possible have also engendered a radical *qualitative* alteration in airlift. Total ton-mile capability will soon have increased by at least an order of magnitude over 1961—true—but the important point is that we have at the same time achieved a whole new *kind* of airlift.

So we might look upon this new kind of airlift—strategic combat airlift—as a proof in search of the validating experiment.

Strategic Airlift Capability

Airlift has changed through the years since World War II, and the change is more than an increase in range and capacity. Speed of response to a crisis situation is a vital factor that has become achievable with jet and other jet-age technology. The C-141/C-5 working in concert will enable the Military Airlift Command to apply full military capability on a greatly foreshortened time schedule. Exercises like Bold Shot/Brimfire in January 1969 (right, clockwise) . . . Operation Bonny Jack . . . Big Lift . . . and Reforger have been steps along the way to airlift's goal: effective deterrence of "limited" war.





Because airlift has been used to date, with minor exception, in the traditional way. The record of several exercises will illustrate the point.

- **BIG SLAM/PUERTO PINE**, March 1960 – first of the so-called strategic mobility exercises conducted on a large scale. A total of 21,000 troops and 11,000 tons of cargo were airlifted from 14 bases in the United States to Puerto Rico, and return, in a 15-day period. While the numbers seemed impressive at the time, the troops were from a large assortment of Strategic Army Corps units, not an integral fighting force; the cargo was miscellaneous, not organic divisional battle equipment; and the distance from the CONUS to Puerto Rico was short compared to real-world military strategy. Rated a highly “successful failure,” **BIG SLAM** did dramatize the deficiencies of a C-118/C-124 type of force, while at the same time providing a vivid glimpse of what combat airlift *could* be.

- **LONG PASS**, February 1961 – This exercise, by spanning the Pacific, remedied the range deficiency of the Puerto Rico scenario, but it had to make a corresponding trade-off in the size of the force airlifted. Slightly more than 1000 Army troops and 1000 tons of cargo were carried from the CONUS to the Philippines and back, while 200 troops and less than 100 tons went from Hawaii to Clark AB. With some added Tactical Air Command personnel and equipment, the total force package came to 1700 troops and 1400 tons. It was a brave attempt by C-118s, C-124s, and C-133s, but still only a veiled hint of the genuine possibility of airlift.

- **LONG THRUST IIA**, January-February 1962 – This rotational type of deployment to the NATO area was the first definite manifestation of the enormous promise of jet airlift. The distance, from the State of Washington to Germany, was realistic enough. However, the 5300 troops and 170 tons of cargo could not be described as overwhelming, nor was the closure time—almost six full days—for a force of that size awe-inspiring. Two of the three battle groups remained in Europe, while the other was redeployed to Fort Lewis, Washing-

ton; thereafter a further series of **LONG THRUST** exercises rotated these units back and forth. The revealing aspect of this first operation (**LONG THRUST I** had been canceled the year before) was the impact of a jet transport, the C-135. While mission flying time to Germany for the older aircraft ranged from 31¼ hours on the C-133 to 38¼ for the C-124 (with all the maintenance, supply, servicing, and support complications at the way-stops), the C-135s flew nonstop in 10½ hours. While these converted tankers were highly productive and efficient, they were not fully *effective* for the combat airlift mission. They were, for one thing, unstressed for intensive hauling of heavy military equipment, and, for another, they had to be loaded through a side door high off the ground, which restricted the individual items of battle gear that could be accommodated. They also required long concrete runways for takeoff and landing. They were, in short, more closely akin to the “people hauling” jets of the airlines than to combat airlift workhorses. But they did, once and for all, underscore what speed and range could do for the rapid-response military mission, and they strongly foreshadowed today’s ability to fly modified polar great-circle paths to achieve minimum distance and shortened enroute times.

- **BIG LIFT**, October 1963 – Again demonstrating rapid and “massive” reinforcement of NATO forces, this exercise airlifted a full division—more than 15,000 troops—and closed the force in 63 hours. The concept of the operation was for the troops, deploying from Texas with little more than toothbrushes in the way of impedimenta, to “marry up” with equipment already prepositioned in Germany. Thus, the grand total of cargo airlifted was some 440 tons, and three-fourths of that belonged to a TAC Composite Air Strike Force that was also involved in the exercise.

So, while highly touted as a “landmark” operation, **BIG LIFT** was little more than another **LONG THRUST**—but with three times as many troops, slightly more cargo, and a closure time less than half as long. These were important improvements, to be sure, but it is perhaps unfortunate that they were so widely

advertised because even today the BIG LIFT type of thinking seems to dominate a good deal of the prevalent insight into airlift.

As a matter of fact, one would have to say that the REFORGER I/CRESTED CAP I operation of early 1969 was, basically, BIG LIFT revisited: about the same number of troops, offloading once again at the vast, modern Rhein-Main complex, very little more cargo, and a longer time to close the force.

It should be noted, in the last connection, that force closure time is rarely constrained by any limits inherent in the airlift system itself, given a certain irreducible minimum dictated by the distance to be covered and the size of the force to be moved. The original LONG THRUST, for example, could have been accomplished much more quickly; BIG LIFT could have beaten even the low 63-hour mark; and certainly the REFORGER exercise could have been greatly compressed in time. The actual closure time, in such cases, is prescribed by the planners of the force being moved, by budgetary considerations, by the priority accorded the operation (vis-à-vis, for example, the undiminished need for airlift to Southeast Asia and the rest of the world), and any number of other factors.

This is not to say that such exercises are not extremely useful. They exercise both the MAC force and the airlifted forces in concert, they test the entire airlift system, and they demonstrate both the *capability* and the *intention* of the United States to honor its international commitments.

But what they do *not* do is demonstrate conclusively what combat airlift can be and should be. Those two things, interestingly enough, were first demonstrated—although on a somewhat microcosmic scale—almost two years before BIG SLAM ever took off for Puerto Rico.

The summer of 1958 was one of those times of "double trouble" that have become more the rule than the exception in the years following. Almost simultaneously, help was critically needed in both the Middle East and the Taiwan Strait. MAC airlifts to both Lebanon and the Far East brought a modest show of force to each area, which to all appear-

ances resulted in the stabilization of both situations and thereby proved to be a workable deterrent. We may have been a little short in the capability department, but the United States left no doubt as to its intention and determination. The invariant in that case would certainly seem to have been our speed of response.

The same effect was achieved during the 1961 Berlin crisis, when MAC airlift played a large part in moving TAC forces to Germany. Again in the Cuban missile confrontation, airlift brought a massive concentration of power into focus in the Southeastern United States and also moved a large force of Marines from California to Guantanamo Bay. And in 1965, regardless of what one may feel about the *casus belli*, the immediate appearance of a sizable show of force in the Dominican Republic did quell the disturbance.

No proof can be had as to what might have happened in any of these situations *without* airlift, but the rapid marshaling of forces *was* the common denominator in every instance—the undeniable invariant. Thus, there is very powerful presumptive evidence that national will, made immediately manifest and unmistakable through high-speed strategic mobility, was the operative element.

With such precedents, one is strongly tempted to speculate upon what effect the same sort of demonstration, on a much larger scale, might have had in Southeast Asia in the early 1960s—or even in 1964 or 1965.

One possibility may be deduced from Professor Walt Rostow's *New York Times* interview at the beginning of 1969, in which he postulated that the United States would have been better off to intervene with military force in Vietnam on a major scale nearly three years before it did in 1965.

Or from a lecture delivered at Air University by Dr. Frank N. Trager of New York University in April 1968:

To achieve a limited-war goal does not necessarily imply that the conventional means employed should be applied with restraints or other forms of gradualism. . . . one should use sufficient conventional power to achieve his goal in the shortest possible time. . . . It seemed

to me that the doctrine of limited war and limited means to achieve its ends . . . omitted from consideration the operative concept of *time* in the use of power. I have unsuccessfully argued that the *speedy* use of enough conventional power in Vietnam would have been more acceptable at home and less costly on the battlefield.²

This thesis would seem to have been contained within the body of official Department of Defense policy, as evidenced by extracts from Secretary Robert S. McNamara's posture statements before various committees of the Congress:

The ability to concentrate our military power rapidly in a threatened area can make a great difference in the size of the force ultimately required and, in some cases, can serve to halt aggression before it really gets started. [FY 67 Defense Budget]

All of our studies show that the length and cost of a war, as well as the size of the force ultimately required to terminate it favorably, are importantly influenced by how fast we can bring the full weight of our military power to bear on the situation. [FY 68 Defense Budget]

. . . the ability to respond promptly to clear threats to our national interests and the security of our allies, possibly in more than one place at the same time, can serve both to deter and to prevent such threats from expanding into larger conflicts. [FY 69 Defense Budget]

In each instance the Secretary was addressing the addition of the C-5 to the MAC strategic airlift force, major improvements in the national sealift posture, and the presence of prepositioned equipment in specified areas. None of the three conditions obtained when the serious buildup of our forces in Southeast Asia (SEA) began in 1965. There were no C-5s in MAC, and MAC had only about one-sixth of the full C-141 force. Sealift was in rather marginal condition with respect to both the available number of bottoms and the berthing and handling facilities in Vietnam. And prepositioning had not applied to that immediate area.

Therefore, a rather sizable burden descended upon the airlift segment, and the resultant great increase in strategic logistical airlift has already been described. As an inter-

esting aside, a part of the cargo carried by MAC duplicated urgently needed military equipment which had already been shipped via surface but which—because of long unloading delays—was in ship bottoms sitting off the harbors in Vietnam. Another vital part of the load consisted of equipment for improving and enlarging the harbors and replacement parts for the heavily used handling equipment at the ports.

In addition to the constantly accelerating, high-volume logistical role, MAC combat airlift also came into play in the succeeding period. Flying integral battle units and their equipment into the war area, such operations as BLUE LIGHT, EAGLE THRUST, COMBAT FOX, and BONNY JACK were the first combat airlifts conducted under a de facto state of war. But, while they previewed what the C-141/C-5 force would be capable of doing in the future, they did not provide the definitive laboratory experiment that would prove the basic concept. For one thing, a good part of the massive logistical base had already been fairly well established; and, for another, the concept of operation did not call for minimum closure times.

For example, EAGLE THRUST, which was to airlift the 101st Airborne Division less one brigade from Fort Campbell, Kentucky, to Bien Hoa, Republic of Vietnam, was scheduled by the Army to move in three echelons over a period of 42 days. If required, the entire national strategic airlift resource could have been massed behind the task and the entire mission completed in less than 2½ days, even in that end-1967 time frame.

A precise summation of the SEA operation was given by General Westmoreland to the Holland Society of New York in November 1968. "During those early days of 1965," he pointed out, "I took a calculated risk on our marginal logistic capability. Finally, in the latter half of 1966 our physical facilities and logistical organization were able to receive the magnitude of forces required to move into sustained combat and to keep constant pressure on the enemy." From that point on, he continued, beginning in late 1966 and continuing into 1967, we brought to bear on the enemy

in South Vietnam the full measure of our power.

What MAC combat airlift will be able to accomplish, in the C-141/C-5 era just ahead, is to bring about that application of full military power—not in one year, or two or three, but within a greatly foreshortened time from the moment a threat is perceived.

This could, of course, be accomplished more easily if major items of equipment were prepositioned in the objective area. But it is manifestly impossible to have everything everywhere, aside from political, diplomatic, and caretaking problems.

The FDL concept could alleviate many of these difficulties and is, in my own opinion, an essential element of sealift capability for military purposes. In fact, whatever combat airlift may be able to achieve in the way of deterrence, it is difficult to conceive of any sustained operation that does not ultimately depend upon surface lift for the great bulk of routine supply. It would therefore certainly be desirable to improve our total sealift resource, including a highly responsive commercial segment similar to our own Civil Reserve Air Fleet program.

Numerous studies have concluded what appears almost self-evident: the MAC C-141/C-5 force would make its maximum contribution to the national effort, under a wide variety

of circumstances, in conjunction with sealift and prepositioned equipment.

But, to deter hostile action *anywhere* in the world, or to contain aggression with maximum force in minimum time, ton-mile efficiency per se is far less relevant than *fast, effective force deployment*. And that is the one *dominant* capability of the MAC combat airlift force.

I HAVE SAID that we do not physically have a combat airlift capability in the ultimate sense because such a capability presupposes the C-5 type of aircraft. By early fall of this year, we will be close to an initial operational capability with the C-5. But we will still not have genuine combat airlift until the full *concept* of modern strategic mobility is fully understood.

If we look upon BIG LIFT—and its various repetitions—as the ultimate airlift “lesson learned,” then we will not really have learned anything of durable value at all. I hope I have shown that the strategic mobility of this nation in the future will be of an order entirely different from anything we have yet experienced and that it *can* be, above all, an effective deterrent against protracted and eroding “limited” wars.

And that, beyond any doubt, is what the revolution in airlift is really all about.

Scott Air Force Base, Illinois

Notes

1. Howell M. Estes, Jr., “The Revolution in Airlift,” *Air University Review*, XVII, 3 (March-April 1968), 2-15.

2. Frank N. Trager, “What Is Security in Southeast Asia?” in *Air University Review*, XX, 1 (November-December 1968), 103-12.



A NEW ERA FOR MAC'S RESERVE FORCES

MAJOR GENERAL GILBERT L. CURTIS

A NEW and revolutionary era has arrived for the Military Airlift Command gained Reserve forces. Old concepts have given way to new outlooks which promise to bring a more vital and direct involvement of Air Force Reserve forces in the mission of the Military Airlift Command (MAC). Inasmuch as these forces are an integral part of the total MAC force available to meet any level of increased activity, the concepts and structure which shape them must be compatible with the active force. We in the Military Airlift Command feel that the benefits gained from bringing this compatibility to the MAC active and Reserve forces constitute the most

significant development to affect AFR forces in many years.

impact of the revolution in airlift

The 1966 name change of the Military Air Transport Service to Military Airlift Command has often been related to the current ongoing revolution in airlift. This revolution also relates to the evolution of the modern jet airlift aircraft, the C-141 and the C-5. This change in the basic character of the airlift force, started in the latter years of the Eisenhower administration, was greatly accelerated by President Kennedy's 1961 decision to alter the national strategy that had been oriented to nuclear-war deterrence. The change to a strategy of flexible response to meet a greater number of contingency situations had a profound effect on MAC and its Reserve components, the Air Force Reserve and the Air National Guard. The term "Reserve" in this discussion refers to both components.

When measured against the characteristics of an airlift force demanded by the flexible response strategy, the aircraft then possessed by MATS were not adequate. The airlift force of the late 1950s and early '60s was essentially limited to an island-hopping, terminal-to-terminal, airline-type operation. To provide the flexibility required for the new strategy, the MAC airlift force was programmed to become, by the early '70s, a mixed force of C-141 and C-5 aircraft. The long range, relatively high speed, high capacity, and advanced military operating characteristics of this force will permit operation into forward combat areas. Instead of being a relatively inflexible and

limited logistics agency, the airlift force today is evolving to the point of sustaining large-scale deployments and resupplying these forces so as to create an effective on-scene military reaction force that could, in fact, deter large-scale land warfare.

In contrast, the relatively new MAC Reserve airlift units, first activated in 1959, were equipped with aircraft that were being replaced in the active force by a new generation of jet airlifters, the C-141. The new jets, including the C-5, will be 4 to 16 times as productive as the aircraft assigned to the Reserves. Ironically, this gap in the relative capabilities of the Reserve and active airlift forces occurred before the Reserves were fully equipped with the obsolescent C-124s.

The conversion of MAC to a jet airlift force meant that the worldwide airlift support system would also be converted, with maintenance and materials-handling equipment necessary to support jet aircraft. In essence, if the reciprocating-engine reserve airlift was to be effectively utilized, it would require either the existence of a costly support system, including island bases that would not be properly utilized in peacetime or the necessary lead time to deploy a full support system in time of contingency. The conversion process to maintain jet aircraft is fully under way.

Traditionally, Reserve capability has been increased by assigning Reserve forces more capable aircraft released from the active force. In the case of strategic airlift, this procedure is not feasible. The change of MAC to an all-jet force is occurring over a relatively short time span. Accordingly, equipment is not available for assignment to the Reserves.

This problem is further complicated by the fact that new aircraft are so expensive that the alternative of purchasing them for the Reserves is not likely to be acceptable to the decision-makers in Washington.

This apparent incompatibility in active and Reserve resources was not lost on the Department of Defense. In fact, by the mid-sixties DOD had already ordered a complete phase-out of MAC-gained airlift units.

As the MAC force changes to an all-jet force of C-141s and C-5s, the number of aircraft will be reduced by almost one-third, but at the same time the ton-mile capability will more than double; under certain operational conditions, it may actually quadruple. The capability to realize the full potential inherent in the new jet aircraft is, however, limited by the manning that can be expected in future peacetime budgets. These aircraft can and should be operated at considerably higher rates than we can expect from our peacetime manning. Therefore, the phase-out of the MAC-gained Reserve airlift units and the subsequent loss of the experienced Reserve airlift personnel were not in MAC's interest.

Reserve Associate Unit concept

In consideration of these facts the Com-

mander of MAC, General Howell M. Estes, Jr., directed in January 1966 a complete reappraisal of the command's future Reserve needs. While the main focus was to be on strategic airlift, the full range of MAC's many mission areas was to be included. Four key points of guidance were followed: (1) that augmentation would be primarily by organized units, (2) these units would be complementary to and compatible with the force to be augmented, (3) the units' organizational structure and concept of operation should permit flexible response at all levels of activity rather than only under general war mobilization, and (4) that the units' operation must be cost effective.

The Reserve Associate Unit Program was developed from that review. These units are distinctly different from the typical Reserve flying unit. They do not possess their own organic aircraft but rather share the C-141s, and later the C-5s, of an active MAC wing. Further, their organizational structure and personnel strength are predicated on a total force (active and Reserve) Unit Detail List (UDL), which is designed to meet the wartime requirements of a MAC wing at a greatly accelerated activity rate.

In this regard, perhaps the most striking difference from the typical Reserve flying unit

Group Hq		Materiel Sq		Military Airlift Sq		Aerial Port Fl		Support Sq	
6 off	ART*	4 off	ART	51 off	ART	1 off	ART	5 off	ART
11 amn	4	230 amn	83	56 amn	28	24 amn	1	27 amn	4
17 total		234 total		107 total		25 total		32 total	
								67 officers	
								348 airmen	
								Totals 415 (120 ART)	
								12 civil service	
								427	

*Air Reserve Technician

The low-wing C-124 Globemaster, obsolescent equipment for Military Airlift Command active forces, currently serves as the workhorse of the command's Reserve units.



is the absence of large support functions used primarily to open new bases overseas. This is explained by the fact that MAC does not increase its base structure in wartime. Rather, MAC operates at an increased rate through its existing bases and through the CONUS and overseas bases of other major commands.

An associate group with 415 people assigned will be organized at each of the eight bases in the U.S. where MAC airlift units are to be located. Organizationally, the group will consist of a headquarters, a materiel squadron, a support squadron, an aerial port flight, and

one airlift squadron for each airlift squadron in the active wings. The airlift squadron will initially have 16 aircrews, which represent a wartime capability of 2.5 hours per day for each of the active squadrons' 16 C-141s or C-5s. The materiel squadron has enough personnel to support that sized flying-hour program. The aerial port flight has the number of personnel needed to meet the increased traffic load associated with the increased activity. And, finally, the support squadron contains the numbers and skills necessary to support the increased base population.



In essence, the associate group is a mission-oriented organization that is tailored to MAC's specific requirements. Accordingly, the associate program is not recommended for general application to all MAC missions or to other commands.

The heart of the peacetime unit is an Air Reserve Technician (ART) force of 120 people, which provides the necessary management and support of peacetime training activities, primarily in the form of flying hours and instructor capability. The existence of this ART force is vital to the program, to insure that Reserve

training is not conducted at the expense of active force productivity.

Reservists are trained to the same standards as active duty personnel. Pilots and flight engineers attend the MAC C-141 transition training unit (TTU), which is followed by additional training in their own unit, to complete requirements for worldwide qualifications. For pilots, this includes flying 60 hours per quarter to maintain currency. The navigators and loadmasters attend local flying training detachments (FTD), followed by flying training in their units. The satisfactory completion of "combat airlift training" signifies the end of the initial upgrade training program. Initially, the new group will lean heavily on the active wing for training assistance. However, the Reserves will eventually be fully capable of conducting their own training programs.

Peacetime training for the associate aircrews has distinct advantages over present training programs. The Reservist will have a greater opportunity to fly with the shorter elapsed round-trip times of the jets and the more frequent mission departures of the 32-64 aircraft of a wing than is possible with a Reserve unit with only eight aircraft.

For the Air Force, this training is also productive. After initial qualification, more than 70 percent of annual training will be on productive airlift missions. This productivity, if replaced by commercial airlift at current rates, would cost almost twice as much as the annual cost of the Reserve training program.

The Reserve unit's dependence on the active force for equipment and facilities resulted in a unique approach to combat-readiness (C) ratings. While active and Reserve units report their C-status separately, there will also be a combined rating, and the periodic readiness inspections will be based on the combined active and Reserve units' capability. Thus, the active wing commander shares the responsibility with the Reserve group commander for operational readiness.

The wartime capability of Reserve forces is the basic reason for their existence. In the associate program, participation during periods of increased tension short of general war



Utilizing an HU-16 Albatross fixed-wing aircraft, the 301st Air Force Reserve Aerospace Rescue and Recovery Squadron at Homestead AFB, Florida, is one of five Reserve squadrons supporting Military Airlift Command rescue missions. . . . The proposed replacement of the Albatross and the HC-97 with the HH-3 "Jolly Green Giant" helicopter used in Southeast Asia would make Reserve capabilities more compatible with combat requirements.

The Aerospace Audio-Visual Service may acquire Reserve assistance in fulfilling photo documentation requirements in Southeast Asia.



is emphasized. Formerly, MAC-gained Reserve airlift forces have flown as much as 60 percent of their wartime rate in voluntary support of the Southeast Asia (SEA) logistics mission. This effort was difficult because of the personnel's 12–15 days away from civilian employment, and it was also difficult to form all-Reserve crews. It is possible for this participation rate to be equaled or exceeded in the associate program because of the shorter round-trip times and the flexibility for a Reservist to fly with an active crew or for an active crew member to fly with a Reserve crew that is short a crew member. Obviously, in the event of mobilization, MAC will have an immediately available expanded wartime capability to meet increased Joint Chiefs of Staff requirements on a sustained basis.

associate program activation and management

DOD approved the associate program in October 1967 and ordered the 944th Tactical Airlift Group to move from March AFB, California, to Norton AFB, California, and be reorganized as a Military Airlift Group (Associate), to be associated with the 63d Military Airlift Wing (MAC). This initial group was considered a pilot unit to test and further

define the program concept developed at MAC headquarters. Emphasis was placed on converting an optimum number of Reserve C-119 aircrew members rather than recruiting former MAC C-141 personnel. Furthermore, members of the C-124-equipped parent wing were not allowed to transfer because of their involvement in SEA support missions.

A particularly tight schedule, for a Reserve unit, was decreed for attaining C-2 status: 24 February 1969, 11 months after the activation date of 25 March 1968. The 944th achieved this C-2 milestone on 20 February 1969—in fact, it had sufficient crews already transport-qualified and scheduled for combat airlift training so that C-1 could be attained in short order.

Approval of additional units was forthcoming even before the 944th began operation as an associate unit. To date, 12 C-141 associate airlift squadrons within seven groups have been approved for activation by the end of FY 70.

A great deal of thought was given to the inherent problems associated with such an unusual undertaking, primarily resulting from the concept of shared equipment and integrated wartime organizations. In peacetime, both units needed strong unit integrity, yet

at all times they had to strive to develop a cohesive unit that could achieve rapid and productive consolidation should mobilization require. The regular force must have its integrity to respond immediately and effectively to any contingency, especially under political conditions that preclude Reserve participation. The Reserves must also have unit integrity to conduct a strong training program without degrading the active force capability. Unit integrity is a key to the ultimate success of the program.

Emphasis is placed on equality and common standards. Reserve ART's in the maintenance area have been integrated into the functional areas, working daily in the position they will occupy upon mobilization. In this way the active and Reserve units gain respect for each other as well as an understanding of the mutual dependence which exists as they attain an effective capability.

The C-141s of the 63 MAWg fly both the wing and 944 MAGp insignias, indicative that they are sharing these aircraft. The same idea has been carried out on facilities that are shared and on signs along the base perimeter.

worldwide airlift support

Airlift operations depend heavily on a worldwide support system located on bases that are associated with the normal flow pattern to overseas locations. Obviously, contingencies will occur that require new support squadrons at locations previously nonexistent and related to the conflict. Reserve aerial port squadrons and mobile enroute support squadrons provide this kind of expansion.

The 1966 MAC analysis showed that while the twelve existing aerial port squadrons were adequate, two support squadrons were needed in addition to the existing six. DOD approved one of the two in 1967 for activation in March 1968 at Norton AFB, and MAC will continue to seek approval for the second squadron.

CONUS aeromedical evacuation

The new emphasis on the flexible response strategy had its effect on the other mission

areas of MAC as well. The aeromedical airlift system within the United States has had to be increased significantly in recent years to handle the casualties returning from the Vietnam conflict. Augmentation in wartime was planned to use Reserve airlift aircraft from the strategic airlift force.

Two factors made this a less realistic concept: DOD had, in fact, programmed the phase-out of all MAC Reserve airlift units; and the increased emphasis on support of deploying United States Strike Command forces meant that the secondary aeromedical role might not be accomplished with the required degree of certainty.

MAC therefore proposed creating an associate aeromedical airlift group to augment the 375th Aeromedical Airlift Wing at Scott AFB, Illinois, which is presently converting to the twin-jet McDonnell Douglas C-9 aircraft. The 932 MAGp presently at Scott is converting from the C-124 to the C-9, having started in July 1969.

To meet the rest of the requirements for movement of general-war patients, MAC gained DOD approval to convert four Air National Guard C-121-equipped MAWgs to the aeromedical airlift mission, which they had previously performed in a secondary role.

aerospace rescue and recovery

Another MAC support mission is the Aerospace Rescue and Recovery Service. Rescue, as it is more commonly known, has five Reserve squadrons equipped with HC-97 or HU-16 aircraft. These units are performing in an outstanding manner in the search and rescue missions, as well as in the precautionary orbit (duckbutt) missions that support fighter deployments.

The units are not able, however, to perform adequately in the new and more publicized Rescue roles now being performed in Vietnam, principally combat aircrew recovery. MAC therefore has suggested re-equipping these squadrons with HC-130 aircraft and HH-3 helicopters, so that their mission capability will be more compatible with any contingency requirements of our combatant forces.

Another Rescue role is that of Local Base Rescue (LBR). When we were faced with new requirements in SEA, our only course was to transfer units from CONUS: there has never been an expansion capacity in either the active or Reserve air forces. The LBR role is similar in nature to the peacetime help given for many years by the Air National Guard to Air Defense Command interceptor units on alert duty. MAC felt that Rescue could use a number of Reserve LBR's in the same way. The Reserve LBR's would be located at the more stable USAF bases (those not subject to short-notice deployment), such as Air Training Command bases. The active units would continue to be at Tactical Air Command bases in the CONUS and at all overseas locations.

Obviously, care must be taken to have a proper balance of active and Reserve units, to insure that we maintain a proper personnel base for overseas rotation during peacetime and nonmobilized emergency conditions. A very favorable aspect of the Reserve LBR is the expansion capability with the larger Reserve personnel complement. With the stable alert commitment, there are more personnel in a Reserve unit, whose members participate on a part-time basis, than in a regular unit. Upon mobilization, a resource base will exist that permits at least one new LBR, assuming equipment is procured, which could be activated for each Reserve LBR in existence.

Aerospace Audio-Visual Service

The final area of MAC support missions, requiring a new Reserve approach, is the Aerospace Audio-Visual Service (AAVS). Unlike other organizations, this area has not had Reserve unit augmentation in the past. Like the other mission areas, the photo documentation mission has had its scope and focus significantly increased by the new national strategy.

AAVS tasks in documenting Air Force operations in SEA exceeded the existing capability so greatly that the 600th Photo Squadron had

to be organized. A similar increase in contingency operations by mobilization of operational Reserve units would require still another photo squadron. Therefore, MAC feels that a Reserve combat photo documentation squadron is a realistic contingency resource.

THE command's experience in implementing this ambitious package of program changes has already validated this unique "total forces" approach to Reserve affairs. Thus, our units are flexible enough that they can be productive in peace as well as war. The cost-effectiveness aspect of the program significantly lessens the problem of program justification during periods of austere budgets.

The command's approach to a Reserve force is best summed up in a statement by General Estes after the Department of Defense approved the initial associate unit:

The Air Force Reserve, over the years, has given to the regular Air Force tremendous backup in both flying and ground units. . . . As far as the Military Airlift Command is concerned, the Air Force Reserve has provided support in terms of airlift units and air rescue units in addition to a number of different types of ground units. It is vitally important to the capability of the Military Airlift Command that this Reserve support continue into the future.

Furthermore, it is important as we achieve new and modern aircraft in the inventory of the Military Airlift Command, such as the C-141 and the C-5, that our Reserve forces be capable of operating these more modern types of aircraft rather than back up the regular force in outmoded older style aircraft.

This is the purpose of the Associate Program within the Air Force Reserve: To directly couple formed Reserve units, not individuals with regular units flying these modern aircraft so that in times of emergency we are capable of achieving maximum capability which is inherent in these new modern aircraft. I am sure that this is going to be a fine program for the Reserves and the United States Air Force.

Hq Military Airlift Command



**COMBAT
AIRLIFT
TRAINING
IN MAC**

MAJOR GENERAL COURTNEY L. FAUGHT

IN THE Military Airlift Command, "combat airlift" is defined as the employment of strategic airlift forces to fly fighting elements directly into a combat zone; airlanding or airdropping the troops and their equipment; and resupplying them through either direct, long-range air lines of communication (ALOC) or high-volume intertheater operations. The method of insertion into the objective area is a function of the mission that the airlifted forces are to carry out and of their capability.

MAC's ability to carry out this combat airlift mission gives our national planning and decision elements a rapid, responsive capability for direct delivery of CONUS-based battle-ready units to areas of conflict or threat anywhere on earth. On certain occasions in the past, rapid reaction to deteriorating situations (Lebanon and the Taiwan Strait, among others) has helped to limit and contain conflicts which, without the timely interposition of sufficient force, might have grown into uncontrollable threats to world peace.

The rapidity, as well as the size, of such responses will in the near future be greatly enhanced with MAC's all-jet C-141/C-5 combat airlift force. Whereas it has previously been necessary to use intermediate staging bases to transfer combat forces from long-range propeller-driven aircraft to short-range tactical aircraft in order to execute the employment phase of the mission, the combination of the C-141 and C-5 will eliminate the necessity for that deployment/employment transfer.

The difference is perhaps best illustrated by a typical scenario from onload at Pope Air Force Base, North Carolina, to airlanding or airdrop in Southeast Asia.

With the C-124 type of force, 73 hours elapse between first takeoff at Pope and destination. The time is generated by the low speed of the aircraft, mid-Pacific routing to maximize the allowable cabin load (ACL), and a 12-hour ground time at Kadena to transfer to the theater's C-130 aircraft for the final (employment) segment of the mission.

With the C-141/C-5 force, the elapsed time is 27 hours from first takeoff at Pope to arrival of the formation over the objective

area. This elapsed time includes two-hour ground time at Elmendorf AFB, Alaska, and four hours at Kadena Air Base, Okinawa. The four hours at Kadena are required to enable the force to "close in" and then take off with a 30-second formation interval for a 10-second in-trail separation to the objective area. The 46-hour saving not only is significant as a matter of accelerated responsiveness, which could in itself spell the difference between success and failure, but is magnified many times over when the situation calls for recycling the airlift force for massive delivery within a short time period. And of course planning factors are greatly simplified by the elimination of transloading, and potential confusion is correspondingly reduced. Comparable savings of time and complication apply, of course, to any other area of the globe.

staff reorganization for responsiveness

This very fundamental difference between the old C-124 type of capability and the combat airlift potential of the C-141/C-5 force has necessitated a great deal of change within MAC. The command is now in the process of reorganizing its staff structure from the headquarters down to the airlift wings, so as to carry out its combat mission more effectively. New combat tactics and techniques staffs are responsible for the support and planning functions that were previously divided among diverse staff agencies in the various headquarters. Complete and responsive staff support is now provided for all the tactics and techniques required for training and deploying the MAC airlift forces. The planning functions of these new staff agencies include the employment portion of operations plans, operations orders and frag orders.

aircrew training

Combat airlift/airdrop training is required of all MAC C-141 aircrews, and the entire C-141 aircraft force possesses the airdrop mission capability. The crews accomplish aerial delivery training in their local areas, using drop zones (DZ) selected to meet all criteria for a safe training environment.



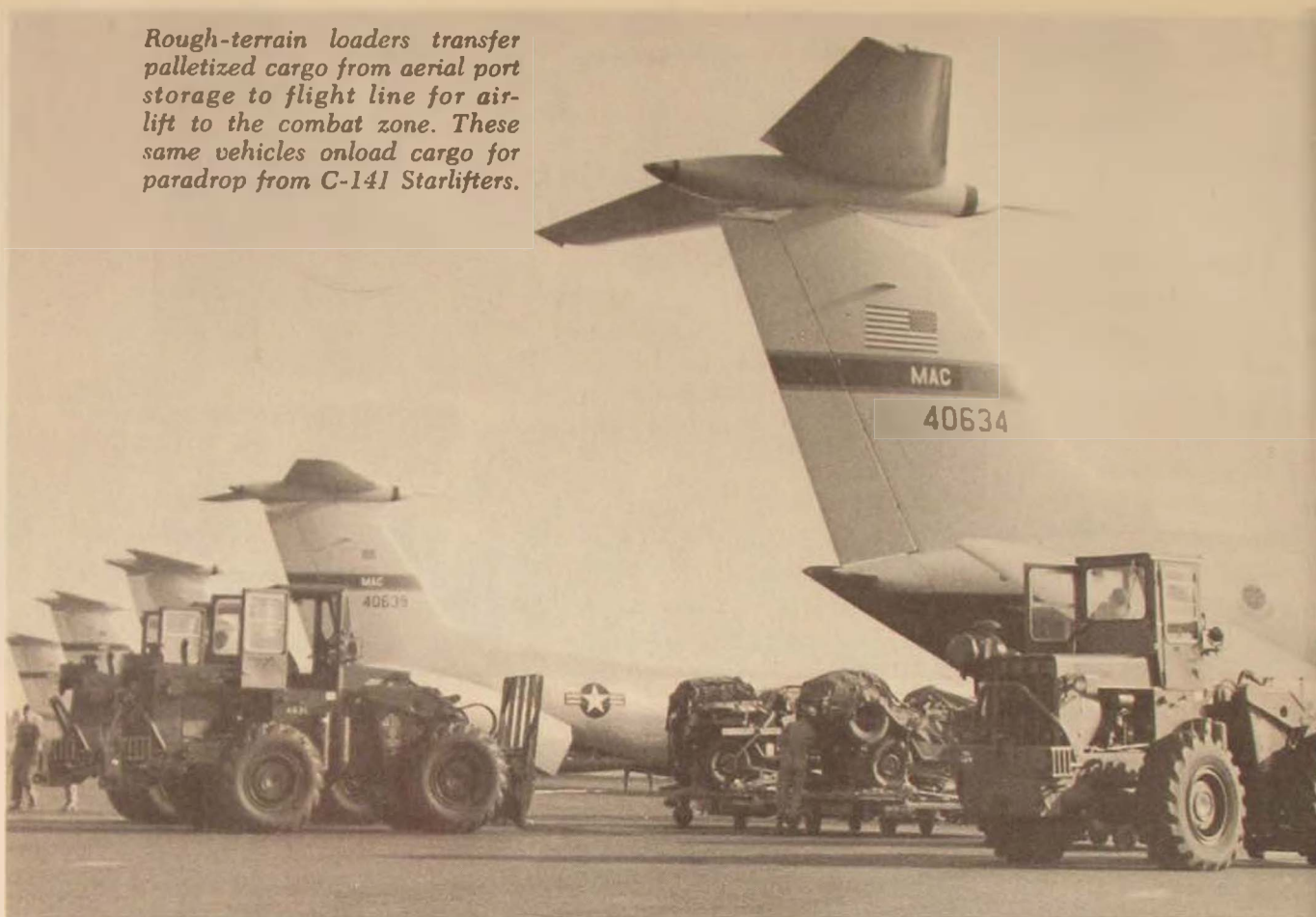
MAC Reserve Forces flying the Southeast Asia shuttle look forward to being equipped with C-141 jet transports soon. . . . Meantime the piston-engine C-124 will continue their faithful workhorse.

A training mission begins when the crews arrive for the mission briefing, which includes a description of the operation, navigation information, weather, communications, and the other details necessary for successful performance. Specialist and serial lead briefings are also held if the nature or complexity of the training operation so dictates. The aircraft commander or his representative conducts a troop briefing at planeside. Specific times are determined for each portion of the mission, from start engines to taxi, takeoff, on-course departure, time over target, and landing. The

flight portion of the mission includes the maneuvers of formation takeoff and assembly, IFR and VFR climb-out, weather penetration, orbits, descent into the objective area, low-level enroute navigation, two types of slow-down procedures, and, finally, the airdrop.

The tactical airdrop formation of the present era is an in-trail aircraft formation with 2200 feet between element aircraft (three aircraft to an element) and a two-mile separation between element leaders. All aircraft maintain the same altitude, with the element wingmen establishing wingtip clearance to the left and

Rough-terrain loaders transfer palletized cargo from aerial port storage to flight line for air-lift to the combat zone. These same vehicles unload cargo for paradrop from C-141 Starlifters.



right, respectively, to avoid jet wash and wingtip vortices. A slowdown to drop airspeed (130 knots) is established one to three minutes prior to arrival over the dz. The vFR in-trail formation is normally used for entry and exit of the objective area at minimum altitude and high speed. Drop altitudes for training are 1000 feet for personnel and between 700 and 1100 feet for equipment. Equipment drop altitude varies with the type of parachute and whether parachutes are used singly or in clusters. For wartime airdrop of personnel, the altitude can go as low as 600 feet, according to the decision of the troop force commander. The equipment drop altitude, however, will be the same in war as in training, since it is realistically based upon the altitude at which the recovery parachute load system can be expected to function reliably.

The question has arisen as to why we do

not use the World War II airdrop formation, with its nose-to-tail and wingtip-to-wingtip clearance. The answer goes back to 1963 and the Tactical Air Command's Project Close Look, which evaluated new equipment and tactics for improvement of aerial delivery modes. Among the conclusions was a recommendation that the high-speed, low-level, in-trail formation be adopted in place of the V formation, for the following reasons:

a. Enroute and dz weather minimums could be lowered.

b. The formation is more maneuverable, permitting maximum evasive action and consequent reduction of vulnerability.

c. As the number of aircraft increased beyond 27, less time would be required for delivery on the dz by the in-trail than by the V formation.

d. Training requirements for initial pilot

Marines line up to board MAC C-141s for paradrop during a joint MAC/Marine Corps training exercise.



checkout would be reduced, resulting in better economy of operation.

The new procedures, together with other possibilities, were thoroughly field-tested in 1966 in a large-scale maneuver, Exercise Rapid Strike II. Out of this three-week operation, which included the airdrop of 9075 personnel, 282 vehicles, and 67 tons of other equipment, came the jointly agreed position that the in-trail formation be adopted as the standard technique.

MAC is now developing an additional formation procedure growing out of low-level airdrop experience in Vietnam. With complete control of the air in that conflict, it is tactically more sound for the airlift force to approach the dz above 5000 feet, descend in-trail to arrive at the dz airdrop altitude and airspeed, accomplish the drop, and then begin climb and increase airspeed in order to get out of range of any small-arms fire as rapidly as pos-

sible. This specialized technique, of course, will be applicable only to a situation like that in Vietnam, lacking counterair.

The MAC airdrop training program is presently being strengthened through use of Strategic Air Command's radar bomb scoring (RBS) sites. Runs are made by C-141 aircraft against the RBS site at the culmination of a low-level navigation route. The aircraft is scored according to its actual air position in relation to the desired computed air release point (CARP) position. After departing the RBS site, the crew makes a run on a local dz. The combination of the RBS run and a standard airdrop provides varied and realistic training for all crew positions.

In addition, MAC conducts large-scale (36 C-141s) airdrop training exercises, with aircraft and crews from every C-141 airlift wing. These COLD MASS operations provide aircrew, staff, and command/control training in large-





Combat Control Teams

Three members of the first USAF combat control team to parachute in combat—4 April 1966, near Saigon—mark the drop zone for the jumpers who follow. . . . A combat controller of the 7th Aerial Port Squadron radios an incoming aircraft that the DZ is clear. . . . The parachuting soldiers belong to the Army of Vietnam Airborne Division.



scale formation techniques and procedures, as well as a practical basis for their refinement.

The Military Airlift Command also sponsors an intracommand combat airlift competition that brings together the finest airdrop crews from each wing in a contest to determine the best crew and wing in MAC. The competition fosters the objective of all-around improvement in the command's aerial delivery competence.

mission support

The entire training program requires a great deal of specialized support from other wing sections. The aerial delivery section of the MAC Aerial Port Squadron is a case in point; its day-to-day mission is to provide cargo parachute packing, airdrop load buildup, aircraft loading, and dz load and parachute recovery services. This type of unit is manned by airfreight personnel and aircrew loadmasters who specialize in aerial delivery operations. One of their typical functions is the packing of 64- and 100-foot-diameter cargo parachutes, by means of which 4000-pound supply loads, jeeps, and other Army vehicle and equipment items are delivered.

Another essential support section of the Aerial Port Squadron is the Combat Control Team (CCT). The CCT is manned by Air Force jumpers whose war mission is to parachute into the objective area to mark the drop zones and provide communications and air traffic control at the airhead in an airborne operation. The unit also provides landing, taxi, and takeoff instructions during an airlanding operation when normal air traffic control services have not previously been established. The CCT is equipped with portable UHF, VHF, FM, and HF radios, visual marking equipment, radar beacons, and the weapons and field gear necessary to support deployed combat operations. During local aircrew training, the CCT mans the dz and furnishes jumpers to satisfy wing aircrew training requirements for dropping personnel.

For deployment missions at locations where MAC does not have established operations, a special organization known as an Air-

lift Control Element (ALCE) is used for command and control of the mission. Within the ALCE is a nucleus of personnel who are specialists in the operation of deployed missions; they are supplemented by other wing personnel resources as required by the scope of the particular task to be accomplished. In addition to the control function, the ALCE furnishes operations, materiel, aerial port, and support resources at the deployed location.

exercises

The MAC airlift force is tested for capability as realistically as possible during large-scale joint training exercises, deployments, and maneuvers. The MAC contribution to these missions is broadly variable: it ranges from deployment to a theater staging base; through participation in the employment phase by airdrop of personnel alone, or equipment only, or personnel *and* equipment in combination; or by airlanding only; to any combination of these various levels of participation. In many of these varied airlift tasks, MAC joins with the Tactical Air Command (TAC) and theater airlift forces.

Some typical missions of the above categories include the airlift of the 101st Airborne Division (—) to Vietnam in December 1967; the 10,000-man Army/Marine reinforcement of our Southeast Asia forces in February 1968; the airdrop of 2000 U.S. and Greek paratroopers with equipment 20 miles from the Bulgarian border in August 1968; a large airdrop in east central Spain during December 1968; the airdrop of 82d Airborne Division elements on Vieques Island, Puerto Rico, in January 1969; and the deployment and redeployment of the 24th Infantry Division (—) from Fort Riley, Kansas, to Nürnberg, Germany, in February-March 1969.

The MAC force is also tested for mission capability through the medium of the wing Operational Readiness Inspection Test (ORIT), which commences with the no-notice arrival of an inspection team from MAC headquarters. In the course of the ORIT the wing is evaluated on its performance and reaction in all aspects of wartime, contingency, and disaster conditions.

One part of the response is a six-aircraft day/night mission with a personnel/heavy equipment airdrop. The mission imposes precise requirements as to takeoff time and time over target, and the air-delivered loads of personnel and equipment must impact on the DZ within 300 yards of a predetermined point.

affiliation program

Combat airlift training within MAC is supplemented by an active wing/division affiliation program. This program establishes liaison between specific MAC wings and identified Army, Marine, and Tactical Air Command units. The activities of the program are directed toward the ultimate goal of faster reaction to contingency requirements. Individual MAC airlift wings are associated with from four to nine units of the other services, ranging in size from a brigade to a division. The unit staffs maintain a close working relationship, with cognizance by each of the other's mission, capabilities, and requirements. The planners of both the MAC units and the supported units have developed a deeper awareness and understanding of airlift planning requirements under various conditions of deployment. This close and informal working liaison at all levels ensures more effective response during deployment outloading as a result of unified team effort; such teamwork is facilitated because the people involved have labored together during both training exercises and actual contingency conditions.

The affiliation training program is strengthened by classroom instruction in load documentation, preparation of equipment for air shipment, aircraft capabilities and limitations, load planning, tie-down, and loading procedures. The instruction is provided by MAC aerial port loadmasters to the personnel of the user units. Classroom training is followed by four to eight hours of actual aircraft loading practice, with various aircraft configurations and loads.

Beyond that, affiliated troop units have been furnished construction drawings for a universal loading simulator (ULS) designed for local fabrication. The simulator can be quickly modified to provide load training for the C-5, C-141, C-133, and C-130 aircraft. Through use of the ULS, training costs for both MAC and the user are significantly reduced, eliminating some of the static load requirements for use of actual airframes.

To round out the affiliation arrangement, the wing and unit staffs periodically review airlift requirements, prepare load plans, and develop onload airfield marshaling procedures—all aimed at optimizing effective utilization of the combat airlift force and ensuring a smooth, integrated flow of troops and equipment. They also survey adjacent airfields for equipment and facility capability, as well as availability for support of future deployment operations. These surveys enable MAC to determine the number of ALCE personnel and the equipment necessary to support operations from such locations.

The payoff of all these joint affiliation activities is a responsive effort that has materially reduced the time required to plan and load forces for whatever emergency or contingency may arise.

THE combat airlift task of the Military Airlift Command has been shown to include a full range of command and joint programs to support and increase mission effectiveness and efficiency. These programs include: responsive staff organization; a continuous and comprehensive aircrew training regimen; necessary mission unit support arrangements; a vigorous wing/division affiliation program; and an active exercise schedule to ensure current and proved performance capability along the entire spectrum of the Military Airlift Command combat airlift mission.

Hq Military Airlift Command

WEATHER MODIFICATION IN SUPPORT OF MILITARY OPERATIONS



MAJOR THOMAS A. STUDER

WEATHER modification is now being accepted as one of three major areas toward which efforts to advance meteorology should be directed. It is taking its place alongside development of a comprehensive observing system and of a more sophisticated, reliable prediction capability, to form an inclusive weather-support system.

Weather modification has only lately come to this level of prominence in the meteorological community, and the emphasis that it is to receive when competing for attention and resources is not yet clear. Its general acceptance by the military and the seriousness with which its potential is viewed are even more ambiguous.

Within the Air Force, individual opinions on weather modification, if reduced to basic convictions, seem to fall largely into two categories. The first category holds that weather modification does not have sufficient promise, either for supporting conventional military operations or as a weapon system itself, to warrant expenditure of developmental time or effort.

This opinion, however, is seldom baldly stated; it is usually qualified or hedged, in recognition, perhaps, that many similar positions taken with regard to other new fields in their infancy have proven to be embarrassing. The profoundly pessimistic quality of many original estimates for the future of the airplane is a case in point. The second category is convinced that eventually,

in the arsenals or weapon-support areas of future military forces, weather modification will have an important role. Often this opinion is accompanied by a tacit affirmation that a usable capability is so far off that there is little point in mounting a vigorous effort in the area yet. It is felt that weather modification properly should be allowed the benefit of further grinding in the mills of pure research until it reaches a form coherent enough to warrant military attention. Not irrelevantly, much of the civilian community may hold similar views, with the added qualification that weather modification, like chemical and biological agents, is too insidious to be used morally in war.

Enough is now known about the basic physical processes that control the world's weather engine to state with considerable certainty that the first opinion will be proven wrong. The second view, however, is a different matter and will, with its many variations and gradations, play an influential part in deciding the eventual role which weather modification will assume in the military.

There is ample reason for a sober, conservative approach. Many immense problems must be solved before dramatic capabilities are in hand. In many instances substantial advances in the basic knowledge of cloud physics and the earth's general circulation are necessary prerequisites to either the development or the responsible employment of weather-modification capabilities. More sophisticated statistical and climatological techniques are required, to permit an adequate distinction to be made between the effects caused by attempts to modify the weather and those that would have occurred naturally. These factors, however, should not be allowed to loom so large that they are predominant in all decisions and virtually dictate that nothing more than modest research efforts shall take place for the foreseeable future. It is important that adequate recognition be given the small but very real possibilities that now exist. It is perhaps in this area that maximum value can be gained from investment of military development resources. To enumerate:

(1) It has been demonstrated conclusively

that supercooled fog and stratus (composed of liquid water droplets at temperatures below freezing) can be dissipated over areas many square miles in size.

(2) Extensive theoretical work has revealed several possible ways to dissipate warm fog (temperatures above freezing) on a scale at least large enough to lift airfields above instrument approach minimums.

(3) It is possible to modify the normal growth of clouds and as a consequence change normal patterns of rainfall. Except in certain special meteorological situations it is not known in what manner or to what extent either the cloud growth or rainfall is altered.

In all probability it is within these three general areas that all weather-modification efforts aimed at operational capabilities will fall for a number of years to come. The important point is that man-induced changes can be made now in each of the categories. Although often these changes are small and the means to accomplish them crude, the changes nevertheless are real. In the third area, a considerable spectrum of potential weather-modification tools actually exists.

With the rise of weather modification to a position where it is being viewed seriously, there has been a corresponding swell of opinion holding that the actual employment of all weather modification should be confined to peaceful purposes. The magnitude of its potential effects, extending as they can to large areas of the earth and into long periods of future time, strongly suggests that this powerful tool be subjected to thorough review of all possible results, in an atmosphere of open, unhurried discussion, prior to careful and cautious responsible implementation. The current lack of adequate means to measure or even estimate the full effects resulting from interfering with the normal course of weather lends further support to this position.

The reasonableness of such an approach is unquestionable, particularly if international agreements with, eventually, appropriate monitoring provisions are enacted. Assuming this to be the general course toward which employment of weather modification will tend, two points should be made:

(1) It appears there will be a class of weather-modification capabilities that create weather changes of only a local or transitory nature. Their impact on weather or climatology over large geographical areas is negligible. Their military value may, however, be substantial. An example of such a capability would be techniques to dissipate warm fog over the approaches to airfields. Such capabilities should be omitted from the list of actions that are internationally restricted to peaceful purposes.

(2) There will be a continuing need to explore the military applications of all techniques to change weather, if for no other reason than to achieve an ability to detect attempts by unfriendly powers to alter the weather over the territories of the United States or its allies. There is no reason to think that scientists of the free world will be unique in their ability to develop weather-modification skills. In fact, there is reason to suspect that the Soviet Union is well beyond us in some areas and that even Red China is rapidly expanding its efforts in weather modification. Common sense demands that we remain aware of the possible military uses which these world powers can make of their growing knowledge.

Military interest and programs in weather modification will, then, continue. So far, these programs have been concerned primarily with in-house research or with monitoring research being carried on in other agencies or institutions. As understanding of the basic physical principles involved increases, however, the need and justification for developmental programs designed to adapt this basic knowledge to the solution of operational problems will steadily increase. A broader effort involving more field testing may already be overdue.

Since the Air Weather Service has a newly assigned responsibility to provide, or to arrange for, weather-modification support to units of the Air Force and Army, it has a strong general interest in the research which is under way and a particular interest in those areas where techniques or equipment have advanced to the point that operational testing in the field is warranted.

cold-fog dissipation

In the main, only techniques to attack fog have advanced this far. During the past two winters, Air Weather Service has carried on a program of operational testing or application of several techniques for dissipating supercooled fog. The results have clearly shown a very practical use for such a capability. Admittedly, supercooled fog is not a major problem, considered from the standpoint of all Air Force and Army activities. At a small number of airfields and operating locations in northern climates, however, supercooled fog is an aggravating problem for several months each year. Elmendorf AFB in Alaska is an example. From November to the middle of February this terminal is subject to intervals, lasting occasionally for several days, when cold fog restricts visibility to less than airfield-approach minimums. In the past this caused serious interruptions to an orderly flow of scheduled air traffic—interruptions that became increasingly costly and intolerable as U.S. military forces became more and more involved in Southeast Asia. During the past two years airborne fog-seeding operations have been carried out at Elmendorf AFB with a WC-130 aircraft of the AWS 9th Weather Reconnaissance Wing. The number of aircraft diversions necessitated by supercooled fog has thereby been markedly reduced.

No formal test and development program was undertaken to create a proven capability before seeding operations were begun at Elmendorf. The Alaskan Air Command had a problem, and the best available equipment and techniques were applied in an effort to eliminate or relieve it. Dry ice was chosen as the most proven agent to create the necessary freezing nuclei. In view of the terrain and the almost entirely unknown value of ground-dispersed seeding materials, it appeared mandatory to use an aircraft; and the WC-130 was selected as the seeding platform because its performance and range made it ideally suited to this kind of work. As the WC-130's prime mission is typhoon and hurricane reconnaissance and as these phenomena seldom occur during the three winter months when the supercooled fog occurs, the WC-130s are to

some extent available to support fog missions. A single WC-130 was used at Elmendorf. Procedures were established whereby it could be launched in less than an hour on a 24-hours-a-day, seven-days-a-week schedule if fog threatened airfield operations.

Though the additional aircraft landings and expedited departures thus made possible do not describe fully the value of the fog seeding and their number is sometimes difficult to calculate exactly, they give some quantitative basis for assessing whether the cost of employing a WC-130 in such a role is justified. Best estimates are that during the winter of 1967-68, 91 aircraft landings and 93 expedited departures could be attributed to seeding operations. With more fog during the winter of 1968-69, the estimate rose to 180 aircraft landings made possible and 155 departures expedited. By far the greater portion of these were MAC C-141 Starlifters en route to and returning from Southeast Asia. MAC has estimated that the cost of diverting a single C-141 or commercial contract carrier at Elmendorf AFB is approximately \$1000. The saving in operating costs is obvious. The results of a seeding operation carried out to assist incoming aircraft on the morning of 29 December 1968 are shown by the adjacent photographs. The first was taken at 1120, just before seeding began, when the entire base complex was shrouded in fog; the surface visibility was a quarter mile. The second photograph was taken at 1230 from approximately the same position. The entire runway is now clear, although the unseeded fog can still be seen farther out. Four C-141s landed between 1215 and 1320.

In all probability this support will continue in the future, so long as the density of air traffic through Elmendorf is at a level high enough to justify it. The effectiveness of fog seeding should improve as further experience is gained in applying it operationally. The lack of a thorough development and test program before beginning actual operational support was evident on occasion. At times seeding failed to lift the approaches to the airfield above operating minimums, principally because either the seeded fog failed to move as

predicted over the approach to the runway or the flight pattern and dispensing rate were unsuitable for the fog occurring at the time. Though the physical basis for useful operational techniques against cold fog have been known for years, only recently has real interest been shown in developing them for military use. Much still remains to be learned to improve their reliability. A particularly critical need is to find some means of coping with the low-level winds that cause the seeded fog to drift.

This need has been convincingly illustrated in seeding operations carried out in Europe. During the winter of 1968-69, Air Weather Service conducted operational tests, using a WC-130, at Hahn, Bitburg, and Spangdahlem Air Bases in the Eifel region of West Germany. At Hahn AB tests frequently were conducted in which areas of fog were seeded as much as ten miles upwind from the intended target of clearing, the approach to the runway. The three accompanying photographs were taken during a test in which a six-mile-long lane was seeded 12 miles southeast of the Hahn runway, in the top of fog approximately 900 feet thick. The photographs are from a point adjacent to the runway overrun. Seeding was done at 1013, and the wind in the fog was estimated to be 130° at 12 knots, although subsequently it was determined to be closer to 20 knots. At 1110 (first photo) no effects from seeding had been observed at the runway. At 1120 (second photo) a clearing had moved over the entire approach and touchdown area, the sky overhead became clearly visible, and horizontal visibility increased to over one-half mile. Precipitation fallout leading to improved visibility had obviously taken place before the clearing reached the runway. At 1135 (third photo) the wind had drifted the seeded area north and west of the base and fog again covered the approach and runway. In this test a reasonably good estimate was made of the direction and distance from the desired clearing that the fog should be seeded. In the majority of seeding operations, this was true. Sufficient failures occurred, however, in both Alaska and Europe, to identify this as the greatest single

problem in seeding of supercooled fog.

stratus dissipation

The aircraft and equipment used against supercooled fog can be employed with even greater effectiveness to dissipate supercooled stratus clouds. Between 1961 and 1964 the Air Force Cambridge Research Laboratories, in response to a requirement stated by the Tactical Air Command, developed equipment and techniques especially for this purpose. Interest of the operating command waned during the development period, however, and none of these systems was actually brought into the inventory. In part, the low interest stemmed from the fact that stratus does not interfere with the normal peacetime training mission to the same degree that fog does, and it is rather easy to lose sight of the problems that it can cause during combat in northern climates. Future joint Army-Air Force training exercises in Europe and Alaska during winter months will be carefully watched, and airborne systems used in the theater against cold fog will, if practical, be used against interfering supercooled stratus clouds. A greater appreciation of the impact that low stratus can have, primarily on effective tactical close air support, should be gained.

ground-based fog dissipation

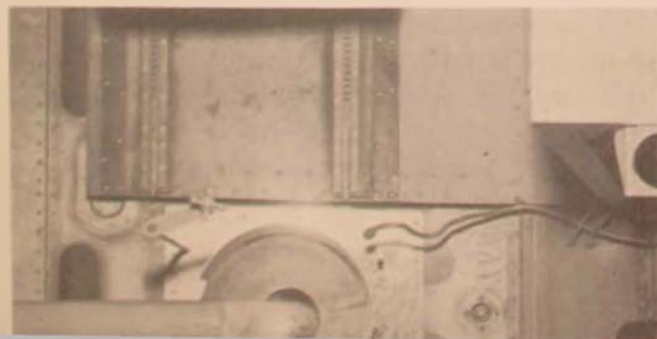
To complement airborne systems for dissipating cold fog, Air Weather Service is testing ground-based systems, which are potentially more economical because no airframe is required. Obviously they are less flexible, since inherently they lack the freedom provided by an aircraft, which permits seeding in almost any area desired or where necessitated by existing low-level winds. A first series of tests carried out with ground propane dispensers at Fairchild AFB, Washington, has shown that results on a scale large enough to permit launch and recovery of aircraft can be attained. Testing is to continue. If a reliable ground system can be devised, it should prove of considerable value at a number of airfields where cold-fog problems do not justify the cost of an airborne system.

warm fog and stratus

The most immediate and pressing weather problem facing all the services is that caused by warm fog and stratus. It is correct to say that no other single weather phenomenon, considered from a military standpoint, is so important. The principal cause of reduced visibility, worldwide, is warm fog and stratus. Reduced visibility has greater impact on Army operations than does reduced trafficability or extremes of temperature; reduced visibility in airfield-approach zones and over tactical battle areas interferes far more with Air Force operations than does turbulence, hail, or other commonly recognized hazards to flight; and reduced visibility outranks winds and high seas as a hindrance to naval operations. In Project Reforger I/Crested Cap I, a joint Air Force-Army test of a new tactical deterrent concept carried out in early 1969, warm fog and stratus hampered airlift operations just enough to indicate how serious and crippling they could be to the effective use of such a concept in emergency operations.

More and more attention is being focused on this problem as advances in technology reveal promising new avenues to possible solutions. Almost all effort so far has been directed to finding ways to live with or get around the problem. As an example, much of the research aimed at finding ways to allow aircraft to land during periods of low visibility has been concerned with work on the so-called zero-zero landing system. This system would instrument aircraft and terminals with sophisticated landing aids that would permit essentially pilot-free, "hands-off" landings with no requirement for forward visibility. Work has reached the point where the tremendous cost and complexity of such a system are being revealed. A great deal of the cost is generated by the need to have almost error-free systems. Where literally hundreds of passengers and a multi-million-dollar aircraft are involved in a single landing, no doubts as to the reliability of the landing aids can be tolerated.

It may be practical now to give more serious consideration to a carefully planned frontal assault on the fog itself. Though warm



Fog Seeding Operation

The WC-130, primarily utilized for typhoon and hurricane reconnaissance, becomes an airborne seeding platform during fog-dissipation tests conducted in Alaska and Europe. . . . Dry ice, chosen as the best proven freezing agent effective against supercooled fog, is brought aboard the aircraft in cakes and stored in cold chests until the operation begins. . . . When the most advantageous area upwind from the intended target for clearing is reached, crushers process the dry ice to the proper seeding consistency. . . . The agent is then dispensed from the airborne system through a dropsonde chamber.

fog can be dissipated only by "brute-force" techniques that are cumbersome and expensive, there are situations where such techniques might be a cheaper alternate solution to a problem. In zero-zero landing systems, the stringent performance requirements for landing aids could be greatly relaxed if sufficient visibility were assured so that aircraft could be landed visually in the conventional manner by a pilot. Incorporating a fog-modification capability into a zero-zero landing system to provide a slant-range or forward visibility of at least 700-1200 feet not only may be less costly but also may enhance the safety of the landing operation. An airborne capability to dissipate warm fog on a scale large enough to permit uninterrupted airlift operations of the type needed in Reforger/Crested Cap may be within the state of the art. If means to improve visibilities to one-half mile can be made relatively inexpensive, they can be very useful at many airfields too small to justify even the landing aids needed to lower approach minimums to one-quarter mile.

Some developmental work has been carried out in the past three years, particularly by the Naval Weapons Center and commercial organizations funded by the Air Transport Association. Greater efforts are needed.

IN ALL WORK undertaken to develop operational capabilities in weather modification and

in all attempts to apply these to solving specific operational problems, one point must be kept clearly in mind: weather modification is going to grow step by step. Often these steps will be very small and laboriously taken. At present the science of weather modification is in a stage roughly equivalent to the aeronautical sciences at the time the Wright brothers made their historic flight at Kitty Hawk. In all probability it will be a considerable period of time before the equivalent of an SR-71 comes off the weather-modification drawing boards. To advance at all will require a willingness to invest time and resources in efforts that carry considerable risk of failure.

Initially, weather-modification capabilities are going to be crude and primitive and frequently so costly that only very careful estimates of their cost-saving features will prevent their being summarily dismissed as impracticable. This will be compounded often by the need to resort to statistical techniques to estimate the results of their application. There is every reason to think, however, that with continued research, carefully planned development, and conscientious operational testing, these capabilities will steadily improve in power and value and will repay many times over the effort and money invested in them.

Scott Air Force Base, Illinois

TECHNOLOGY AND AEROSPACE POWER IN THE 1970s



GENERAL BERNARD A. SCHRIEVER, USAF (Ret)

THE TITLE "Technology and Aerospace Power in the 1970s" leaves the inference that somehow technology will dictate military policy. I would like to correct that inference. While technology is vital, we have to have the proper policy and the proper attitude at the leadership level if we are to have the necessary aerospace power.

During the past several years, we have had a policy which has inhibited technology. For the past eight years, we have had a very active policy leading toward a political détente with the Soviet Union. I am sure no one quarrels with the basic idea of a détente between the United States and the Soviet Union. What is debatable is whether a détente is actually possible and how we should go about achieving it.

There were people who expressed the belief as far back as the early 1960s that the Soviet Union desired an accommodation with the United States. They felt that if we could only reduce cold war tensions by avoiding provocations with the Soviet Union we could in fact achieve a détente. Among the things

which these people considered provocative was our strategic superiority, which they thought would induce or initiate action leading to new weapon systems. The theory was that these new systems would tend to escalate the arms race, especially nuclear weapon systems.

I will not argue whether these beliefs and the actions taken in recent years on the basis of these beliefs were right or wrong. I will leave it to your judgment to determine whether we have made any real progress toward a meaningful political détente. But the fact remains that in recent years we have slowed down our progress in military technology as a result of the détente theory.

Dr. John Foster, as Director of Defense Research and Engineering in the Office of the Secretary of Defense, stated last year in his testimony before the Congress that financial support for technology had been steadily reduced since 1964. Under this policy of reduced research and development, we have not initiated any new weapon system programs. Admittedly, we did begin a major program for the very large logistic transport aircraft,

the C-5A, which is now undergoing airborne testing. But we did not initiate any new strategic systems. As a result, we now have reached a condition of strategic parity with the U.S.S.R. In one of his last statements before leaving office, Secretary of Defense Clark Clifford officially stated that we would arrive at strategic parity with the Soviet Union in 1969.

The advocates of political détente remain very aggressive today—aggressive and adamant that their approach is the right one. Their aggressiveness is manifested in a number of ways, particularly in the stories we see in the East Coast newspapers. Their attack on the antiballistic missile (ABM) system is unceasing. Unfortunately, there are some vulnerabilities in this system which make it a logical target for criticism. But, if they are successful in blocking the deployment of this system, they will undoubtedly expand their attack to include all other military developments as well. Their campaign includes constant references to the so-called military-industrial complex. Hardly a day goes by without some article in the *Washington Post* and *New York Times* on this subject. The articles in these papers and in some popular magazines as well contend that the military has done a miserable job in designing and developing new systems for national security, that cost estimates have been unrealistic, and that reliability has been low. The purpose of these attacks has obviously been to undermine the confidence of the American people in what

was being done by the Defense community.

By comparison, there seems to be some change in Defense policy under the new administration. Secretary of Defense Melvin Laird, on the tv program "Face the Nation," recently gave some very enlightening facts about what the Soviets had been doing to strengthen their military posture. He stated, for example, that in the area of defense against missiles the Soviets had been spending at the rate of 3.7 dollars to every 1 of ours. And that this ratio equated to about 7 to 1 if the gross national product of the two countries was taken into account. Mr. Laird also stated that the Soviets had maintained a substantial margin over the U.S. in their recent expenditures on offensive systems. I think this is the kind of factual information that the American people need to be told if they are to provide the right kind of recommendations to their political representatives in Washington on matters of national security. I think without question that the American people should express their beliefs about national security, but they cannot offer very sound opinions unless they have the essential facts. I was pleased that Mr. Laird offered these enlightening facts to the American people on Soviet military programs.

After the right policy has been adopted, its implementation depends upon the right attitude. Hence attitude among leaders is extremely important. Attitude can be described in many different ways, but I would think that a leader must exhibit a positive attitude, characterized by dedication, motivation, initiative, and innovation. Such a positive attitude is essential for leaders of groups and organizations in this dynamic technological age. The policy under which we have been operating during the past seven or eight years has placed a considerable amount of inhibition on our leaders in technology who would normally have a positive, can-do attitude. And the management procedures governing Defense R&D and systems acquisition have imposed additional frustrations on those who had a positive attitude. Instead of building hardware, the Department of Defense has conducted endless studies. And the sense of urgency that existed during the Fifties in developing our ICBM

On 19 February 1969, Air University presented another Thomas D. White Lecture, when General Bernard A. Schriever, former Commander of the Air Force Systems Command, spoke on the subject "Technology and Aerospace Power in the 1970s." Air University Review takes pleasure in presenting an adaptation of General Schriever's views to its readers.

THE EDITOR

force and getting us into space has all but disappeared during the Sixties.

Let me cite examples from some of my personal experiences. The Thor, you will recall, was a medium-range ballistic missile. We selected a contractor for the Thor in two weeks' time. Under present procedures, it would take a year or longer. In regard to the Minuteman, which is now the backbone of our intercontinental ballistic missile (ICBM) force, we had a similar experience. When I first went to the Pentagon to discuss the Minuteman, no one had ever heard of an ICBM with a solid propellant. But we gave a complete briefing on the planning and technical studies that we had carried out to determine the feasibility of such a missile, and within forty-eight hours we had approval to go ahead with the Minuteman.

Initially, we were authorized only \$50 million for the first year of the Minuteman program. We knew it would take \$150 million. But we were betting that the other \$100 million would come, and it did. A year later, General White called me in to ask me to knock a year off the Minuteman schedule.

That was the climate of the day and the sense of urgency that existed during the Fifties.

In more recent years, the idea has been presented that we are on a technological plateau. Many of us who have spent our lives in technology simply cannot agree with that thesis. And I think the comments that I make later will substantiate the fact that we are not on a technological plateau. Back in 1963 and 1964 we made a massive study in the Air Force of the potential of technology—what we called a “technological forecast.” In other words, we tried to predict what technology could do, what deficiencies it could fill, what improved weapon capabilities it could provide during the next five-, ten-, and fifteen-year periods. The study was made by members of the government, both military and civilian, but the study group also included experts from industry and the academic community. Project Forecast, as it was designated, recommended certain high-priority areas for R&D, recommendations based on the greatest potential payoff

for the future. Some areas promised major breakthroughs or quantum jumps.*

The technological areas recommended for high-priority R&D were rather broad. One area was materials; propulsion was another; aerodynamics was still another; and electronics in its broadest sense was recognized and recommended, along with nuclear weapons and lasers. I would like to address myself to a few of these, just two or three, because they are still, today, in 1969, the areas of highest potential. They still contain the promise of the quantum jump that we used to talk about in the Fifties.

Let us look first at materials. Materials are basic to everything we build these days, especially to aeronautics and to aerospace. Designers are always looking for lighter and stronger materials and for materials that can withstand higher temperatures. In recent years there has really been a breakthrough in materials, particularly in boron filament composites, carbon filament composites, and several other advanced composites. They are stronger and lighter than aluminum or titanium or stainless steel. Aircraft structural weights can be reduced by as much as 30 percent with the use of these materials. This weight advantage has been thoroughly substantiated in the laboratories. Detailed studies have been made by both nonprofit organizations, like the RAND Corporation, and by industry. This kind of weight advantage really constitutes a major breakthrough. As a matter of fact, it is probably the most important breakthrough in materials since the Bronze Age, and that was 3000 years ago.

Engine weights can also be reduced very substantially by the use of these advanced materials in compressor blades, engine cases, and all other parts that do not have to be subjected to high temperatures.

In addition, some high-temperature materials have been developed, as well as new cooling techniques, which together allow for a very substantial increase in turbine operating temperatures. To name one example: the

*Editor's note: General Schriever's article entitled "Forecast" was published in *Air University Review*, XVI, 3 (March-April 1965), 2-12.

airplane with the highest performance today, the SR-71, can fly at speeds of over mach 3 or more than 2000 miles per hour. It has a turbine inlet temperature of 2200°F. With the application of some of the new materials and cooling techniques, there is no reason why we cannot raise inlet temperatures to 3000°F.

If both the lightweight and high-temperature materials were used, engine designers could give us engines with thrust-to-weight ratios (a measure of the efficiency of an engine) of over 20, as compared with today's common thrust-to-weight ratios of ten or less. These more efficient engines would give us substantial increase in fuel economy, or what we call specific fuel consumption.

These more powerful and more efficient engines and the stronger and lighter aircraft structures could be available during the Seventies. I think it is just a matter of sooner or later, not "if." In fact, the first applications are already being made. For example, recently Lockheed selected a Rolls Royce engine for its new jumbo jet or airbus, the L-1011. Why? Because Rolls Royce was using carbon filament compressor blades, which substantially reduce the weight of the engine and give it considerable growth potential. Since Lockheed made that decision, both of the U. S. jet engine manufacturers, General Electric and Pratt & Whitney, have initiated programs to apply the advanced materials in their new engines. I am sure we will see these new materials being introduced in an evolutionary process in the newer engines that will soon be going into production.

The second technological area that was identified in Project Forecast for high-priority R&D was propulsion. A vital goal to reach in propulsion is supersonic combustion. All our jet engines today burn their fuels at subsonic speeds, even though the aircraft may be traveling at supersonic speeds. The result is a great deal of drag in the inlet ducts because the air has to be slowed down in going through the combustion chambers. With supersonic combustion, this drag would be eliminated and engine efficiency would be significantly increased. Supersonic combustion has been achieved in experiments, both in and outside the laboratory.

What does supersonic combustion mean

for air-breathing engines? We have been struggling to design an aircraft that will fly at mach 3, three times the speed of sound. We are facing many difficulties in our supersonic transport (SST) program. Throughout the program, the state of the art has been pushed to build an aircraft that can fly at mach 3.2 economically for commercial use. With supersonic combustion, we can jump immediately from mach 3 to something like mach 6 to 10, meaning that we would more than double the speed of our fastest aircraft today. Theoretically, it is possible with supersonic combustion to attain speeds that are almost orbital. From a technical standpoint, the "aerospace plane" that we were talking about a few years ago—one that could take off on a runway and climb and propel itself into orbit—may not be as farfetched as some people then thought. I will not predict this kind of plane for the 1970s, but it certainly is technically feasible and could very well be developed before the turn of the century.

People who have been advocating a slowdown in military R&D, who oppose the research necessary to give us supersonic combustion, often support their arguments by claiming that such R&D would be too costly. I disagree. I do not think that a valid case can be made for a reduction in research and development, or for reduction in the Defense budget as a whole, on the grounds that defense costs are overstraining the national economy. Even with Vietnam, our military expenditures have been less than 10 percent of the gross national product per year. The 1970 budget is projected at \$79 billion, and that is 8.2 percent of the GNP. Economists agree that this is not an overwhelming burden on the economy of a developed nation. The Soviet defense budget is closer to 15 percent of the GNP.

WHAT can we expect to see in the 1970s and '80s? I think it is fair to say that technology—available technology—could bring about a revolution in aeronautics. I imagine this statement comes as a shock to many. When we climb aboard the commercial transports of the day and cross the country in four to five hours in parlor comfort, it is difficult for us to imagine that we could be just enter-

ing into a revolution in aeronautics. But we must remember that the Wright brothers made their first flight just a little over sixty years ago. When I went through flying school in 1932, we flew in open cockpits, wore helmets with goggles, and tied scarves around our necks. Snoopy didn't have anything on us at all—we looked just like him. So, if we consider the progress that has been made since I entered flying school thirty-six years ago, it should not tax our imagination to foresee revolutionary progress in the next thirty-one years, between now and the year 2000. When I predict a revolution in aeronautics, I mean just that.

Let me give one example of how the revolution might develop in regard to our new logistics aircraft, the C-5A. This huge airplane will weigh over 700,000 pounds fully loaded and will carry over 100,000 pounds of cargo 6000 miles, nonstop. With some improvements to the engines, such as I have mentioned, plus the introduction of some advanced materials in the airframe, there is no reason why the range of that aircraft could not be extended to 10,000 miles with an increased payload.

With the advent of these large, efficient, and economical aircraft, we could have developments beyond airborne warning and control to, perhaps, a mobile air defense system. Those who are familiar with our technological forecast will remember that we talked about mobile air defense (MAD) and airborne defense. With large aircraft for command and control and with fighter aircraft similar to the F-12, which would have a long-range radar and long-range missiles on board, and with tankers for airborne refueling, it would be entirely feasible to use a force of that kind to sweep large air defense areas or to achieve and maintain air superiority. In other words, the mission of air defense for North America could be extended to other areas.

Taking a look at the aeronautical revolution from another direction, I foresee a regeneration of interest in nuclear propulsion for aircraft. We know that it is feasible to build nuclear propulsion systems for aircraft. There has been a lot of progress since the earlier program was canceled a few years ago.

But as we begin to design very large aircraft for very long-range operations, the demand for nuclear propulsion will return, and this time I think it will be heeded.

Another area in which there could be revolutionary development in aviation in the next decade or so is the short takeoff and landing (STOL) aircraft. We have had the technology to build STOL aircraft for quite some time, but we have not been able to build an economical or efficient one, for either commercial or military use, except for very specialized purposes. We are now entering a period in which we can expect profitable, efficient, high-performance STOL cargo aircraft. I know many airline executives who think that STOL aircraft will be the next major development in commercial aviation. I am convinced that, if we include some of the new technologies in materials and propulsion in the next generation of STOL aircraft, we can have an acceptable one. I think we might also be able to develop an effective STOL tactical aircraft quite soon, and eventually I am sure we will also be able to design one for strategic use.

There has been quite a debate about whether a requirement exists for an airplane with hypersonic flight, that is, flight above mach 5. There is no doubt in my mind that a requirement *does* exist, both commercially and militarily. Of course, one of the big problems with respect to the supersonic transport is that it will produce a sonic boom in excess of three pounds per square foot. That is completely unacceptable for overland flight. But a hypersonic airplane, flying at 150,000 feet, would create only a very low-order sonic boom that would be tolerable for overland flight. That same hypersonic vehicle might also serve as a reusable booster for space flight. The same propulsion technique could be applied. And a reusable booster would be a major step forward in economical space operations.

If we could couple a reusable booster with a lifting body (i.e., a wingless vehicle whose whole configuration develops lift), we could have controlled re-entry instead of today's return to earth via ballistic trajectory, which has been the course followed by Gem-

ini, Apollo, and other manned flights. A controllable or maneuverable re-entry vehicle would add a great deal of operational flexibility. We know that, technologically, such vehicles can be developed.

We need still other capabilities in space. To our proven capability to rendezvous, we need to add a rescue capability, a repair capability, a resupply capability, and a maneuverable re-entry capability. I call these the five Rs of space. They are all within our grasp, from a technological standpoint. If we could develop a reusable booster and a maneuverable re-entry vehicle, we would be able to add a whole new dimension to space operations. The technology is in the laboratory; we need to push the application.

Another area of technology on which I would like to comment briefly is electronics. Electronics was one of the areas identified by Project Forecast as having a high potential for development and deserving priority R&D. I would like to expand the term "electronics" to include inertial guidance systems, infrared technology, and some laser applications. One of our most difficult technical problems in the Air Force is finding and identifying targets and then being able to hit them accurately. This problem is particularly difficult at night and in bad weather. The answer to the problem lies in some recent developments in electronics, especially in infrared and laser technologies. Our experience in Vietnam has taught us again that our ability to find and identify targets is a pacing factor in the application of air power. We need to press forward vigorously with developments in electronics relative to this problem.

The state of the art in electronics also has strong impact on our ABM system, with particular emphasis here on infrared technologies and nonnuclear means for the destruction of warheads. Although most of the current debate about the ABM is more confusing than enlightening, the fact is that there are some soft spots in the system from the standpoint of technology. It might be well for us to remember that there never has been a 100 percent effective defense system against aircraft, and we would be wise not to expect one

against missiles. But we do need to make a start. We have been carrying on R&D for a long time, and, as I said, we have made important advances in electronics applying to the ABM system. These technologies, however, will not move forward aggressively unless there is the impetus and motivation of having an active system program and the continuing responsibility of improving the system. This responsibility has always been the key to progress. In the ICBM program we started with the Atlas, a "soft" missile system. Within five years we had progressed to the Minuteman in hardened silos and the sea-protected Polaris and Poseidon missiles. In other words, we must get going in order to get there. In my opinion, we need definitely to proceed with an antiballistic missile system.

I am confident we can make the necessary technological advances to give us an effective ABM system, possibly as early as the 1980s. We know that the Soviets are working hard to improve their existing system. And the country that has an effective ABM system will have a tremendous advantage in the strategic balance of power. I would be very much concerned if the Soviets had it and we did not.

I HOPE that this discussion has pointed up the very great potential for further development in the next two or three decades in the areas of materials, propulsion, and electronics. A survey of those other areas of technology identified by Project Forecast would reveal the same kind of potential, I assure you. In short, *we are not on a technological plateau*. Technology remains extremely dynamic. It holds tremendous challenge, tremendous promise, and a very serious threat. The Soviets have not slowed down their efforts to advance technology. They have moved forward vigorously in every area and with all the speed they can muster. The advance of Soviet technology remains a threat.

If we are to get our technology moving forward again, we must have a change in policy and attitude. I believe such a change is in the offing, judging from what Secretary Laird has been saying recently. It is my observation that a feeling exists in the Department

of Defense and in other governmental departments that under no circumstances can we allow our technology to lag behind the Soviet Union's.

That does not mean that we cannot negotiate with the Soviet Union to try to bring about an end to the cold war or to reduce world tensions. There is no reason why we cannot advance our technology and negotiate at the same time. That is precisely what the other side will be doing.

We should also recognize that the high-risk R&D, which only the Department of Defense can justify and carry out, applies not only to our national security but also to our economy. Spin-offs from Defense research and development greatly benefit our economy.

As for the change I predict in policy and attitude relative to technology, let me add the qualifier that some of the procedures, some of the systems, that have been put into operation in recent years cannot be easily reversed or streamlined. After some twenty-odd years around Washington, I have learned that it is very difficult to unseat the bureaucrats. They become entrenched and very difficult to redirect. But I think there will be changes even there, though it will take a little time to bring them about. Along this line, do not expect any immediate changes in the level of Defense resources being applied to technology. How-

ever, I would expect the FY 71 budget to place substantially more emphasis on new weapon systems. The level of that emphasis will be influenced to some extent by Vietnam, unless we have been able to bring that situation under control.

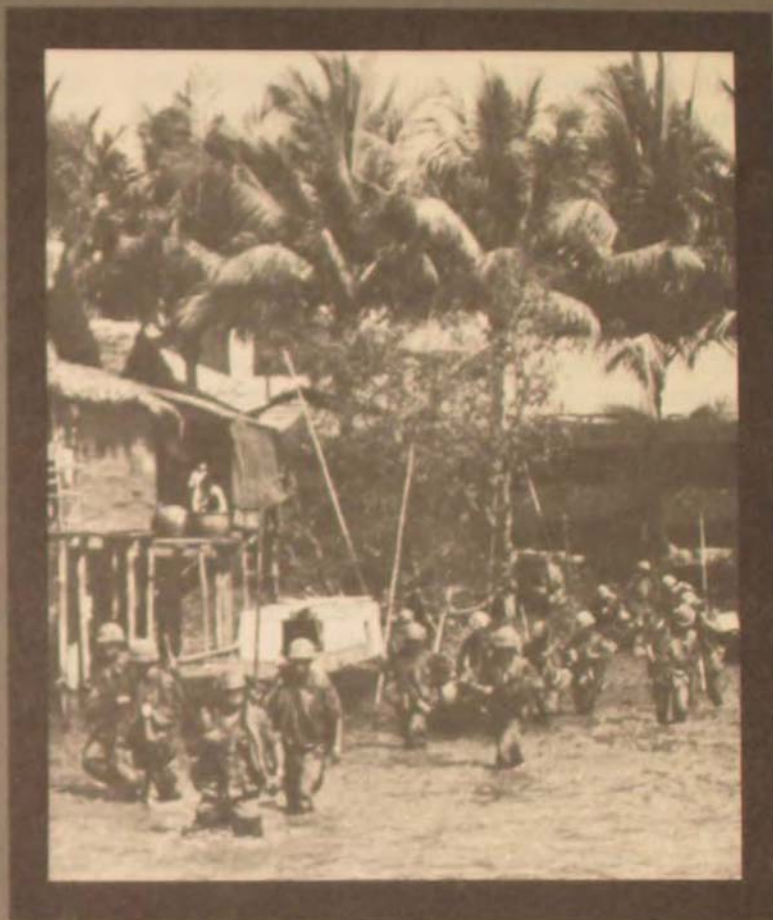
I might point out that other government agencies are entering into the field of research and development. This is especially true of the Department of Transportation, the Department of Housing and Urban Development, and the Department of Health, Education and Welfare. I am sure that any of you who have to go through the traffic jams in New York or Washington or elsewhere will welcome additional R&D in these areas. Studies I have seen in transportation, in ground systems as well as air systems, have presented some fantastic futuristic schemes. I am convinced that we will see some of these in the next ten to twenty years.

Regardless, however, of the debate going on now relative to investment in security versus investment in domestic affairs, the nation will continue, in my opinion, to support in increasing amounts the technology necessary for our national security.

I am quite optimistic that we have turned the corner and that we are going to see technology pursued in a more vigorous manner in the future.

Arlington, Virginia

HISTORY, VIETNAM, AND THE CONCEPT OF DETERRENCE



COLONEL WILLIAM C. MOORE

EVER since the United States became involved in Vietnam, the strategy being followed has been debated from every conceivable angle. The hue and cry often reached deafening proportions, with the press pointing the finger of blame in all directions but specifically demanding that the military devise a new strategy. These demands carried the connotation that the military was responsible for the strategy that failed. In rebuttal, a few voices (mainly military) pointed out that it was a civilian strategy, devised by civilians and executed by civilians, to include control of the smallest detail of military operations.

As in most debates, there is a bit of truth on each side. Perhaps more time must pass before the facts can be objectively sifted, coldly analyzed, and translated into irrefutable conclusions by the Toynbees, Tolstois, and Morisons of the future. But what are the historians of the future likely to find in their search for facts upon which to base analyses? What will the periodicals of today tell them?

How are they likely to categorize the personalities involved, their philosophies, the forces at play, the authority in contention, and the decisions made?

In one arena, the military, the events have been so continuous, so open, so widely publicized in the journals of the world that the play and counterplay of military forces, their subtle application in the power struggle, their threatened use, their actual use, hardly need the jelling process of time to make sense. Thus historians of the future are likely to view today's events in the military arena much as we now do. They are likely to find that there has been a pattern, a sense of direction, a thread that traces its course throughout the period of war and near war in which we live.

They are likely, for instance, in researching the current debate on strategy in Vietnam, to find that the military does have legitimate contentions that the strategy being followed is largely a civilian strategy and that the controls imposed by civilian authority have been restrictive on military operations. The historian will also find, however, that the military is far from blameless. The basic strategy, the strategy of flexible response, the strategy of gradualism, was promoted and sold to civilian authorities by responsible military men. A quick review of the journals of the years 1955 to 1961 should dispel any doubt that General Maxwell Taylor was the principal architect of the strategy of flexible response. This is well documented, and no analysis or conjecture will be required by future historians to set down as fact that General Taylor tried to sell his concept when he was a member of the Joint Chiefs of Staff; that he was unsuccessful; that General Eisenhower, then President, is reported to have used the word "parochial" to describe Taylor's feelings; that General Taylor left the Joint Chiefs and wrote a book; that he continued to promote his concept; that President Kennedy recalled him to active service. Perhaps President Kennedy had already de-

ecided on flexible response and simply sought out General Taylor in order to obtain support and give his strategy a military flavor. But this is conjecture which is best left to the future historian.

It is not historical conjecture, however, that President Kennedy, by selecting the strategy of General Taylor, in effect accepted advice outside the active, organized military establishment, outside his principal advisers, the Joint Chiefs of Staff. In fact, this same body of military men had rejected General Taylor's concept. President Eisenhower, Supreme Commander during World War II, rejected it. Yet the rejected concept suddenly became national policy. Historians have no choice but to view this as fact.

Historians will only be able to speculate, however, whether the Joint Chiefs of Staff as a corporate body would have recommended that flexible response should have been *announced* as U.S. strategy. Most certainly, there is evidence in the journals of the time that the Joint Chiefs wholeheartedly supported such a strategy; but supporting a decision once it has been made is quite different from recommending the decision. History will undoubtedly conclude, therefore, that the military cannot disown entirely any responsibility for a concept of fighting a war that by all standards has been found wanting in Vietnam.

Why the strategy of flexible response has been found wanting is not such a moot question to the historian as the debate implies. Some of the reasons for the predicament of Vietnam become apparent if the concept of flexible response is analyzed in the light of historical events leading up to flexible response and its impact on the enemy. How did the potential enemy view this shift in U.S. policy? Did his subsequent actions reveal his views as to our intentions in relation to possible actions he might take? What were his conclusions as to what might happen to him, what risks he could take?

The historian must ask these questions in the light of the basic U.S. objective. This objective, from a historical point of view, has been and always will be to deter war and, hopefully, to eliminate war as an instrument of national policy. In this light, the historian must also recognize that the strategy to deter war is quite different from the strategy to fight a war once it starts. One strategy involves what the potential enemy thinks is likely to happen to him, while the other is what actually does happen. Flexible response by its very nature is associated with the latter—how to fight a war after it starts. The whole concept revolves around the theory that, in the nuclear age, wars must be managed and kept within acceptable nonnuclear limits. To the historian this may well be considered the first flaw in the concept of flexible response, or at least the official announcement that U.S. policy would be based on such a concept may be so considered. The historian will ask himself: Did not the announcement of such a concept remove some doubts the aggressor had as to what might happen to him? Did not the announcement carry with it the suggestion that the U.S. was attempting to find an acceptable strategy for war somewhat short of a nuclear strategy? Did this not, in turn, carry with it the deep, significant implication that the United States believed that nonnuclear war was inevitable? Analyzed in this light, in the light of the enemy reaction, the announcement that flexible response would be U.S. policy could have no other effect than to convince would-be aggressors that the U.S. was weakening its deterrent, that the risks of aggression were not as great, that caution was not so important.

The historian will find that until the concept of flexible response became U.S. policy many people firmly believed that considerable progress had been made toward reducing the likelihood of war. This hope of progress was based on the apparent fact that the existence of a capability for nuclear warfare was sufficient to deter war, to make it unthinkable, to eliminate it as an instrument of national policy.

In reviewing history as it pertains to the philosophy of deterrence, a historian may find in the annals of time that the facts are quite

clear. He will find that at the end of World War II the United States reduced its military capability to the point of impotence. The Soviet Union initiated no corresponding reduction. As a result, her strength in conventional forces vis-à-vis that of the United States became overwhelming. The United States was confronted by a situation in which the few nuclear weapons available for use against the Soviet Union would certainly wreak havoc, but the number might not be sufficient to prevent the Soviet Union from overrunning Europe. Furthermore, there existed in the world and in most segments of U.S. society a moral compulsion against the use of nuclear weapons.

As a result of these factors, the power position of the Soviet Union was sufficiently strong to permit exploitation by the leaders of Communism. Accordingly, Soviet policy and actions during the period of 1946–48 were extremely aggressive and gave every indication that the Soviet Union intended to place all of Europe, and ultimately the rest of the world, under the red banner of Communism. Soviet diplomacy was characterized by naked, often-brutal force, rarely restrained by fear of effective counter action by the United States.

The United States, reacting to this threat and pursuing the objective of “peace through strength” (deterrence), forged a mighty nuclear-capable force, consisting primarily of strategic air power, with which to confront the leaders of the Soviet Union unless they refrained from the use of force to support their plan to communize the world.

THE POLICY of nuclear deterrence was successful. The leaders of the Soviet Union were deterred from initiating general war. They were also deterred from overt use of their forces in limited war for fear such a war would escalate to nuclear war. Soviet planners, in analyzing U.S. strength, realized that the United States had no alternative except to use nuclear weapons to prevent defeat in limited war. The spectrum of wars likely to occur, therefore, was compressed. The threat of Soviet forces could no longer tip the balance in favor of a Communist take-over. Winston Churchill

attested to this fact when he expressed the view that if it were not for the existence of U.S. nuclear power all of Europe would be under Communist domination. The Soviets under the threat of nuclear war were forced to temper their probes against the West. No longer could Soviet diplomacy remain untethered; no longer could the Soviets risk the provocation of direct, overt challenge. Soviet diplomacy was forced to become less inflexible, less daring, more cautious. In fact, the Soviets were forced into a policy of peaceful coexistence, a policy which gave promise that future relations between the Free World and the Communists would become less of a dangerous polarity involving constant risk of war and more of an equilibrium with adherence to diplomatic standards designed to minimize the risk of war—to prevent the *casus belli* from arising because the consequences of war would be disastrous.

The threat of nuclear war was undoubtedly the major contributing factor to this tempering effect on Soviet diplomacy and Soviet aggressive intentions. The Soviets realized that further aggression by the Communists had to be more covert, less provocative, less discernible—aggression somewhat lower in the spectrum of war. War by proxy appeared to be an acceptable risk, and the invasion of South Korea by North Korea resulted. Here too the challenge was met. North Korea was defeated. The Communists were forced to escalate the war by the introduction of Chinese military units in order to salvage their original position. They never quite succeeded. Shortly thereafter the Communists sought to negotiate an end to hostilities. Many factors undoubtedly influenced the Communists to end the war short of achieving any of the objectives for which the war had begun. Not the least of these factors was the fear that the United States was considering the use of nuclear weapons and threatening courses of action, the logical conclusion of which would be escalation to engulf Communist China.

The war ended, and although there has been constant bickering ever since, the one impression that was created, the climate of opinion that has endured, is that the United States would not go through another experi-

ence similar to Korea. No longer would the United States respond with undue restraint to aggression by China or her proxies. No longer would sanctuaries be respected. No longer would the United States lean over backward to keep the war from escalating to the use of nuclear weapons. The U.S. would use all of its power if a situation like Korea erupted again. This impression was not lost on the Communists, and the tactic of direct overt invasion of one small nation by a Communist satellite was discarded. The spectrum of war was compressed further. The Communists were forced further down the scale to find a type of aggression that was acceptable, not so risky as to provoke U.S. counteraction, not too sophisticated (so as to circumvent U.S. technological superiority), and, most important, a type of war in which the U.S. threat to use nuclear weapons would not be credible.

AT ABOUT the same time that the Communists were searching for new ways to expand their system by force, the United States, having just concluded an election which resulted in a change in administration, suddenly announced that flexible response would become U.S. policy. In essence, the new policy as reported in the press of 1961 contained two main points:

First, the policy of nuclear response would serve primarily as a deterrent to all-out general war. Second, aggressions short of general war should be deterred by creating powerful, balanced forces that could be used in flexible combinations. Response to aggression should be with only the amount of force needed to stop the aggression.

Analyzed in relationship to history, analyzed as to its impact on the enemy and its impact on the basic U.S. policy to deter war, to eliminate war, the announcement couldn't have come at a worse time. To a historian analyzing events in the perspective of past United States policy, the sudden shift from an announced policy of massive retaliation to one of flexible response was an open invitation for the enemy to calculate U.S. intentions and determination accurately. The shift told the

Communists things that many people believed would reverse the desirable trend toward less daring, more cautious action which had compressed the spectrum of war to a very low order. The flexible response policy was an invitation to disaster, an invitation to the enemy to test the policy. The policy of nuclear retaliation, on the other hand, had inhibited him from trying something for fear that the response would be overwhelming.

History will reveal that, during the Eisenhower years when this country followed an announced policy of massive retaliation, we were in reality following an unannounced policy of flexible response. The historical events of Lebanon, the Taiwan crisis, action in Laos, Vietnam, and Berlin—all support this view. In other words, this country followed a grand strategy involving a policy within a policy—one political, the other military. It was an overall political strategy to deter war, to prevent war, to eliminate it as an instrument of Communist policy. It was a military strategy of response according to our desires, entirely unpredictable to the enemy.

In the light of history, there is no contention that it does not make sense to pursue a policy of flexible response. But many people believe that it did not make sense for the President to *announce* such a policy. Announcing to the world that the U.S. would follow flexible response only served to weaken the U.S. deterrent by informing the enemy that the political or grand strategy was being subordinated to the military strategy. Our sudden shift could only mean that we were concerned with finding an acceptable strategy to fight a war once it began, rather than a strategy to deter war. We were in effect saying that war cannot be eliminated as an instrument of national policy; that war is an acceptable policy if the fighting is kept within manageable proportions.

This "managed war" theory was also saying more. For one thing, the theory presupposes that either side may accept defeat, even to the extent of losing large numbers of men and great quantities of materiel, rather than using all its available power, if necessary, to avoid defeat. The theory also presupposes that one

of the contending parties will seek to negotiate before the scope and intensity of the combat escalate into a war of great magnitude. And the theory presupposes that both sides are willing to fight to a draw or that one side is willing to accept a limited defeat both in combat and in the negotiations which follow.

In regard to the effect on the enemy, is not such a theory self-defeating? By accepting war as inevitable, do we not invite it? Does not acceptance of the nonnuclear, flexible response theory only serve to convince the Communists that the United States does not plan ever to use nuclear weapons? And does this not in turn encourage the enemy to begin a war, knowing the restraints imposed offer a gamble at odds favorable to him? History tends to support this conclusion. Since the announcement of the policy of flexible response, Communist probes have been bolder and more aggressive. Witness the Berlin wall, the subsequent Berlin crisis, Cuba, the Dominican affair, Vietnam, and lately the Pueblo incident. Ironically, the Cuban crisis was resolved not by the threat of flexible response but by President Kennedy's threat of retaliatory nuclear attack on the Soviet Union itself.

History, therefore, is likely to conclude that previous U.S. actions in confronting the U.S.S.R. in Europe, in meeting the challenge in Korea, in the Taiwan crisis, in Cuba, and in other incidents forced the Communists to choose less intense, less provocative, less overt forms of aggression. The specter of likely defeat in major war or the risk that limited aggression would escalate to major war tempered relations between the Communists and the Free World. War, therefore, was less likely. The *casus belli* was missing, and there existed a hope that war between major powers could conceivably be eliminated as an instrument of national policy.

The concept of flexible response and the manner in which it is being applied in Vietnam appear to reverse this trend. The fear is that Vietnam has convinced the Communists that the United States is willing to engage in conventional operations of considerable magnitude, to impose self-restraints, and to use less than its full power against an aggressor. The

Communists can rightfully conclude, therefore, that the need for caution in diplomacy and in the use of force to support political objectives has been lessened because the consequences of miscalculation have been diminished. The policy of flexible response as a deterrent to the cautious probe, the disguised internal uprising, the undiscernible *coup de main* is not credible!

Whether our preoccupation with flexible response has placed the United States government in a position from which it can never return to a strategy of dynamic deterrence only the enemy knows and only history will reveal. It can be argued that the deterrent to the cautious probe has been destroyed by the prolonged nature and magnitude of the war in Vietnam. It can also be argued, and history will tend to prove, that the theory of flexible response has not been applied as the theory intends. The concept of flexible response requires the response to be rapid and in such strength as to quickly restore the situation to the previous status quo. The enemy should not only be stopped, he should be confronted with such overwhelming force that he cannot pursue his original course of action successfully and therefore will abandon the effort, returning to his original position. In other words, the enemy must not be permitted to escalate at a pace within his capability and resources. This mode of flexible response has not been applied in Vietnam. On the contrary, U.S. escalation has been gradual and at a pace the enemy can match; hence, the term "gradualism," the connotation of which is a violation of the concept of flexible response.

But there is reason to believe that Ho Chi Minh would never have initiated action in Vietnam had he vaguely suspected that U.S. determination would escalate the war to its current magnitude. There is also reason to believe that this lesson has not been lost on other would-be aggressors. If Vietnam is a lesson to

the world that the United States is willing to escalate—indeed will escalate in order to prohibit the aggressor from achieving his objectives—then we have taken a major step toward a return to a strategy of dynamic deterrence. This willingness to escalate is the key to deterring future aggressions at the lower end of the spectrum of war. This, I think, is why history will be kind to President Johnson and Secretary of State Rusk, because if we continue to stand firm in Vietnam as they advocated, then the world will have made incalculable progress toward eliminating war as the curse of mankind. Why? Because any would-be aggressor, the Soviet Union included, must face the inescapable conclusion that the higher a war escalates, the greater will be the military advantage of the United States. The fear of escalation, therefore, is a definite advantage to the United States. It is a tactical advantage in operations. It is a strategic advantage in the political struggle between the Free World and the Communist World because it has a temporizing effect, it creates doubt, it discourages aggression.

If we had failed to stand firm in Vietnam, if we had sought to negotiate at any price, if we had announced, as some wish to announce, that the United States will never again become involved in a war such as Vietnam, then a return to a strategy of deterrence would be well-nigh impossible. Progress toward eliminating war would have been slowed. From the long-range point of view, our willingness to escalate to forestall success by the enemy, our willingness to continue fighting rather than accept a disguised defeat at the Paris peace talks, and the determination we have shown are the only means of salvaging what was almost lost by the 1961 decision to announce a strategy of flexible response, a strategy of how to fight rather than how to deter war.

Bolling Air Force Base, D.C.

Air Force Review

IN SEARCH OF AN AVIATION ENVIRONMENT MASTER PLAN

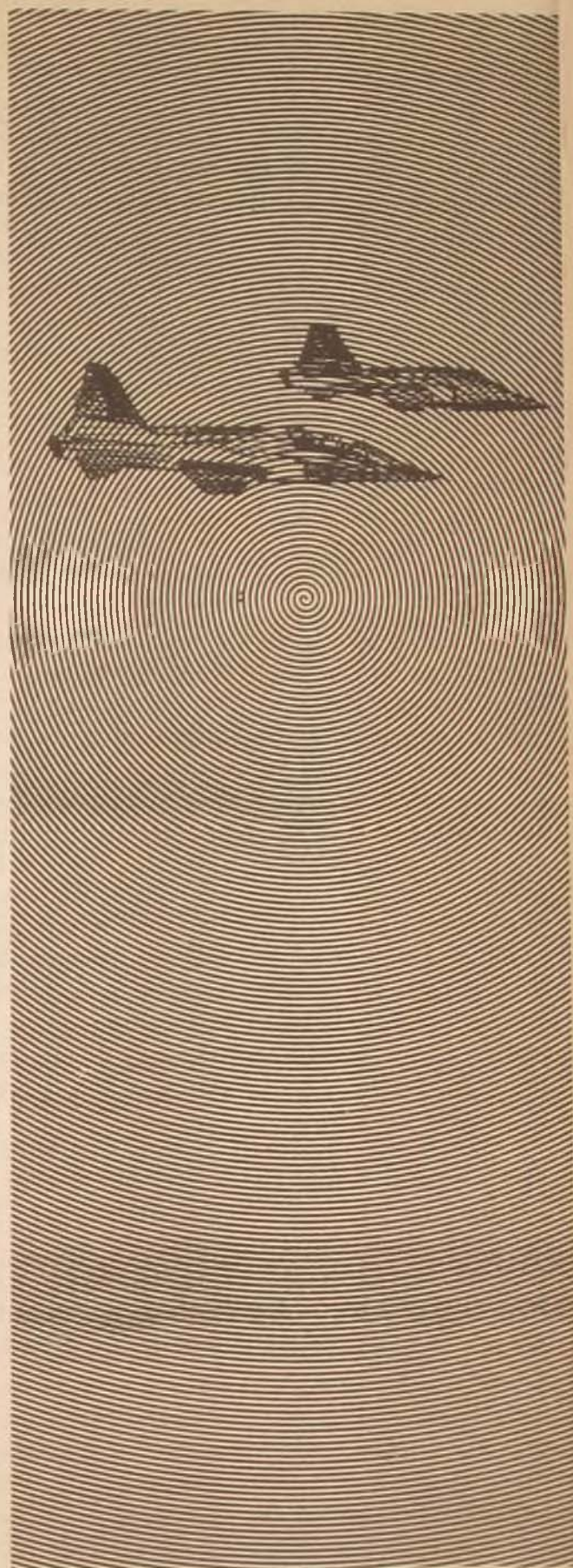
MAJOR WILLIAM R. SIMS

CAPTAIN ANGELO J. CERCHIONE

From a perch well above the soldiers and artisans laboring on the walls, he sat with his plans before him, carefully noting the progress of the work. Fortifying this place was not a simple undertaking—not as simple as had first been indicated by the council of elders. The census when taken proved that the plans for the outer walls had been inadequate. Less than half the people in the region would have been able to find shelter here.

Below, the gangs of men struggled with massive stones which in the hands of his masons would become walls, gates and passageways. The work itself was relatively easy. However, it was the long, interminable talks with the people who would ultimately occupy this place that he found monumentally exhausting, sometimes frustrating work.

His thoughts turned to the still unfinished inner walls. Somehow within that defensive core true self-sufficiency had to be achieved. In addition to the palace and the temple which had long occupied this favored high ground, there was need for a cistern and a granary. It was enough to split a soldier's brain. He leaned his head back against a boulder and tried to remember a day when life had been simpler.



MAN has come a long way since the days when his communities were ringed with walls and defense was the city's *raison d'être*. Military reservations today are being surrounded by cities, and defense seems somehow not directly related to the security of neighboring communities. However, the evolutionary force that severed the military man from his role as an urban planner is about to bring them together again.

The United States is beset with urban problems that can only be solved by agencies working together at all levels of government. So pervasive are the effects of growth and change that the complexity of the situation has begun to cast military men in roles with which they are not entirely familiar. Daily they may be found in earnest conversations with zoning commissioners, Federal Aviation Administration officials, mayors and town councilmen, airport operators, school principals, city planners, sanitary and highway engineers. These conversations are as important to the survival of a base as is its ability to defend itself against an aggressor; but, unfortunately, these many diverse yet interrelated activities have often been pursued in an uncoordinated manner. This fragmentation of purpose may pose a very real danger to the future of Air Force bases. Some of the changes taking place in the United States, both on the ground and in the air, are indeed recasting the military's role in urban and regional planning. More important, such changes point to the need for a higher order of coordination among base agencies and between base and town.

The historical precedent is there to be studied, for at one time the city builders were also the city protectors. No less an authority than Arnold Toynbee reminds us of the original purpose of the city:

Cities . . . were an exceptional form of human settlement, and their abnormality was signalized and symbolized by the wall that demarcated a primitive city's diminutive area from the vast surrounding countryside. Behind and within these physical defenses, a new form of social life could, and did, take shape. The Greek word for city—*polis*—originally meant a citadel, and this citadel might consist of noth-

ing but a ring-wall surrounding the crown of a hill.¹

In the years since the Greeks coined the word *polis*, the character of warfare has changed. In the process Toynbee's citadel was divorced from its urban core, and the two were sent in separate directions. The core remained at stage center while its defensive shell was sent into the wings. Except for the frontier forts and seacoast defenses, military establishments in the United States were relegated to the more remote parts of the country. During the past 75 years, America's wars have been fought somewhere beyond its borders. Its military camps became jumping-off places for troops bound for distant fronts rather than fortresses charged with the immediate defense of a nearby city. This was no less true for the nation's emerging aviation arm.

The Air Force, with its mandate to train great numbers of men in the relatively new and risky art of flying, invariably selected base sites that lay far from neighboring towns. In point of fact, the present-day standard for a virgin base limits siting to no closer than 15 miles but no farther than 25 miles from its "support city."² Fortunately, many of the sites originally chosen were among the best the country had to offer. By the late 1950s the Air Force was comfortably ensconced on some 9.6 million acres of land that is currently worth \$14 billion.³ Equivalent in size to Connecticut, Delaware, and New Jersey, this land is composed of approximately 2900 separate sites, only a hundred of which have a flying mission.

The trek into the wilderness may be nearing an end, for the military is about to return to its ancient role of deep involvement in city and regional planning. This stems partially from the fact that Americans are buying more homes, and, like hyperactive bacteria in an agreeable Petri dish, new communities are rapidly spreading outward from the old population centers. Generally speaking, the movement seems to be in the direction of the Air Force's once remote bases.

In part, the predicament arises from population growth. During the Second World War, posters proclaimed that 160 million Americans

had gone to war. Today Americans number 200 million, and within less than a decade the country will add another 40 million.⁴

The dramatic increase in population has been accompanied and compounded by several other factors. In particular, the growing trend among Americans to leave the city for a home in the suburbs is putting new pressure on the remaining open spaces. In a book published last year, *Air Transportation 1975 and Beyond: A Systems Approach*, the root causes of the city-to-country flight were identified. "Increasing incomes and the automobile, abetted by the Federal policy that built roads and guaranteed home mortgages, made possible the home in the suburbs."⁵ Once an appreciable number of people had settled in an area, business and industry would be attracted to this new market and labor pool.

Into the suburbs and beyond the homesteaders advanced, and no movement as vast as this could take place without affecting the rest of the country. Lewis Mumford, in his book *The Urban Prospect*, lashes out at the excesses which accompany the exodus now in progress:

The upper-income group image of urban dispersion is the green ghetto of the exurban community, just far enough beyond the metropolitan center and its spreading suburban belt to be able to zone its territory for housing at a minimum density of one family to the acre. . . . Every year, . . . a million acres of agricultural land are taken over for housing, largely scattered in green acres, and another million acres are withheld from farming through speculation and social erosion.⁶

In the aviation world, the civilian airports generally were the first to come in contact with this latest wave of settlers. As airports are traditionally located closer to the communities they serve than are Air Force bases, many airport owners and operators soon came to realize that they were directly in the path of rapidly advancing communities.

Although the public initially considered the airport to be much like any other business, its effect is far more potent, for an airdrome close to a highway system helps to form a transportation nexus. A dynamic component, the airport has all the life-giving force of an

irrigation system. In its primary capacity it moves people, and where people congregate—even momentarily—business flourishes. This economic growth always means better employment opportunities, and the newly employed prefer to live closer to their jobs. The attractiveness to airport employees of shortened commuting distances is one factor that influences home developers to encroach upon the lands bordering an airport.⁷ Finally, it is only a matter of time before the new settlers become fully acquainted with an airport's almost continuous aircraft noise. Here are the oil and water that will not mix: unregulated urban growth and jet noise.

When confronted with the noise problem, most people assume that science will soon come to their rescue. But the Jet Aircraft Noise Panel of the Office of Science and Technology has reported that development of a quiet engine is not even on the horizon.⁸

With no hope in sight for a breakthrough in engine noise suppression, a second avenue must be explored: controlling urban growth near airports. Recently, civilian aviators and planners have begun to stump for joint airport/community planning in the aviation magazines. A leading planning consultant, H. McKinley Conway, Jr., has called for such an approach: ". . . the typical within-the-fence-only airport master plan is a luxury we can no longer afford. For every airport, there must be an *airport area plan* which integrates the airport into the urban complex."⁹

At the heart of most area plans is one of two basic techniques for converting an airport into a compatible neighbor. Airport management (or community leaders) either may seek to create a buffer between themselves and their neighbors through the outright purchase of surrounding acreage or obtain zoning protection through special legislation.

Although the first alternative is an expensive one, developers of jumbo jetports are seriously considering the land buffer option. In fact, the Dade-Collier International Airport in the Florida Everglades is large enough to hold four of the nation's biggest airports.

As planned, Dade-Collier will cover 39 square miles, and under a twin-county agree-

Aircraft Noise and Federal Housing Regulations

Some years ago the Federal Aviation Administration sponsored a study by a civilian firm which was later distributed by the Air Force as AFM 86-5, *Land Use Planning with Respect to Aircraft Noise*. The noise exposure as discussed in the report is interpreted in relation to expected response from residential communities; the concept of composite noise ratings (CNR) in noise measurement is introduced also. A CNR is determined only after giving consideration to the basic variables, such as frequency of operations, time of day, aircraft gross weights, and runway utilization percentages. The CNR's are then converted into one of three categories: Zones 1, 2, and 3. Each carries a verbal description of predicted reactions for the groups living within the described zone.

Zone 1: Essentially no complaints would be expected. The noise may, however, interfere occasionally with certain activities of the residents.

Zone 2: Individuals may complain, perhaps vigorously. Concerted group action is possible.

Zone 3: Individual reactions would likely include repeated vigorous complaints. Concerted group action might be expected.

The Federal Housing Administration (FHA), in a letter to field offices, concurred that "... areas falling into the classification of Zone 3 . . . are not acceptable for proposed new residential development." The letter stated that under certain conditions mortgages for homes in Zone 2 would be underwritten. Commanders should thoroughly investigate the conditions set forth in FHA Underwriting Letter Number 1989, dated April 16, 1965, for complete details.

In order for local FHA field offices to be aware of those factors which will adversely affect marketability (the key determinant influencing the FHA's decision to grant or withhold assistance), the commander or his representative must ensure that a copy of the aircraft noise intensity study has been transmitted to the proper FHA representative. It would be equally prudent to have copies of this document sent to the FAA and to zoning boards at each level of jurisdiction.

ment it will be zoned for aviation use three miles beyond the boundaries of the jetport proper, making a total of 51 square miles devoted exclusively to aircraft operations.¹⁰ As the Honorable Earl M. Starnes, vice-mayor of Metropolitan Dade County, has pointed out: "Dade-Collier has not only been planned to contain aircraft and allied industries, but to serve as a container of aircraft noise."¹¹

HOW WELL do USAF bases stack up as "noise containers"? Not too well. Depending on a number of factors, it would take somewhere in the neighborhood of 20-30,000 acres of land to embrace what the bioenvironmental engineers define as "Zone 2" and "Zone 3" noise levels (see box). Of the 100 USAF

bases whose primary mission involves flying, only 11 have sufficient acreage to qualify as containers of noise. Excluding Eglin and Edwards AFB's (464,980 and 301,000 acres respectively), the other 98 bases average only 6400 acres.¹²

There is another reason for possessing such large tracts of land: to exclude high-density housing from a potentially dangerous area. According to the Directorate of Aerospace Safety, in a report entitled "Summary of USAF Aircraft Accidents in Vicinity of Airfields 5 Mile Zone," almost ten percent of all aircraft accidents happen within an air base's control area. Based on 174 USAF accidents in 1960-64, the report leaves no doubt about this high-hazard area for dwellings, and it concludes with the recommendation that "... base com-

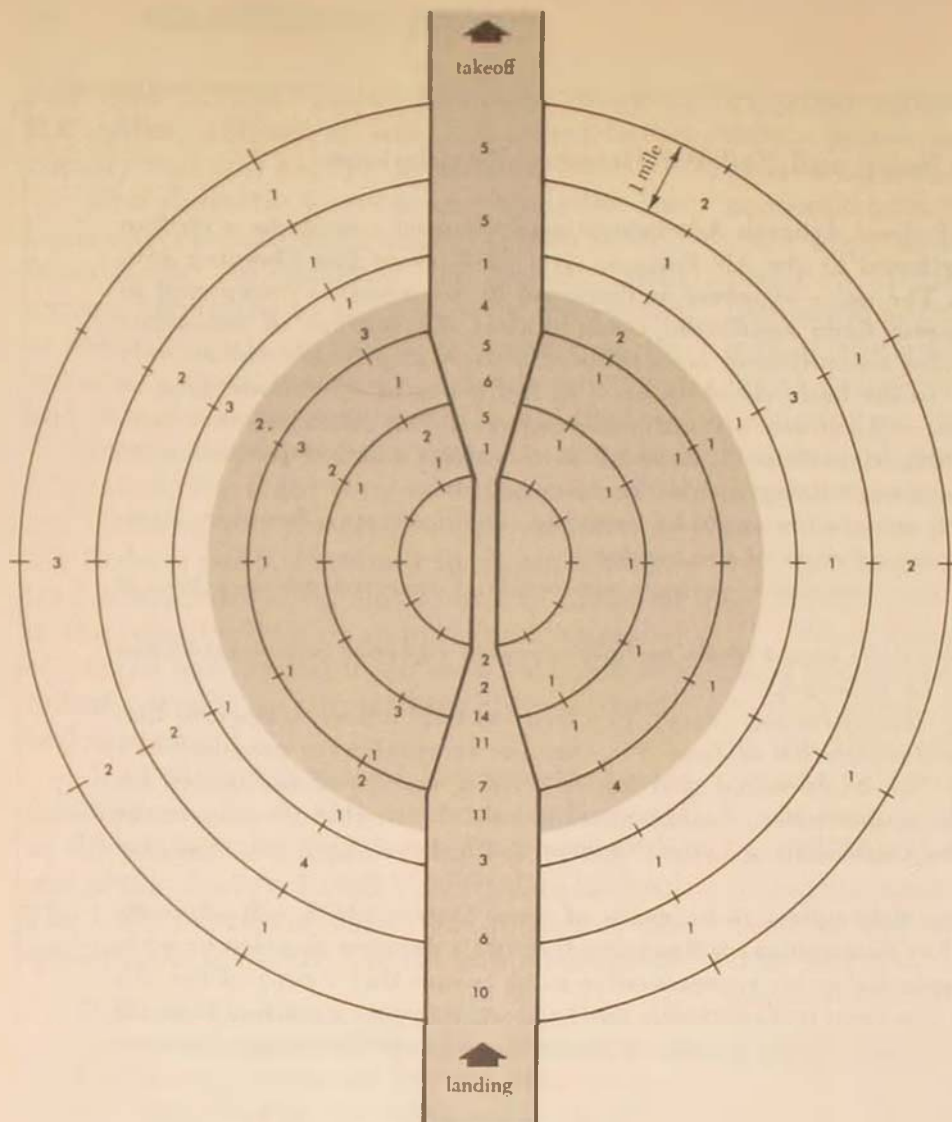


Figure 1. From a study of USAF aircraft accidents in 1960-64, the Directorate of Aerospace Safety plotted the location of 174 accidents within 5 miles of air bases. The approaches to runways took the greater toll—66 on landing, 32 on takeoff—while 39 more mishaps occurred within 2½ miles of the bases. Obviously these areas especially should be kept free of high-density housing.

manders use this summary as a basis for discouraging local civil authorities from approving zoning requests for housing and commercial enterprises in areas along the extended centerline of runways for at least two and one half miles."¹³ (See Figure 1.)

Recently, the study was used for just that purpose by a southwestern Air Force base seeking to secure the support of its local community council in countering the threat of urban encroachment. Alarmed by the report that work was soon to begin on a housing development a short distance from the base, the commander advised local officials of the predictable aftereffects. They held meetings to investigate the matter thoroughly. The base's zoning protection flows from a county airport zoning ordinance, enacted in 1957. Similar to many such ordinances in effect in the United

States, it seeks to promote the health, safety, and general welfare of the county's inhabitants by preventing the creation or establishment of airport hazards as public nuisances.¹⁴ This ordinance was probably adequate for its task in 1957, when the airports subject to its provisions were surrounded by desert or agricultural lands. The county has since had a phenomenal rate of growth (second in the nation), and the nearby desert and farms are fast disappearing beneath concrete and asphalt.

If lives, property, and the public investment are to be safeguarded by zoning, its definition of hazards must be broadened to include the effects of urban encroachment. To remedy the shortcomings of the county ordinance, the base commander suggested to city and county officials that the area surrounding the base be zoned for low-density

housing—one house every one or two acres. This recommended low-density belt (seven and three-quarter miles long by two and one-half miles wide) encompasses the high-hazard area identified in the Directorate of Aerospace Safety's five-year study. Further, the suggested revision emphasizes that this same area is also subject to Zone 2 and Zone 3 levels of noise intensity.

In this particular instance the classic textbook solution is being sought. Fortunately, the commander and his staff recognized the incipient encroachment trend in time to take action, and they found local agreement that the base's recommendations were sound and that the base had the welfare of its neighbors at heart. At this writing the ordinance revision has not yet been approved, but the progressive spirit manifested by both the base and its neighbors exemplifies this important lesson: timely urban planning is the foundation of tomorrow's successful community relations.

WHEN the trend toward urban encroachment is ignored, the problem may become a much more difficult one. For when poor planning allows two community subsystems (e.g., a base and a housing development) to become entrenched in a situation in which only one can survive, the resulting conflict may cause untold hardship for the entire region. Only recently has it been accepted that cities, like the men who built them, can sicken and die. Restoring health and vigor to a stricken community or base is surely a herculean task. On the edge of the Sonoran Desert, for example, an Air Force base is now receiving such intensive treatment. Its history sheds light on the collective efforts necessary to improve what is fast becoming a hostile environment caused by the urban growth in its direction.

First indication of the potential threat to the base (referred to in a recent issue of the *Review*¹⁵) came in a report entitled, *Urban Encroachment Study, 1968-1990*,¹⁶ which sought to project future growth trends of the communities surrounding the base. The study was primarily concerned with the question,

"At what point in time will the constricting urban matrix cause the flying mission to be outlawed?"

Obtaining the necessary research data was a simple matter. Each of the 12 nearby communities had commissioned studies to guide their long-range development. Several were little more than inventories of community resources, but most of them discussed in detail projected population growth and eventual use of the surrounding land area. Put together in mosaic fashion, a composite map encompassing some 500 square miles graphically draws attention to the future growth intentions of the region. (See map, page 70.)

In recent years, two urban corridors extending from the metropolis to the east have begun to converge on the base in a pincerlike movement. According to all the urban studies consulted, the area surrounding the base is one of three major areas in the region in which future population expansion should be expected. At the predicted rate of growth, the base has only five to ten years before nearby communities begin to crowd into its high aircraft disaster potential areas and intense noise zones.

Not all the base's problems are so far off. Plans are being considered to open a university branch campus next year a mile from the perimeter fence and well within the Zone 2 noise intensity pattern (estimated enrollment by 1985: 36,000). Farther south a satellite airport anticipates within the next five years a fleet of some 300 permanently based light aircraft. To further complicate the situation, plans are being made to use this facility as a training site for large commercial jet aircraft (mainly for "touch and go's"). This could lead to a dangerous airspace problem, since our air base has over 200 jet fighters in combat crew training.

If disregarded, this situation would lead to an easily predictable outcome. However, from the moment the *Urban Encroachment Study* defined the problem, it was apparent that an enlightened solution would require a fully coordinated staff effort. For this reason a Community Relations Advisory Committee was formed. Chaired by the wing vice commander, it has as permanent members the base com-

mander, deputy commander for operations, base civil engineer, and the heads of the legal, safety, and information offices. A wing supplement to AFR 190-20, "Community Relations Program," requires all base agencies to integrate their activities into the overall wing community relations program.¹⁷

An interdisciplinary group is charged with the formulation of long-range community relations plans, and it has within its membership the expertise to carry out those plans. It amounts to an urban planning board which is actively seeking to communicate with all local organizations on the future of the base and the community.

To launch its broad-gauged community relations program, the committee sent copies of the *Urban Encroachment Study* to city and county zoning authorities, the state's department of aeronautics, the communities that were inadvertently fostering the encroachment problem, legislators representing the affected areas, higher headquarters, and a

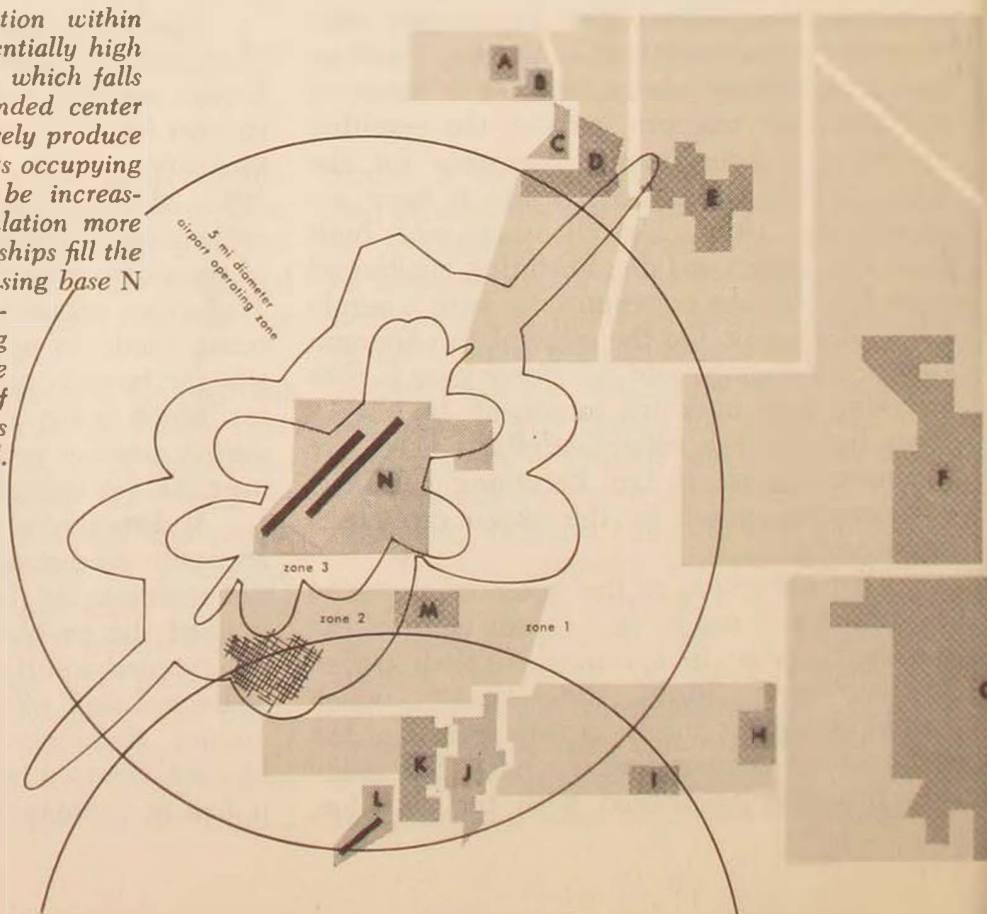
number of other interested individuals. In addition, briefings were given to several key transportation committees inquiring into the future needs of aviation in the state.

To secure the greatest possible legal protection, the committee is also investigating the possibility of having the county zone the areas beneath the runway approaches for low-density housing. It is within these same approach limits, the Directorate of Aerospace Safety emphasized, that 56 percent of all the base-side aircraft accidents occur.

Since the cluttering of local airspace is part of a broader problem stretching beyond state borders, the base joined with several state agencies to host a symposium on the need for master-planning the aviation environment; a second symposium is planned for December 1969. Out of that first symposium grew a movement to create a state air transportation master plan and the necessary legislation to make it possible.

As with the earlier case study, a quick fix

Unrestricted housing construction within Zones 2 and 3 and in the potentially high aircraft disaster areas (much of which falls within Zone 3 along the extended center lines of the runways) would surely produce an outcry from affected residents occupying those lands. Real estate will be increasingly in demand as area population more than doubles by 1985 and townships fill the remaining open land. Aircraft using base N will disturb residents in communities D and M, and increasing traffic at airport L must share airspace with jet fighters of the base. A university campus (crosshatch) will soon be added.



is not anticipated because of the variety and complexity of the interests involved. The course set for the base may not bear fruit for a number of years, but it offers the hope of ultimately being able to achieve a rational solution with the help of local citizens and community agencies. While it is too early to be able to pass judgment on the effectiveness of this particular program, the integrated broad-spectrum approach is worthy of emulation on an Air Force-wide basis. Certainly the problem is becoming that widespread.

The danger always in sounding alarms is to be regarded as either a Chicken Little or a Cassandra and summarily dismissed. Yet one need only awaken from the dream that there still exists a frontier America of inexhaustible resources to realize that the problems are rapidly multiplying while the options are steadily dwindling. Happily, the continent is still a plastic medium that can be molded, but time may allow it to solidify before its man-made deformities can be eliminated.

IN THE two case histories discussed, a variety of techniques were employed to solve looming urban problems. Of these, which elements should a basic program contain?

The single step which more than any other will determine how soon (if ever) a base will have homes sidling up to its perimeter fence is the accomplishment of an encroachment study. Depending upon the installation, this can be as simple as a chat with the town clerk or as complex as the 60-page study mentioned earlier. It should be remembered that this regional survey plots the occupation of land by home owners against time; but without an accompanying jet aircraft noise intensity study it is meaningless. The base bioenvironmental engineer has the capability to perform this service; in fact, the study should be on file as part of the installation's master plans. The combination of the two studies will afford an accurate picture of the extent of encroachment around the base.

Whether these studies indicate trouble ahead or not, the pace at which change occurs

at the local and regional levels dictates an early formulation of a base policy guidance group. One useful approach has been the Community Relations Advisory Committee mentioned earlier. This group focuses attention directly on the "total community" aspects of the base's existence. It does so not only by constantly evaluating its position vis-à-vis those who share the surrounding ground and airspace but also by continually examining its spiritual and psychological links with its neighbors. Further, this group could establish base "identity" concepts appropriate to present and projected missions. It could periodically assess the base and all its activities in relation to its position within the total local and regional fabric.

Once the base's policies have been defined and the activities of participating agencies have been orchestrated, specific objectives and guidance might be given to such specialized groups as the Real Property Resource Review Board. This board is charged with solving zoning problems and with maintaining liaison with physical environment planners. Other agencies as well would receive their mandates from the advisory committee, for at the very core would be a master plan that enunciates goals based upon a full understanding of the total physical and psychological setting. Such comprehensive planning is vital if the base is to accomplish its mission without antagonizing the public, upon whom the Air Force depends for support.

Many of the individual projects we have mentioned were established in response to a particular set of circumstances. How far the Community Relations Advisory Committee may wish to pursue public education programs or cooperative association with the military and civilian aviation communities will have to be determined by the local situation. Once the interdisciplinary advisory committee has been formed and the basic survey of the local environment has been made, any number of major or minor variations may be employed.

It is the integrated committee approach which is most important, for in years past each agency went its own way in dealing with problems peculiar to its discipline. Like the seven blind men examining the elephant, each had

a narrow view of reality. Hence, the flight safety people made an in-depth study of the incidence of aircraft accidents within five miles of the base; the information office staff devised programs to explain to the public that aircraft noise is a modern-day necessity; the civil engineer updated the base master plans once a year to satisfy an outmoded regulation; the base commander met with local organizations and tried to win a new, critically needed bridge or replied repeatedly to official nuisance complaints; the flight facilities officer sought to protect his airspace from constant assault by commercial jets, parachutists, crop dusters, and balloonists; and the legal officer prepared a defense for a newly enacted zoning ordinance because a local citizen rightly or wrongly felt that it was an abridgment of his rights. This cannot be the way in which the world's most modern Air Force will step into the coming decades.

The America of the 1970s and '80s will be bigger, more complex, wealthier, more exciting—and a dozen other positive or negative superlatives. Civilian aviation will be seeking some 800 new airports to add to the 10,000 already in operation. Certain segments of the aviation industry are predicting a 400 percent increase in business within a decade. And in the midst of this turned-on country will be the United States Air Force with its continuing

mission of safeguarding the liberties of some 260 million Americans.

The time is at hand for the Air Force to take its position in the vanguard of the movement for comprehensive long-range urban and regional planning. To do so would be to protect the public's investment in its air arm and to ensure that the Air Force of tomorrow will possess a system of bases unfettered by debilitating urban problems.

From his office near the flight line, he sat with the base master plans before him, noting the work his office had nurtured through to completion. Serving the new mission was not a simple undertaking—not as simple as had first been indicated by headquarters. First, it was the new construction for that behemoth the C-5, and then came the V/STOL requirement. And all of it had to be shoehorned into 6400 acres.

His thoughts turned to the newly enacted regional zoning ordinance. The best of many thousands of years of man's experience in learning to live together with other men went into its making. He could not help smiling as he thought of this achievement which he and the base urban planning group had brought off. With that kind of creativity available to the world, who need be afraid of the twenty-first century with its billions of people? He leaned his head back and laughed aloud, exulting in his strength, and tried to remember a day when life had been more beautiful.

Luke Air Force Base, Arizona

Notes

1. Arnold Toynbee, ed., *Cities of Destiny* (London: McGraw-Hill Book Company, 1967), p. 13.
2. "Site Selection (New Bases)," *Air Base Master Planning Manual*, AFM 86-6, February 10, 1959, Chapter 6, pp. 35-37.
3. William Marlow, realty specialist, Hq USAF, an interview, June 1968.
4. Leslie L. Thomason, "Manna in the Marketplace: Constraints in the System," *Master Planning of Airspace: A Total Systems Approach* (Verbatim), October 26, 1968, p. 7.
5. Bernard A. Schriever and William W. Seifert, *Air Transportation 1975 and Beyond: A Systems Approach, Report of the Transportation Workshop* (Cambridge, Mass.: M.I.T. Press, 1968), p. 4.
6. Lewis Mumford, *The Urban Prospect* (New York: Harcourt, Brace & World, Inc., 1968), pp. 130-31.
7. Airports like New York's John F. Kennedy International may have as many as 37,500 employees. At both military and civilian airports, such a group becomes the spearhead of urban encroachment.
8. "The Alleviation of Jet Aircraft Noise near Airports," U.S. Office of Science and Technology, March 1966, quoted by Schriever and Seifert, *op. cit.*, p. 28.
9. H. McKinley Conway, Jr., "Crisis in Airport Planning," *Airport World*, I, 2 (November 1968), 50.
10. Earl M. Starnes, "Airport Operation and Urban Planning," *Master Planning of Airspace: A Total Systems Approach*, p. 72.
11. From a personal conversation during the symposium sponsored by the Arizona Department of Aeronautics, Arizona State University, and Luke Air Force Base, 26 October 1968.
12. "Guide to Air Force Bases," *Air Force and Space Digest*, September 1968, pp. 182-96.
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15. Angelo J. Cerchione, "A Case for Continuity," *Air University Review*, XX, 3 (March-April 1969), 39.
16. *Urban Encroachment Study, 1968-1990*, Office of Information, Luke AFB, Arizona, August 1968.
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Military Affairs Abroad



A NEW CHIEF FOR THE SOVIET AIR FORCES

HARRIET FAST SCOTT

FOR the first time in twelve years the Soviet Air Forces have a new Commander-in-Chief. In March 1969 Marshal of Aviation Pavel Stepanovich Kutakhov replaced Chief Marshal of Aviation Konstantin A. Vershinin as head of the world's second most powerful air force.

Marshal of Aviation Kutakhov, 54 years old, reached his present position after a meteoric rise during the past three years. In 1966 he was a two-star general-lieutenant, assigned as Commander of Aviation for the Odessa Military District. The next year he was transferred to Moscow—the “center”—to the post of Deputy Commander-in-Chief of the Air Forces. In this move he picked up a third star, denoting the rank of a general-colonel.

Not long before the Soviet invasion of Czechoslovakia, by one of the strange coincidences that abound in the Soviet Union, Ku-

takhov was put in the number two aviation role. The then First Deputy Commander-in-Chief of the Air Forces, 63-year-old Marshal of Aviation Rudenko, was transferred to a new assignment as head of the Gagarin Air Academy.¹ (On the army side, the famed General Shtemenko was made Chief of Staff of the Warsaw Pact Forces two weeks before the invasion.)

Eighteen months after gaining his third star, Kutakhov was again promoted, in February 1969, to become a Marshal of Aviation.² A month later it was learned that he had moved up to take over as Commander-in-Chief. There was no formal announcement in the Soviet press of Marshal Vershinin's retirement from that position. *Red Star*, the official Soviet military newspaper, carried an item on March 19, 1969, that at first glance appeared

to be a routine news item. It listed the senior Soviet guests at a reception held at the Mongolian Embassy on the previous evening celebrating the 48th anniversary of the Mongolian People's Army. Among the guests was "Commander-in-Chief of the Air Forces of the U.S.S.R., Marshal of Aviation P. S. Kutakhov."³

This is often the way in which the outside world learns of changes in the Soviet political-military structure, through some obscure press announcement that lists a new name in a position previously held by someone else.

Kutakhov's predecessor, Chief Marshal of Aviation Vershinin, had occupied the Commander-in-Chief position since 1957. In fact Vershinin, now 69, had also served in that position from 1946 to 1949, being moved to a job in National PVO (air defense) when Stalin put Marshal of Aviation Zhigarov in command in anticipation of forthcoming Korean events. Vershinin, one of the world's senior airmen, has spent a half century in Soviet aviation, beginning his air career during the Civil War of 1919.

Kutakhov has yet to be promoted to Chief Marshal of Aviation, which ranks higher than the four stars of Marshal of Aviation or General of the Army but somewhat below Marshal of the Soviet Union. At the present time there are three Chief Marshals of Aviation in the Soviet Union. One of the most senior is Novikov, head of the Soviet Air Forces during World War II and imprisoned by Stalin after that war. He was "rehabilitated" after Stalin's death and now is Commandant of the Civil Air Fleet Academy. Another is Chief Marshal of Aviation Golovanov, former head of Soviet Long Range Aviation, whose present position is unknown. As to the position of Chief Marshal of Aviation Vershinin, he will remain on active duty for life, since there is no provision for retirement in the Soviet Armed Forces beyond the 4-star rank.⁴

Commander-in-Chief Kutakhov is well known in the Soviet Union for his airmanship. In 1966 he, along with 30 other Soviet officers, was awarded the honorary title of Distinguished Military Pilot of the U.S.S.R., and at the same time six navigators were awarded the honorary title of Distinguished Military Navi-

gator of the U.S.S.R. These awards are "for special service in mastering aviation equipment, for a high showing in training and educating flying cadres, and for many years of continuous flying safety records."⁵

Kutakhov is a World War II fighter ace, with 13 German aircraft individually confirmed as destroyed and 28 additional assists in destruction.⁶ During that war—the Great Patriotic War, as the Soviets call it—he served on the Karelian front, where in 1943 he commanded a squadron in the 19th Guards Regiment of the 7th Air Army.

Along the Karelian front the Soviet Union shared a border with Norway. One can conjecture that during that time Kutakhov was attempting to protect American ships carrying supplies into the Soviet port of Murmansk. This was a primary route for supplies sent to the Soviet Union by her two main allies, the United States and Great Britain. The huge convoys, assembled in Britain, were escorted through the North Sea by British and Canadian naval forces, since the greater part of the United States Navy was engaged with the Japanese in the Pacific. These convoys were under attack by wolf packs of German submarines as well as by surface raiders as the ships neared German-occupied Norway. After that, the convoys came under attack by German land-based aircraft until they got within range of Soviet fighter protection in the Murmansk area. Between March and July 1942, over one-fourth of all U.S. ships sent to Murmansk were sunk before reaching their destination.

Kutakhov made good both as a commander and as a fighter pilot. By May 1943 he had received the award "Hero of the Soviet Union," one of the first Soviet Air Force officers to be singled out for this decoration in World War II.⁷ Also he was transferred to become commander of the Red Banner Guard's Fighter Regiment of the 7th Air Army.

Kutakhov's regiment was engaged in flying fighter cover, in Yaks and LaGGs, for the lower- and slower-flying Sturmoviks. During the first day of their counteroffensive against German positions, in October 1944, the regiment's pilots flew as many as a dozen indi-

vidual sorties. According to Soviet accounts, during the first escort mission of the day the Sturmoviks were jumped by 18 Me-109s. Kutakhov was leading the Soviet fighter escort of 8 aircraft, which pressed the attack against the Messerschmitts. The German attack was broken, Kutakhov claiming one Me-109 and his flight four others.⁸

From the Yaks and LaGGs that Kutakhov flew in World War II, the Soviet Air Forces have progressed to entirely different air weapon systems. In August 1968, on the occasion of Soviet "Air Force Day," Kutakhov described the Soviet Air Forces as follows:

Owing to the equipment with new armaments, including nuclear weapons, the firepower of each combat plane was increased. That which in the years of the Second World War was beyond the power of large aviation formations, in our day can be resolved by a group of a few airplanes. Our long range aviation, in cooperation with the Strategic Rocket Troops and the Navy, can carry out effective strikes on important enemy objectives both on land and on the ocean expanses which are located quite far from our borders. This kind of aviation has every possibility for waging combat actions on a global scale.

The aircraft in frontal aviation can successfully destroy small-sized objectives and, in cooperation with surface-to-air missile units, protect troops from strikes from the air. Modern military transport aviation can transfer troops and different combat equipments, including artillery weapons, rockets, armored transports and tanks, by air, over enormous distances and at great speed.

Aviation rocket equipments are constantly improving. Modern new kinds of guided aviation rocket projectiles and winged rockets have been created. Supersonic rocket-carriers can carry out nuclear rocket strikes on objectives from a great distance without entering the air defense zone of the enemy. Modern radar systems of rocket guidance, intercept stations and radiotechnical systems allowing the release of rockets and the dropping of bombs from great heights as well as from extremely low altitudes, at maximum speeds, day or night, in ordinary or in bad weather conditions, are found in the armaments of aviation.⁹

An officer does not become Commander-

in-Chief of the Soviet Air Forces on the basis of his military abilities alone. His political promotions must parallel his military promotions. Although little is known about Kutakhov's participation in the affairs of the Communist Party, he was a delegate to both the XXII and the XXIII Congress of the Communist Party of the Soviet Union (CPSU),¹⁰ and it can be assumed that he has served at various levels in Party activities within the Ukrainian Soviet Socialist Republic, for example. His predecessor, Marshal Vershinin, is a member of the Central Committee of the Communist Party, a political position almost inherent to the military position that he occupied. As for Marshal Kutakhov's political beliefs as a member of the Communist Party, his article in the December 1968 issue of *Aviation and Cosmonautics* should be carefully studied. At that time the future Commander-in-Chief of the Soviet Air Forces, echoing the Party line, wrote:

We live in a complicated and strenuous time, a time of great social achievements and of high tension in the class struggle on a worldwide scale. The dirty war of the U.S.A. in Vietnam, the middle-eastern adventure of Israel, the sinister military-political union of the U.S.A. and the Federal Republic of Germany in Europe—these are the most striking examples of the aggressive intrigues of imperialism in different parts of the world.

However, the imperialist aggression is suffering one failure after another. In our day the indestructible world socialist system has become the decisive force of social development. Imperialist forces, and first of all the imperialists of the U.S.A., are losing hope of stopping the powerful march of socialism by military means, so they are more and more banking on ideological diversion. The whole enormous apparatus of anticommunist propaganda is directed now toward weakening the unity of socialist countries, the international communist and workers' movement, setting off one socialist state against another and tearing them away from the Soviet Union.

How dangerous the ideological diversion of imperialism is was clearly shown by the development of events in Czechoslovakia. The counterrevolutionary and right-wing forces in this country, under the flag of fighting for

"democracy," unleashed a furious campaign against the Communist Party of Czechoslovakia and its leading role, against the basis of the socialist government in Czechoslovakia. Seizing means of mass propaganda, they used these means for unbridled antisocialist demagogy, for undermining friendship with the Soviet Union and other socialist countries. Over Czechoslovakia hung the real threat of losing socialist gains. And only the fraternal aid of the Soviet Union and other socialist countries saved the Czechoslovakian people from this threat.

Events in Czechoslovakia once again have shown that the ideological struggle is an acute class struggle where there is not and cannot be neutrality. V. I. Lenin wrote that "this is the only question: bourgeois or socialist ideology. There is no middle course . . ." And here the conclusion was made: "Therefore *any* belittling of socialist ideology, *any* moving away from it thus means strengthening bourgeois ideology." Our answer to the subversive activities and intrigues of the imperialists, in addition to the further raising of the vigilance and combat

readiness, must be uncompromising struggle with enemy ideology in all its manifestations.¹¹

But what of China? Interestingly enough, this major threat that Kutakhov's fighters and bombers may face during the next decade is not mentioned in his article. Soviet political-military spokesmen explain the fighting along the Sino-Soviet borders as the work of a Chinese military dictatorship and the personality cult of Mao Tse-tung. Communist doctrine does not recognize conflicts between "fraternal socialist countries."

Marshal of Aviation Kutakhov has taken command of the Soviet Air Forces at a very critical time in Soviet history. Well-known World War II leaders have been retiring for several years, and this change has now begun to affect the highest levels of the military hierarchy. What effect this will have on the future posture of the Soviet Air Forces is yet to be seen.

McLean, Virginia

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In My Opinion

MOSCOW SPEAKING

LIEUTENANT COLONEL DONALD L. CLARK

MOSCOW SAYS: "The American Army is the loyal servant of the monopolists and plays the role of the butcher of freedom, democracy, and progress. The American military vulture was one of the main organizers of the intervention against the world's first government of workers and peasants."

One would not be surprised to hear or see such statements emanating from Red China, a land in the throes of violent upheaval, or perhaps even from Cuba, where, after only ten years of Communist rule, rabble-rousing and U.S.A. baiting are still the order of the day. But what about the U.S.S.R., the world's first, most prosperous and respectable Communist state?—a nation that wraps itself in peaceful Tashkent robes and claims for itself the mature leadership of the world's masses. No one expects the U.S.S.R. officially to heap praise on



American imperialism—war, slavery, racism!

the United States government or its military. but, strangely enough, few Americans seem to be aware of the constant flow of crude and virulent anti-American propaganda that is carried on within the Soviet borders.

As a recent returnee from two years' duty in Moscow, I am asked many questions about life there. The one answer which my questioners are most surprised to learn—even sometimes dubious about believing—is that of the uncalled-for and blatant anti-American campaign which continues today in the U.S.S.R.

In 1967, the 50th year of Soviet rule, the Communists diligently worked to establish an image of success, maturity, power, and leadership. The Soviets were very proud of this image and reacted with neurotic sensitivity to the literally hundreds of articles in the Western press describing their country. A few of

the articles, which many of us read, were rather sharp indictments of the failure of Communism, but most were at least grudgingly complimentary and many erred only on the side of overemphasizing Soviet achievements and painting too attractive a picture of the U.S.S.R. today. In spite of this the Soviets complained bitterly about the "polemics" in the articles and were insulted because the Western world did not force its press to be more polite and diplomatic in its treatment of their State. (To a country with complete control of the news media, freedom of those organizations elsewhere is incomprehensible.)

Not once during this same grand celebration, however, did the Soviets lessen or sweeten their internal program of anti-Western propaganda. The United States, West Germany, and Israel were still caricatured daily as vile, untouchable nations involved in enslaving, maiming, and exploiting mankind. Even the 50th year parade in Red Square featured floats depicting Uncle Sam as a dollar-mad creature poised with atomic bombs over the heads of the enslaved masses.

I do not mean to be unfair or overly critical of the Soviet people or their government. Indeed, today in the U.S.S.R. there are encouraging signs of genuine progress, maturity, and peaceful leadership. They have recorded outstanding accomplishments in education, industry, and scientific exploration, but I feel that more Americans should be aware of some other facts about the Soviet Union, such as the lies and distortions with which the communication organs of the Communist Party of the U.S.S.R. indoctrinate and saturate their populace. Indeed, only an awareness of this program can lead to action to stem it, and it must be silenced if there is to be any real hope for the peoples of these two great nations to learn to understand each other.

In November of 1967, posters depicting a U.S. soldier sticking a bayonet through a child and announcing the slogan of the U.S. Army to be "rape and destroy" were noted on many street corners in Moscow. Nor is the quotation with which this article begins fictitious. The use of "butcher" and "vulture" as descriptive of the American military is not from a propa-

ganda broadcast beamed to backward parts of the world but a direct quotation from the 28 December 1968 issue of *Red Star*, an official Russian military newspaper with much larger circulation than our military publications. It is a daily paper found on every newsstand in the Soviet Union, and it carries world, party, and sport news as well as military articles. *Red Star* is frequently displayed in total on public billboards at bus stops and convenient locations, just like the more famous *Pravda* and *Izvestia*. The article from which the quotation was selected is a review of a new Soviet book entitled *The US Army—What It Is Like*. The book is an alleged exposé of our Army, calling it the force that has invaded almost every country in the world—a well-organized, armed-to-the-teeth army of low moral composition unlike its Red counterpart. The book purports to reveal several "expressions" of GI's which exhibit their disdain for the Vietnamese people and their conditioned reflex to shoot unarmed Vietnamese without remorse.

Articles of this nature are not uncommon. Indeed, they appear almost daily, along with greatly distorted cartoons, either ridiculing, insulting, or maligning the United States, Israel, or West Germany. Even Red China, which for its part has elevated the U.S.S.R. to the status of public enemy number one, receives better treatment in the Soviet communication media than we do. Coverage of Communist China is given, but the articles tend to be objective narrations of the events rather than "distortive, name-calling" types. (The fact that factual accounts of current events in Red China are sufficiently damaging may explain this.)

Soviet propaganda organs in the recent past have concentrated their tirades on U.S. diplomats, bankers, former President Johnson, former Secretary of Defense McNamara, General Westmoreland, General Moshe Dayan, the "Sick Society," and particularly the U.S. military forces and their "junior partners," a name used at times to describe Canada, any and all members of NATO, Israel, South Vietnam, South Korea, and others. Currently the most popular area of attack seems to be U.S. chemical and biological weapon research. A long article in *Pravda* on 18 January 1969 is en-

titled "The Poisonous Weapons of the Pentagon" and is typical of several that have described the evils of such warfare. This article broadly hints that the United States refused to ratify the Geneva Accords because she secretly planned to make effective use of the weapons it outlawed. The article states, quoting a Japanese source, that the United States has been illegally using poison gas in Vietnam and in 1964 alone killed 30,000 women, children, and old men through the wide use of chemical warfare. The article's author, a Soviet lieutenant general, writes, "The 'ruling circles' of the U.S.A. use their propaganda machine to bewilder the public and hide the 'beastlike' activities of the militarist." He closes with a statement calmly mentioning that the Soviet Chemical Corps is prepared and on guard to defend the innocents of the world against such evil weapons and then issues this warning:

Mr. Imperialist, you must not forget that those monstrous weapons of war cannot stop the progressive movement of mankind toward progress. Poisonous weapons of the Pentagon—they are the weapons for the advocates of a bankrupt strategy.

This provocative program is not limited to radio, the press, and television. The Soviets long ago recruited the arts as a weapon in their drive to "educate" the masses about the evils of the "capitalists." One of the most unpleasant nights I spent in the Soviet Union was in the city of Krasnodar, where I visited the local musical theater to see the play *Moi Bezumni Brat* (My Crazy Brother). This was in 1968, and the play was one of the new repertoire being offered to the people in all fifteen of the Soviet Republics. The play takes place in contemporary U.S.A., and—to give a nutshell synopsis—the story concerns a rich "yankee banker" who has decided to destroy the Soviet Union and perhaps start World War III. With no apology, he is portrayed as having the power to lift the phone and launch Strategic Air Command and to control all the police and government officials. The banker's twin brother ("crazy" because he does not approve of exploiting the masses and accumulating wealth) discovers the evil man's plans

and in an involved plot saves the day by sending the banker off to the insane asylum in his place. Every conceivable cliché of the "capitalist hater" is used in this play. Negroes are shown as slaves who are kicked and humiliated, the working class has escaped reality by drunken debauchery, and the police are gum-chewing, fat servants of the banking clique. It was really funny until one realized that it was serious and that the Soviet audience was enjoying it—believing it to the point of pulling hard for the defeat of the degenerate banker. How long, how many times, do such pictures of the West have to be shown to a man before he believes? How wise does he have to become to reject this propaganda? And what chance for sound judgment exists when such propaganda is almost the only "information" he receives? As I thought of these questions and watched the audience reaction, my first response of humor turned to anger and sadness.

Arguments can be made that such propaganda serves many Communist purposes and needs. How else can the Soviet leaders, for example, while constantly espousing a love for peace and a revulsion from the rotten tools of war, justify to their own people the large and clearly evident role that *they* have given to chemical and biological warfare training and research? By what better way can they justify their increasing military expenditures to their deserving, demanding, and needy consumer population than by playing up the warlike and monstrous qualities of the capitalists? It has been noted that articles of the "all foreigners are spies" type get their biggest play close to Secret Police Day, and articles of the "U.S. warmongers and their ICBM's" type increase as Rocket Forces Day approaches. Still, one cannot help wondering if it has not become a conditioned response—not with the people but with the disseminators.

Envision a land that can join satellites in space, compete with respect and success in international athletic competitions, educate the once backward tribes of Tadzhik, and produce a scientist who can write:

The division of mankind threatens it with destruction. Civilization is imperiled by: a universal thermonuclear war, catastrophic hunger

for most of mankind, stupefaction from the narcotic of mass culture and bureaucratized dogmatism, a spreading of mass myths that put entire peoples and continents under the power of cruel and treacherous demagogues. . . .

In the face of these perils, any action increasing the division of mankind, any preaching of the incompatibility of world ideologies and nations is madness and a crime.¹

A land so well endowed has no real need for this kind of propaganda unless from fear—an irrational fear of the truth.

An awareness of this misuse of propa-

ganda gives the United States a key indicator of the sincerity of Soviet détente moves. It would be an easy matter for the West to point out to the Soviets that this program creates an unhealthy atmosphere and is a barrier to any genuine understanding or agreement. We could refuse to negotiate any matter while such flagrant violations of international courtesy continue. The Soviets will continue the program only as long as it gains more for them than it loses—if they can negotiate and at the same time self-indoctrinate, they will. On the other hand, if negotiations which are

A Soviet Sampler

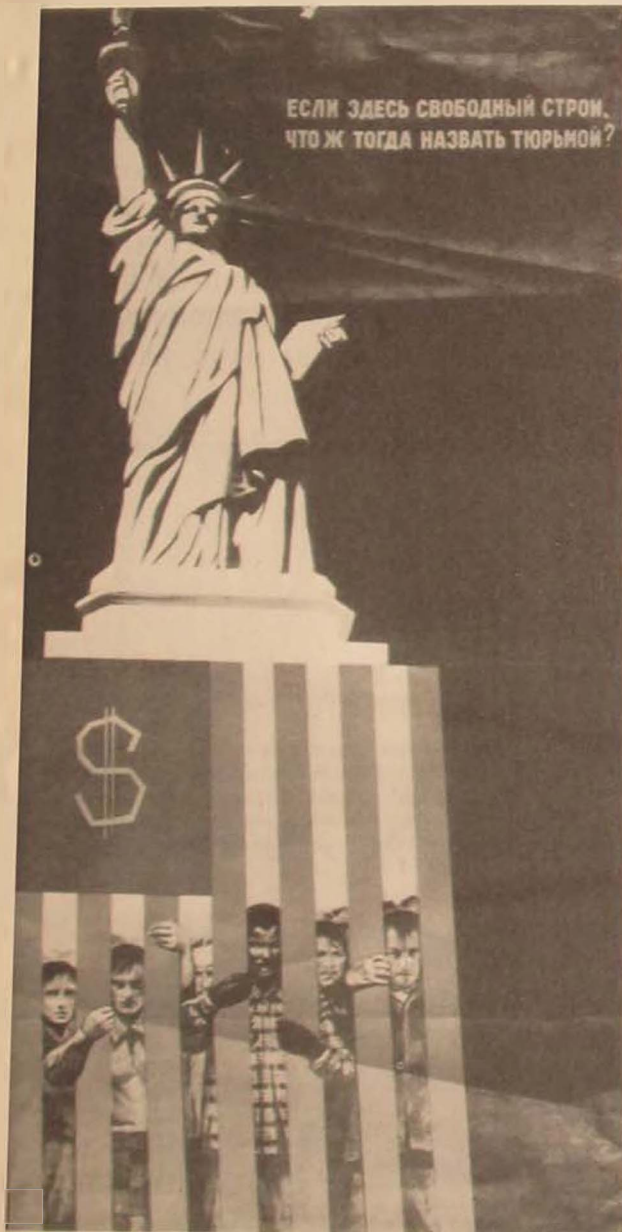
Soviet propaganda posters blazoning the anti-U.S. theme reiterate ad nauseam the same dreary themes: the war, the bomb, the Klan, the dollar, racism, hate, etc.



mutually attractive are prohibited because of the propaganda campaign, the Soviets would be forced to re-examine it for need and purpose. Such an examination in the light of world and current Soviet realities might find the program so lacking in both these areas that the Soviets would turn the valve and shut off the flow. Would this be a worthwhile Western objective? Many believe that it would. Recently the Secretary General of NATO, Manlio Brosio, stated that the real lesson of Czechoslovakia was that genuine détente will come only through improved relations with the

U.S.S.R. and that that is impossible until the Soviet people become convinced "that the Western World is not as hostile to them as the communist propaganda insists that it is. . . ." The key factor in that misunderstanding is the program of distortion and exaggeration described herein.

We know that the United States is not a perfect country, but neither is it anything like it is portrayed to the Soviet people. Coexistence would become a more readily obtainable goal if the Soviet child in school and man on the street, who may become a Central Com-



mittee member, heard and saw a more balanced picture of the United States. For the sake of 240 million Soviet citizens, we must become aware of the effects of this opprobrious treatment of the West and seek to have the system changed. The time is ripe—the Soviets, for many and varied reasons, are calling for negotiations in several areas, and a precondition from our side that Soviet internal coverage of the United States must be realigned to conform with truth and international norms should have a good chance for success. This need not be a publicly stated demand. Soviet official reaction to it, no matter how presented, will be to shout “Interference in internal affairs.” Their official answer, however, is unimportant; the real answer will become readily evident. The Soviets have demonstrated that they know how to switch on and off and retool their propaganda (Stalin, China, De Gaulle, Yugoslavia are examples), and they could respond quietly with no loss of face, yet with absolute assurance that their response would be detected by the West.

A positive Soviet response to the proposed precondition would certainly not ensure immediate agreement in negotiations. It would not result in speedy withdrawal of Soviet troops from Czechoslovakia or in sudden Soviet

acceptance of our oft-proffered proposal of weapons limitation with on-site inspection. But what about the long-term benefits in the areas of mutual understanding and reduction of tensions? A change in these areas, albeit gradual and over the long haul, is an inviting prospect and might well create the environment that would lead to *successful* future negotiation of critical problems.

Current conditions are ideal for seeking this change from the Russians. We have a new President, whom the Soviet press has already treated with extreme fairness and caution, and they have exhibited an eagerness to negotiate seldom matched in our modern relations.³ Only one ingredient is missing from the brew—awareness. I am reminded of the expression “What you don’t know can’t hurt you” and struck by its enormous falsity. We have not been fully aware of the Soviet officially sanctioned description of our nation, but nonetheless it *has* hurt us, the Soviet people, and the world. As few Americans have lived in the U.S.S.R. and watched this system of misinformation enveloping the unsuspecting population, this article is designed as a partial substitute for that experience.

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Notes

Credit for the article title belongs to the Soviet author Yuri Daniel, whose short story entitled “This Is Moscow Speaking” led to his jail sentence. The author recommends the story to those interested in contemporary U.S.S.R.

1. From “Thoughts on Progress, Peaceful Co-existence, and Intellectual Freedom” by Andrei D. Sakharov as translated in the *New York Times*, 22 July 1968. Dr. Sakharov is a leading Russian physicist and a leader of the national intellectual movement in the U.S.S.R.

2. Manlio Brosio, “Soviet Policy: Weakness Yes, but Danger Too,” *The Atlantic Community Quarterly*, VI, 4 (Winter 1968-69), 499.

3. The reasons for the current Soviet eagerness to negotiate merit treatment in a separate article but include, to name a few, budgeting problems, the Czechoslovakian invasion, and Soviet internal disturbances. As a result, their particular eagerness offers diplomatic advantages to the West that are exploitable.



Books and Ideas

AMERICA FACES THE THIRD WORLD

DR. CHARLES A. LOFGREN

IN THE LAST several years, critics of American foreign policy have advanced a variety of arguments against foreign involvement. Some question commitments in specific geographical areas; others attack foreign commitments in general. Another dispute arises

over the *type* of activities the nation should undertake beyond its borders, regardless of area. Should American assistance be limited to economic aid? Should it include military materiel but not personnel? Advisers but not combat forces? Should aid be provided only to those regimes fostering political democracy and social reform?

In the face of issues like these and the protracted war in Vietnam, it is not surprising that in February of this year Dr. George Gallup detected an upswing of isolationist sentiment in the country. But many of the critics would reject the isolationist label. Richard J. Barnet is one of these, yet there can be no doubt about his quarrel with recent trends in United States foreign policy.

Barnet's argument in *Intervention and Revolution: The United States in the Third World*† begins with the notion that a group of men whom he labels "National-Security Managers" make American foreign policy. These policy-makers unfortunately see the world in terms more appropriate to the 1930s than to the 1960s, for stability is their major goal, and they equate anything that threatens to upset the stability of the world with the imperialism of Nazi Germany. Aggression, if not stopped, can only lead to more aggression and ultimately to a direct threat to the United States.

Because of this outlook, these men find especially alarming the instability which today characterizes the "Third World," an area "roughly equivalent to what used to be called the underdeveloped world," in which Barnet includes Latin America, Africa, the Middle East, and Asia outside the Soviet Union. (p. 4) But the National-Security Managers are not so disturbed by just any disruption of the status quo in this region as they are by left-leaning movements, which, they fear, provide openings for Communism, a menace with international implications.

This viewpoint, according to Barnet, has led to extension of the cold war and its attend-

ant horrors to the Third World and assumption by the United States of the role of international policeman. The final result can only be an intensification of the very revolutionary fires which the policy-makers desire to bank, while at the same time the national revolutionaries themselves are driven to believe that their only hope lies in international action. "The United States," writes Barnet, "has succeeded in fulfilling its own prophecy." (p. 57)

What explains the National-Security Managers' outlook? Barnet argues that security, stability, and peaceful change have become obsessions with them because, seeing these as normal conditions, they fail to realize that other societies may be unable to operate with or share such values. Yet the National-Security Manager feels perfectly justified in using violence as a coercive instrument to bring such societies into the modern, stabilized, American world (and, in the process, to make the world a safe place for Americans).

Such an approach amounts to an American policy of *unilateralism*. Barnet's solution is a policy of *multilateralism*—a revitalization of the peace-keeping and (if I read correctly between the lines) the social and economic machinery of the United Nations.

Within Barnet's own framework, however, evaluating his policy preferences proves difficult. About two-thirds of his study concentrates on essentially historical material, and most of the remainder consists of observations on the present scene. His proposal of multilateralism receives attention only in a part of his last chapter (Chapter 11), and the discussion there contains few specifics on the new policies (or nonpolicies) which he wishes the United States would implement. Thus, unless Barnet succeeds in convincing his readers that anything would be better than the present system, he really establishes no case for trying his solution.

But since so much of his account does consist of historical material, I think it fair to begin an evaluation of the book by assessing

†Richard J. Barnet, *Intervention and Revolution: The United States in the Third World* (New York: World Publishing Company, 1968, \$6.95), 302 pp.

the quality of Barnet's history. A review of his history, of course, will not automatically establish the worth of his conclusions. For one thing, the logical relationship between his historical and other empirical data and his conclusions is not well developed. Nevertheless, the historical segments of *Intervention and Revolution* provide insight into Barnet's standards of scholarship and judgment.

To begin, one might well question the adequacy of Barnet's background history, that is, his treatment of the pre-1945 period. In discussing American foreign policy in the 1930s, for instance, he correctly pictures the early New Deal as, on balance, isolationist. (pp. 83-84) But he also indicates that "[Franklin] Roosevelt himself supported the Neutrality Act of 1935," without noting that FDR's actual preference was for legislation that would have given him selective powers to invoke neutrality, rather than for the act actually passed, which did not permit him to discriminate, as he wished to, between aggressors and their victims.¹

Barnet then goes on to portray FDR's quarantine-the-aggressor speech as "his first major step away from neutrality in the direction of asserting world police responsibility for the United States. . . ." But at least one recent study seriously questions whether Roosevelt had anything so bold in mind.² Thus Barnet's brief treatment of the middle and late 1930s would lead the reader to think that there were sharp turns in policy, when in fact that was not the case.

On the other hand, the postwar willingness of the American government to undertake formal political and military commitments abroad definitely does mark a distinct departure from past practice. Yet one's understanding of the new approach gains nothing from Barnet's contention that since World War II "the national-security bureaucracy has assumed for the *first time* in over one hundred years that the United States is vulnerable to attack." (p. 77, italics added) From Lincoln and Seward and their fear of British intervention in the Civil War, down to Franklin Roosevelt and his concern with what he saw as a Nazi military threat, at least some policy-

makers have recognized U.S. vulnerabilities.

Barnet could have avoided such infelicities had he consulted a broader range of sources; as his book stands, however, it rests too often on an overly narrow base. In discussing the nineteenth century phenomenon of Manifest Destiny and again in reviewing the diplomacy of the New Deal, for example, he strangely overlooks, among other standard accounts, a number of respectable histories written by members of the "New Left" (or "Wisconsin") school of historians. Thus, from relying on Weinberg's *Manifest Destiny*, first published in 1935, Barnet describes the nineteenth century thrust for empire in largely ideological terms, whereas LaFeber's 1963 study, *The New Empire*, might have directed his attention to some concrete commercial factors underlying expansion in the latter part of the century.³ Similarly, Gardner's *Economic Aspects of New Deal Diplomacy* might have led Barnet to mention the international economic implications of the same early New Deal policies which he sees as isolationist politically.⁴ (I do not mean to say, of course, that the New Left's approach to the study of American diplomatic history is without fault, for it most assuredly has its own defects, and I suspect that it ultimately will prove more provocative than convincing.)

But Barnet is most concerned with the period since 1945, which, because of its immediacy to the present, best illuminates what he regards as the current misdirection of American policy toward the Third World. Thus, early in his account, he stresses the importance of the Korean War (pp. 66-68), which he describes as "the most mysterious event in the long history of Stalin's dealings with foreign communists," adding:

It is one of the essential assumptions of official Cold War history that Stalin ordered the war. Indeed, Korea being the only [*sic!*] case in the postwar period of the overt use of communist armies across an international frontier . . . , it has been used again and again as the prime example of communist aggression.

Others have also questioned why Stalin ordered the Korean attack, but for Barnet the

mystery begins to dissolve if one rejects the assumption that Stalin ordered the attack and if one considers the provocative actions taken by South Korea in the two years prior to the attack. "It is certainly at least as plausible that the North Koreans attacked to forestall an attack from the South," he concludes, "as that this was a case of Hitler-like aggression." Significantly, the South Koreans had taken a highly belligerent stance toward the North during the two or so years prior to June 1950, as evidenced by Major General Charles A. Willoughby's statement that "the entire ROK [South Korean] army had been alerted for weeks and was in position along the 38th parallel." Additionally, South Korean President Syngman Rhee had been publicly proclaiming his intention to unify the peninsula by force.

In arguing his case, Barnet closely follows Professor Fleming's revisionist account, *The Cold War and Its Origins*. In fact, as he acknowledges, he took the Willoughby quotation from Fleming, who in turn took it from an article by Willoughby in *Cosmopolitan Magazine* for December 1951. But Fleming's version of the Willoughby quotation has the North Korean army, *not* the South Korean, alerted and in position. (Actually, as Willoughby himself has described elsewhere, both armies were in position by 25 June.)⁵

More important, the composition of the ROK forces needs mentioning. Intended and equipped primarily for internal security duties, the South Korean army lacked the capability to undertake an invasion of the North. That fact alone, of course, does not rule out the chance that the North Koreans saw the South Koreans as a real threat. Their view of reality may have been a warped one. But in the absence of any concrete evidence on how North Korea did perceive its southern neighbor, it would seem proper to note that the condition of the ROK army could easily have worked to discount the conclusion that South Korea posed a threat.

It may not be fair, however, to judge Barnet too harshly on this matter, because he contends that for his purposes "the crucial question is not whether communist military forces attempted to conquer noncommunist

military forces in a divided country, but whether the communist forces were directed by the Soviet Union." In dealing with *this* question, he finds plausible the argument of W. W. Hitchcock, who had earlier been with the United States military government in Korea, that North Korea attacked without consulting the Soviet Union. Yet Barnet cautions that "the mystery remains, for it is hard to credit a communist government established by Soviet occupation with an act of such audacious independence."

But does this suffice as an adequate assessment? Hitchcock's article was published in 1951, well before the war in Korea was over and well before many of the historical returns on it were in. In fact, much of what Hitchcock says does not stand up in view of later evidence, and much of it rests on a particular set of assumptions. Beyond that, we have fairly conclusive evidence that Soviet advisers were attached to the North Korean army down to the divisional level and that the final preparations for the attack took at least ten days, which makes reasonable the inference that the Soviets knew beforehand of the attack. And in a day when the North Koreans were almost totally dependent on the Soviets for military materiel, not to mention other types of aid, it seems unlikely that the Soviets could not have stopped the attack had they wished to.⁶

Unfortunately, Barnet's treatment of Korea is not his only debatable interpretation. In the five chapters that comprise Part Two of *Intervention and Revolution* ("The Truman Doctrine and the Greek Civil War," "The Lebanese Civil War and the Eisenhower Doctrine," "The Dominican Republic: To the Johnson Doctrine," "America in Vietnam: The Four Interventions," and "The Subversion of Undesirable Governments"), he takes sufficient liberties with some of his major sources to raise doubts about the whole enterprise.

In discussing the subversion of leftist regimes, for instance, Barnet argues that the United States supported the central government of the Congo against the Stanleyville secessionists because American policy-makers feared that otherwise the Communists would move in. Especially seeking to discredit the

idea that the Americans had any humanitarian motives in aiding the rescue of the Western hostages held by the Stanleyville rebels, he maintains that the United States could have saved the hostages simply by ordering the central Congolese government to stop bombing Stanleyville. That such action was not taken is evidence for Barnet that the real and primary objective of the United States was to bring down the Stanleyville rebellion. (pp. 248-51)

He bases his argument on Ambassador William Attwood's account of his adventures in African diplomacy, an account which indicates that a number of Africans told Attwood that Stanleyville *said* the hostages would be released if the bombings ceased. But Attwood also makes it plain that there were other indications that the Stanleyville authorities could do little to control their own troops. In other words, no matter what the Stanleyville government said it might do, harm was likely to befall the Western hostages held by the rebel forces.⁷ Barnet may be correct in his conclusions (and undoubtedly the actions of the United States were prompted by more than simply humanitarian motives), but if he cites a former ambassador as an authority, he has an obligation to report his views accurately.

Similar problems occur in connection with Barnet's use of Major Edgar O'Ballance's *The Greek Civil War, 1944-1949* and John Bartlow Martin's *Overtaken by Events*, an account of Martin's Dominican experiences. And while it is still too early to judge the accuracy of much of what Barnet writes about the Vietnam intervention, the title he gives the chapter on Vietnam is itself strange and betrays a basic weakness of the whole book. Barnet fails to specify what he regards as the *four* interventions in Vietnam, and the reader is at a loss to determine this for himself because Barnet never states his criteria for determining what constitutes an intervention.

More broadly, the book echoes the oft-repeated complaint of contemporary foreign policy critics that Americans, or at least American policy-makers, suffer from mistaken ideas about American omnipotence. In seeking to impose American-style stability on the world,

the critics charge, the United States has attempted the impossible and in the process has created strife in the developing nations and stifled their legitimate aspirations. Such an accusation is clearly implied by a statement like this:

For years the model of a successful counter-insurgency was Greece. . . . But in the process, the political structure of the country was undermined. In the atmosphere of suppression, the extreme-right wing flourished. Twenty years after the Truman Doctrine was announced, the most reactionary military dictatorship in Europe or the Near East came to power. . . . (p. 277)

But does it make sense to blame the present situation in Greece on the Truman Doctrine? One might as easily assert that the Greeks today are not behaving much differently than in the past—during, say, the interwar period. To put the point more generally: Even if Americans have sought worldwide stability, it may turn out rather to be the critics of American policy who harbor the real illusions of American omnipotence. For it is difficult otherwise to understand how they could lay at the doorstep of one nation quite so much responsibility for all the tribulations of the world.

From the beginning of the book onwards, in any case, the underlying assumption is that much, or perhaps most, of America's postwar activity in the Third World has been ill-advised. Beyond that, Barnet is never quite clear as to whether he is explaining why the events he writes about occurred, whether he is examining those events in order to test hypotheses that could explain the course of postwar policy, or whether he is simply describing what happened. The confusion appears early in the study at a rather explicit level (pp. 11-19) and continues thereafter. Most basically, however, what is missing is a careful elucidation of the standards one might use to judge the wisdom of America's policies and actions abroad.

To illuminate what this would involve, one might well begin by recalling a comment that John F. Kennedy made about the game of rating the Presidents: "How the hell can

you tell? Only the President himself can know what his real pressures and his real alternatives are. If you don't know that, how can you judge performance?"⁸ Kennedy's statement suggests that understanding and judging key policy decisions are difficult, at best. But this does not mean that one can attempt to assess what does go on in government or prescribe what should go on, without first trying, as best he can, to determine the pressures and alternatives that confront policy-makers as a result of both domestic and foreign developments.

For years now, it should be noted, careful historians of the policy process have sought to understand what policy-makers in particular past situations regarded as the range of alternatives open to them. They have also examined how earlier decisions served to limit the range of policy-makers' future alternatives. More recently, in works with which Barnet must be familiar, his fellow political scientists have attempted to analyze systematically the decision-making process in general.

Only after the foreign policy critic has developed a full picture of the pressures on policy-makers and the alternatives open to them is he in the position to assess the policies and actions emerging from the governmental process. From that point on, as a minimum, he must compare the results and implications of the policies under study with the probable results and implications of both inaction and possible alternative decisions and actions. Apropos Barnet's final chapter, one might ask when and how the outcomes of particular situations would have been different if international agencies had borne the burden of action in the Third World.

In part, this kind of comparative approach would involve fairly factual considerations. I think, for example, that Barnet is mistaken in asserting that "Isolated acts of terrorism by revolutionaries will not prevail against . . . [the power of constituted governments] unless the authorities have lost their capacity to govern." (p. 280) It seems to me that terrorist activities can seriously affect a government's "capacity to govern." Careful study of relevant situations in the recent past could perhaps resolve the matter.

To illustrate: One author calculates that there were "thirty-eight wars with an average duration of 5.8 years between 1945 and 1962." A recent popular account focuses on 25 conflicts in the post-World War II period.⁹ Many of these wars and other conflicts involved insurgency against established governments. It might be fruitful to examine intensively several in which the existing governments were brought down and several in which that did not happen. But my hypothetical study would also have to make clear why particular wars received attention and others did not. Otherwise the reader would have no way of evaluating its real significance. In short, systematic attention to selection criteria is a necessity in any policy study drawing on history for its evidence.

Nevertheless, judgments about foreign policy, like judgments about almost anything else, usually take one beyond the empirical realm, for different men may use different basic frames of reference to interpret what they see in the world. Thus I think honesty dictates that the foreign policy critic should thoroughly understand, and should describe for his readers, the relevant fundamental premises of the men whose actions he is assessing, *and his own premises* as well. In gaining the required understanding, however, an adequate sampling process is again necessary if the critic uses the historical approach, as Barnet does. For logic demands that if the critic is to understand fully the policy-makers' basic frames of reference—that is, if he is to determine their preconceptions both about how the world operates and about what constitutes the national interest of the United States in the world, as those preconceptions relate to insurgency, revolution, and intervention—then he must give careful attention to their actions in episodes that did *not* trigger American intervention as well as in ones that did.

In evaluating Barnet's closing recommendation—that the United States shift from unilateralism to multilateralism—one should consider an additional question: Is it really possible for a powerful nation to avoid intervention, try as it may to do so? Let me stress that this is an especially significant question,

for it calls attention to the likelihood that whatever great powers do has an effect on the course of the world. In sum, intervention may be an unavoidable fact of international life.

Consider a problem that has received increasing notice in the last few years. Reputable authorities contend that within ten to twenty years there absolutely will not be enough food for the world's population, no matter how it is distributed.¹⁰ If these forecasts prove correct, a surplus-producing nation like the United States cannot possibly avoid making decisions about distribution priorities—decisions which almost automatically will constitute intervention from the perspective of some people, even if the chosen course is simply to pass the question on to a body like the United Nations. Someone is going to go hungry in any case—someone who might not have, had the pattern of distribution been dif-

ferent. And if, to put it bluntly, some of the world's hungry people become aggressive before they die (perhaps when told that others are not so hungry), can the resulting violence be blamed on American intervention?

Or consider the worldwide operations of American business. Even the Europeans are now finding it difficult to meet what J.-J. Servan-Schreiber calls "The American Challenge."¹¹ Assuming that the United States government refrains from intervention abroad, American influence in the world will not thereby suddenly cease or come under multilateral control, unless a major reorientation of the domestic political economy is effected at the same time. And this seems unlikely.

The world remains a complex one and generally presents policy-makers with no completely satisfactory alternatives.

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Notes

1. See Robert A. Divine, *The Illusion of Neutrality* (Chicago: University of Chicago Press, 1962), pp. 81–121.

2. Dorothy Borg, *The United States and the Far Eastern Crisis of 1933–1938* (Cambridge: Harvard University Press, 1964), pp. 369–98. See also Divine, pp. 211–14.

3. Albert K. Weinberg, *Manifest Destiny: A Study of Nationalist Expansionism in American History* (Baltimore: Johns Hopkins Press, 1935); Walter LaFeber, *The New Empire: An Interpretation of American Expansion, 1860–1898* (Ithaca, New York: Cornell University Press, 1963). Among the non-New Left studies which Barnet might have consulted on the subject of Manifest Destiny are Norman Graebner, *Empire on the Pacific* (New York: Ronald Press, 1955), which assesses the commercial motives underlying expansion in the 1840s; and Frederick Merk, *Manifest Destiny and Mission in American History* (New York: Knopf, 1963), which introduces some needed distinctions regarding the ideology of expansionism.

4. Lloyd C. Gardner, *Economic Aspects of New Deal Diplomacy* (Madison: University of Wisconsin Press, 1964). For two non-New Left studies of foreign policy in the 1930s, see notes 1 and 2.

5. D. F. Fleming, *The Cold War and Its Origins, 1917–1960*, 2 vols. (Garden City, N. Y.: Doubleday, 1961), II, 589–608 (the Willoughby quotation is on p. 599); Major General Charles A. Willoughby and John Chamberlain, *MacArthur, 1941–1951* (New York: McGraw-Hill, 1954), pp. 350–55.

6. Soon Sung Cho, *Korea in World Politics, 1940–1950: An Evaluation of American Responsibility* (Berkeley: University of California Press, 1967), pp. 245–75; Roy E. Appleman,

South to the Naktong, North to the Yalu (June–November 1950), [*U.S. Army in the Korean War*, vol. 1] (Washington: Office of the Chief of Military History, 1961), pp. 7–12. Hitchcock's article, "North Korea Jumps the Gun," may be found in *Current History*, XX (March 1951), 136–44. Interestingly, one of the works cited by Barnet (p. 75n) in connection with his discussion of Korea is Allan S. Whiting, *China Crosses the Yalu: The Decision to Enter the Korean War* (New York: Macmillan, 1960), which largely assigns responsibility for the war to the Soviets; but Barnet appears not to have accorded Whiting's remarks much weight.

7. William Attwood, *The Reds and the Blacks: A Personal Adventure* (New York: Harper and Row, 1967), pp. 191–217.

8. Arthur M. Schlesinger, Jr., *A Thousand Days: John F. Kennedy in the White House* (Boston: Houghton Mifflin, 1965), p. 674.

9. Ernest W. LeFever, "The U.N. as a Foreign Policy Instrument: The Congo Crisis," in Roger Hilsman and Robert C. Good, eds., *Foreign Policy in the Sixties: The Issues and the Instruments* (Baltimore: Johns Hopkins Press, 1965), p. 144; Carl and Shelley Mydans, *The Violent Peace: A Report on Wars in the Postwar World* (New York: Atheneum, 1968).

10. See William and Paul Paddock, *Famine 1975! America's Decision: Who Will Survive?* (Boston: Little, Brown, 1967); and Dr. Paul R. Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1968).

11. J.-J. Servan-Schreiber, *The American Challenge*, trans. Ronald Steel, with foreword by Arthur Schlesinger, Jr. (New York: Atheneum, 1968).

WORLD WAR II: EUROPE IN THE THROES OF TOTAL WAR

MAJOR DAVID MACISAAC

THAT tiresome old soldier Clausewitz once offered a warning to soldiers and statesmen, one thus far heeded more in the breach than in the observance. Reflecting on the new forces released by the French Revolution and the wars that followed, he observed that in the new circumstances, once battle was joined, warfare tended to swallow up its original purposes and take on a momentum of its own.

Events since Clausewitz's day have amply demonstrated the accuracy of that gloomy observation. Who, for example, South or North, could have foreseen that the firing on Fort Sumter would lead to the butchery of Antietam and Gettysburg, the burning of Atlanta and Columbia? Surely none of the powers that rushed to the aid of Serbia in 1914 had any idea at all of the holocaust awaiting them. And who in the governments of Great Britain and France a quarter-century later could have foreseen the outcome of their decision to go to the defense of Poland, a nation whose fate they abandoned before the war was over? Wherever we look (and Vietnam promises to be no exception), the end result of a decision to commit a problem to a solution by force almost invariably turns out to be either unforeseen or unintended or both.

All this is not to say that the intended victim is not done in. Hitler and the Japanese warlords were, after all, defeated, and decisively so. But who in 1939 or 1941 could foresee either the limits to which that war would go or the problems it would in itself create and leave behind? Even within the confines of a single conflict the self-generating momentum of modern warfare seems to carry men well beyond the limits of rational calculation. A

case in point might be made of the theorists at the Air Corps Tactical School in the 1930s. Carefully nurturing a doctrine predicated upon the precision bombardment of selected industrial targets, not for a minute would they have conceded that Dresden or Tokyo or Hiroshima lay at the end of the furrow they ploughed.

The nuclear age brought with it new imperatives to find solutions to the problem of controlling and directing military forces. Many rose, both within and without the professional military establishment, to answer the call. But whether we take gaming theory or computer-aided command/control systems, Kahn's escalation ladders or McNamara's "controlled response," the dispassionate observer on the sidelines might be pardoned if he smiles now and then, out of turn as it were. "Have these men done their homework?" he might ask. "Are they aware that their essential confidence in their ability to direct and keep under control an actual conflict situation is a confidence that has been shared by innumerable predecessors?" It is this question that darts in and out between the lines of two new contributions to the ever increasing flood of books dealing with World War II. In the first of the two, and that most likely to be of interest to present readers, the question is put in stark terms; in the second it appears in more muted form, but it is there nonetheless.

Setting aside questions of theme for the moment, let me say at the outset that Anthony Verrier's *Bomber Offensive*† is a good book, representing a valuable addition to the pioneering work of Craven and Cate¹ in this country and Webster and Frankland² in Great Britain. A former defense correspondent for *New Statesman*, *Observer*, and *Economist* and

†Anthony Verrier, *The Bomber Offensive* (New York: Macmillan, 1969, \$8.95), x and 373 pp., appendices, maps, diagrams, bibliography, index.

author of *An Army for the Sixties*, Verrier has put together the best one-volume interpretation of the strategic air offensive over Europe. What happened and when is by no means ignored, but his primary concern is with showing *how* and *why* the chosen policies and strategies developed. In attempting this he takes into account the struggle of the Royal Air Force to remain independent after World War I, the doctrinal development in the thirties, the situation (and personalities) when war broke out again, Germany's air defense system, and the purely tactical (or operational) factors that determined the limits of flexibility open to Britain's Bomber Command and the U.S. Eighth Air Force. Relying largely on the British and American official histories (both of which he takes to task on occasion) and other published materials, Verrier supplements these with the results of interviews with numerous survivors, especially crew members. The interviews paid off in at least one respect: his treatment of the day-to-day life of crew members, in training and in combat, in the air and on the ground, provides insights often lacking in the official accounts.

Unlike a number of other writers, Verrier took the pains to find out, and explain, the precise workings of the radio and navigational aids introduced during the offensive; whether it is Gee, Oboe, H₂S, H₂X, or SN-2 (German night fighter radar), he introduces each at the appropriate place and describes it in terms a layman can understand. In this same respect his description of the German defensive techniques (e.g., the Kamhuber Line) is more informative than that found in most German accounts that have been published on this side of the water. Thus, in crew life, danger, courage, technique, Verrier's account, for reasons other than its comparative brevity, is likely to be favored by those performing similar tasks today.

But for all this, Verrier is a journalist first and historian second; in the conduct of the offensive he sees a message for today, and his basic theme dominates the whole book. The offensive, he argues, except for its part in preparing the way for OVERLORD, never held a clear-cut place in overall Allied strategy. As

a result of this, along with the personality of Sir Arthur Harris, the vacillation of Churchill, and the American attempt to make General Carl Spaatz "the top airman in Europe," the RAF closed ranks behind Harris, and the bombing offensive ran on out of control. The defeat of the German Air Force and the depletion of its fuel supply (largely U.S. achievements), coupled with new techniques for increasing the accuracy of both British and American air forces, opened up possibilities never present in the early stages of the war. Nevertheless, by early 1945, wedded to tactical doctrines that earlier were inescapable, *both* air forces reverted, night and day, to what can only be fairly described as "area bombing." Having become obsessed with what was tactically feasible and being determined to break the ground stalemate, they pounded away at Germany with club rather than sword; Dresden was the inevitable result. After citing the differences and disagreements at all the higher levels (FDR, Churchill, the Combined Chiefs of Staff, Eisenhower and his staff at SHAEF), Verrier concludes: "The fact nevertheless remains that they were not of one mind and it follows therefore that airmen who knew what they wanted to do were allowed to go ahead and do it, and in their own way."

If this analysis is correct (and Generals Spaatz, Eaker, and Doolittle would not agree that it is), how might it be relevant for us today? Let Verrier answer:

The short answer to the question is that the twentieth-century version of total and global war has led to a search for deterrents to it, but one on the whole conducted by men whose capacity for taking a political or strategic argument to its logical conclusions has been rather less than their wish to preserve the fabric of national armed forces and, above all other considerations, retain separate, and so far as administratively and operationally possible, independent services for the planning and the prosecution of campaigns by sea, land or air.

Hard words, these, and reflecting deep-seated fears. The problem with Verrier's thesis is one that affects *any* more or less one-sided interpretation of historical events: somewhere within it lies at least an element of truth; or,

lacking that, an insight into the processes of change that participants in the events, blinded by the exigencies of the moment, were unable to grasp. (Cynics, of course, point out that this is what keeps historians in business.) But the major question is unavoidable: Is Verrier's analysis on the whole correct? This reviewer takes a charitable (wishy-washy?) position and suggests that it is closer to the mark than we might wish it were. A close reading of the records justifies the late Major General Orvil A. Anderson's observations that during World War II (1) air warfare advanced from infancy to adolescence, and (2) what evolved over Europe was "an improvised air war." Perhaps the really relevant question is whether the sort of control and review of policy whose absence Verrier deplures is even *possible* in the throes of total war. The Herman Kahns among us either think so or hope so. If the former, let us be skeptical; if the latter, we can only join them.

CONTROVERSY and provocative interpretation take second place to dispassionate narrative in Gordon Wright's truly excellent and quite unusual history of the war in Europe.† Wright's volume is the twentieth in the justly famous "Rise of Modern Europe" series, edited by William L. Langer and published by Harper & Row. What makes this volume so unusual (and valuable) is the author's decision to concentrate not on the military, air, and naval conduct of the war but rather on what was going on behind the fighting fronts, how the war affected the lives and fortunes of the peoples of Europe as a whole. True, he begins in the standard manner: Chapter I, "Europe on the Brink"; Chapter II, "The Expansion of German Power." But beyond this point he departs from the normal pattern, and only 37 of the remaining 224 pages of narrative are devoted to the resurgence of Allied power and the defeat of the Third Reich. Total war, Wright reminds us,

means something more than hurling every available element of physical force into the fray; it also involves the total ordering behind that effort of society in all its parts—political, economic, social, scientific, and psychological.

The chapters on the psychological and scientific dimensions of the war cover ground that has been worked before in great depth if not within integrated narratives of the war as a whole. But other chapters provide cogent summaries of less familiar aspects of the war, its "economic dimension," for example, and "Europe's response to conquest: the Resistance movements." The economics chapter treats the following general topics: the economics of blitzkrieg; the Western Allies, from complacency to action; economics as an offensive weapon; the Soviet economic effort; and the economics of total war in Germany. Here one finds, just as an example, a comparative analysis of what lengths each country went to in supporting its war effort. If the German side of the story is well known to many Americans, the Soviet and British sides are not. Here, however, the mysterious workings of Britain's Ministry of Economic Warfare (involved in commodity control, pre-emptive buying, selection of targets for the bomber offensive) are explained and evaluated.³ The chapter on Resistance movements covers each country, from Norway to the Balkans, and does not omit the part played by such organizations as the Special Operations Executive, Britain's equivalent of our Office of Strategic Services (OSS).

It is this broad-gauge treatment that gives the book its special dimension. The student concerned to find out what was going on in Hungary or Czechoslovakia during the Nazi occupation can find out quite a bit if he is a patient researcher and can read a number of languages. But he cannot normally find such matters in a *general* history of the war—not, that is, until now. And as with all the volumes in this series, the Bibliographical Essay, arranged under 28 subheadings⁴ in 37 closely

†Gordon Wright, *The Ordeal of Total War, 1939–1945* (New York: Harper & Row, 1968, \$7.95), xviii and 315 pp. (Also available in paperback, Harper Torchbook, TB 1408, \$2.25.)

packed pages, is a significant contribution in its own right.

All this is not to say, however, that the soldiers' war finds no place; it is merely condensed and placed within a larger context, one which most veterans of that war never saw but which European civilians can never forget. The bomber offensive, for example, is covered in only nine pages, but, interestingly enough, its contribution to final victory is rated higher than its frequent critics would allow. It "undoubtedly hampered the German war effort in much more than a marginal way. What it failed to do was to destroy civilian morale—to break the German people's will to work and to endure."⁵

Wright concludes with two chapters in which he tries to show, first, how the war itself, particularly the conflicting purposes of the Allies, prepared the way for the cold war; and second, the impact of the war on the social, cultural, and psychological stability of the European peoples. Calmly, dispassionately, and with no trace of the rancor that bedevils the "revisionists" who try to show that the cold war was entirely the fault not of the Russians but of the Western Allies, he traces in detail the misunderstandings and mutual distrust

that began to infect the Great Coalition once victory seemed assured.⁶ These concluding chapters contain many of the most thoughtful pages yet addressed to questions of lasting importance. Not only to end where we began but, more importantly, to give Professor Wright's own eloquence its due, it seems appropriate to conclude in his words:

The changes for which men consciously thirst and work and die are not the only ones produced by a great war. More profound and more sweeping, perhaps, are those that are unintended and even unforeseen. . . . Thus the Second World War seems to have initiated or reinforced trends toward a mood of lawlessness, toward a confusion and corruption of values, toward a decline in man's belief in a rational universe. . . . The battlefield, no longer limited and defined, was everywhere; it was occupied by civilians and soldiers alike. . . . Old beliefs in causality tended to dissolve before these evidences of chaos; there was a growing sense that irrational forces rule man's fate. No scientist, no historian has yet discovered a technique for measuring the enduring after effects of war; but no thoughtful man can doubt their severity or their persistence.

United States Air Force Academy

Notes

1. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II* (University of Chicago Press, 6 vols., 1948–55).

2. Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany, 1939–1945* (London: Her Majesty's Stationery Office, 4 vols., 1961).

3. The U.S. counterpart to Britain's Ministry of Economic Warfare was our Foreign Economic Administration. While almost all histories of the war refer to the FEA's main responsibility, the Lend-Lease program, rare indeed are those that treat its other, rather more clandestine, activities. *Very secret* at the time and involving activities somewhat at variance with those normally associated with a free-enterprise system, the whole story of the FEA (like that of the Economic Warfare Division of the U.S. Embassy in London) will probably never be told.

4. To wit: published or microfilm source materials; periodicals; general accounts; immediate background; the problem of Hitler's war aims; military aspects, general; Polish campaign; Norwegian campaign; Western campaign; Battle of Britain; Mediterranean and North African campaigns; the war in Russia; the campaign in Italy; Normandy and the invasion of Germany; war in the air; war on the sea; espionage and intelligence operations; civil-military relations in wartime; economic aspects of the war years; science and technology; psychological warfare; psychological impact of the war; German occupation policies; Nazi persecution of "racial" and political enemies; Resistance

movements (5 pages on this alone); wartime diplomacy; intellectual and cultural aspects of the war period; domestic events in the nations of Europe.

5. This view accords with that of Webster and Frankland and the U.S. Strategic Bombing Survey. The latter's report on morale concludes that morale was *affected*, but nowhere does it go so far as to suggest that morale was *destroyed*. Craven and Cate pretty much skirt the question. Among Verrier's five specific conclusions (pp. 312–23) is one that states: ". . . the collapse or even the deterioration of enemy civilian morale should not be included as an objective." This conclusion is labeled a "factor" pertaining to air warfare as demonstrated in World War II. The other four conclusions are that control of operations must be concentrated; intelligence of enemy strength must be reliable and up to date—more so than is required for ground operations; command of the air is more than the capacity to continue operations; and "precision bombing" is a term of art only, making for false optimism and inaccurate estimates of the ratio of force to target.

6. Chapter X abounds with examples. One to which Wright gives special place is the U.S. and British refusal to allow the Soviets to participate in the Italian settlement in 1943. In Stalin's eyes, he suggests, here was the *cordon sanitaire* being re-established. "Although Stalin's charges of bad faith were unfounded, he was doubtless convinced of their validity."

The Contributors



GENERAL JOHN PAUL MCCONNELL (USMA) was Chief of Staff, United States Air Force, from 1 February 1965 until his retirement on 1 August 1969. After flying training in 1933, he served for a time as a fighter pilot; other early duty was in operational, engineering, and administrative assignments, including Assistant Executive to the Acting Chief, Army Air Forces; Chief of Staff, AAF Technical Training Command; and Deputy Chief of Staff, AAF Training Command. Assigned to the China-Burma-India Theater in 1943, he saw combat in Burma and held training, staff, and command positions in India, Ceylon, and China, where he was Senior Air Adviser to the Chinese Government, until 1947. Subsequent assignments have been in Air Force Headquarters as Chief, Reserve and National Guard Division, later of Civilian Components Group, DCS/O, to 1950; in England, where he commanded the Third Air Force and 7th Air Division, to 1953; in Hq Strategic Air Command as Director of Plans, to 1957; as Commander, Second Air Force, SAC, Barksdale AFB, to 1961; Vice Commander in Chief, SAC, to 1962; and Deputy Commander in Chief, U.S. European Command, France, to August 1964, when he was appointed Vice Chief of Staff, USAF.



GENERAL HOWELL M. ESTES, JR. (USMA) was Commander, Military Airlift Command, for five years preceding his retirement on 1 August 1969. After three years with the cavalry and in flying training, 1939-40, he served in various training and command assignments during World War II. Other assignments have been at Hq USAFE, in chief and deputy chief roles in plans and operations, to 1948; at March AFB, California, as Commander, 1st Air Base Group, 22d Bomb Wing, and 44th Bomb Wing, to 1951; on combat duty and as Vice Commander, FEAF Bomber Command, 1951; at March AFB as Commander, 105th Bomb Wing, later 12th Air Division, to 1953; Commander, Air Task Group 7.4, Joint Task Force Seven, Operation CASTLE, Eniwetok, 1954; at Wright-Patterson AFB as Director, Weapons Support Operations, later Assistant Deputy Commander for Weapon Systems and Commander, Detachment 1, Hq ARDC, and Director of Systems Management, to 1957; at Hq USAF as ACS/Air Defense Systems, later ADCS/O, to 1961; in Air Force Systems Command as Deputy Commander for Aerospace Systems, Los Angeles, 1962; and as Vice Commander, AFSC, Andrews AFB, Maryland, to 1964. General Estes is a 1949 graduate of the Air War College.



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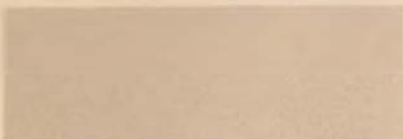
Military Airlift Command. He was commissioned in 1940 and spent the war years in B-17 and B-29 training and command assignments. Since then he has served in Hq Far East Air Forces as Chief, Cargo Traffic Control Section and Transportation Division, to 1949; student, Air Command and Staff School, continuing there as an instructor until 1953; in Hq USAF as Chief, Traffic Division, and of Requirements and Allocations Division, to 1956; as Deputy Commander and Commander, 1502d Air Transport Wing, Hawaii, to 1959; ADCS/O, Hq Military Air Transport Service, Scott AFB, to 1964; Commander, 63d Troop Carrier Wing, at Hunter AFB, Georgia, to 1966 and at Norton AFB, California, to August 1968, when he assumed his present position. General Curtis is a graduate of the Industrial College of the Armed Forces.



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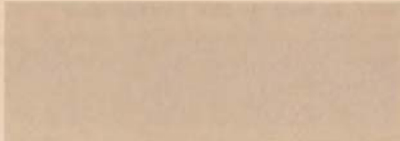


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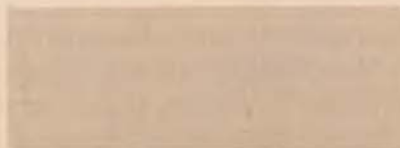


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HARRIET FAST SCOTT lived and traveled extensively throughout the Soviet Union as the wife of Colonel William F. Scott, U.S. Air Attaché, 1962-64. Her fluency in the Russian language and her familiarity with Russian military writings have been reflected in articles in *Military Review* and *Air University Review* and in selections and translations from the Soviet military press appearing in the Pentagon's *Current News* and *The Friday Review of Defense Literature*. Mrs. Scott is coauthor, with Dr. William R. Kintner, of *The Nuclear Revolution in Soviet Military Affairs* (1968).



LIEUTENANT COLONEL DONALD L. CLARK (M.A., George Washington

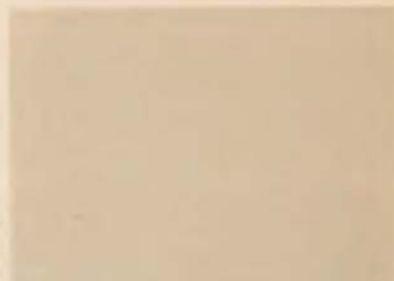
University) is Chief, Communist World Branch, Air Command and Staff College. Commissioned from AFROTC upon graduation from Southern Methodist University, he has held assignments in Strategic Air Command, Air Training Command, USAF Security Service, Hq USAF, and Air University, as crew member (navigator), provost marshal, squadron commander, and instructor. He was Assistant Air Attaché in Moscow, 1966-68. Colonel Clark is a graduate of the Squadron Officer School and Air Command and Staff College and is a frequent lecturer on the U.S.S.R. in the civilian community as well as Air University.



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MAJOR DAVID MACISAAC (A.M., Yale University) is an Assistant Professor of History, United States Air Force Academy. Since his commissioning in 1957 from AFROTC, his assignments have been as Chief, Personnel Control Branch, 4245th Strategic Wing, Sheppard AFB, Texas, 1959-61; Chief, Officers Branch, Military Personnel Division, Hq Sixteenth Air Force, Torrejon AB, Spain, 1961-64; Instructor in History, USAFA, 1964-66; and Ph.D. candidate in history (AFIT-sponsored), Duke University, 1966-68. His dissertation on the U.S. Strategic Bombing Survey, 1944-47, is nearing completion. His articles have been published in *Air University Review*, and he is on the Editorial Board of *Aerospace Historian*.



AWARD

The Air University Review Awards Committee has selected "A New Vitality in Soviet 'Defense' Posture" by Major William T. Wilson, USAF, as the outstanding article in the July-August issue of the *Review*.

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