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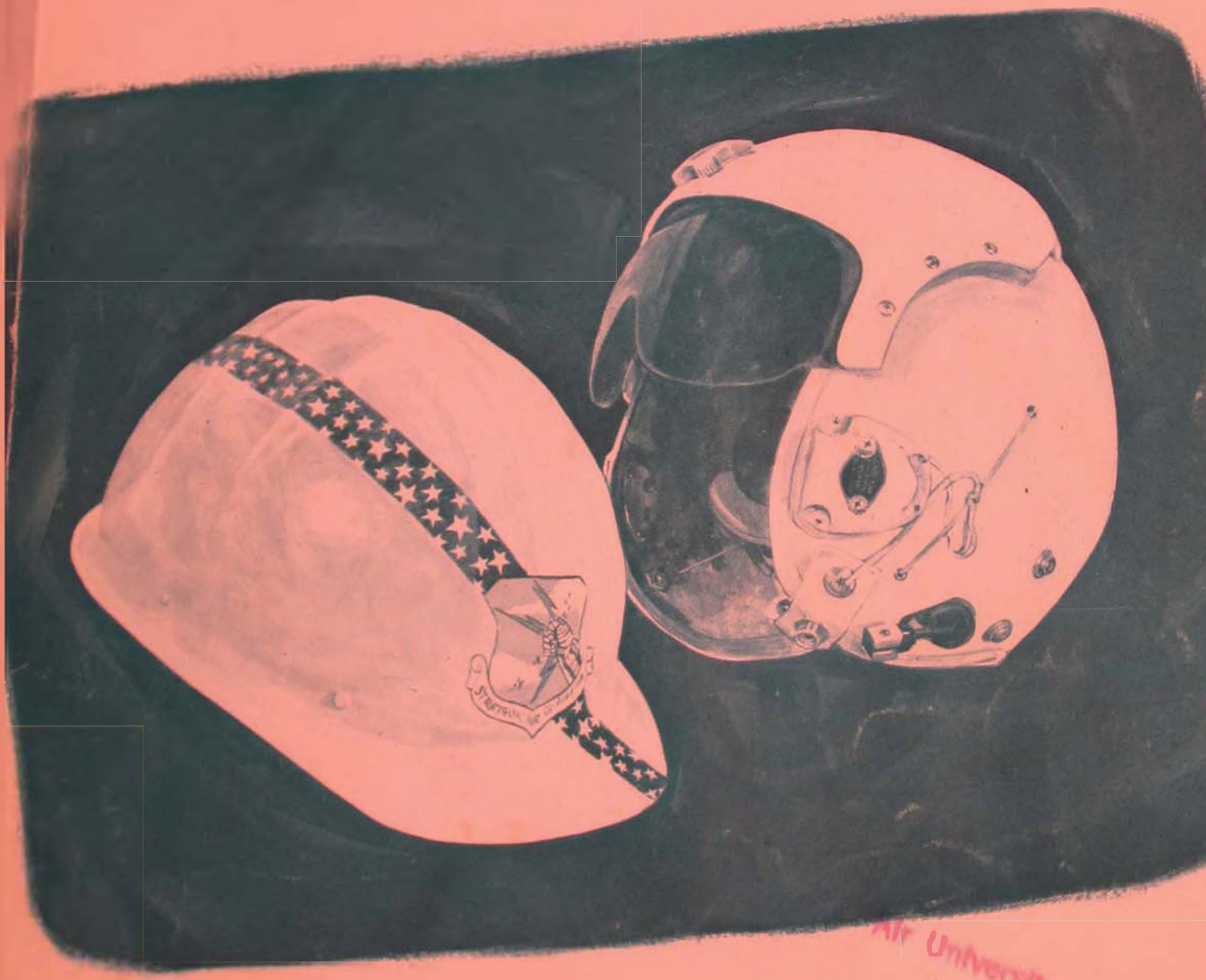

STRATEGIC AIR COMMAND: INSTRUMENT OF NATIONAL POLICY

JANUARY-FEBRUARY 1968

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the cover

"By mixing our strategic force, . . . we take advantage of both [manned aircraft and guided missile] systems and can cover the entire spectrum of strategic requirements." Thus two hats, those of the flying crew and the missileman, denote the Strategic Air Command. In this issue of the *Review*, General Joseph J. Nazzaro, SAC Commander in Chief, and three members of his command present an inside view of SAC's global mission and operations.

SAC: AN INSTRUMENT OF NATIONAL POLICY

General Joseph J. Nazzaro

WE IN Strategic Air Command have always believed that a full understanding of the capabilities of the command is essential to those we wish to deter, as well as to our own citizens. Any action or counteraction directed by our national authority and taken by the command demonstrates to the world SAC's role as an instrument of national policy and as a deterrent to war.

Faced with the militant threat of world Communism, the Free World cannot afford to base its plans for survival on wishful thinking or hopes for a better world. Instead, to counter this threat and assure that the position of the United States is maintained, SAC operates from a strategy of deterrence—one which requires a strong force in being. While our opponents are the only men in the world who know what level of superiority will deter them, to date our decisive—if not overwhelming—capability has prevented a nuclear confrontation.

Superior, flexible offensive systems, with the ability to inflict unacceptable damage, are the vital ingredients of this force. This is the first principle involved in deterrence. Secondly, to a nation which shuns initiation of hostilities and is disinclined toward pre-emption, the survivability of this force is basic. A third element of this strategy is command and control. This force would fail to fulfill its mission if we could not—or the Communists thought we could not—maintain command and control of the force under the worst possible situations. With these three elements of a deterrent force in mind, I would like to discuss the Strategic Air Command as it is postured today and touch on a few of our interests in the future.

The mission of the command has been stated in a number of ways throughout its 21-year history, but it remains essentially the same: the deterrence of general war. In fact, just before the War Department published the official directive establishing the command in 1946, the AAF Commander, General Carl Spaatz, in a note to the Commander, Continental Air Forces, wrote: "The Strategic Air Command will be prepared to conduct long-range offensive operations in any part of the world, either independently or in cooperation with land and naval forces . . . to conduct maximum range reconnaissance . . . to provide combat units . . . to train units and personnel in maintenance of the strategic forces in all parts of the world . . ."

That statement and the implementing directive heralded the beginning of SAC and assigned to the command some of its duties. Actually, the SAC capabilities for strategic aerospace conflict have developed until they apply across the warfare spectrum. These applications could include a "show of force" or demonstration of intentions during the cold war; long-range, all-weather conventional bombing support in limited warfare; and the deterrence of any aggressor from escalating to general war. A study of the record will show that SAC has been pre-eminently successful in meeting its stated and implied responsibilities in each of these categories during the past 21 years.

Although our bombers have always had the ability to deliver conventional weapons or "iron" bombs, the current use of B-52s in Southeast Asia has focused increased interest and emphasis on that capability. We effectively employ the B-52s, originally designed for a high-altitude nuclear role, in high-density bombing of South Vietnam areas that are controlled by the Viet Cong. Targets are nominated by the Commander, Military Assistance Command, Vietnam, approved by the Joint Chiefs of Staff, and executed by SAC.

It is important to understand that SAC's conventional capability is not considered a replacement for, or in competition with, theater forces available to commanders. SAC is there to combat the enemy with a concentration of firepower that cannot be supplied in any other way. Although many observers point out the rather unusual application of heavy bombardment units in a guerrilla warfare situation, the use of the large-payload, all-weather capability of strategic bombers in support of ground forces is certainly not new.

In 1944 we used hundreds of B-17s to "carpet bomb" before Saint-Lô and assist with the breakout from the Normandy beachhead.

In Korea we used B-29s to support front-

Anyone doubting the role of strategic bombers in guerrilla warfare has perhaps forgotten the carpet-bombing missions of World War II. To assist the Allied advance from the Normandy beachhead, entire wings of B-17s streaked across the Channel and saturated enemy-held areas.

line troops and saturate enemy buildup areas. In nine days after being alerted, SAC bomb groups flew their first mission against the Communists. These units took just three months to destroy every strategic industrial target in North Korea—with conventional bombs. With no industrial targets left, B-29 bombers systematically destroyed transportation lines, enemy airfields, and even flew close support missions.

Today, in Southeast Asia, when the requirement arises for a large concentration of bombs, accurately delivered, under any weather conditions, the employment of SAC bombers offers the best solution.

The B-52 raids have been cited by Viet Cong and North Vietnamese defectors as the "most feared" combat capability employed against them.This is understandable when one considers that each B-52 can deliver up to a 60,000-pound bomb load at any range, through the use of air refueling. In terms of bombs, this amounts to eighty-four 500-pound bombs or forty-two 750-pound bombs stored internally and twenty-four 750-pound bombs carried externally on racks under the wings. Contrast this with the maximum 20,000-pound capacity of the B-29 in Korea and the 3000- to 4000-pound load of the B-17 in Europe.

While our contribution to conventional warfare in Southeast Asia is made entirely by manned aircraft, SAC's primary mission of deterrence of general war is best accomplished by a mixed force of bombers and intercontinental ballistic missiles. It should be recognized that both bombers and missiles are excellent weapon systems and that each has unique capabilities lacking in the other. In the overall SAC deterrent mission each system plays a complementary, not a competitive, role.

A quick enumeration of the advantages of each system will illustrate this point. Manned bombers best meet the requirement for *flexibility*. While an ICBM, by definition, follows a ballistic path to its target, the manned system can vary tactics, axis of attack, altitude, and penetration corridors and can circumnavigate known or detected concentrations of defense.

(Continued on page 8)

Mixed Strategic Force

Among the deterrent forces of the Strategic Air Command are manned aircraft and guided missiles in several configurations. At a Montana Minuteman site a SAC maintenance technician (opposite) climbs down to check out a component of the silo-stored intercontinental ballistic missile. . . . B-52 Stratofortresses, armed with 60 tons of bombs and Hound Dog missiles, probe deep into enemy territory, routing the Viet Cong and keeping them on the move. . . . A KC-135 takes off for a refueling rendezvous. . . . Aboard an EC-135C airborne command post, the SAC airborne battle staff checks a communications system. The aircraft contains four UHF transmitter-receiver systems and four single side-band units, which can be used in pairs or all together for monitoring various channels.

The manned bomber can seek out targets the precise locations of which are not known, determine if they have been neutralized by previous strikes, and attack as necessary. With our missile systems, the exact geodetic information for the target must be known, and success or failure of a missile strike must be determined by an outside reconnaissance effort.

The missiles, on the other hand, are unquestionably superior in their "quick kill" capabilities. Their fast reaction of one minute or less, plus the unprecedented speeds, enables them to destroy targets approximately thirty minutes after decision to launch. This speed of application is far beyond that of our present or foreseeable manned strike systems.

By mixing our strategic force, then, we take advantage of the superior features of both systems and can cover the entire spectrum of strategic requirements.

SAC's mixed force today is composed of some 600 B-52 and B-58 bombers supported by a similar number of KC-135 jet tankers, to insure adequate range extension for complete target coverage. The missile force numbers more than 1000 Titan II and Minuteman I and II intercontinental ballistic missiles. This is the hardware employed by the command.

But for many years in SAC we have functioned under the established principle that the most important part of an in-being capability is people and that personnel proficiency and dedication are primarily responsible for our day-to-day capability. SAC's present position can be equated to the ingenuity and drive of its professional manpower over the years. Intensive training, great responsibility, frequent hardships, and intensive quality control have made the men of SAC the most professional military organization in history.

This continuous program of training, "no notice" operational tests, and improvements to tactics and techniques assure the capability of this force to carry out its mission.

Survivability, the second requirement mentioned earlier, means that a credible deterrent force must be able to survive the initial strike by an enemy and still deliver an unacceptable level of damage upon him and his war-making ability. To accomplish this, it is SAC's task to ensure, within the limits of the resources provided by Congress and the executive branch of the government, the maximum survivability of its force-in-being at any given moment.

In an age of ICBM's able to strike halfway around the world within a half hour, only wide dispersal and a quick-reaction posture assure the survival of our manned systems. In October 1957 a limited number of SAC bombers and tankers at U.S. and overseas bases went on ground alert, and since early 1961 we have maintained approximately half our bomber and tanker force on ground alert. Dispersed at many operating locations, they are ready to react well within the warning time provided by the North American Air Defense Command Ballistic Missile Early Warning System (BMEWS). Operation of a ground alert of this magnitude demands a professional force of crews and support personnel, with crews averaging a 74-hour duty week.

As a further step we have tested and proved the concept of airborne alert with several thousand training sorties. Under this concept, now known as the airborne alert indoctrination training mission, a percentage of the command's B-52s remains continuously airborne, 24 hours a day, seven days a week. This tactic would assure the survival of a portion of the command's retaliatory striking power even under an all-out missile attack executed in total surprise. It was during the highly volatile Cuban missile crisis of October 1962 that SAC first conducted an actual airborne alert, the first in the history of air power. This was maintained throughout the period of confrontation, convincing the Soviet leadership that its offensive missiles should be removed. In the face of this, plus other demonstrated American military strength, the missiles were withdrawn from Cuba.

Because ICBM's, unlike bombers, cannot be recalled once they are launched, the survival considerations of this part of the mixed force are quite different from those of the bombers. The missiles must ride out an enemy attack and then function in the environment of a nuclear exchange. Our Titan II and Min-

uteman silos are widely dispersed, at least one bomb apart, so that one enemy weapon could not destroy more than one of our silos. In addition, they are hardened to withstand anything but a direct nuclear hit. Missile combat crews carry the same alert responsibilities as their aircraft counterparts: to be prepared 24 hours a day to respond to national command authority.

The quick reaction of our manned aircraft and the hardening of the missile sites, coupled with the wide dispersal of both systems, give us a high degree of confidence in our ability to survive an enemy's first strike.

The third essential of the SAC force is command and control. Our national authorities must have not only day-to-day control of the strategic forces but positive communications and execution in wartime.

The SAC force is controlled from the underground command post at Offutt AFB near Omaha. From this command post our worldwide command and control communications network maintains instantaneous contact with all SAC units as well as with the National Military Command Center and other unified commanders around the world. Our three numbered air force headquarters maintain alternate command posts that could take over should SAC headquarters be destroyed.

A further backup is provided by another SAC innovation, the Airborne Command Post. Since 3 February 1961, we have had an Airborne Command Post aircraft continuously airborne, complete with communications equipment and manned by an experienced team of controllers. The availability of this airborne control team, headed by a SAC general officer designated as airborne emergency actions officer, gives further guarantee of effective control of the SAC force.

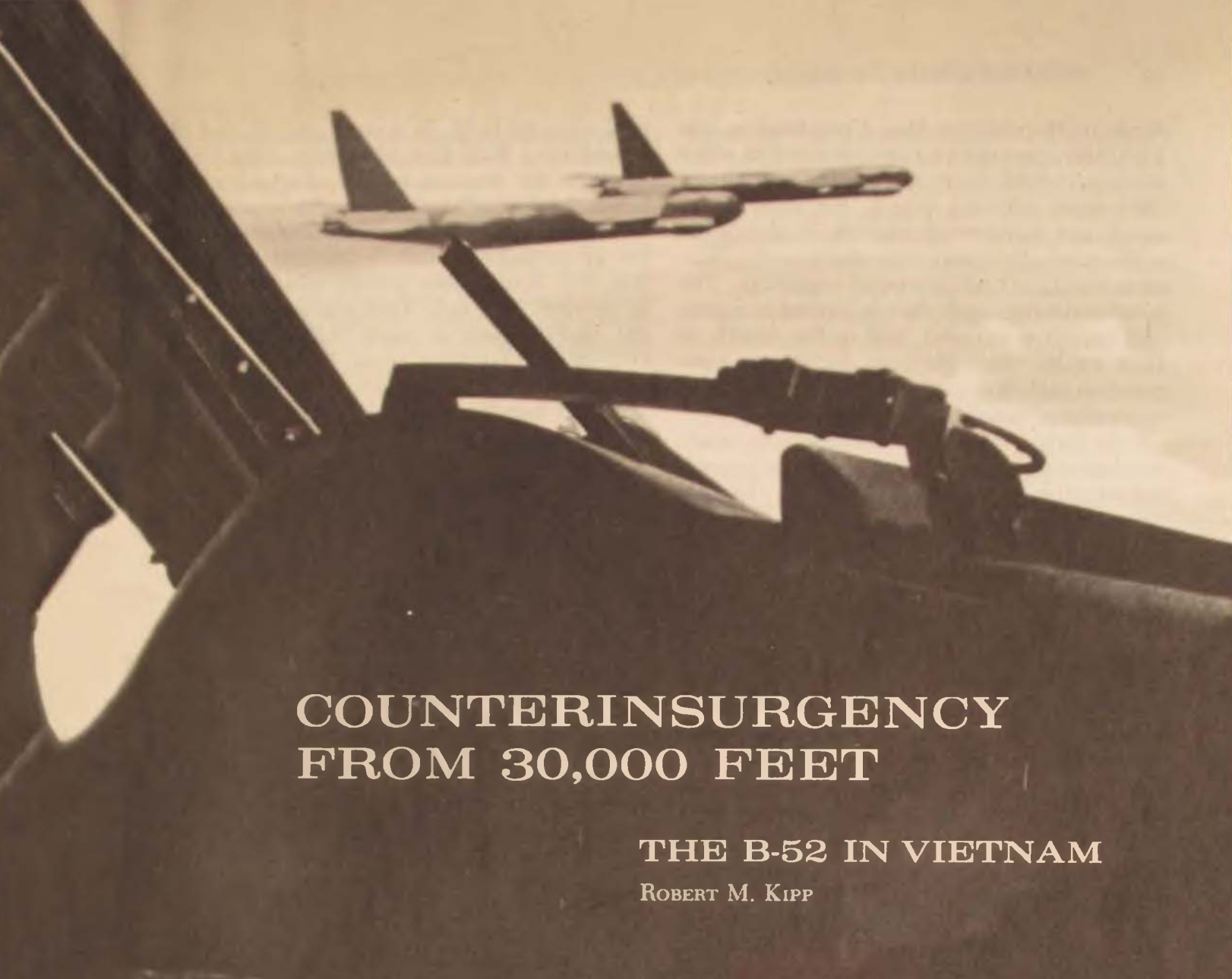
I HAVE BRIEFLY described the essentials of a deterrent force and how SAC fulfills these requirements at this time. We are convinced that maintaining strategic superiority is one of the most critical defense problems the United States faces today and in the future. We believe our national strategic military effort should continue to develop the mixed force.

First, we should retain the flexibility tested and demonstrated in manned bomber systems. The bomber version of the F-111 will become operational in the SAC inventory in the late 1960s. In conjunction with the newest model B-52s, the FB-111 will give us complete target coverage through about 1975. By that time, even the newest B-52s will be nearing obsolescence, and we see the need then for a larger aircraft than the FB-111 to cover the deeper targets. Such a system, the Advanced Manned Strategic Aircraft (AMSA), is being evaluated today.

Second, we should continue to improve our missile capabilities. This we are doing. Through force modernization, the Minuteman I is giving way to the improved Minuteman II, and a further development called Minuteman III will continue to expand and upgrade our missile capabilities.

With the deterrent force I have described now in being, our government has considerable freedom to use diplomatic, economic, and political instruments in international affairs as well as support our allies in limited wars or contingency operations. As a result of this current capability, our primary concern is not so much for today as for the continuation of this capability into the future.

Hq Strategic Air Command



COUNTERINSURGENCY FROM 30,000 FEET

THE B-52 IN VIETNAM

ROBERT M. KIPP

You don't fight this fellow rifle to rifle. You locate him and back away. Blow the hell out of him and then police up.

Brigadier General Glenn D. Walker,
ADC, 4th Inf Div

STRATEGIC AIR COMMAND always has possessed a capability to deliver conventional bombs. A number of bomber crews were scheduled to make an actual drop of high-explosive ordnance during each training period. The command did not accord the program much priority, however, until the early 1960s. The Kennedy Administration placed renewed emphasis on improving the abilities of the nation's armed forces in limited-war situations that did not call for the use of nuclear weapons.

The first SAC operations plan to specify units and the number of aircraft that might be called upon for limited-war operations using conventional ordnance was prepared to meet a requirement expressed in the Joint Chiefs of Staff's Joint

Strategic Capabilities Plan. Completed in late 1961, this contingency plan remained in effect until early 1963. Succeeding plans in 1963 and 1964 were different only in the units designated and number of aircraft. It should be understood, however, that these early plans represented a kind of on-call capability. The command's responsibilities in limited war were still largely undetailed, and to the middle of 1964 similar plans prepared by theater commanders included no explicit provision for SAC conventional weapons support.

In early 1964 a definite acceleration in SAC contingency planning took place. The worsening situation in Southeast Asia and the continued national policy emphasis on flexibility of arms to counter aggression at any so-called threshold of violence had convinced General Thomas S. Power, then Commander in Chief, SAC, that his bombers should play a more prominent role in limited conflicts. He told the president of RAND Corporation that ". . . exploitation of SAC's potential for engaging in any level of conflict . . . would result in a greater economy in our national defense posture, produce more positive results, and increase national prestige by a clear demonstration of national resolve."[1] The CINCSAC received encouragement in the development of his plans from the then Vice Chief of Staff of the Air Force, General J. P. McConnell, and from Secretary of Defense McNamara. On 1 July 1964, SAC published its most comprehensive contingency operations plan to date. It provided for a range of alternatives for delivery of conventional and nuclear weapons under conditions of limited war. Of particular interest, in light of subsequent events, was the provision for operation of a force of B-52s and tankers to support Commander in Chief, Pacific.

In the spring of 1964, bomb wings designated as having a contingency mission began an extensive testing program to verify and improve their ability to deliver conventional munitions. They continued the tests in May and early June, using a B-52F modified by affixing two sets of multiple-ejector external bomb racks to the wing pylons. This modification permitted the B-52 to carry 24 additional 750-pound demolition bombs and increased the total capacity to 51. In a more realistic test of capability, a B-52 flew 5200 miles from California to the Mariana Islands, dropped a full bomb load, and landed at Andersen AFB, Guam. Through the late months of 1964 testing of contingency units continued to insure that they could move quickly should they be so ordered. The year 1964 had seen substantial improvement in SAC's ability to deliver conventional bombs. General Power in a sense summed up the importance of this not newly acquired but lately polished capability in a speech in October:

> It is not generally known that SAC also has the capability to deliver conventional weapons, and it can do so on short notice, accurately, and from bases far beyond the reach of any limited-war opponent. Therefore, strategic airpower is an invaluable tool in limited war.[2]

No forces were deployed until early in February 1965. Then, as part of a series of actions to expand U.S. strength in the western Pacific, the Joint Chiefs of Staff ordered to Guam those forces which the contingency plan specifically assigned to the Far East. On 11 February bombers and tankers from Mather AFB, California, and Barksdale AFB, Louisiana, left for bases in the western Pacific. There they were to wait for several months before being called into service.

After several months of study it was decided that the B-52s could be used most effectively in the Vietnam war against enemy logistics centers. The reputation of the Viet Cong as a skilled sapper was well deserved. In the jungles of War Zones C and D, in the Iron Triangle, and in numerous less-well-publicized parts of South Vietnam, the VC had located his supply caches, training centers, hospitals, and communication centers. Facilities were widely dispersed. The tree canopy hid them from aerial observation. Tunnels, trenches, bunkers, and caves honeycombed the areas. For years these sanctuaries had been virtually inviolable from attack. Joseph Alsop has described their importance in the guerrilla's strategy:

> Two or three night marches out from the base, one or two days fighting at the scene of his regiment's operation, and two or three night

> marches back to his regimental main-base area —that was about the maximum effort that was normally required each month. The balance of every month was spent resting, training, absorbing replacements, and doing meticulous sand-table exercises to prepare for the next sally against a government post. And all these weeks between operations were passed in the absolute security of a main base, with its simple but comfortable barracks, its reassuring fortifications, and its food caches.[3]

From these secure bases the VC lately had been emerging in battalion strength to challenge the government of South Vietnam. Consequently, General William Westmoreland, Commander of United States Military Assistance Command Vietnam (COMUSMACV), assigned a high priority to attacking them with air power. Tactical aviation had proved unsuitable for the job because precise information regarding elements within the target area necessary for pinpoint bombing was not available. The B-52 seemed the ideal means to deliver a large amount of high explosives in a short period of time on these area targets. The bomber's all-weather capability also would be valuable during the seasonal monsoon weather. The JCS and Secretary of Defense agreed that the B-52s should be committed. Mr. McNamara explained later: ". . . the military commanders felt—and I believe that this was a proper use of the weapon—that these strikes would destroy certain of the Viet Cong base areas . . . there is no other feasible way of doing it."[4]

The target selected for the first B-52 strike on 18 June 1965 was a typical Viet Cong jungle sanctuary, measuring two by four kilometers, in the Ben Cat Special Zone, Binh Duong Province, northwest of Saigon. From this area the VC had been launching attacks against traffic on nearby Route 13. Intelligence indicated that troops were massing there for a suspected offensive. The mission of 18 June was not an auspicious beginning. Two bombers collided during the refueling phase of the mission and crashed into the South China Sea off the Philippines. Another aborted prior to reaching the target. Twenty-seven B-52s reached the target, but one did not bomb because its bomb-bay doors malfunctioned. The tragedy of the lives lost and the destruction of the aircraft tended to overshadow all else, especially since ground reconnaissance teams could find little evidence that the strike had caused any VC casualties or significant damage to facilities.

As might be expected, sections of the press were critical of what seemed to be an unorthodox use of strategic aircraft (the analogy of using a sledgehammer to kill gnats found its way into print again), but attention focused on the costly accident and the contrasting small loss to the enemy. The military command in Saigon chose to evaluate the strike within the context of the Vietnam war itself, which by its very nature permits few spectaculars, even when using B-52s. The ordnance got to the target as planned, ground troops were able to penetrate, without loss, an area heretofore considered unassailable, and coordination of the mission had been excellent. Those responsible for running the war in the theater felt the B-52 strikes should continue. If the VC was not home today, he would be home tomorrow. The B-52's mission would be to harass the enemy, disrupt his normal activities, permit him no respite from attack even in his jungle redoubts, and wear him down psychologically. The accomplishment of these objectives pointed to a long campaign, the end of which could not even be predicted. It was within this context that the first B-52 mission assumed its proper perspective.

After one mission in June and five in July 1965, B-52 conventional bombing activity accelerated during the next five months in proportion to expansion of U.S. participation in the war. By the end of the year missions were being flown almost daily. The bombers ranged from Quang Tri, South Vietnam's northernmost province, to An Xuyen, its southernmost province. Over 1500 sorties were effective over the target. Forces used ranged from 30 to 6 aircraft per mission. The standard ordnance dropped was the 750-pound bomb, although late in the year SAC began to use the 500-pound bomb in the bomber's internal bays. Almost 26,000 tons of high explosives were dropped during the first six months of operations.

(Continued on page 16)

...a day's work

Although accounts in the public press may sometimes smack of high drama, usually to the men on the ground and to those at the controls a B-52 bombing mission against the Viet Cong is all in a day's work—servicing the mighty Stratofortress, stoking her with bombs, and easing her aloft for flight to the appointed objective.

Yet routine though the job may seem overhead, there's plenty of "action" below, where SAC's B-52 with its 60,000-pound bomb load has become the "most feared" threat to both the Viet Cong and its North Vietnamese supporters.

It was admittedly an expensive operation. Secretary of Defense McNamara estimated that the cost of the bombs alone was $30,000 a sortie.[5] But the Secretary had also said earlier that what the U.S. sought in South Vietnam was a limited objective, and it would be accomplished with the lowest possible loss of lives and not necessarily with the lowest expenditure of money.[6]

The magnitude of operations continued to increase during 1966. Twice as many sorties were flown in the first half of the year as during the last six months of 1965. In number of sorties launched, which is a more accurate measure of activity than mission totals, the increase was more than 700. Also a greater variety of ordnance was carried, and heavier tonnages were dropped after the B-52F was replaced by the B-52D, which had been modified with a high-density, internal bomb bay capable of holding a maximum load of eighty-four 500-pound bombs. Add to this the 24 bombs carried externally, and the total load became one hundred eight 500-pound bombs.

As for targets, there was no change in the overall priority. The VC encampments continued to receive the most attention. Additional strikes were made against targets previously hit or in areas adjacent to prior targets. As a direct result of improved intelligence, more information was received of particularly worthwhile targets, usually of troop concentrations, which had to be struck quickly for maximum results. When this happened, previously planned missions were delayed.

In April 1966 B-52s hit North Vietnamese territory for the first time. Two missions struck the Mu Gia Pass, a natural supply interdiction point on the Laos–North Vietnam border. In the summer months, as infiltration of North Vietnamese troops increased, particular attention was given to targets in the vicinity of the Demilitarized Zone separating North and South Vietnam. Increased direct support of ground troops also was given. In late 1965 SAC bombers twice had assisted infantry actions, in Operation Silver Bayonet (Battle of the Ia Drang Valley) and Operation Harvest Moon. In this capacity the heavy bombers performed as long-range artillery (an analogy often used by ground commanders), hitting suspected enemy strong points and reported troop concentrations. By December 1966 it was estimated that more than half the strike requests came from field commanders. Such targets demanded immediate response. Beginning in July 1966 SAC designated a portion of the Guam bombers as a quick-reaction force. This force used preplanned routes to the target for bombing close to friendly troops. Thus planning was reduced to the minimum, and reaction time was little more than the time required to fly to the target.

In the 18 months from June 1965 through December 1966, SAC B-52s in Southeast Asia dropped more than 130,000 tons of high explosives on nearly 800 missions. During this time almost 98 percent of all bombers launched dropped their bombs over the target as planned. The B-52 proved a very reliable instrument for delivering high explosives. Air and ground crews displayed a high degree of professional skill in accomplishing their tasks. No less a standard had been expected when SAC was called into action, and, indeed, this was part of the reason why it was called. What SAC had done, it had done well. But what had it done?

General Westmoreland has emphasized on a number of occasions his satisfaction with the results of the air campaign to date. The heavy bombers provided him with the means to lay down a concentration of firepower on relatively large target areas during day or night and in all kinds of weather. He did not have this capability before. He was convinced that the cumulative results of such missions would prove the concept valid. That troops were able to penetrate areas previously in the sole possession of the VC was itself significant. Westmoreland took personal interest in the selection of B-52 targets to insure that the bombers were being used profitably. He also visited Guam in June 1966 to talk to bomber crews and explain how their efforts fitted into the bigger picture of the war.

WITH the limited amount of information available to date, it is not possible to arrive at a substantive conclusion regarding

bombing effectiveness, but some observations can be made, based on what has been learned.

Aerial photography, the most common means of accounting bomb damage, followed each mission, but the character of the terrain and the enemy's tactics of tunneling and underground storage made assessment of damage by this means alone unreliable. Ground exploitation was considered the best means of assessing bomb damage. More than once troops combing the target area found supplies and facilities that had not been detected in photographs. During the first months of B-52 operations there were relatively few U.S. troops in South Vietnam, and they were needed on higher priority missions. Also, many of the targets were deep in VC-controlled areas and thus inaccessible. By the end of 1965 only about one-third of the targets had been exploited by ground troops. When infantrymen did go in, the chances of their finding that the strike had been effective were about fifty-fifty, according to General McConnell. Half the time the enemy camps were where intelligence said they would be, and the VC were hit hard; the other half, intelligence was faulty, and the camps were either not there or the VC had not been in the target area when the bombs fell.[7] The number of ground follow-ups increased with the number of U.S. troops in Vietnam. Continued emphasis was given to improving the quality and increasing the number of Army observations.

Those entering a typical B-52 target area found the landscape torn as if by an angry giant. The bombs uprooted trees and scattered them in crazy angles over the ground. The tangled jungle undergrowth was swept aside around the bomb craters, sometimes revealing previously hidden field fortifications and openings to tunnel systems. The holes blasted in the jungle canopy made convenient landing zones for helicopters supporting the advance of the infantry. Upon occasion caches of enemy materiel (rice, salt, clothing, ammunition, weapons, medical supplies, and documents) were located and either confiscated or destroyed. Only rarely were any enemy dead found, although reports often spoke of trails of blood, used bandages, and a "smell of death" which lingered in the area. The Viet Cong were usually quite thorough in carrying off their wounded and dead or burying them in the interval between the end of the bombing and the arrival of troops.

It was equally difficult to assess the immediate effect of B-52 bombings on enemy morale. Because many strikes were in areas tightly controlled by the VC, people with knowledge of the strikes were difficult to find in any number. Still, with time, prisoners, defectors, and refugees did provide some information of what it was like to be on the receiving end of what one VC soldier-poet called "the chain of thunders." Most discouraging to the VC, it seemed, was the effect of delay-fuzed bombs on their cave and tunnel complexes. General Earle Wheeler, Chairman of the JCS, has said: ". . . the weight and acceleration of the 750 and 500-pound bombs are such that they will penetrate deep into the ground before they go off, and then will collapse the tunnels and cave complexes which the Viet Cong had been led to believe were absolutely invulnerable from any sort of bombing."[8] The VC took measures to mitigate the effects of the strikes—more frequent movement, wider dispersal when in bivouac, and deeper tunnels. But perhaps the most realistic response to the B-52s was the one explained by a former VC platoon leader: "All of us, including our superiors, have been instructed to run as soon as we heard the roaring from the high sky . . . no matter how deep the tunnels."[9] General Westmoreland has said that prisoners and defectors list the B-52 as the most feared of all weapons arrayed against them.[10]

Not surprising, then, by the end of 1966 more than half of all calls for B-52 support in Vietnam came from field commanders. These were given first priority because the requesters were usually in contact with the enemy. The unparalleled, lavish use of firepower as a substitute for manpower is an outstanding characteristic of U.S. military tactics in the Vietnam war. Israeli General Moshe Dayan, who visited the country in the fall of 1966, witnessed its application:

> The Americans carry out their counterattacks and pursuits in the jungle not with infantry but

with firepower . . .

The problem faced by an American infantry unit engaging the Vietcong is not how to storm the enemy positions but how to discover where they are. The storming and assault will be done by the 155s and aerial bombs. These are not restricted to jungle paths and are not vulnerable to ambush.

The most effective weapons the Americans have for this function are their heavy bombers and they can operate no matter what the weather or visibility.[11]

Reporting on this kind of support during Operation Harvest Moon, Major General L. W. Walt, Commander of the Third Marine Amphibious Force, described the effect of a B-52 strike as "awesome to behold" and added that as a result: "The enemy has abandoned his prepared positions and much of his equipment in great confusion, and this is making our part of the job easier."[12] Brigadier General Ellis W. Williamson, Commander of the 173d Airborne Brigade, emphasized the precision of the strikes: " . . . I have observed several dozen, the strike comes in at the appointed moment and it hits exactly where we asked it to. They are accurate. They're extremely good."[13] Perhaps Major General F. C. Weyand, Commander of the First Field Force during Operation Attleboro, best summed up what the heavy bomber strikes mean to the infantry:

These B-52 strikes are of incalculable value . . . They do tremendous damage to enemy installations and base facilities; they destroy enemy fortifications; and most of all they constitute a Sword of Damocles over the heads of VC field commanders that must enter into any of their plans that would call for massing units preparatory to a large scale attack.[14]

It seems reasonable to suggest that the main contribution of B-52s to date in the Vietnam war has been the constricting effect the bombings have had on the enemy's freedom of movement and range of action. Emphasis then focuses on the psychological effect on the enemy of being bombed—or what is perhaps almost as disturbing, the threat of being bombed —and its debilitating effect on enemy plans for major operations. There is increasing evidence that the bombings are lowering enemy morale and, according to General Westmoreland, have " . . . frequently resulted in the enemy being thwarted in his plans for an offensive and his being prevented from massing and carrying out his planned maneuver."[15] This kind of total pressure, for which the B-52 is uniquely qualified, is calculated ultimately to destroy the cohesion of the enemy's organization. To date, success in this endeavor has been encouraging.

Hq Strategic Air Command

Notes

1. Ltr, General Thomas S. Power to Mr. Frank R. Collbohm, 17 June 1964.
2. Address by General Power at the anniversary banquet of the Strategic Industries Association, Los Angeles, 17 October 1964.
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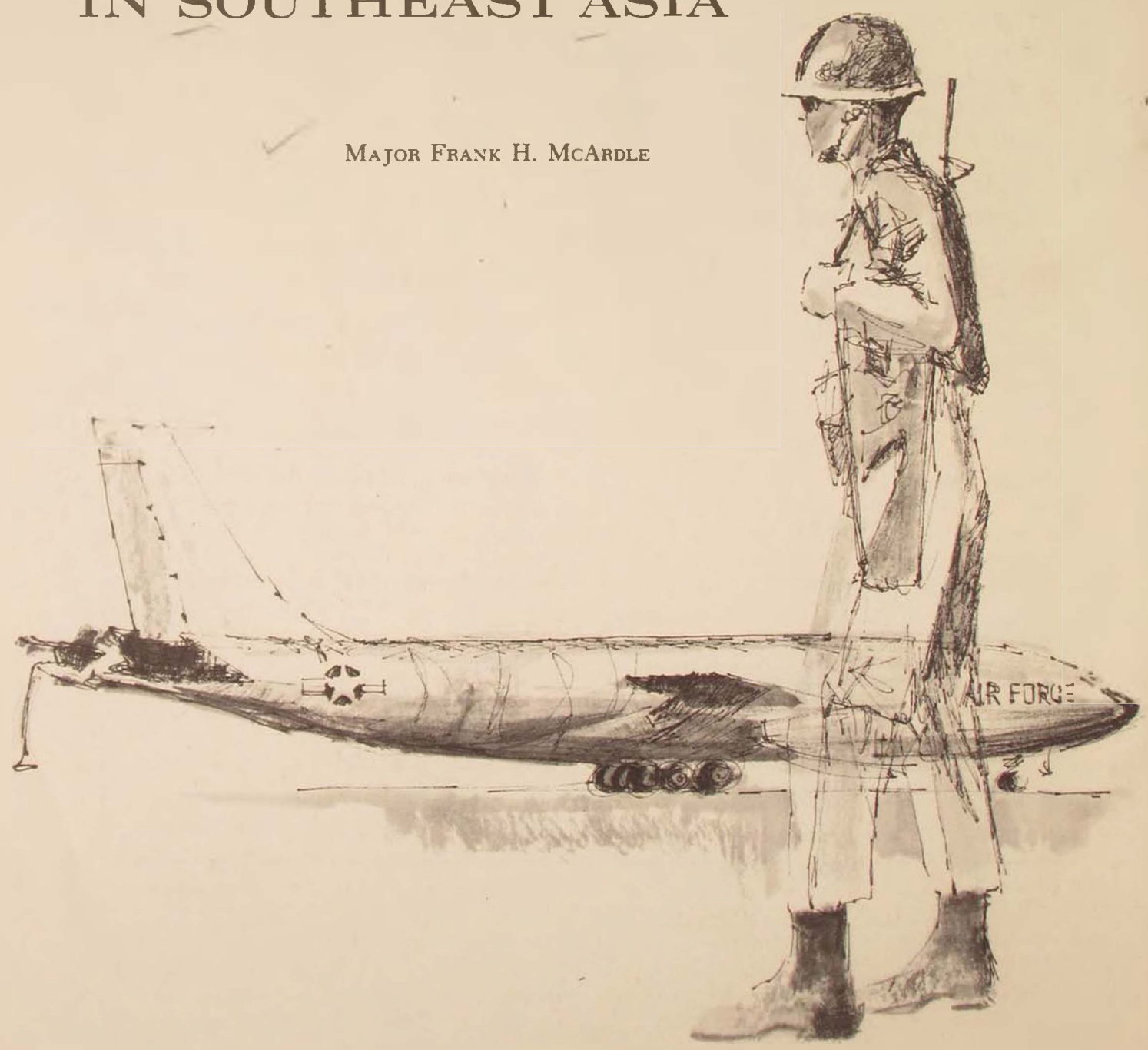
THE EDITOR

THE KC-135 IN SOUTHEAST ASIA

MAJOR FRANK H. MCARDLE



DURING the early morning hours of 18 June 1965, B-52s struck Viet Cong targets in South Vietnam in their first actual bombardment mission. This date is generally considered as the entry of the Strategic Air Command into the conflict in Southeast Asia. But it was not.

During the year before, SAC had used the KC-135 to support fighter deployment into forward operating areas and had been refueling fighter strikes as early as January 1964. This employment of the KC-135 has been marked not by any one great dramatic action but by consistently excellent performance while refueling over 167,000 aircraft and offloading 1.7 billion pounds of fuel in supporting B-52 and fighter operations through June 1967.

Three very broad areas of operations are involved in SAC's refueling responsibilities in the western Pacific:

1. Supporting the deployment of tactical fighters across the Pacific to forward operating bases.
2. Refueling support for Tactical Air Command strikes in combat operations against targets in North and South Vietnam.
3. Providing air refueling to western Pacific based B-52 combat operations.

The KC-135 was designed and built to provide refueling support of SAC's deterrent forces and primarily had been engaged in these strategic operations when TAC began phasing out its propeller and jet-augmented KB-50 in 1964. SAC had become the single manager of all Air Force KC-135 refueling in 1960. The command's mission was broadened to include refueling support for the Tactical Air Command. SAC began adapting its training and crew procedures and allocating its tanker resources to provide the fighters of the general-purpose forces with efficient and effective refueling. To the strategic environment within which SAC tanker forces operated was added a new and different medium of operation: the tactical environment. Resources for this increased responsibility came from SAC's forces in-being, with no degrading of its deterrent structure or lessening of its Single Integrated Operations Plan capability. Scheduling and managerial functions were expanded to allow additional uses of the SAC tanker force while maintaining its primary mission of supporting the manned bomber portion of SAC's deterrent strength.

The Boeing KC-135 is a high-speed, high-altitude airplane capable of offloading any part of its 200,000-pound fuel capacity. Operating throughout the world under a variety of conditions, in climates ranging from the frozen arctic to the hot, humid tropics, this tanker also can transport 83,000 pounds of cargo, 80 passengers, or any combination of the two. A team of four highly trained individuals comprises the small crew of this large multiengine aircraft. Crew integrity is a command policy and plays an important role in the successful employment of the KC-135. The mission of the aircraft and size of its crew demand that each member be skilled in a variety of tasks; therefore, duties normally performed by flight engineers, loadmasters, and others are divided among the four crew positions. In addition to normal duties the two pilots are responsible for environmental control, electronics, hydraulics, engine performance, and fuel management. The latter duty includes distribution and balance of as much as 100 tons of fuel and safely offloading some of it to receiver aircraft.

Navigation and electronic rendezvous with receivers are the tasks of the third member of the crew, the navigator. He is assisted in part by the boom operator, who makes celestial observations using a periscopic sextant. The boom operator is also the weight and balance technician, but his principal task is flying the 47-foot boom into the receptacle of the receiver aircraft to permit fuel transfer. This operation is usually performed silently, but often the boom operator talks the receiver pilot into position in much the same way a radar controller directs a landing by use of the ground-controlled approach technique.

Skill levels required of SAC tanker crews are maintained through constant and exacting training missions, which are designed to provide each crew with a continuing variety of conditions in which to operate and which very closely duplicate actual combat missions in

A KC-135 Stratotanker refuels F-4C Phantoms en route to a bombing mission over North Vietnam. From his position below the tanker empennage, the boom operator guides the 47-foot extensible boom into the receptacle of the receiver aircraft, sometimes talking the receiver pilot into position.

duration and objectives. These missions provide excellent experience, realistic training, and a firm foundation of fundamental tactics and procedures. Rigid training requirements for all tanker crews are identical throughout the command and are accomplished by using standardized procedures. Uniform quantity and quality of flying training and combat-readiness levels are maintained through realistic exercises. Objective evaluations of the exercises enable measurement of crew and unit capability and have provided the basis for an effective and efficient transition from a training environment to actual combat refueling missions. This transition, managed with no significant changes in operation or employment principles, was guided by SAC's tactical doctrine and demonstrated the soundness of training procedures and techniques developed by the command for its tanker forces over a period of years.

fighter deployment

Providing effective and timely response to operational commitments in Southeast Asia requires a network of bases, extensive communications, supply and maintenance facilities, and a vast amount of detailed planning and programming. Fighter deployments and daily combat refueling of strategic and tactical aircraft utilize common resources of planes, crews, and support facilities and are centrally commanded and controlled. These operations are carried out at changing levels of intensity and involve every SAC base in the zone of interior, thus extending the operation halfway around the world. For clarity and exposition, the three refueling functions will be described separately, although actually certain SAC organizations serve all phases of tanker operations in the Pacific, and the mission assigned to flight crews may involve any one of the three on a given day.

To handle the steady stream of traffic into the Pacific and to maximize the benefits gained through repetitive operations, two bases are utilized as staging areas through which flow, almost without exception, all westward tanker deployments. Refueling support for fighter movements originates from March Air Force Base, California. A task force organized for this specific purpose is the briefing and planning

Gas Station in the Sky

With the intensification of our effort in Vietnam, extending aircraft range and time aloft has become increasingly vital. The KC-135 Stratotanker has been indispensable in its role of refueling tactical fighters during trans-Pacific deployment as well as fighter and bomber aircraft engaging in combat operations. Shown taking advantage of the airborne service station are (1) F-105 Thunderchiefs, (2) a camouflaged B-52 Stratofortress, (3) an F-100 Super Sabre, (4) an F-105 Thunderchief, and (5) an F-104 Starfighter, refueling en route to Southeast Asia.

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agency for SAC. It coordinates with TAC agencies all fighter movements into the area. Tanker crews, on temporary duty for about ten-day periods, arrive at March the day before scheduled departure for specialized route briefing. Normally two fighters are programmed against a single tanker for the deployment across the Pacific, but often two or more tankers escort and refuel a cell of fighters. In this case a task force commander is assigned to the operation and acts as the single point of contact for such items as scheduling briefings and enroute support.

At Hickam AFB a permanent SAC staff and 24-hour command post assist all operations passing through this Hawaiian base. The SAC Current Operations Section provides mission briefings and communications assistance and arranges crew rest facilities and maintenance support with the host base, also working hand-in-hand with TAC's aircraft delivery group in preparation for the 3300-mile flight from Hawaii to Guam. After launch, the fighters, which may have departed from another base, rendezvous with the tanker off the California coast, and the formation is joined for the overwater flight. At this point the techniques and procedures developed through countless training missions begin the payoff on their investment cost. Once over the water on the long leg to Hawaii the mission ceases to be "training."

Navigation and fuel now become the center of interest, and the KC-135 provides both critical items. Celestial navigation is the primary means of directing the flight to destination. The navigator is assisted in this task by the boom operator, who alternates duties between the front and rear of the plane: forward he obtains the celestial observations necessary for precise navigation; in the rear, from his position beneath the empennage, he directs the receiver into position and performs the hook-up that allows fuel to be transferred and the mission to continue.

Shortly after level off the first fuel is offloaded to check out receiver refueling systems and top off tanks. If all is in order, the mission continues; if not, the mission returns to base. The single most important item to the success of missions over long stretches of the Pacific is the fuel remaining in the fighters' tanks. Each overwater leg is divided into several decision points. At these points fighters must have a prescribed amount of fuel "in tanks": the amount that will allow the fighters to return or divert to a designated base or continue to their destination with no further refueling. Planners, experienced in the aircraft being deployed, carefully calculate these bingo points and bingo fuel requirements, as they are

known. At these bingo points the decision becomes one of the "either-or" variety, and the final decision rests with the flight leader, the tanker commander. Either the fighter has the required minimum fuel remaining in his tanks to continue to destination, or he turns around. Any malfunction in either the tanker or receiver which delays a refueling beyond a bingo point, even if it is of a temporary nature, such as a faulty circuit breaker that could be corrected within five minutes, causes the mission to return to base. These refuelings allow but one course of action up to a certain point in the flight plan, then immediately change to another, now a committed course of action, with the assurance that the fuel in tanks will be sufficient to reach the landing base safely.

Missions of this nature require close coordination and communication between the tanker and its receivers. Usually there is little idle conversation, not because of any dictate but because crews are deeply occupied with the business at hand. Fuel bookkeeping is maintained by the KC-135 copilot and navigator, who monitor and adjust bingo points and fuel for winds and weather, constantly cross-checking to avoid any possible error and advising the receiver pilots of fuel status and mission progress. Flight profiles are a compromise between the respective optimum altitudes and speeds of the receiver and the tanker and are planned to provide the maximum fuel offload capability, thereby providing quantum increases in fighter range and significantly reducing time en route. Once radio and radar contact is established with Honolulu Center, the fighters come under its control and precede the tankers for landing. The first leg of the mission is completed.

The number of fighters involved in the movement and the length of the leg from Hawaii to Guam sometimes require the use of augmenting tankers. The addition of even a single tanker to a flight greatly increases range capability and assures fuel reserves for all aircraft well above the minimum acceptable. Offloading all transferrable fuel from the augmenting KC-135 first, before any other tanker is used, leaves the remaining tankers with practically a full supply for the deploying fighters. As the lone KC-135 leaves its formation, the flight of fighters and remaining tankers continue westward over the Pacific toward Guam. The tanker whose mission is completed provides planners with a resource capable of producing dividends from several promising alternatives: the KC-135 may return directly to Hickam for further employment; it may recover into Wake Island for servicing and a turnaround mission refueling eastbound or westbound aircraft; or, if the tanker's deployment mission is complete, the aircraft and crew may be returned directly to its home base in the United States. The use of an augmenting tanker in and out of Wake Island is an example of matching command requirements with the potential of the KC-135. High-frequency radio communications and position reporting to traffic control facilities are provided by the KC-135. These long-range communications greatly enhance the efficiency of the operation and provide command control of the deploying force and its response to mission needs. SAC radio networks furnish direct air-ground communications between the enroute tankers and the control agency to provide information on mission progress, crew status, and maintenance requirements.

At Guam the mission is almost complete except for final delivery of the fighters to their destination. Essentially the same premission events take place as before: briefings on communication procedures, enroute weather, and emergency procedures. The next day the tanker-fighter combination departs Guam for the final stage of its flight. Somewhere over the western Pacific the fighters leave their tanker escort, which, after many hours of close flying, has become a familiar and trusted friend. Assured through the KC-135's high-frequency radio of favorable landing conditions and weather en route, the fighters continue to their destination, and the tankers return to Guam. The fighter deployment is now complete, and the tankers have accomplished their task. They have escorted and refueled fighters that may have started their journey halfway around the world. The fuel transferred by the tankers has extended the range

of the fighters almost to the physical limits of their human crew.

No longer responsible for the fighters, the tanker and crew must now return to the United States. Flying east from Guam, the plane usually carries a mix of cargo and passengers, fully using its large interior and providing the command with fast return of high-value items to repair depots and a source of transportation for cargo and passengers.

two operating environments

One important portion of SAC's tanker mission has been described. Now let us turn to the actual combat employment of the KC-135. The mission of this airplane can be simply stated: it refuels bombers and fighters. The way in which it is employed in these two roles reveals the effectiveness of this aircraft. The distance of targets from the refueling area and the range of receivers are two marks differentiating the fighter and bomber refueling missions. In one, the targets are close, minutes from final fuel transfer and sometimes within sight of the tanker crew; in the other, targets are distant, unknown to tanker crews, and often hours from refueling. The bomber mission is characterized by exacting and mandatory timing requirements, precise airspeed and altitude schedules, prescribed navigation, detailed flight plans, and large offloads. The mission is flown in radio silence. Missions flown in support of fighters are also minutely planned and carefully flown, using established procedures for each phase of flight; but the tactical fighter environment is characterized by the tanker's reaction to the *needs* of the receiver. These needs are the distinguishing feature of this environment, for missions change daily, hourly, and often after takeoff, necessitating quick changes in timing, routes, and refueling areas. If the tactical situation dictates rapid changes for fighter missions to exploit an unanticipated advantage or in response to ground support needs, it follows that the SAC tanker force must also respond and be just as flexible. In fact, much of the rapid response of fighters is dependent upon assured refueling. It is well to point out that strategic bomber receivers also are capable of rapid response to tactical situations, but their *refueling environment* changes little, if at all.

KC-135s are employed in supporting B-52 strikes, illustrating SAC's application of air refueling to the contingency mission. The tanker force and flight crews are usually from the same organization as the bombers they support, since bombardment wings with their integral tankers are deployed overseas on temporary duty for periods of about six months. Entire aircraft maintenance organizations, armament and electronic technicians, ground refueling specialists, and all essential support skills accompany aircraft and crews forward and come under the operational control of the 3d Air Division headquartered on Guam. The forward bases are staffed by permanent party to assist these temporary units in getting established. Phase-in of arriving organizations is done gradually, on a carefully controlled basis, to allow an overlap of tactical combat qualified crews. This system is command policy and has been used over a period of years to provide an orderly flow of units from the ZI to overseas bases while sustaining required combat potential. By the time a bomb wing's last crew arrives forward, weeks after the start of the operation, the organization has gained a large reservoir of mission experience, and newly arrived crews are absorbed into the operation with no decrease in mission effectiveness.

Refueling large numbers of B-52s engaged in actual bombardment posed familiar problems but on a daily basis and much larger scale than training missions. Rendezvous, navigation problems, and myriad other considerations all add to the difficulties encountered on any one mission, in fair weather or foul, day or night. B-52 missions are flown under absolute radio silence. This demands precise scheduling, exact timing, and thorough crew knowledge of mission flight plans and objectives.

Before flying their first mission, SAC tanker crews are thoroughly briefed on the general support of B-52 operations. Mission construction, tactics, and flight plans are systematically analyzed during two days of intensive study

of preplanned or "canned" missions. Staff officers and specialists in each crew position supervise the study periods, answer questions, and assist crews. Comprehensive written examinations are administered, to evaluate crew preparation and knowledge and to assure that they are completely prepared.

If one were to fly aboard a KC-135 as an observer during a B-52 mission, one characteristic of the flight would be most apparent: the radio silence. The entire mission is performed that way—engine start, taxi, takeoff, assembly, enroute formation, and refueling. Weather obstacles such as tropic storms are circumnavigated silently, each plane following its predecessor by means of radar station-keeping at the planned altitude and at an exact distance behind the flight leader, who is responsible for navigation and timing. Time may be gained or lost as necessary, and flight plans provide for this contingency. Crews follow their flight leader while maintaining their own navigation data. Thus each knows exactly how much time must be lost or gained and anticipates spacing turns and maneuvers accordingly. Rendezvous is scheduled for an exact time and precise coordinates. It is effected hours after takeoff, without any verbal contact between the aircraft. Proper join-up of programmed tanker-receiver combinations is accomplished by means of coded electronic signals. Bomber streams are staggered into planned refueling areas and altitude blocks so as to provide a safe, steady flow of movement through this critical phase of flight and to allow reassembly, once refueling is complete.

Actual hook-up and fuel transfer are routine, for each crew has performed this maneuver hundreds of times in the past. In the radio silence, the only conversation heard is interphone communication among the crew. Tankers need only provide the briefed fuel to complete their mission. Once fuel transfer is complete, tankers reform into enroute formation and proceed to destination. At a planned distance out from the recovery base, radio silence is finally broken to facilitate the landing phase of the operation. Even this phase is critical, for often large numbers of tankers recover in a relatively short span of time, and delays or missed approaches can slow the entire recovery effort.

The flight is complete upon landing, but the mission is not. Aircraft must be inspected, serviced, repaired if necessary, and prepared for the next mission. Flight crews are debriefed by a team of specialists. Equipment discrepancies discovered during flight are discussed in detail with the crew, much as a doctor discusses symptoms with a patient. The lessons learned are analyzed, and any weak area in crew or aircraft performance, mission structure, or tactics is investigated and corrected. Only after all paperwork is complete is the mission concluded. Critiques provide information essential to continue a successful and increasingly effective operation.

refueling fighter missions

Hundreds of training missions have prepared the tanker crews for refueling combat-bound B-52s. At their home base, before each ground alert tour, tanker crews receive comprehensive briefings and study their portion of SAC's emergency war orders. They study the tactics and employment of the KC-135 in strategic operations. As has been shown, refueling a B-52 in Southeast Asia is an extension of the strategic mission, modified very slightly and adapted to that situation. However, refueling a variety of tactical fighters dictates marked changes in tanker operations, for most of them are weighted down with externally mounted weapons and refueling takes place close to the area of conflict.

Examination of the areas in which operations against North Vietnam are conducted reveals that airspace over the land mass of Southeast Asia is limited by sovereign borders. Over international waters, it also is severely restricted in certain regions. This limitation on freedom of movement is a significant constraint in fighter refueling operations. The number of fighters involved is another factor that produces changes in flying tanker missions. Obviously the fuel capacity of the KC-135 enables it to handle several fighters, and when refueling near the target area the tanker is capable of handling many. Performance of fighters also influences the employment of the KC-135, particularly in low-level fighter operations directed against northern targets.[1]

Silhouetted against a Pacific sky, two Stratotankers stand ready to refuel tactical fighters headed for the Far East.

These factors alter the employment of the KC-135 and provide a frame of reference for discussing its role in tactical fighter operations.

Manning for this phase of SAC's refueling commitment is supplied from the ZI on a temporary basis. Flight crews and maintenance teams are funneled through Castle Air Force Base, California, to Thailand, for periods of about 60 days. A cadre of permanent party is thereby augmented by a programmed selection of maintenance skills on a sustained basis. Managing the operation this way (rather than with all permanent party) is profitable because it provides many maintenance and flight crews experience in combat refueling, valuable maintenance data on aircraft and systems reliability, and a continual source of organic transport of supplies and personnel to and from the United States. This logistical effort carried 24,000 tons of cargo and transported 40,000 individuals in 1966.[2]

When crews arrive in Thailand, they are briefed on all aspects of fighter refueling operations. They spend a full day in specialized preparation and general study before flying actual missions. Before each mission, the briefing covers coordination for refueling fighter strikes, radio frequencies to be used, and call signs, and each crew is given composite mission sheets of the day's activity, to enable it to fly all or any part of another refueling mission without further briefing. The missions flown in several refueling areas are almost identical, and a crew needs only the information contained on the composite sheet to fly either solo operations or as part of a formation of tankers in any refueling area. A significant aspect of refueling fighters in Southeast Asia which has been influential in changing tanker tactics is the relatively narrow confines within which refueling takes place. The necessity of respecting international boundaries, always allowing a buffer zone, considerably narrows the overwater corridor within which the KC-135s and receivers regularly operate. The same general situation exists in airspace over land areas and poses similar restrictions on freedom of movement.

Sustained operations place large numbers of aircraft in refueling areas at any given time. Traffic control is complicated because of the number of flights which must be refueled in minimum time and because one tanker is scheduled for multiple flights of receivers and proceeds back and forth over the area several times, dropping off receivers and picking up new ones while other tankers do the same. Altitude differentials provide vertical separation, while timing and scheduling assist in maintaining the horizontal distance between flights. Radar controllers act as coordinators and assist the orderly flow of traffic in each area.

Another difference in the tactical situation is the number of fighters involved in the refueling effort, since the smaller fuel capacity of fighters allows a higher ratio of receivers to tankers. Fighter strike missions consisting of multiple waves can often be handled by just a few tankers; ratios of 16:1 are common and do not tax the fuel offload capability of the KC-135. Changes in fighter tactics have produced consequent changes in the employment of the SAC tanker force. Response to low-level operations of TAC fighters resulted in lowering refueling altitudes, which, prior to operations in Vietnam, were conducted above 25,000 feet. Normally refueling takes place at altitudes near the optimum for each of the aircraft involved, and benefits from this type of operation are obvious when considering fuel economy and range. Lowering the refueling altitude to between 10,000 and 20,000 feet, with much of the refueling done at the lower levels, has only slightly diminished the tanker's effectiveness. However, the fuel-economy/altitude trade-off is considered insignificant because of mission duration and capacity of the tanker, and it is mentioned only to provide an accurate account of the changes in employment dictated by the environment.

Weather is an important part of any flight environment and is especially important over Southeast Asia. Moist air is present, and thunderstorms and rain are a daily occurrence over most of the area. The conditions add to the list of factors already mentioned which influence tanker operations. The weather phenomena most likely to hamper refueling operations occur at the lower levels. Although refueling

is routine in most kinds of weather and cloud formations, the clouds present in these areas and altitudes are the cumulus type, often with heavy rain and turbulence which hinder jet fighters carrying external ordnance and hamper the tanker pilot working to hold a stable refueling platform. Refueling can be accomplished at these altitudes, but tactics employed by the SAC tanker force are varied to adapt to the situation and provide effective support of the tactical fighter.

The full panorama of the tactical refueling environment now begins to come into focus. A mission directed to refueling tactical fighters in Southeast Asia may have any or all of the following characteristics: a high ratio of fighters to tankers, low-level operations in tropic weather, multiple tanker-receiver combinations, and limited airspace. Once en route to a refueling area, a solo tanker or the leader of a formation of tankers contacts the ground controller responsible for radar monitoring of all aircraft in a particular section. Coded messages are exchanged and authenticated to establish identity, and the rendezvous begins under radar direction. Initial join-up is made under the direction of the ground controller, who is intimately aware of the day's activities and thoroughly experienced with speed differentials, turn ranges, and aircraft performance.

Flight identity is established by use of radar transponders, and cell join-up is then effected. Receivers form off the tanker's tail and slightly to one side while awaiting their turn on the boom. During the offloading process the tanker proceeds on course to the end-refueling or drop-off point. Often a drop-off control time is required for tactical reasons, which necessitates maneuvering by the tanker. This must be coordinated with the radar controller, for there are limits to the maneuvering airspace. Other tanker-receiver combinations also may be altering course for the same reason or to avoid heavy cloud formations, whose turbulence can upset timing by bouncing receivers off the boom or making hook-up difficult. An altitude is assigned to each tanker, but often changes of one or a few thousand feet make the difference between successful offload and timing or delayed refuelings. Naturally, the mission is paramount, and changes are coordinated with the ground controller. This leads to an unusual amount of interphone and radio communication. While altitude and heading changes are being coordinated with the ground controller, the boom operator may be talking a receiver into position, and the second flight of fighters is probably airborne and identifying themselves to the controller and asking vectors to their tankers.

Distance-measuring equipment in the aircraft is an excellent help in establishing position, particularly because of the extensive maneuvering required. Airborne radio direction-finding equipment is used to assist rendezvous. Both these kinds of equipment have proven valuable in tactical operations; and with airborne radar they are effective and are used extensively in getting the receiver mated with the correct tanker. Time intervals between receiver flights depend upon tactical requirements. Often these intervals are very close, with one flight cell waiting in position for the other to clear the boom so it can begin refueling.

While refueling is in progress and maneuvering is taking place, tanker crew members are busy with their respective professional specialties. Each one performs a part of the entire operation, all the coordinated parts together making up the employment of a single KC-135 in the tactical environment. The navigator is busily keeping track of the aircraft position relative to end-refueling points, control times, and international boundaries; the copilot is managing and balancing the fuel load while pumping it to the receiver and monitoring the radios; the boom operator is engaged in the most important job at hand, getting the boom into the receiver for the fuel transfer; and the pilot is monitoring the entire operation on radio and interphone, following the directions of the navigator and ground controller, talking with the receiver, and evaluating the weather conditions for possible maneuvering.

Formations of tankers are handled in much the same manner. However, the formation required for fighter aircraft differs from

the bombardment formation. Again, response to the operating environment dictated the change, and tankers generally refuel in-trail, offset from the leader only a few degrees. Strategic operations make freer use of offset procedures and increase the distance between tankers. In each environment, vertical separation is maintained for safety. In strategic operations the aircraft do not generally require much maneuvering; however, in tactical operations the limited airspace, weather at lower altitudes, and control time problems require considerable maneuvering, even with large numbers of aircraft. This is done safely by freely using radios and following the flight commander's and ground controller's instructions. Weather encountered during refueling is more restrictive than prohibitive in nature and poses no serious navigation or flight-following problem. Spacing of tankers is maintained by means of aircraft radar. Fighters, accustomed to close formation flying, move in closer to maintain visual contact during weather penetration, keeping the formation intact. Airborne and ground radar, visual observation, and pilot reports help the crews to remain clear of turbulent areas. Once receivers are off the boom and until the next flight of fighters is in position, the tankers are somewhat less concerned with the weather, although weather never ceases to be a factor. Speed and flight path are adjusted to make good the next control time or rendezvous point, and the cycle of hook-up, offload, and maneuver begins anew.

Bingo fuel is an item of critical interest in deploying fighters across the Pacific. In tactical operations, the situation is reversed, and bingo fuel becomes the concern of the tanker. Refueling many fighters, coupled with higher fuel consumption at the lower altitudes, can deplete the tanker's fuel supply more rapidly. Consequently each refueling area has its own bingo fuel limit for a tanker. When fuel "in tanks" reaches bingo, the tanker is cleared from the area by the ground controller and climbs to optimum altitude for the flight to its recovery base. The chance of fuel reaching bingo level is not a concern on outbound missions because of known adequacy. However, such concern may be a significant factor if the tanker remains on station for random post-strike refueling. In this case it may reach bingo fuel while fighters are exiting the target area. The situation poses no serious problem because the multiple tankers involved are always capable of fulfilling the needs of returning fighter aircraft, which may need only partial refueling to keep landing weights within limits. If post-strike refueling is programmed or appears necessary, a full tanker is dispatched for that specific purpose. If it is not used, nothing is lost, and the trade-off is well worth the small price: fuel expended versus assured refueling and recovery of valuable aircraft and crews.

The excellent capabilities of the KC-135 are clearly demonstrated in its employment in rescue missions. Much has been written of the lengths to which the Air Force goes in rescuing downed pilots, so this aspect need not be reviewed here. A network of communications, an airborne command post, poised helicopters, and tactical fighter cover all contribute to this vital operation. Contributing equally, although more remote from the dramatic scene, are SAC tankers which quietly provide fuel to fighters, allowing a protective cover to be flown over the downed airman.

When a pilot is down in hostile territory, air cover is an immediate necessity, and there can be no delay in organizing his rescue. If he is spotted by his wingman or other aircraft, half remain in the area, flying cover, while the others leave and call for rendezvous with a tanker. The events which then rapidly take place make full use of the assets of the KC-135 in the tactical environment. Radar controllers query tankers in the area as to their fuel status, and replies are given in "Bingo plus ---- pounds of fuel." This provides controllers with vital information and provides a priority of tanker selection to handle those fighters which need fuel because of maneuvering over the downed pilot. Rendezvous is made by the quickest means (usually a combination of radar, radio direction-finding, and distance-measuring equipment), and fuel is offloaded to the fighters who know the exact location of the downed pilot. When refueled, they be-

gin a shuttle between the tankers and the scene of action, relieving those planes which remained and are now in need of fuel. When word of a possible rescue operation is received, a tanker on ground alert for this specific purpose takes off with full tanks and heads for the rendezvous area. Ground radar controllers position the KC-135 in an orbit at the best location for refueling the fighters, which shuttle back and forth, providing constant protection for the airman and communications with his rescuers en route. Rescue operations begin without any immediate forecast and develop rapidly, despite all the constraints and problems inherent in the tactical environment. SAC KC-135 tankers respond with their full capability and play a distant but important role in the drama. Fortunately, not all damaged planes are lost; some fighters consume much fuel in maneuvering or dogfighting and require emergency refueling to insure a safe return to base. During 1966 fifty-one fighters with almost empty tanks were saved by KC-135s.[3]

A comment is in order about refueling areas. They are busy, crowded at times, and some of them are confining. A question often asked is: "Why not get more?" The answer is not *more* refueling areas; it is to make *better use of those already in existence.* This is done through advanced and changing tactics and effective response to the situation as it exists in daily operations. To do so any other way would upset the priority of principals. SAC does not dictate to PACAF when and where to refuel because SAC does not determine the fighter missions' requirements. An analysis of SAC tanker operations in the tactical environment can best be summarized by stating that the KC-135 is employed in a way which maximizes its operational capabilities, overcomes the disadvantages of use at low altitude, and, most important, satisfies the needs of the consumer.

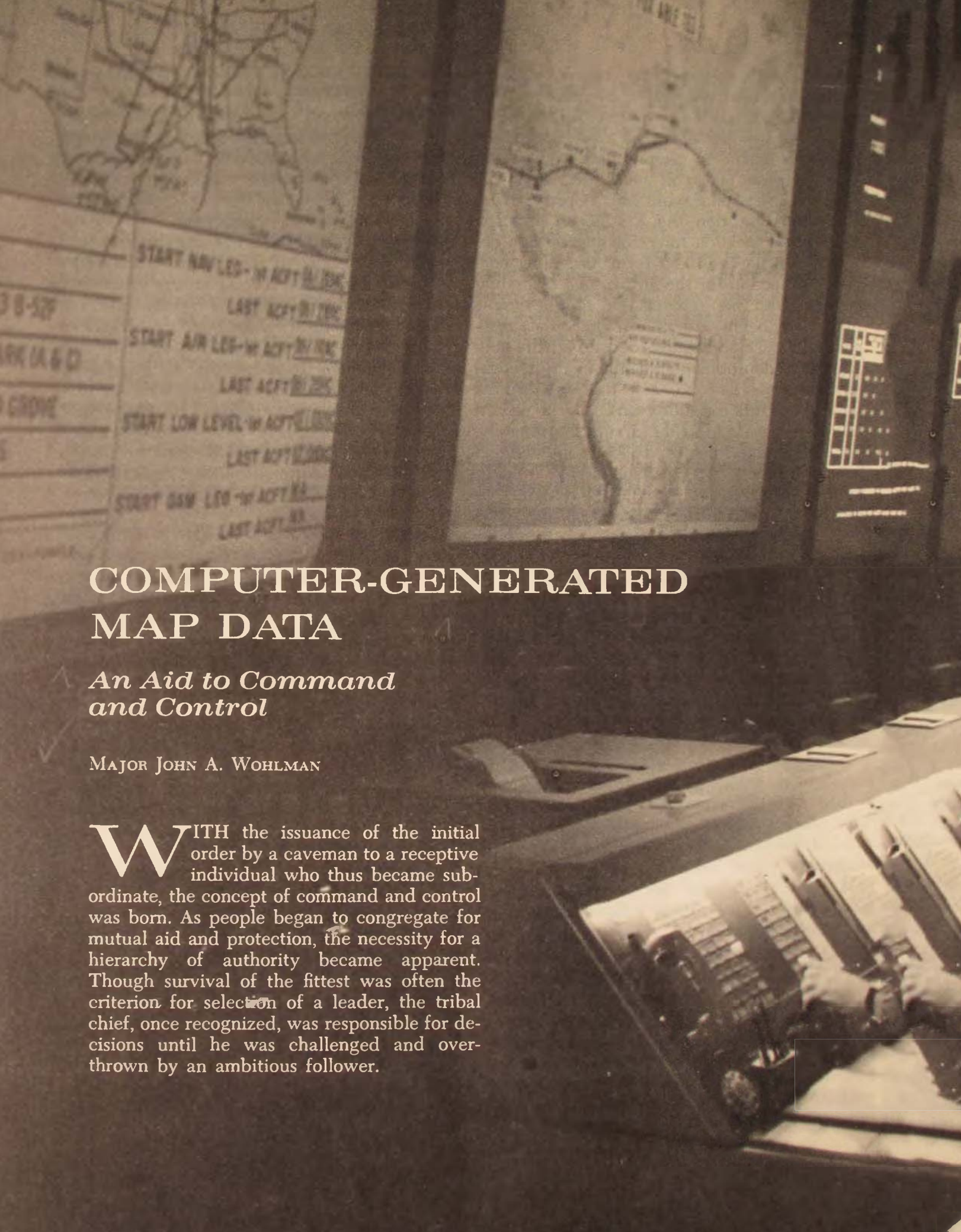
Travis Air Force Base, California

Notes

1. Major General George B. Simler, "North Vietnam's Air Defense System," *Air Force and Space Digest*, L, 5 (May 1967), 82.

2. Major General George B. Simler, "Wing of the Month —4252 Strategic Wing," *Combat Crew*, XVIII, 3 (April 1967), 19.

3. *Ibid.*



COMPUTER-GENERATED MAP DATA

An Aid to Command and Control

MAJOR JOHN A. WOHLMAN

WITH the issuance of the initial order by a caveman to a receptive individual who thus became subordinate, the concept of command and control was born. As people began to congregate for mutual aid and protection, the necessity for a hierarchy of authority became apparent. Though survival of the fittest was often the criterion for selection of a leader, the tribal chief, once recognized, was responsible for decisions until he was challenged and overthrown by an ambitious follower.

In a Strategic Air Command underground command post, computer-generated displaysare projected on the wall screens.

The inception of a quasi-military organization magnified the requirement for command and control. In early times, a chief or commander encountered relatively simple problems, though they were nonetheless significant to him. He predicated his judgment on a strategy the sum total of which he carried in his head or pocket. His area of immediate concern was often entirely within eyesight. With a properly positioned peripheral guard, he had sufficient warning of an enemy threat to give him adequate time to prepare a defense or counteroffensive for employing his forces. However, as methods of transportation and communication improved and weapons became more sophisticated, the potential battlefield grew proportionately. Commanders soon realized that they needed a staff to provide information upon which to base decisions.

From the earliest recorded history, military leaders have exercised command and control. Yet in today's space age this term has suddenly acquired a mystical connotation. In his Maxims, Napoleon wrote, "Commanders-in-chief are guided by their own experience and genius."[1] This axiom is as valid today as in the era of Alexander the Great. However, the advent of electronic devices has seemingly introduced the notion that command and control is now suddenly emitted from a magical black box. In reality, the employment of mechanical devices to aid in computation has been traced back thousands of years. Whether gleaned from advance scouts of yesteryear or extracted from the puzzling innards of today's computer, the information obtained is merely the essential data upon which a commander determines a course of action—a means to an end. Thus, command and control may be defined as an interaction of man and machine to provide for the collection, processing, storing, and retrieval of information and its application by a commander in making timely decisions.

The compression of time and space stemming from the continual improvements in aerospace technology and the sophistication of weaponry has simultaneously reduced available reaction time. In an age of supersonic aircraft, intercontinental ballistic missiles coupled with nuclear warheads, and warning times diminishing to a matter of minutes, today's commander must have immediately available and in usable form the pertinent information upon which to base his decisions. The volume of raw data supporting these decisions has become of such magnitude that it is often humanly impossible for an individual to manipulate it in the allotted time. Gone are the days when a commander could recall from memory the particulars concerning available forces which might be applied to a specific operation. In-commission rates, weather, and numerous other factors change daily or even hourly. To keep abreast of these criteria manually has become an insurmountable task. The large-scale, high-speed digital computer with its associated equipment has alleviated this problem to a degree, but future developments in the field of cybernetics must keep pace with advances in the other sciences lest we encounter a time gap.

SAC Automated Command Control System

Within the Strategic Air Command, the potential of automated data processing as an effective aid for control of the force was recognized as early as 1954. A closed-circuit color television network was first utilized as an interim display facility. After a computer was put to use in 1957, the main functions were resolution of time-over-target conflicts, monitoring the status of the force, flight-following Emergency War Order (EWO) missions, and peacetime exercises. The need for even more rapid transmission, processing, and automated presentation of information ultimately led to the development of the SAC Automated Command Control System (SACCS).

The key to the success of SACCS is communication, speed, and flexibility. With warning time of an impending nuclear attack having been reduced to a matter of minutes, SACCS was designed as a real-time system. A real-time computer system has been defined as one that controls an environment by receiving data, processing them, and returning the results quickly enough to affect the functioning of the environment at that time.[2]

The SACCS was delivered to Strategic Air Command by the contractor in March 1965. Programming problems generated largely by an inability to keep pace with the dynamic SAC environment resulted in the system's not being functionally usable. Continued debugging by SAC and contractor programming personnel led to a limited usable product by July 1965.

The SAC Automated Command Control System performs in seven significant areas of operationally interdependent functions: planning, force readiness, force exercise, alert and execution, force control, command data exchange, and continuity of command.[3] The SACCS is composed of three subsystems:

(1) Data Transmission Subsystem, which provides the communication network between the bases, the Data Processing Subsystem, and the Data Display Subsystem;

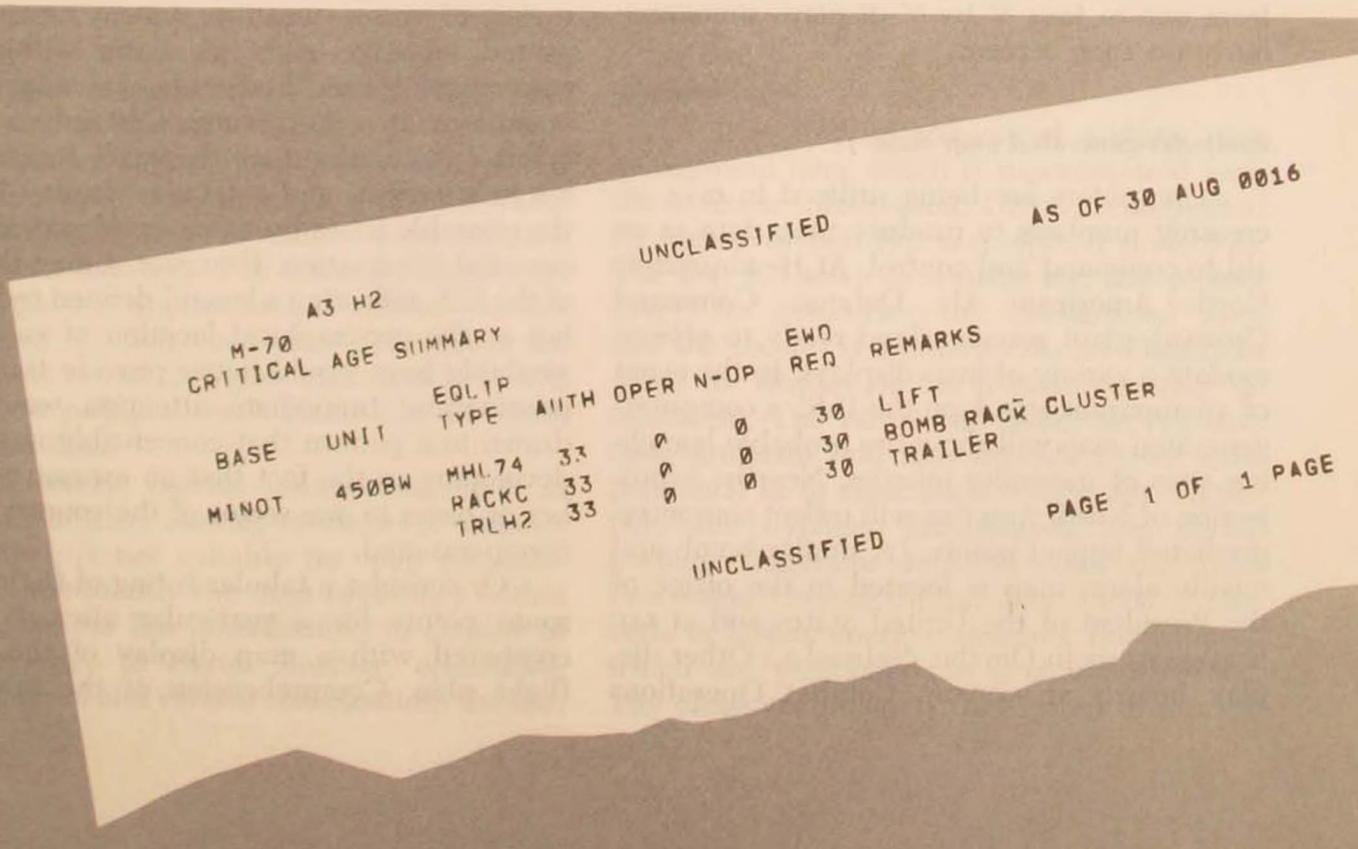
(2) Data Processing Subsystem, which is composed of three large digital computers known as Data Processing Central (DPC);

(3) Data Display Subsystem, which embodies four data display centrals to provide multicolored screen projections and black-and-white printer displays.

In actual operation, the Data Processing Central is initially primed with information on current force structure, requirements, facilities and base status, and other pertinent information, which constitute a data base. In the event the computer is destined for planning purposes, the data base includes climatological and weather data, aircraft performance characteristics, intelligence information, force posture, etc. An integral part of the initiation of the system is the loading of groups of instructions, called programs, which dictate how the raw data received should be processed.

Communications equipment known as Remote Communication Central (RCC) directly connects SAC bases throughout the world to the Data Processing Subsystem via a complex network. Each site is capable of inputting precisely formatted messages on a variety of subjects; e.g., alarms, weather, force generation and execution, materiel status, and flight plans. Message traffic is routed through an Electronic Data Transmission Communications Central

A requested printer display. Forced displays are similar but are automatically generated when conditions warrant.



(EDTCC), one of which is located at Hq SAC and at each SAC numbered air force. The EDTCC, itself a large computer primarily designed as a traffic routing and switching device, analyzes the input, determines the destination from header information, and dispatches it to the DPC for further processing.

At the DPC the input is ingested and compared/evaluated with the previously established data base. Inputs of a routine nature result in a mere update of the data files. However, if manipulation of the data reveals a condition that warrants immediate Headquarters consideration, a display is forced. Displays may also be requested, when desired, by using one of numerous display request devices.

Displays are either output on impact printers, which print in a typewriter mode at the rate of 800 lines per minute, or are optically projected on screens in one or more of the SAC command posts. Printers are strategically located throughout the command, a minimum of one being associated with each request device. Projection screens for wall displays are installed in each of SAC's numbered air force headquarters. Each command post screening room consists of from four to six 16′ by 16′ projection screens capable of accommodating a display of similar size or from one to four 8′ by 8′ displays simultaneously on each screen.

computer-generated map data

Computers are being utilized in ever increasing numbers to produce map data as an aid to command and control. At Headquarters North American Air Defense Command (NORAD), giant screens stand ready to accommodate a variety of map displays. In the event of an apparent attack on the U.S., a computer-generated map will show the probable launching sites of incoming missiles. Nearby, a projection of North America will reflect computer-predicted impact points. (A similar bomb and missile alarm map is located in the office of the President of the United States and at SAC headquarters in Omaha, Nebraska.) Other display boards at NORAD's Combat Operations Center under Cheyenne Mountain portray significant aircraft activity. Identified but not processed for display are the thousands of military, commercial, and private flights that traverse the country daily. All unidentified flights are monitored continuously, however, until positive identification or interception has taken place. Flights of special interest are also monitored on the huge maps.

The raw data utilized by the computer in generating these displays originate from a multitude of radar sources, such as BMEWS, Dew Line, etc. Within minutes, the various inputs are transformed into meaningful data, which are then properly positioned and displayed.

The familiar theory that one picture is worth a thousand words was applied in the designing of the SAC Control System. Though the majority of displays may be achieved in tabular form, it was desired that SACCS also provide certain information in pictorial fashion on map backgrounds. Evolvement of map displays was realized in early 1967, and a flight profile capability should ultimately be achieved. Further exploration of the map medium is under way, with intelligence displays and expanded flight-following capabilities on the horizon.

Let us suppose that from any one of a variety of causes—weather, runway repair, suspected sabotage—eight air bases within the continental United States are unavailable for operations at a given time. Certainly a commander is cognizant of the exact location of his installations, and a tabular display listing the unusable bases by name could provide the essential information. However, a map display of the U.S. reflecting a legend-defined red symbol at the geographical location of each unavailable base would better provide the same information. Immediate attention would be drawn to a pattern that conceivably might be developing or the fact that an excessive number of bases in one sector of the country were nonoperational.

Or consider a tabular listing of flight plan route points for a particular aircraft sortie compared with a map display of the same flight plan. Comprehension of the intended

Computer-generated map showing SAC bases, represented by triangles. Unavailable bases would be in red. Reason for closure is indicated by: "W"—weather; bomb symbol—nuclear detonation; ✲ — alarm. The circle of x's denotes hurricane Hazel.

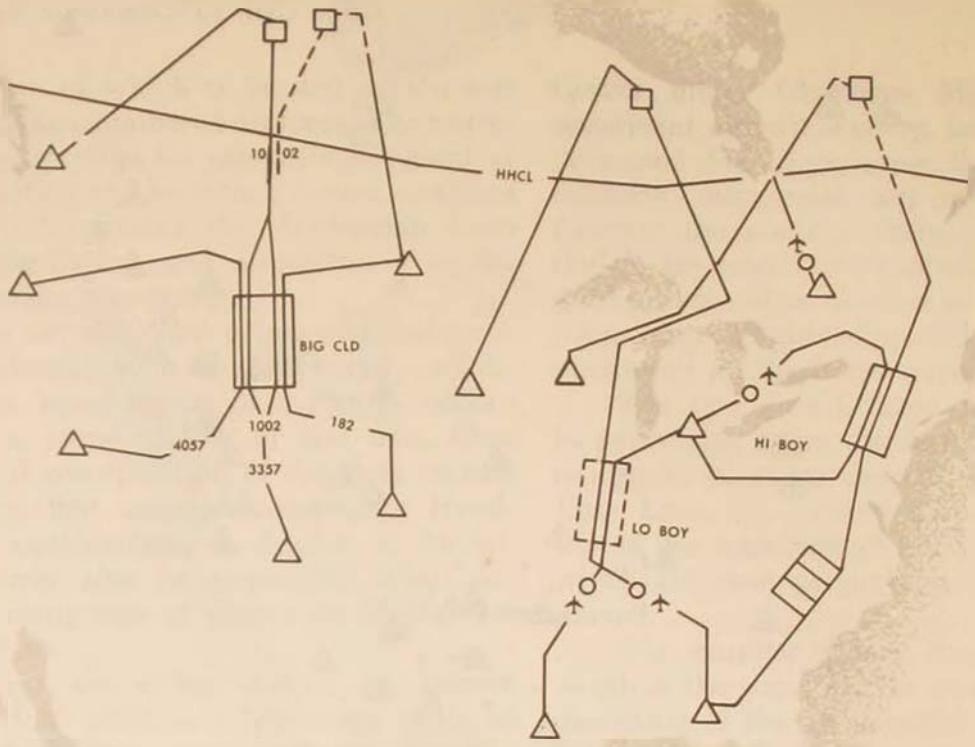
flight path is immediate when the flight plan is viewed on the map display.

Weather information also readily lends itself to map presentation. Of particular value are displays of severe weather areas outlined in colored symbols. For example, hurricanes and typhoons appear as red circles and are identified by their code name. Tornadoes are displayed as red polygons and thunderstorms as yellow polygons, each marked by its storm identification.

Obviously, certain information, such as numbers of alert aircraft available or vehicles deadlined, is not suitable for map presentation. Consequently the map capability within SACCS thus far has been limited to display of data relative to alarm, weather, operations, and materiel and various combinations thereof.

map display

A map display consists of a static map background over which is superimposed various dynamic information. This is accomplished by means of two types of optical projectors. The first is known as a projector, still picture (PSP), for projecting the background map, and the second is a Group Display Generator (GDG) for display of the dynamic overlay information. The PSP is not unlike an ordinary slide projector and may operate either independently or in association with a GDG. To display the dynamic information, the Group Display Generator receives from the Data Processing Central digital data which it converts to alphanumeric characters and symbols, which are positioned on a charactron tube. The character image is transferred to a nega-



A display of bomber and tanker sortie routes reflects live data: aircraft position, direction of flight, deviant flight path, etc.

tive film, from which a film positive is made and positioned for optical projection in the GDC. The entire operation requires approximately 15 seconds.

A GDC is subdivided into four positive film stations, each of which projects a display onto an 8′ by 8′ quadrant of the screen. Symbols are projected or lines traced by means of sequential positioning of a given symbol. The GDC is also capable of generating display data in any of seven colors, thus permitting placement of color coding emphasis on significant items. Red appearing in a display indicates an emergency or alert condition, while green means a satisfactory situation or completed action. Other colors are representative of marginal conditions, exercise data, war gaming, etc.

modes of projection

Screen projection of a tabular display is accomplished in typewriter mode with the normal 8′ by 8′ screen quadrant accommodating 48 lines of information, each line with a maximum length of 72 characters. Individual character positions are broken down into 70 small squares, 7 units wide and 10 high. In this mode, actual character styling occupies only 5 of the 7 horizontal and 7 of the 10 vertical spaces, the remainder providing for automatic character and line spacing.

For map presentation, the placement of dynamic display data is by position mode. Each of the 70 squares constituting one character position in typewriter mode is singularly addressible in the position mode. Thus the 48 vertical lines expand to 480 positions (10 ×

48), and the 72 horizontal lines expand to 504 positions (7 × 72). Placement of a character for a map display is determined by computing the x,y coordinates, x being one of the 504 possible positions along the horizontal axis and y one of the 480 locations along the vertical axis.

The current SACCS map library contains at least one slide of each geographical area of interest or concern throughout the world. With three types of maps—polar stereographic, Lambert conformal, and Mercator—the slide inventory normally consists of multiple coverage of known or potential trouble areas. Considerable research went into the development of the basic paper charts from which the map slides were ultimately generated. Ideally, areas of water would be blue in color, land masses brown, and Communist-dominated areas red. A problem arose, however, in maintaining color consistency in dynamic overlay data when the data extended over more than one background hue. For example, a red line changed in tone as it passed from a brown land mass through a red Communist area and over a blue-shaded ocean.

To permit conversion of input latitudinal and longitudinal reference points to the x,y coordinates for subsequent projection on a map background, certain information pertinent to each map slide must be available. Therefore, stored in the computer data files and referred to as "parametric data" is the following common information for each slide:

Type of projection

Legend position indicator

Map boundaries—the two extreme latitudes and longitudes that encompass the map area

Corner point—latitude and longitude of the extreme upper left corner of the background map, expressed in radians

Rotation angle—the angle of rotation required to position the displayed information correctly, expressed in radians

Distance—the distance, in inches, between 2 points on the same longitude

Distance reference points—the latitude and longitude of the 2 points used in determining the distance.

For the Lambert conformal projection, additional information must be provided:

Reference longitude—value of any longitude contained on the map

Standard parallels used in the source map from which the slide was made.

And for the polar stereographic:

Angle from the "new x axis" (horizontal edge) of the slide to the Greenwich meridian, measured counterclockwise.

With these reference data and utilizing formulas provided in part by the Aeronautical Chart and Information Center, St. Louis, Missouri, the map's computational program transforms the latitude and longitude of the dynamic map data to x,y coordinates and rotates these computed coordinates for proper positioning on the selected map background.

slide selection

In calling for a map display, the requester may specify a particular map background, or he may elect the option of having the computer program determine the most appropriate slide. A desired map is designated merely by including, as part of the display request, the ID of that particular slide. Once the geographical coordinates of all dynamic overlay data have been determined, the reference parametrics for the specified slide are recalled from data base storage to enable translation.

In the event the requester fails, either by oversight or choice, to specify a background projection, specialized coding is activated and a slide is automatically selected. Following compilation of the latitudes and longitudes of all the dynamic data to be displayed, a search of the slide library is initiated. Each slide capable of accommodating within its boundaries all data requested automatically becomes a candidate for slide selection. Final selection goes to the slide with the largest scale. Only Mercator and polar stereographic projections are considered for automatic slide

selection, as the scale for Lambert projections differs, thus prohibiting comparison.

the future

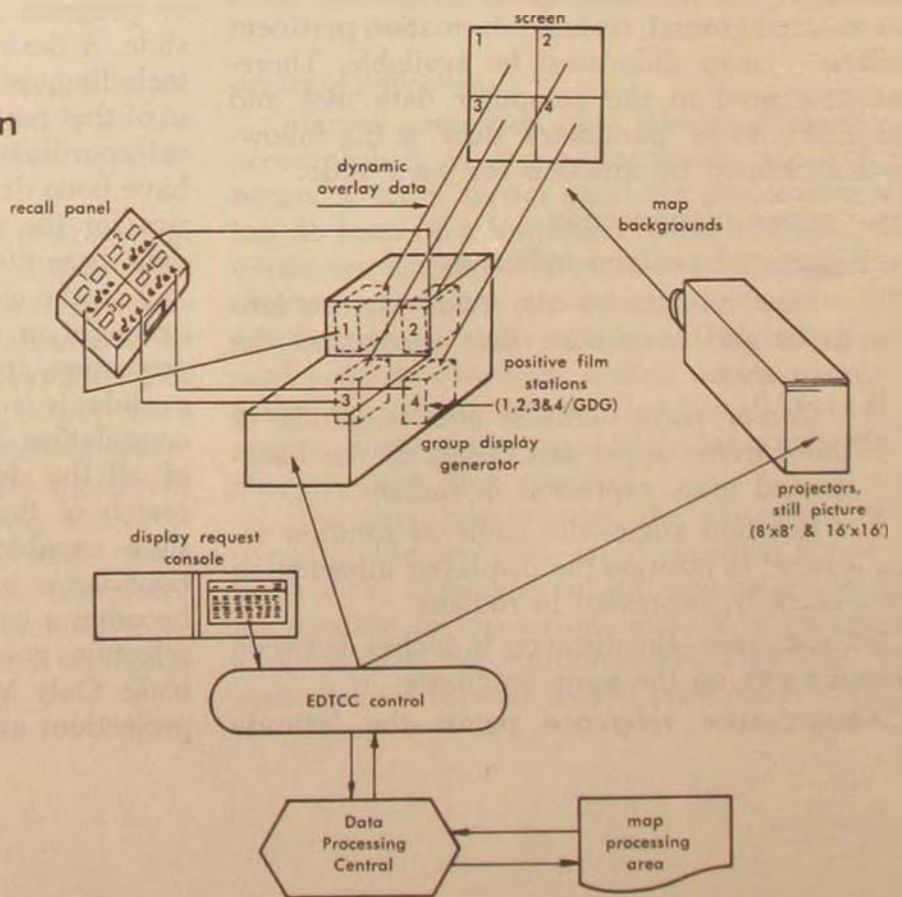
The machine cycle time of a current-generation computer is measured in microseconds, and memory transfers occur in terms of nanoseconds. (A nanosecond is one thousandth of a microsecond or 10^{-9} second.) Yet a concerted effort is continually being expended by manufacturers to reduce total processing time, the slowest factor being input/output (I/O). One proffered solution is the concept of multiprogramming, under which several programs reside in the computer concurrently. When the highest-priority job encounters a requirement for I/O, control passes to a second program, which operates until the I/O operation for the first is terminated. Should this task likewise encounter a request for I/O, a third program is initiated. Total processing time for a particular task may be slightly lengthened, but overall lapsed time for a "batch" of programs is significantly reduced, there being no lost time in the central processor. Larger core storage and expanded supervisors° are other areas currently under study and development.

Although the computer, as it is known today, is comparatively new, third-generation machines are in production. As in the field of radio and television, such words as "microminiaturization" and "integrated circuitry" are becoming commonplace. Where once an immense console, with hundreds of flashing lights and alarms, was thought essential for monitoring the wizardry of the computer, there now stands a simple panel easily operated and monitored by one or two individuals.

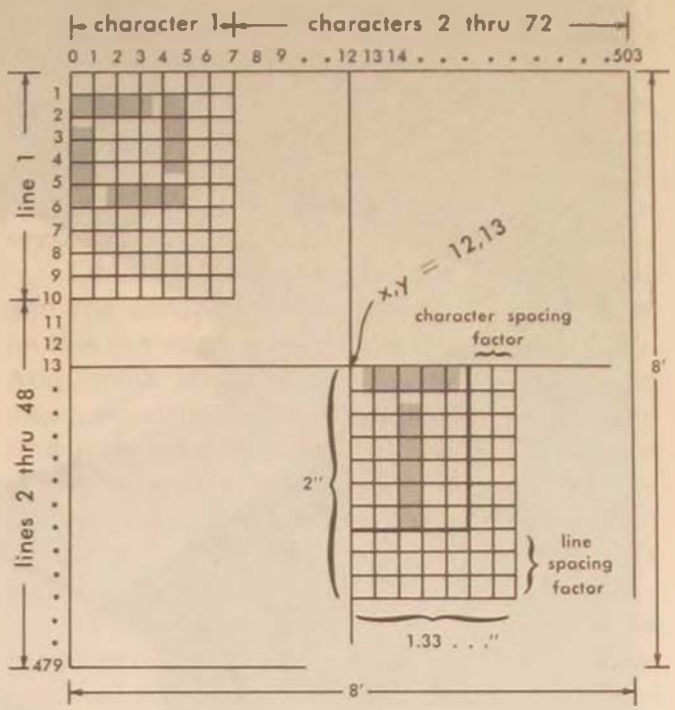
Within the realm of maps, we find three-dimensional stereoscopic application on the horizon, as well as increased use of cathode-

°An expanded supervisor is a control program with increased capability to determine sequence of operation.

EDTCC-DPC Interaction



An Electronic Data Transmission Communications Central (EDTCC) analyzes the input and dispatches it to the Data Processing Central (DPC) for further processing.



Computer-generated tabular material is displayed on the screen by character mode, the characters being placed in the spaces somewhat as a typewriter does. For map presentation, the dynamic display data are positioned in the spaces according to computed x,y coordinates.

ray tubes. Preliminary use of scanning techniques indicates a possibility of computer-generated map displays containing both static and dynamic information. This would eliminate the need for a background projection such as is currently provided by the PSP.

The search for increased speed and emphasis on accessibility and retrievability of data are of particular interest to the proponents of computer command and control real-time systems, which are among the most complex data communication and processing systems in existence. High on our list of "wants" is development of a query language and data base organization that will grant wider latitude to a commander in retrieving data. More and more emphasis is also being placed on adoption, if not development, of a common language for command and control systems. As more systems come into being, the need for system compatibility becomes increasingly evident.

As I said, the need for command and control existed long before computers were even a figment of man's wildest fancy. This need will prevail as long as a requirement exists to maintain a force to achieve our national policy and objectives.

As for future potential, the major limitations to areas of computer application are the imagination of the user and financial resources.

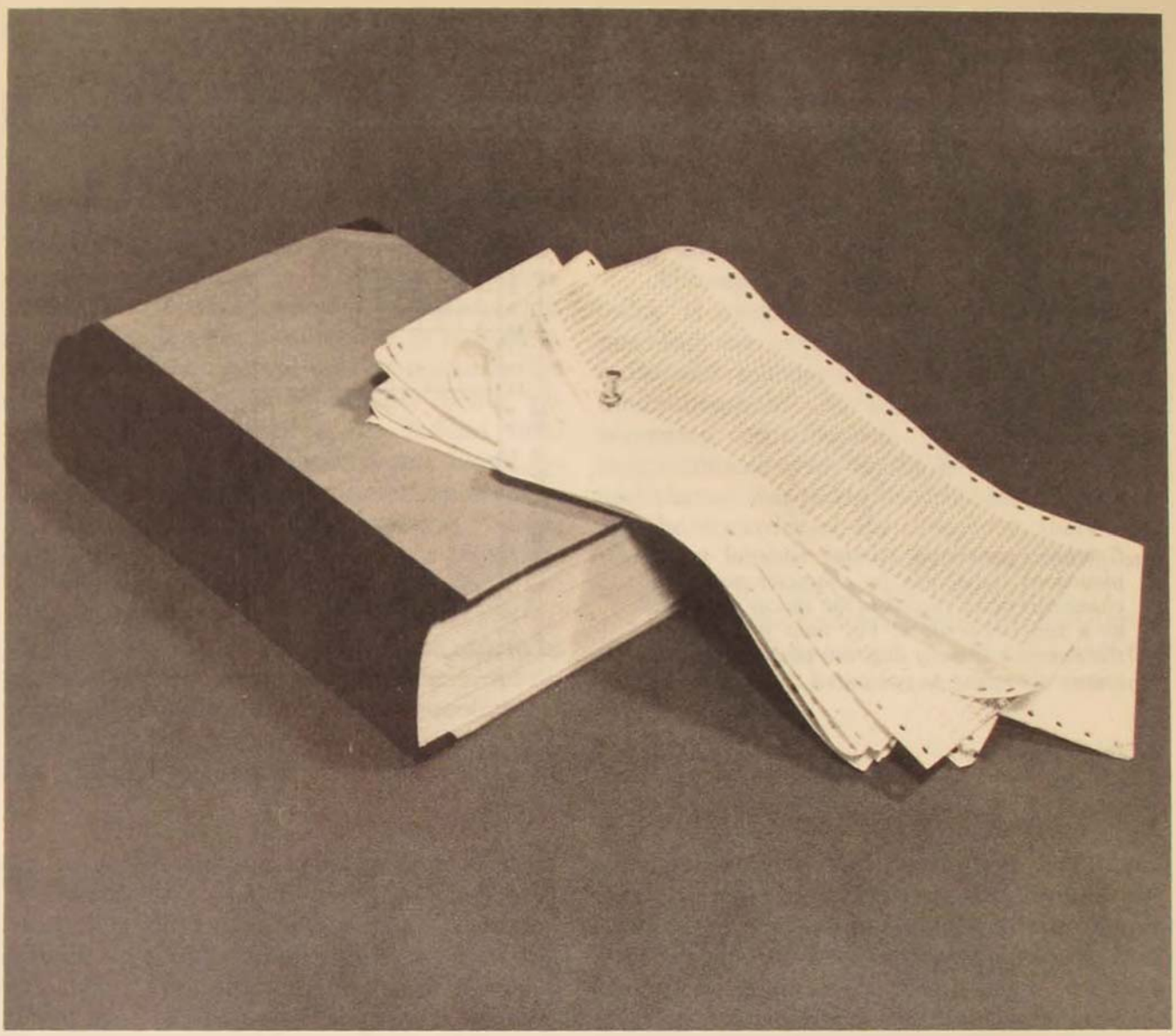
Hq Strategic Air Command

Notes

1. From Maxim 77, as quoted in Thomas R. Phillips (ed.), *Roots of Strategy* (Harrisburg, Pa.: Military Publishing Co., 1940).

2. James T. Martin, *Programming Real-Time Computer Systems* (Englewood Cliffs, N.J.: Prentice-Hall, 1965), p. 4.

3. DODOD Programmer/Operator Manual, Vol. I, Hq SAC, 7 March 1966.



WHAT IS AN OPERATIONAL REQUIREMENT?

COLONEL GEOFFREY CHEADLE

IT has been almost seven years since Secretary of Defense Robert S. McNamara first introduced his "economic" approach to force structure and weapon system planning. This way of doing Defense business no longer inspires the agonized, last-ditch resistance from the military leaders that it used to. The expressions "cost effectiveness," "marginal utility," and "systems analysis" are less often used with disdain or contempt by service staff officers. Some guerrilla warfare still continues, but the more recent confrontations have been concerned with how to *implement* the McNamara-Hitch-Enthoven-Anthony management concepts rather than with question-

ing their inherent applicability. Thus, the military services tend now to incorporate, almost automatically, cost-effectiveness studies and systems analyses as backup documents in all new weapon system proposals. Current arguments concern inputs and assumptions. The accommodation that the services have made to the new management doctrine, however, has in one respect been superficial rather than fundamental: "So they want a cost-effectiveness analysis. So give them a cost-effectiveness analysis!" That this is the case can be seen in the attitude of the services toward what are called "operational requirements."

To a military service staff officer, an "operational requirement" represents a new kind of weapon system or equipment needed by an "operator" (that is, the commander of an operating unit in the field) to do his job adequately. Often with little or no consideration of economic, political, and technical factors, it is alleged that there is an indisputable military "requirement" for the new gear. The claim is usually established as a service "position" and in some military services is still formally documented as a Specific Operational Requirement (SOR).[1] There is an implication that upon publication of the Requirement (now spelled with a capital "R") the burden shifts from the operator (and his service headquarters staff advocates) to the program, budget, and technology agencies, whose function is to finance, develop if necessary, and procure the desired end item.

In the early McNamara days, the staff of the Office of the Secretary of Defense (OSD) reacted to the expression "operational requirements" with great annoyance. After all, they reasoned, an operational requirement was clearly nothing more than the responsibility devolving upon a military leader in the field to accomplish a certain task in order to fulfill his mission—an operator might have an operational requirement, for example, to blow up a certain bridge, take a certain hill, or move some cargo from A to B. The decision as to what new weapon system or equipment the operator might profitably be given to fulfill this operational requirement would naturally be subject to scrutiny at all staff levels for such factors as cost effectiveness, alternative approaches, and so forth.

By now, of course, the OSD staff members generally understand what the military person means by his "operational requirement," and the expression is just filtered out of their conversation.

Obviously, communication between OSD and the services which depended in any way on this key expression was sure to break down. And break down it did, particularly on the many occasions when the beleaguered service staff man answered a penetrating question as to the why of a certain system approach by saying, "But this is an operational requirement" or, even more often, "This is what's called for in SOR 123."

The smarter staff officers in the services early came to understand that to have an "operational requirement" is no argument with the civilians in either OSD or the secretarial offices of the departments themselves. There has persisted, nevertheless, a feeling that "operational requirements" are good things to establish and use internally in the services themselves. This explains the fact that organizational entities still exist in each of the services for handling "operational requirements," and the business goes on apace.

In one sense the Air Force is an exception to this statement. Beginning in June 1966, the Air Force adopted a new and radically different approach toward "operational requirements." The rather straightforward instrument of this change is Air Force Regulation 57-1, "Operational Requirements: Policies, Responsibilities, and Procedures for Obtaining New and Improved Operational Capabilities," 17 June 1966. This regulation came about through a working group set up by Major General Jack J. Catton, then Director of Operational Requirements and Development Plans under the Deputy Chief of Staff for Research and Development. General Catton directed his working group to examine the handling of operational requirements in depth, to work out improved policies and procedures, and to initiate staff actions to implement the new procedures (upon their approval) Air Staff-wide and Air Force-wide. By late 1965 the Air

Force had obtained a few years' experience in doing "requirements" business in the new civilian management environment. The working group was able to draw on considerable expertise in its deliberations, notably on that of Major General Glenn A. Kent, then Deputy Director for R&D Analysis, DCS/R&D, Hq USAF. Almost all consultants confirmed the group's analysis that a bold departure was essential. The end product was a regulation which took the bull by the horns—it abolished the venerable SOR as a way of doing business and implemented a management philosophy which is both conceptually sound and eminently pragmatic.

What is it all about?

As I have stated, the operational requirements process in the military services has to do with selecting and successfully proposing new weapon systems and equipment for development and/or procurement. Even a superficial glance reveals that many commands, agencies, and offices will be involved in this process. What are the specific responsibilities of each? What are their necessary inputs and desired outputs? Where does one agency's responsibility end and the next one's begin? To what extent must the process be formalized, or to what extent can it be left to judgment in individual cases? All these questions must be answered before one is assured that the right people are working the right problems with an acceptably high expectation of success.

For the military services the responsibility for something like an operational requirements process stems from public law. Under Title 10, U.S. Code, the services are required by law to "organize, train, and equip" forces —aerospace, naval, or land forces, depending on the service. Those forces are to be used by the unified and specified commands. The military service headquarters in the Pentagon are not in the chain of command; they do not operate the forces they are required to organize, train, and equip. The service headquarters must rely on their subordinate combat commands (which are the components of the unified and specified commands) for information and recommendations as to what force and equipment resources are needed, now and in the future. By smart management and effective staff action, the service headquarters obtain approval from their departmental secretarial staffs and from OSD for the resources necessary. It is the obtaining of the necessary new kinds of systems and equipment for the "equip" function that gives rise to the operational requirements process. This process must be responsive to the real needs (not necessarily all the requests) of the operators on the one hand and effective in negotiations with the approval authorities for the new resources on the other. Let us see how this has been working in the past.

the traditional way

Until recently the three military services went about the operational requirements business in remarkably similar manners. If I may reduce the official procedures to their essentials and generalize quite a bit, the process was supposed to go like this: An operator would forward a formal requirements document, usually called a Qualitative Operational Requirement or QOR, to his higher headquarters. The QOR would describe a needed new system or item of equipment, going into considerable detail on its required or desired characteristics, intended use ("operational concept"), plus more or less of collateral justification in terms of the threat, relationships with other forces, time period of interest, etc. The service headquarters would be expected to evaluate the QOR and approve or disapprove (very few disapprovals!). The headquarters would then be expected to make the necessary consultations with its R&D support agencies, get the necessary funding, and direct the implementing action. Only first, before implementation could begin, the requirement received from the field had to be blessed as a true military service Requirement (capital "R") by the headquarters. This meant that the weapon system and the corresponding forces had to be factored into the appropriate long-range and mid-range plans (if they affected force

structure), and a formal service position had to be taken and published, usually in the form of a Specific Operational Requirement or SOR. Then, by some completely undefined continuation of the process, the service headquarters was supposed to convert the SOR into reality.

It must be apparent to the perceptive reader that certain aspects of that official procedure were either at variance with the real Pentagon world or at best contributed only accidentally to the fulfillment of the services' legal responsibility to "equip" the forces. Any part-time student of management would predict that the individuals on the operational requirements staffs of the operating commands would tend to concern themselves excessively with the *documents* involved—both their creation and their proper routing and coordinating. That there was much such business occupying Pentagon staff officers is beyond dispute. As to whether it was excessive or not depends on the point of view.

The realities of the situation as perceived by General Catton and his working group were sad. Their conclusions: Not only did people spend much time creating and amending formal documents after the fact to conform with what is going on "where the action is," but—and this is worse—the documents, once created, fooled the writers into thinking they had achieved the goal. The staff officers most knowledgeable about a certain need in the field would sit back and rest on their SOR just when the really productive work of getting approval and funding of the implementing project should have begun. In the meanwhile a more enterprising and less inhibited group of staff officers was getting things done by "wiring around" the official process, using a great variety of nonstandard but effective procedures.

flaws in the approach

There were fundamental flaws in the whole traditional approach, flaws which even the most conscientious and energetic staff could not surmount. The traditional process failed because it was sequential, formal, and defensive.

A sequential approach is generally ineffective because of the nature of research and development and the way new programs are considered and approved in OSD and the departmental secretarial staffs. There are always "happenings" going on in R&D—the atmosphere is consistently one of quick change, often radical change. Getting good new systems and equipment from R&D calls for a willingness to change system specifications, even basic system approaches, right up to the time of proposal to OSD—and even after, if important enough. Also, as Secretary McNamara has made very explicit, the decision-making on high is not limited to a mere approval or disapproval of a single proposed approach. There must be a consideration of alternatives, even alternatives not envisioned by the original proposing agency in the field or in the service headquarters. The sequential approach, beginning with the QOR and proceeding in a step-by-step well-defined fashion, fails because the QOR pre-empts too many decisions on system characteristics, even overall system type, at too early a time and at too low an organizational level. The QOR becomes a command "position" by its very formality, resisting future change with a certain amount of bureaucratic inertia of its own. All this is not to say that the operators should be excluded from the operational requirements process. In general they have an expertise and a firsthand knowledge of the needs of their CINC's which cannot be duplicated. They must be brought into the process at all stages, not just at the kickoff.

The same should be said at this point concerning those agencies which do the R&D for the services. The sequential approach, if followed rigidly (and it is often followed rigidly), keeps the R&D experts in their laboratory cubbyholes during key periods, isolated from the operators, to the detriment of the final product. Strange as it must sound, the most effective operational requirement process is not sequential but can best be described as tentative, a guided sort of muddling through, involving much backing, filling, and evolving. The operational requirements business is a kind of problem-solving, working on detailed versions of the problem: What are the best

new weapon systems and equipment items for the future? This point of view makes the following observation most appropriate: "In an important sense a rational problem solver wants what he can get and does not try to get what he wants except after identifying what he wants by examining what he can get."[2]

The military services have also hurt their operational requirements processes by formalizing them, or at least by formalizing them in the wrong places. In a game where flexibility is essential, the formality of the QOR and SOR restricts one's freedom of movement. A service "position" may not count for much with the decision-makers in OSD, but it certainly is a sacred cow in the service itself. It takes a very wise (and brave) junior staff officer to negotiate with OSD a piece of a program that is at variance with an existing "position." No anarchy is suggested here—it is well known that many "positions" existing on paper (particularly in documents such as SOR's) are not in the best interests of the service as time goes on and situations change. Further, nothing is to be gained by excessive formality. True, some directives for getting action accomplished must be issued in such format as to command the necessary respect and adherence, but traditionally SOR's have not been directives in that sense. Since the services are probably the worst bureaucracies in the government for overformalizing activities, a certain deliberate restraint is always in order.

Many service staff officers see requirements documentation as necessary defensive hedges against an unfavorable future for the proposed system or equipment. If, they think, because of politics, niggardliness, or whatever other ignoble reason motivates the decision-maker he will decide against the requirement, at least the service has publicly stated its needs, and therefore the blame is on the decision-maker for not following through. In this reasoning, SOR's have been viewed as a sort of collective "Pearl Harbor File" which could be used to show the general public that it is not the service's fault that the country cannot be defended with adequate weapon systems and equipment. This defensive attitude would be bad enough in principle, but it would be indefensible in practice because it would divert so much staff energy and expertise from the real business to be done.

What is the real requirements business?

What is, then, the real business of operational requirements? How should it be approached? As I have suggested, the operational requirements process must serve to identify qualitative materiel needs (or operational deficiencies) of the operators and to achieve the approval and funding of the appropriate programs or projects to fulfill the need (or eliminate the deficiency). However or by whomever the needs are identified, the service responsibility to equip the forces calls for the approval and funding of programs or projects. As we shall see, some of the projects call for development, some for modification, some for procurement. Once approved and funded, the projects proceed in accordance with fairly well-defined directives and processes in the R&D, modification, or procurement area. *It is the achievement of this crucial approval and funding of the right kind of program or project which should be the goal of the operational requirements process.* Procedures, documents, and formalities are only useful, even tolerable, insofar as they contribute to achieving this goal. The way to the goal in any particular instance varies with the system, the status of R&D, the urgency of the need, the time of year, the availability of kinds of funding—with a whole host of factors. The effective staff officer keeps the goal in sight and pursues whatever intermediary activities appear to hold the most promise of contributing. The effective official requirements process is one which permits, even encourages, latitude of specific approach by the staffs at all levels, while making crystal clear what the staff responsibilities are in general.

the alternatives

The very organization of the service headquarters staffs tends to fragment or compartmentalize proceedings. If an operational

requirements matter is given to an R&D man to handle, for example, one can expect an R&D answer, even though a modification or an off-the-shelf procurement might really be more appropriate. There is a fundamental problem here, which suggests that we look closely at the alternatives available to a man trying to satisfy an operational requirement. Basically, as stated often by General Catton, there are three avenues of effort for the elimination of an operational deficiency: tactics, modification, or new equipment.

The use of new tactics with existing equipment is an obvious first step available to the operational commander. Witness the air tactics used by our jet fighters in Southeast Asia to avoid the SAM's. Tactics can be changed quickly and locally, but ultimately tactics are constrained by the limiting characteristics of the weapon systems and equipment (or personnel) involved. Because of their local operational nature, tactics are not considered as solutions to operational requirements as we are discussing them here.

The modification of existing (or already in-production) systems, on the other hand, is a valid and often very rewarding course of action to satisfy an operational need. This is the quickest, and usually the cheapest, way to achieve a truly new equipment capability. There is almost no kind of operational requirement for which some modification could not be reasonably proposed as a solution. Naturally, there are limitations; no one can make a silk purse out of a sow's ear, although what the Air Force has done with the stately old C-47 airplane comes close. One does not make a quantum jump with a mere modification, but the value of modifications in general can be seen by the very many different models of weapon systems now in use: F-4B, F-4C, F-4D, F-4E, just to give one example. The time comes, of course, when a completely new system is called for.

New technological advances are usually best exploited in new equipment rather than in modification of older gear. Sometimes such new equipment comes already developed (by a different service, by commercial in-house R&D, etc.), in which case the matching operational requirement can be validly satisfied by direct procurement (and usually testing and evaluation) of the equipment, repackaged as necessary. This often happens with small equipment items that have civilian counterparts (survival equipment, communication sets, etc.). For the big weapon systems and support systems, like aircraft, missiles, and ships, development programs are called for. Even in R&D there is much range of choice that must be considered. A study under exploratory development may be appropriate to produce design characteristics for the "next generation" system. An advanced development will serve to lessen the technical risk for a later engineering development by providing operationally sized and shaped equipment for test and evaluation. An engineering development or an operational system development (the latter if follow-on production for inventory has already been approved) serves to put the technological idea into final military configuration using the latest available technology, for possible quantity production and operational use. It is sometimes quite clear into which development category a project will suitably fall, but often considerable judgment and negotiation are necessary. In some fields, such as advanced aircraft, there are contributory activities going on in many development areas at once.

There is a need for the military service requirements staff officer to have full freedom and encouragement to consider all these approaches, in modifications and new equipment, to do his job properly. The situation is akin to the job of repairing a piece of furniture—it will get fixed the best if the repairman is permitted to use any tool available (to borrow a figure of speech from Major General Otto J. Glasser, Assistant DCS/R&D, Hq USAF).

the Air Force approach

The current Air Force approach, embodied in AFR 57-1, recognizes the limitations of previous Air Force procedures and encourages a change of *modus operandi* in Air Force headquarters and pertinent field agencies. The word "encourages" is used advisedly rather than "requires" or "directs" because of the nature

of the problem. It is one thing to lift the burden of stultifying documentation off the staff officers' backs; it is another to change their old habits and rationalize an old mythology held dear by many. Some will never change, but those who would like to change will at least find the law on their side.

What, specifically, does the new Air Force Regulation 57-1 change? First, it abolishes all SOR's and similar types of document as a way of doing business. Second, it states philosophy concerning service responsibilities, objectives, alternative approaches, and flexibility in much the same terms as I have described. Third, it prescribes a new, very flexible document called a "Required Operational Capability" (ROC), to be used by service field commands as inputs. Fourth, it prescribes a new type of document to be issued as necessary by Headquarters USAF to direct action to be taken by the field on any operational requirement matter. Called a "Requirements Action Directive" (RAD), this document serves to emphasize certain important directives that would otherwise be issued in ordinary letter form. The RAD avoids the undesirable features of the SOR by being a temporary action item of purposely restricted scope; it does not therefore become an albatross of "position" around the staff's neck. Fifth, AFR 57-1 provides for a number of special cases calling for nonroutine procedures (operational requirements in support of Southeast Asia, for example). All in all, the Air Force has put into a single regulation its entire new framework for handling operational requirements.

Does it work?

Admittedly, one regulation, like one swallow, does not make a summer. The big question is, Does it work? It is really too early to tell. This is the sort of thing that people will never agree on, even after the smoke clears. It takes a year to two years for everyone around the circuit to get the new message. Nevertheless, it is possible to see some encouraging signs. At least the *one* swallow is there! A few straws in the wind:

- More bounce to the manpower ounce noted in the Air Staff Operational Requirements Directorate.
- A new wave of end-objective-mindedness sweeping over the Development Plans organization in Headquarters Air Force Systems Command, which is responsible for operational requirements business in that command. A recent document issued by General Kent as DCS/Development Plans, entitled "The AFSC Planning Process: Policies, Procedures, and Terminology," bodes well to do for the Systems Command what AFR 57-1 does for the Air Force as a whole.
- Considerable evidence of increased mutual cooperation between the Air Force Systems Command and its "customers," the operating commands.

ONLY SO MUCH can be done by changing the official procedures. The smart manager transcends the regulations themselves. In my judgment, however, an official mechanism has been created which will remove all unnecessary obstacles to the smart manager and still give the most productive guidance possible to the less favorably endowed. If the twin benefits can be attained of more efficient use of staff energies on the one hand and more effective fulfillment of the "equip" responsibility on the other, then the change will not be in vain. The new Air Force approach appears to score well on both these counts. Let us hope that time serves to confirm this favorable estimate.

Hq Air Force Systems Command

Notes

1. There are variations in nomenclature for some types of operational requirements in some services. Generally, however, they are all handled as described here.

2. Albert O. Kirschman and Charles E. Lindblom, "Economic Development, Research and Development, Policy Making: Some Convergent Views," RAND Paper P-1982 (Santa Monica: The RAND Corporation, 4 May 1960), p. 16.

INTERNAL DEFENSE AND DEVELOPMENT– "IDEALISM" OR "REALISM"?

COMMANDER ROGER J. MILLER, U.S. NAVY

DURING the past two decades there has been an increasing awareness within the United States of the importance of events and trends within the developing countries.[1] This awareness has resulted in widespread agreement that these nations will play a significant role in future world affairs. Yet United States policy towards the developing countries has been the subject of severe and continuing controversy, based on conflicting views of rationality.

Soon after World War II considerable confusion existed in the United States, with its newly attained world power status, regarding its role and responsibilities in the less-developed sectors of the world. A great deal of confusion remains today. Thus, to raise the subject of current United States policy towards these countries–broadly described by Administration spokesmen as "internal defense and development"–is to trigger expressions of a wide range of views and resulting disagreements.

There are more than a few informed observers who are critical of this policy as it is currently explained, maintaining that the policy is out of line with the realities of today's world. One of these critics, George F. Kennan, has expressed his belief that this policy is founded on "slogans and semantic symbols of the past."[2]

It appears reasonable, then, that this inquiry into the nature of the current policy should initially examine the impact which such "slogans and semantic symbols of the past" have had on the policy's formulation and evolution.

An Extension of Containment

In retrospect, it seems clear that United States policy towards developing countries has been largely shaped by this country's broader lines of policy towards the Communist states. It is not mere coincidence that a decided change in United States attitudes concerning

the so-called Third World closely followed the breakdown of great power unity after World War II and the resulting development of the strategy of Communist containment.

The general nature of the policy that would evolve was indicated by President Truman's pronouncement of United States support and assistance to Greece, which was threatened by Communist guerrilla activity in 1947, and in his 1949 inaugural address proposal of a "bold new program for making benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped countries." Humanitarian motives no doubt had some influence on the formulation of the proposal, but it is evident that the principal objective was to extend the Communist-containment strategy to the underdeveloped regions by exerting United States influence there. Then, during the 1950s, it became increasingly popular within both academic and governmental circles to support the thesis that closely linked the economic and social development of these countries to United States security.[3]

The success of Truman's early policy in preserving the independence of Greece and Turkey from the Soviet threat is well known. The post-Stalin era, however, created new problems as the Soviets attempted to establish inroads into the developing countries through their own aid programs, coupled with propaganda campaigns branding United States assistance as only a new form of colonial domination.

During this period the implementation of United States policy was hindered by frequent lack of direction and coordination. It was not unusual to find numerous semiautonomous economic and military entities plus representatives of several United States governmental departments and agencies in a developing country. The occasional press reports of aid mismanagement created periodic embarrassment and concern within this country regarding the government's ability to promote national security through economic and military assistance programs.

Yet nations of the Third World proved more adept than many observers had given them credit for. Effective Communist penetrations there were limited, and many of these governments exploited their increased maneuvering room between East and West. Onto this scene was thrust the growing influence of the Chinese Communists.

Mao Tse-tung's strategy and guerrilla tactics that had proven successful in the take-over of China were soon applied by indigenous Communist elements in Indochina, Malaya, and the Philippines. Though the Communists were defeated in the latter two countries, it was quite evident that other developing countries —plagued by economic stagnation, social injustice, and political instability—were ripe for similar subversive or insurgent attempts. The danger emphasized by the Communist take-over of Cuba, followed by "Che" Guevara's espousal of Mao's tactics and his application of them to conditions in Latin America, was apparent to the United States public and policy-makers. Then the increasingly critical Southeast Asian situation, accentuated by the growing Vietnam conflict, was deemed to be yet another example of Mao's "wars of liberation."

In 1961 President Kennedy stressed the need to develop additional capabilities to defeat this "new type of warfare." In response to this "new" threat, the traditional economic-military assistance policy line was redefined, and reorganization efforts were commenced in an attempt to carry out the policy more effectively. During this period it was frequently reiterated that (a) the security of the United States and its fundamental values could best be preserved and enhanced within a community of free developing nations; (b) assistance and encouragement in the process of development and nation-building would be afforded the developing countries by the United States; and (c) when requested, the United States would assist developing nations to prevent or defeat Communist inspired, supported, or directed insurgency which threatened their freedom and independence.[4] This definition remains applicable today.

Nevertheless, this policy has become the subject of open and severe examination in recent months. In the opinion of some observ-

ers, its rigidity has committed the United States to the Vietnam conflict—a dreaded land war in Asia—contrary to the interests of this country. Thus, criticisms of this policy have attacked its basic premises as well as its implementation.

basic criticisms

A moral crusade. Some critics of the policy believe that, unwittingly, an unrealistic ideological revolution has occurred in the definition of United States national interests. In their opinion, this country has become one in pursuit of a broad universal interest framed primarily in terms of Communist containment. Thus, they maintain that Washington policy-makers tend to define international events in terms of a moral crusade against Communism. This, in their view, has resulted in unwarranted unilateral interventions in the affairs of other nations by the United States.

These observers point to the increased volume of Administration policy statements which interpret national interests in terms of total world involvement and world responsibilities as indications that the United States is attempting to define and protect the virtue of all nations. They view the stated objective "to build an orderly world community" to be overly idealistic and moralistic; they compare the global nature of this objective to the expansive character of Communism itself. Similarly, they claim that a policy which seeks a "world order which is free from aggression" is out of line with reality in this revolutionary age. Thus, they view as unrealistic those Administration statements that have tied United States fighting in Vietnam or intervention in the Dominican Republic to stopping Communism throughout the world. As stated by Professor Hans Morgenthau, a foremost spokesman of this group, "a foreign policy that takes for its standard the active hostility to a world-wide political movement, such as . . . Communism, confuses the sphere of philosophic or moral judgment with the realm of political action and for this reason is bound to fail."[5]

Defender of the status quo. A second basic criticism of the policy is that, contrary to idealistic pronouncements, it has in reality transformed the United States into an anti-revolutionary power. As viewed by these critics, the United States, which was born in insurgency, will actively oppose any insurgency which is Communist inspired or supported *or which may ultimately be exploited by Communists.* Thus, it follows that Washington's principal objective is to defend the status quo.

These critics point to the authoritarian character of many regimes in the Third World which are recipients of United States assistance and note that this support aids in the suppression of legitimate as well as Communist insurgencies. In their opinion, the United States has assumed a reactionary role in a revolutionary age. Supporting this view, Senator Frank Church has stated, "I cannot remember many revolutions that have been fought in splendid isolation . . . it seems to me that the Communists have not changed the rules of revolution by meddling in them, regardless of how much we disapprove of their goals."[6]

The changing nature of Communism. Several critics argue that this policy, initially formed to counteract a monolithic ideology in a bipolar world, is no longer appropriate in a world of growing polycentrism. They note that the monolithic Communism of the 1940s and 1950s no longer exists; that there are many diversities between Russian and Chinese Communism and between these and the increasingly national-oriented Communist movements of eastern Europe and Asia. They view nationalism as a force of greater impact than Communism and believe that there is a high probability that future revolutions in developing countries will be primarily nationalistic in character even though there may be varying degrees of Communist involvement in them.

These observers lean toward the view that current United States policy is an overreaction to Soviet and Chinese espousal of "wars of liberation." They point to the apparently "mellowed" nature of Soviet Communism and to the formidable domestic and

foreign obstacles plaguing the Chinese Communists as evidence of the practical limitations confronting their support for such so-called "just" wars. In addition, it is argued that the deepening schism between Moscow and Peking may be lessened and that, in the long run, Communist unity may be restored by our pursuing a policy which opposes Communism per se.

Power limitation. These critics stress the requirement that a successful policy must balance "means" (elements of power) with "ends" (goals). They argue that the United States simply lacks the power to police the world and that any attempt to do so is a fruitless, never-ending task.

In this regard Administration statements which pledge the United States to oppose "illegal support for so-called wars of liberation" in order to build an "orderly world community" are viewed as indicating a faulty analysis by policy-makers of United States power. These critics maintain that policy limits must be narrower and that each situation should be analyzed on its own merits with respect to the means available and the ends desired.

A logical extension of this argument is the acceptance of major powers' natural spheres of influence. Walter Lippmann, who has compared China's destiny in Southeast Asia to that of the United States in Latin America, has been a leading exponent of this view.

Military excess. The criticism of excess stems from the conviction that current internal defense and development policy too heavily stresses the military component while the real sources of unrest within developing nations are largely ignored. Such denunciations have intensified with the military escalation of the Vietnam conflict, which is often cited as an example of an attempt to solve by military means problems that are social, economic, and political in origin. These critics point to the possibility that current policy will lead to similar developments elsewhere.

In the opinion of these observers, the increased conventional and unconventional warfare capability of the United States, developed by the Kennedy and Johnson Administrations, has contributed to the illusion that problems of poverty, ignorance, social stagnation, and poor government in the Third World can be solved by military means. This, in their view, ignores the real sources of instability in the developing countries and involves the United States in costly, unproductive conflicts abroad.

Extending this argument, some critics maintain that the cost of United States military involvements abroad has restricted vital domestic economic and social progress and has thereby limited this nation's ability to provide more appropriate overseas economic assistance. In their opinion the changing nature of world conflict has reduced the importance of military power while economic strength has become the most effective force in promoting national interests.[7]

"Idealism" or "Realism"?

These criticisms are, of course, interrelated. A careful review of the writings and pronouncements of the more prominent critics, both within and outside the government, indicates that most subscribe to all five of these basic arguments.

It is my contention, however, that these criticisms contain two fundamental flaws. First, they tend to underrate the impact of a nation's domestic ideals and values on its foreign affairs. Second, they overestimate the expansive nature and discriminate application of the policy of internal defense and development.

Labeling this policy as an idealistic, crusading attempt by the United States to expand its standards and values in the developing world ignores reality. It is unrealistic to believe a nation's foreign policy can be divorced from standards and values which exist within that nation's society. Since foreign policy is, in the final analysis, a projection of domestic interests abroad, it is only natural that a nation's domestic ideals and values would have an impact on its foreign affairs. Similarly, no nation can realistically separate its foreign policy from its preference of one

type of international society over another. It therefore does not seem unrealistic that United States policy towards developing countries would be framed in pursuit of such long-term goals as "self-determination," "a stable international society," "a world free from aggression," or "universal human progress," even though the attainment of these objectives may be unlikely in the foreseeable future.

There is little doubt that the formulation of this nation's containment strategy was influenced by its ideals, values, and societal preference. The nature of Communism has undergone a considerable change during the past decade, and a significant factor influencing this change has been the success of the containment strategy in limiting overt Russian Communist expansion. Yet the degree to which the expansionist motives of Soviet Communism have "mellowed" is questionable. During the January 1966 Havana Tricontinental Conference, the U.S.S.R. apparently emerged as the controlling force of an organized movement to coordinate and control subversive and insurgent operations in Africa, Asia, and Latin America. At this conference all pretense of nonintervention in the affairs of other nations was dropped, and the 513 delegates from 83 countries openly committed themselves to the overthrow by violence of all governments that do not meet with their approval.[8]

Another change in the nature of Communism has been the emergence of an increasingly militant and potentially aggressive Communist China. Though the Peking regime has had serious foreign policy setbacks during the past two years, recent official Red Chinese forecasts of a "new revolutionary storm" within the developing world indicate that Mao has not abandoned his quest for ultimate world revolution based upon the projection of his strategy abroad. Indeed, one of the causative factors behind these foreign policy reverses (as well as the current leadership turmoil) has doubtless been the relative success of United States policy towards developing countries. Recognition of the serious obstacles confronting Peking, however, hardly leads to the rational judgment that we should decrease efforts to contain subversion or insurgency sponsored or supported by Red China in developing countries.

The intent of our current internal defense and development policy is to frustrate such Communist designs in developing countries while offering them assistance to progress in independence and diversity. That the policy is based upon this nation's preferred view of international society does not seem overly idealistic. Similarly, this attempt by the United States to influence the developmental process in the Third World hardly deserves the label of a status quo policy.

Criticisms which imply that our policy of internal defense and development is overly expansive and indiscriminately applied are, in my judgment, based upon an excessively rigid interpretation of the policy. In this respect, Administration spokesmen have frequently reiterated that the United States neither desires to become an international policeman nor intends to impose a *Pax Americana* on the world. They have often noted, however, that the United States has treaty commitments to assist in the defense and development of some developing countries. The importance of support and assistance to additional countries is also frequently stressed in terms of the United States' interests. Here it has been pointed out that such assistance is selective. As expressed by Secretary Rusk, "We support that policy in different ways at different times and under different conditions."[9]

Nevertheless, the criticisms include some elements which must be considered, weighed, and debated within the policy-making apparatus of government. It is quite clear that there are few discernible doctrinal guidelines for the implementation of the policy. In part, this is because of the unique nature of and relationships between developmental and defense problems within each developing country. In addition, divergencies of opinion have existed within the United States government itself regarding the implementation of the policy. While these are based on conflicting views of technical problems which are beyond the scope of this article (e.g., the unstabilizing effect of economic development, how best to combat insurgency in a given situation, etc.),

two basic aspects of the policy appear to require further exploration and definition if confusion among both policy-makers and critics is to be lessened:

• *The establishment of priorities.* Since the redefinition of this policy by the Kennedy Administration in 1961, there has been a continuing need to establish priorities among the developing countries. The Senior Interdepartmental Group (SIG), recently established to assist the Secretary of State in carrying out interdepartmental activities overseas, has been charged with "assuring a proper selectivity of the areas and issues" to which the government applies its resources.[10] Hopefully, this reasoned selectivity will result. Here, the short-term and long-term interests of the United States and the immediate and long-range threat pertaining to each developing nation must be considered along with each nation's objective and subjective characteristics. This is a continuing and complex task but one which must be accomplished if the nature of the current policy is to become more coherent and if its implementation is to avoid the aura of crisis-management.

• *Clarification of concept.* The terms "internal defense and development" and "counterinsurgency" have been used interchangeably within some government circles. Yet there are many who believe the latter term to be too restrictive in concept.[11] Essentially, these varying views center around two poles: the defense-oriented people, who emphasize the need for maintaining internal stability in a threatened country, to provide an environment within which development can occur; and the development-oriented people, who stress the need for economic, social, and political improvements which, when attained, would lessen the root causes of insurgency. Thus, the policy concept should be clarified in a manner which places the missions of the several implementing components more clearly in perspective at varying levels of development and conflict. While it is recognized that each threatened country presents a unique problem in this respect, it seems that a general clarification of concept would enable the various departments and agencies involved to more effectively plan and implement their contributions to the internal defense and development effort.

IN SUM, then, the goals of "internal defense and development" and the policy itself seem to be framed in the context of the realities of today's world. Though there may be some degree of idealism in this attempt to influence developing countries to progress along lines favorable to this nation's preferred view of international society, it seems only in line with reality that the wealthiest and most powerful nation in the world would make such an attempt. Nevertheless, criticisms such as those cited point up the imprecise and elusive nature of this policy, and in this respect they suggest a need for more specific policy guidelines. They also describe significant pitfalls which a successful policy of "internal defense and development" must avoid.

U.S. Army War College

Notes

1. Admittedly, the term "developing countries" is a misnomer, as it includes many countries of Asia, Africa, and Latin America that are *not* now developing. Since the term is currently in vogue, it is used here synonymously with "less developed" or "underdeveloped," generally to indicate countries with annual per capita incomes roughly less than $500.

2. United States Senate, Committee on Foreign Relations, *Hearings on Supplemental Foreign Assistance Fiscal Year 1966—Vietnam* (Washington: U.S. Government Printing Office, 1966), p. 358. (Hereafter cited as Hearings.)

3. See, for example, Max F. Millikan and Walt W. Rostow, *A Proposal: Key to an Effective Foreign Policy* (New York: Harper & Brothers, 1957). This thesis has been supported successively by Presidents Eisenhower, Kennedy, and Johnson.

4. For a succinct discussion of the redefined policy, see Dean Rusk, "Problems of Development and Internal Defense," *Foreign Service Journal*, July 1962, p. 11.

5. Hans J. Morgenthau, "Globalism: Johnson's Moral Crusade," *The New Republic*, 3 July 1965, p. 21.

6. Hearings, p. 9.

7. See, for example, James M. Gavin, "Military Power: The Limits of Persuasion," *The Saturday Review*, 30 July 1966, pp. 18–22, 64.

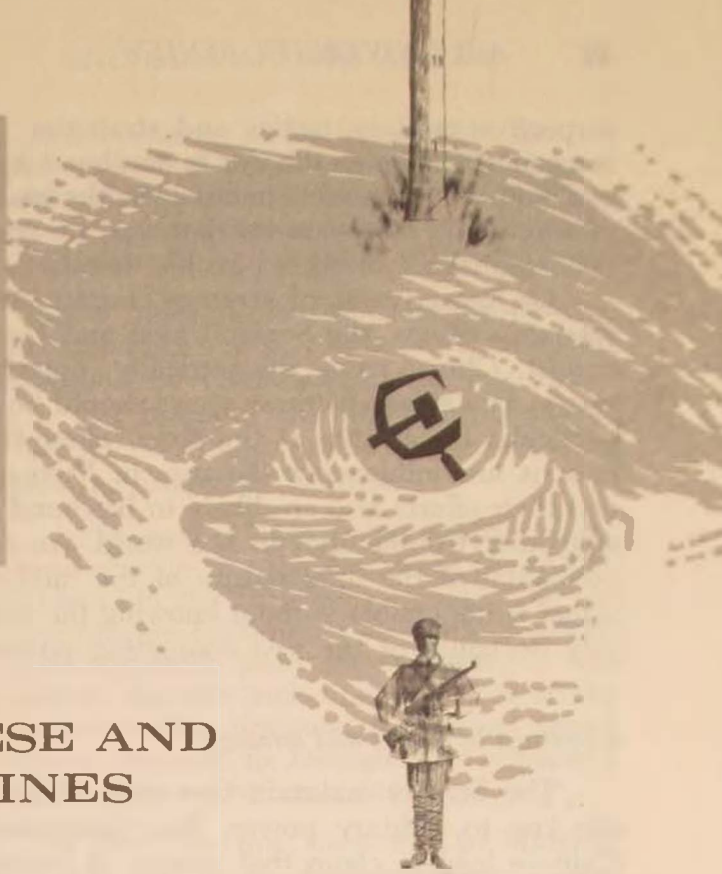
8. United States Senate, Committee on the Judiciary, *The Tricontinental Conference of African, Asian and Latin American Peoples (A Staff Study)* (Washington: U.S. Government Printing Office, 1966), pp. 1–2.

9. Hearings, p. 9.

10. U.S. Department of State, *Direction, Coordination and Supervision of Interdepartmental Activities Overseas*, Foreign Affairs Manual Circular No. 385, 4 March 1966, p. 2.

11. Problems of concept and semantics are both involved here. As approved for interdepartmental usage, "counterinsurgency" is defined as "Those military, paramilitary, political, economic, psychological, and civic actions taken by a government to defeat *subversive insurgency*." (Italics added.) Subversive insurgency is defined as that which is "primarily communist inspired, supported, or exploited." (From *Dictionary of U.S. Military Terms For Joint Usage*, 1 December 1964.) Yet counterinsurgency is frequently interpreted as a purely military concept.

Military Affairs Abroad



THE CONTRAST IN CHINESE AND SOVIET MILITARY DOCTRINES

COLONEL WILLIAM F. SCOTT

THERE was a time when war was war, fought according to universal concepts of doctrine and strategy. Students of tactics paid little attention to situations that differed from the norm. Weapon systems were developed to be used against a probable enemy who was but a mirror reflection of one's own forces. Opposing generals had read the same textbooks—Napoleon's dictums, Clausewitz's *On War*, Mahan's concept of the superiority of sea power, Douhet's heretical belief that command of the air would suffice. A tactical instructor from Saint-Cyr would be at home in a classroom at either West Point or Sandhurst. Throughout the major armies and navies of the world there was a common understanding of the manner in which war would be waged.

Today there is no such certainty. A strategy and a weapon system to meet one threat may be of little value against another. The Soviets speak of their *protivo kosmicheskaya oborona* (anticosmic defense force)[1] and of military-technical superiority, which they consider as "the quantity and quality of nuclear weapons and their means of delivery."[2] The Chinese, on the other hand, claim that "people's armed forces, beginning with only primitive swords, spears, rifles and hand grenades, have in the end defeated the imperialist forces armed with modern airplanes, tanks, heavy artillery and atom bombs."[3]

The military professional of today must be able to bridge mentally the gap between the effects of an antiballistic missile (ABM) system on an enemy's first strike and the number of men required to carry supplies on their backs to supply a guerrilla force five hundred miles away. War-gaming techniques and computer models to determine the effects of a second strike in an ABM environment may have little applicability in determining how to combat an enemy whose sharpened bamboo spike makes an effective weapon.

The cardinal sin in military leadership is the failure to understand the nature of your opponents. In regard to both the Soviet Union and Communist China, such misunderstanding on our part would be inexcusable. Marshals, generals, and military theoreticians of these two nations have stated again and again their

respective military tactics and strategies. In our concentration on the war in Southeast Asia and with our attention focused, in the main, on forces and hardware for that war, we must take cognizance of other possible threats.

On most issues of strategy, tactics, and weapon systems, the Soviet Union and Communist China have diametrically opposite views. An analysis of these views should be of particular importance at this time. These two nations are influencing the war in Vietnam, and their efforts also are likely to be found in any other trouble spot in the world. An appreciation of the total nature of the military threat is impossible without knowing the military doctrines of the two competing powers.

a contrast in tactics and strategy

The Soviets maintain that technology is the key to military power. The Communist Chinese leaders claim that masses of people, properly indoctrinated, are the decisive force. There is a contradiction, of course, between the stated Chinese view and the effort that nation is exerting on nuclear weapons and missiles. These opposing beliefs of the Soviets and the Chinese are their most significant difference, insofar as warfare is concerned, and are a major issue in the striving of each nation for leadership in the Communist World.

Their polemics clearly define the differences. Lin Piao, the Chinese Minister of Defense and heir apparent to Mao Tse-tung, has stated:

> The Khrushchev revisionists assert that nuclear weapons and strategic rocket units are decisive while conventional forces are insignificant, that a militia is just a heap of human flesh. . . . Their theory of military strategy is that nuclear weapons decide everything.

The authoritative *Communist of the Armed Forces*, the Soviet military publication that speaks for both the Communist Party and the Ministry of Defense,[4] appears to reply to Lin Piao's assertion in an article entitled "Military-Technical Superiority: The Most Important Factor of the Reliable Defense of the Country":

> The development of modern military affairs demonstrates the failure of theorists who consider, it is said, even the most powerful weapons useless in the struggle against the masses of the people. . . . During the Great Patriotic War [World War II] the outstanding soldier with the grenade could still face an enemy tank, but in the event of the use of the nuclear rocket weapon, one cannot wage a victorious struggle with the enemy without having the most modern and powerful technical means.[5]

These opposing views, as to whether properly indoctrinated masses of people or technology is superior, have a far-reaching impact. They spell out the difference between the "people's war" advocated by the Communist Chinese and the "wars of national liberation" supported by the Soviets. They are the basis for the "protracted war" thesis about which Mao spoke some thirty years ago;[6] and also for the nuclear rocket war envisaged by Soviet military leaders at the present time, of which it has been said:

> The special characteristics of nuclear weapons let us conjecture that world nuclear war will be short and swift-moving, in which the most decisive impact on its course and outcome will be rendered by the results of the armed combat in the beginning period.[7]

technology—the basis of Soviet strategy, doctrine, and tactics

The Soviet view of war is exemplified by the phrase, "revolution in military affairs," which is found in almost every speech or article written by Soviet officers in which military strategy, doctrine, or tactics are discussed. This phrase has been used in the titles of many articles and for at least one book.[8] The revolution "is primarily connected with the creation of the nuclear rocket weapon,"[9] although it embraces all activities of the Soviet Armed Forces.

Many Soviet writers divide the revolution into three phases: the first the development of the nuclear weapon, the second the combining of the nuclear weapon with the ballistic missile, the third the creation of the control and

guidance system. The third phase, sometimes called the "cybernetics revolution," is still continuing.[10]

The Soviet Ministry of Defense compiled a selection of articles into a book entitled, *Problems of the Revolution in Military Affairs,* and one of the articles asserts:

> Thus, *the revolution in military affairs is an accomplished fact. It led to basic quantitative and qualitative changes in the military-technological base of the armed forces and in its structure. It marked a revolution in the methods of waging war, a revolution in the theory of military art and in the actual combat training of the troops.*[11] (Emphasis in original Russian text.)

One of the many results of the revolution in military affairs has been the reorganization of the Soviet Armed Forces. The Strategic Rocket Troops are regarded as their "main" service.[12] The Troops of National PVO (air defense) normally are listed in second place. PVO now includes two additional components, PRO (antirocket defense) and PKO (antispace defense).[13] PRO has been referred to as the primary component of PVO.[14] After these two services the Soviets list their conventional Army, Air Forces, and Navy, each of which is also armed with nuclear weapons.[15]

In April 1966 Marshal V. D. Sokolovsky, well known in the United States as the editor of *Military Strategy,*[16] stated the Soviet concept of their strategic offensive forces:

> In nuclear rocket war, an aspect of strategic action, new in principle, moves out into the forefront—the strike of the strategic nuclear forces on military, economic and political targets of the enemy, that is, the action of the Strategic Rocket Troops, atom submarines and long range aviation.[17]

In this same article, which apparently was carefully studied in Europe and the United States,[18] Sokolovsky makes an interesting point on the possible uses of nonnuclear forces in any future war:

> It is completely probable that in nuclear rocket war the previous forms of strategic actions, such as strategic attacks in ground theaters, defense in certain sectors, and also the active operations of the forces of the fleet on the ocean and sea theaters, will find a use, although the modes of their use have been basically changed, insofar as here the main problems also will be solved by nuclear strikes.[19]

Soviet military theoreticians emphasize "the beginning period of the war" and the possibilities of "frustrating" the aggressors' attack. For example, the political instructors of the Soviet Armed Forces are directed to present the following doctrine:

> The result of using nuclear weapons might be so effective that the aims of the war will be achieved in this [beginning] period. The imperialists are counting on a surprise attack in their aggressive plans for unleashing a war against the USSR and other countries of the socialist camp. However, the Soviet Armed Forces are able to frustrate the aggressor's attack and carry to him shattering blows.[20]

The same doctrine, presented by Marshal Sokolovsky in 1966, becomes even more thought-provoking:

> *The beginning period of nuclear rocket war, in our opinion, consists of the segment of time from the moment of the breaking out of war to the fulfillment of the basic military, political and strategic missions.* Making a retaliatory nuclear strike is its main content, one which might be directed at frustrating a nuclear attack, disorganizing governments and military administrations, and the destruction of the economic forces and armed forces of the aggressor. As a result of the retaliatory nuclear strikes to the aggressor, such a defeat might be inflicted after which he could not continue aggressive actions.[21] (Emphasis in original Russian text.)

The theme of Soviet military spokesmen on strategy, doctrine, and tactics, whether they be senior commanders or military theoreticians, is overwhelmingly nuclear. This is stressed not only in the official Ministry of Defense newspaper, *Red Star,* and in the official journal of the Main Political Administration of the Soviet Army and Navy, *Communist of the Armed Forces,* but also in the widely publicized "Officer's Library," a series of seventeen books on military tactics, strategy, law, and similar subjects.[22] For example, one of these books,

entitled *Tactics*,[23] is reviewed in *Red Star* as being the first publication of this nature in 25 years.[24] An examination of the book itself discloses an almost total nuclear orientation—an apparent assumption that any future war will involve the use of nuclear weapons. As should be expected, both the Soviet reviews and the book refer to the "revolution in military affairs" which prepares the Soviet Armed Forces for future warfare.

There are many tasks in the Soviet scheme of things for which nuclear weapons would be inappropriate. Among these might be the necessity to quell a second "Hungarian Uprising" or fight a border skirmish with Communist China, of the type which already have been reported on numerous occasions. Another use might be to seize and occupy territory for later inclusion within the socialist camp. While constantly emphasizing the decisive role of nuclear weapons, the Soviets also must justify their maintenance of nonnuclear forces. Therefore, almost invariably, doctrinal writings are concluded with some such statement as

> . . . victory over the enemy can be achieved by the united efforts of all the services and branches of the Armed Forces.[25]

At least once each year a few Soviet writers hedge about the possibility of a nonnuclear war. This was noted in 1962 in Sokolovsky's *Military Strategy* and has since continued on about the same scale. In 1965 one stated:

> In war that is not nuclear rocket, combined arms battle will be carried out as before, with conventional means.[26]

In 1966 another theoretician noted:

> The Soviet Armed Forces must be ready to guarantee the defeat of the enemy not only in conditions of the use of nuclear weapons but also with the use of just conventional methods of struggle.[27]

And for 1967 a similar caveat is given:

> What kind of Armed Forces are necessary for waging present-day war? This question may be briefly answered thus: for waging modern war such Armed Forces are demanded as would be able to wage both nuclear war and any other war.[28]

When such statements as these are made, they generally are but one paragraph in an entire article dealing with nuclear doctrine and strategy. Any actual discussion of the possibility of a nonnuclear war is difficult to find in Soviet military writings. The thrust of Soviet military doctrine, strategy, and tactics is nuclear and technological.

tactics and strategy of the Chinese People's Army

The Chinese concept of warfare, as expounded today, is the complete antithesis of the Soviet concept. Lin Piao concisely sums up the main points of difference:

> In other words, you rely on modern weapons and we rely on highly conscious revolutionary people; you give full play to your superiority and we give full play to ours; you have your way of fighting and we have ours.

In the Chinese view, a war passes through three stages: "the strategic defensive, the strategic stalemate and the strategic offensive."[29] Instead of a "short, swift-moving war," so much discussed by the Soviets, the Chinese think in terms of a protracted war. As Lin Piao indicates:

> . . . the growth of the people's revolutionary forces from weak and small beginnings into strong and large forces is a universal law of development of class struggle, a universal law of development of people's wars. . . . [In war, Mao emphasizes that] the contest of strength is not only a contest of economic and military power, but also a contest of human power and morale. . . .That the war will be protracted is certain, but nobody can predict exactly how many months or years it will last, as this depends entirely upon the degree of the change in the balance of forces. . . . The enemy advances, we retreat; the enemy camps, we harass; the enemy tires, we attack; the enemy retreats, we pursue.

Thus, the Chinese military theoreticians anticipate reverses in the initial periods of war and call upon the people to make exceptional sacrifices. There is no expectation of quick victory. The basic tactics of guerrilla warfare, as described by Mao and Lin, are simple. However, guerrilla war in itself is not expected

to bring about the final defeat of the enemy. As "the balance of forces" changes, purely guerrilla warfare is supplemented by mobile warfare.[30]

The objective in battle is not simply to rout the enemy. The decisive factor is a battle of annihilation, which produces an immediate impact. As Lin Piao so eloquently stated: "Injuring all of a man's ten fingers is not as effective as chopping off one, and routing ten enemy divisions is not as effective as annihilating one of them." In the war of annihilation, Chinese military doctrine emphasizes that the first attacks should be on dispersed or isolated enemy forces. Some cities and even some districts must be abandoned to the enemy in order that he be lured deep within the country. Then, says Lin, the final blow is administered after the enemy "becomes elated, stretches out all his ten fingers and becomes hopelessly bogged down."

If masses of people filled with revolutionary zeal are the decisive factor, then the types of weapons used are of little importance. "The opposing side is the principal source of weapons, equipment and ammunition."[31] One of the purposes of fighting the battles of annihilation is, according to Lin, that "our army is able to . . . capture weapons from the enemy in every battle, and . . . our weapons become better." An army that simply is routed in battle may keep its own weapons during the retreat.

In a remark directed at the so-called "imperialistic powers," Mao Tse-tung sums up his strategy and tactics:

> You fight in your way and we fight in ours; we fight when we can win and move away when we can't. . . . When you want to fight us, we don't let you and you can't even find us. But when we want to fight you, we make sure that you can't get away. . . .[32]

competition for Communist leadership

The military writings on doctrine and strategy by both the Soviets and the Chinese are directed not only for internal consumption and to each other but also to establish their respective claims to leadership in the Communist World. The Chinese are blunt and more outspoken than the Soviets. Lin Piao calls for a people's war on a broad scale:

> Comrade Mao Tse-tung's theory of the establishment of rural revolutionary base areas and the encirclement of the cities from the countryside is of outstanding and universal practical importance for the present revolutionary struggles of all the oppressed nations and peoples, and particularly for the revolutionary struggles of the oppressed nations and peoples in Asia, Africa and Latin America against imperialism and its lackeys.

Lin Piao argued that many of the nations in these continents had political and economic conditions similar to that which had existed in old China. The nations that have predominantly peasant populations are in a position to use the countryside as broad areas where revolutionaries can maneuver. With this rationale, he developed his theme of North America and Western Europe being the "cities of the world" and Asia, Africa, and Latin America as the "rural areas of the world." According to Lin:

> In the final analysis, the whole cause of world revolution hinges on the revolutionary struggles of Asian, African and Latin American peoples who make up the overwhelming majority of the world's population.

Many governments of the world were alarmed by Lin's call to arms:

> Today, the conditions are more favorable than ever before for the waging of people's wars by the revolutionary peoples of Asia, Africa and Latin America . . .

Instead of the "people's war" as advocated by the Chinese, the Soviet Union supports "wars of national liberation."[33] However, the Soviets are vague as to how such wars should be fought and what kind of aid might be given to the nation or group concerned.

Some reasons for the Soviet reticence are fairly simple to understand. The Chinese claim that the Central Asian Soviet Socialist Republics are in reality colonies and as such should throw off the yoke of their Russian conquerors. This would be a war of national liberation in the Soviet sense. The problems the Soviets had with their wars of national liberation attempted

in East Germany in 1953 and in Hungary in 1956 are well known.

Soviet writers are careful not to place wars of national liberation into any one category:

> The forms of national liberation struggle of oppressed peoples are sufficiently diverse, from a national armed uprising, for example, in Algeria and Angola, to a comparatively peaceful achievement of independence of the former French colony of Guinea.[34]

Any commitment by the Soviet Union to any nation engaged in a war of national liberation also is indefinite. To paraphrase a certain former well-known industrialist and United States Secretary of Defense, "What is good for the Soviet Union is good for the rest of the socialistic-communist nations." Through Soviet eyes, it is natural that:

> *By providing the most favorable international conditions for the building of communism in our country and the building of socialism in the countries of all the socialistic-communist nations, Soviet foreign policy thus makes its own contribution to the common revolutionary cause of all nations.*[35] (Emphasis in original Russian text.)

The concept of a Soviet shield is stated by Marshal N. I. Krylov, Commander in Chief of the Soviet Strategic Rocket Troops:

> The main role in defending the peace and the socialist gains of nations belongs to the Soviet Union, the stronghold of social progress. Under the leadership of the Communist Party the Soviet people have created such military power which serves as an insurmountable block on the path of the aggressive aims of imperialism.[36]

In the struggle for leadership of the Communist World, accusations between the two nations take a remarkable turn: each accuses the other of cooperating with the United States in Vietnam. The Chinese accusations are direct, while the Soviets are a bit more subtle. To quote Lin Piao:

> The Khrushchev revisionists have come to the rescue of United States imperialism just when it is most panic-stricken and helpless in its efforts to cope with people's war. Working hand in glove with the U.S. imperialists, they are doing their utmost to spread all kinds of arguments against people's war and, whenever they can, they are scheming to undermine it by overt or covert means. . . . The Khrushchev revisionists insist that a nation without nuclear weapons is incapable of defeating an enemy with nuclear weapons, whatever methods of fighting it may adopt. . . . Isn't this helping the imperialists in their nuclear blackmail? Isn't this openly forbidding people to make revolution?

Ridiculous as this statement is, the Soviets seem compelled to make similar charges:

> Speaking of the help of the Socialist countries to the Vietnamese people, one cannot pass over in silence that pernicious role which the Peking leadership is playing in this business. . . . With their adventuristic internal and external policies they have complicated all the political conditions in Asia and have stabbed the struggling people of Vietnam in the back. In spite of wordy statements, the practices of the Chinese leaders have played into the hands of the American aggressors. The world press unanimously reports that the present policy of Peking has eased the Pentagon's resumption of the bombing of North Vietnam.[37]

This competition between the Soviet Union and Communist China, the two giants of the Communist World, is a contradiction of Marxism that would not have been dreamed of a decade ago. It is one of the significant events of this century. To the military professional, it is a phenomenon that must be clearly understood.

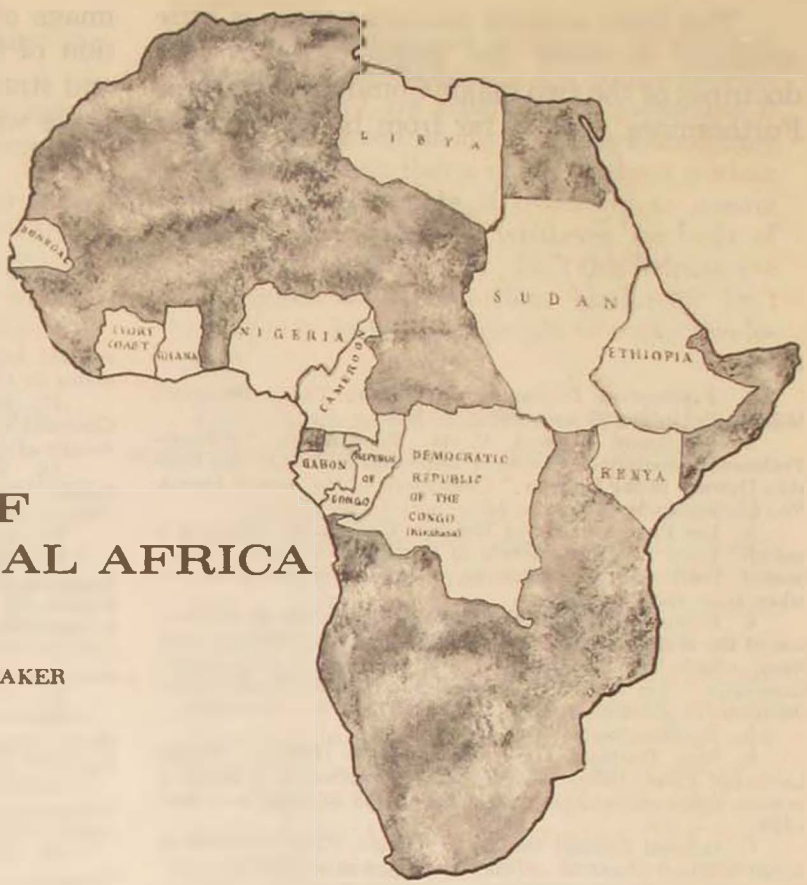
THERE IS a danger that our perceptions of military doctrines, strategies, and organizations of other military forces could revolve around our own "blue team and red team" concept. In our planning, war-gaming, maneuvers, and so on, we tend to match the blue team against the red team, and the two sides generally are identical in organization, composition, and types of weapons available. The moves of each are "rational," and rationality means the same to both sides. Hence we may find it difficult, in actual situations, to understand why the opposing side does not react to our military moves as we expect.

This brief analysis indicates there is little similarity between the military forces and doctrines of the two major Communist powers. Furthermore, each is far from being a mirror image of our own. This is but another reflection of the nuclear age, in which the tactics and strategies of past eras have little meaning. Have we really faced up to the problem?

Hq United States Air Force

Notes

1. *Explanatory Dictionary of Military Terms* (Moscow: Military Publishing House, 1966), p. 348.
2. Lieutenant Colonel V. M. Bondarenko, "Military-Technical Superiority: The Most Important Factor of the Reliable Defense of the Country," *Communist of the Armed Forces*, No. 17, September 1966, p. 9.
3. Lin Piao, Minister of Defense, Communist China, in a speech "Long Live the Victory of the People's War," 2 September 1965. (All the following quotations of Lin Piao are taken from this speech.)
4. *Communist of the Armed Forces* is the official publication of the Main Political Administration of the Soviet Army and Navy, which has "the rights of a department of the Central Committee." See I. Butsky, *Political Work in the Soviet Army* (Moscow: Progress Publishers, n.d.), p. 23.
5. Bondarenko, p. 8.
6. Mao Tse-tung, *On Protracted War* (Peking: Foreign Language Press, 1966). This book is a reprint of a series of lectures delivered by Mao during the period 26 May to 3 June 1938.
7. General Colonel Nikolai A. Lomov, "The Influence of Soviet Military Doctrine on the Development of Military Art," *Communist of the Armed Forces*, No. 21, November 1965, p. 16. (General colonel is roughly the equivalent of three-star rank in the U.S. armed forces.)
8. For example, "The Revolution in Military Affairs and the Task of the Military Press" by Marshal R. Ya. Malinovsky and "The Revolution in Military Affairs and Its Results" by General Lieutenant N. A. Sbitov, both included as selections in *Problems of the Revolution in Military Affairs* compiled by the Soviet Ministry of Defense (Moscow: Military Publishing House, 1965).
9. *Explanatory Dictionary of Military Terms*, p. 393.
10. General Major N. Ya. Sushko and Colonel S. A. Tyushkevich (eds.), *Marxism-Leninism on War and the Army* (Moscow: Military Publishing House, 1965), p. 247. (A Soviet general major roughly corresponds to one-star U.S. rank.)
11. General Lieutenant N. A. Sbitov, "The Revolution in Military Affairs and Its Results," a selection in *Problems of the Revolution in Military Affairs* (Moscow: Military Publishing House, 1965), p. 89.
12. *Explanatory Dictionary of Military Terms*, p. 383.
13. *Dictionary of Basic Military Terms* (Moscow: Military Publishing House, 1965), p. 181.
14. Ye. K. Bragin and A. G. Kubarev, *Anti-Missile Defense* (Moscow: Military Publishing House, 1966), p. 3.
15. General Major K. S. Bochkarev (ed.), *The Program of the CPSU on Defending the Socialist Fatherland* (Moscow: Military Publishing House, 1965), p. 114.
16. Marshal V. D. Sokolovsky (ed.), *Military Strategy*, appeared in Moscow bookstores in August 1962, about two months before the Cuban missile crisis. English translations, entitled *Soviet Military Strategy*, were available in the United States in 1963.
17. Marshal V. D. Sokolovsky and General Major M. I. Cherednichenko, "On Contemporary Military Strategy," *Communist of the Armed Forces*, No. 7, April 1966, p. 64.
18. Wing Commander J. F. L. Long, RAF (Ret), "Shifts in Russia's Strategic Posture," *Royal Air Force Quarterly*, Winter 1966, p. 299.
19. Sokolovsky and Cherednichenko, p. 64.
20. Colonel S. V. Malyanchikov, "The Character and Features of Nuclear Rocket War," *Communist of the Armed Forces*, No. 21, November 1965, p. 71. This article was listed in the "Political Studies Department" of the magazine, and political instructors were to devote six hours to the study of the particular theme.
21. Sokolovsky and Cherednichenko, p. 65.
22. Publication of these books by the Military Publishing House began in 1965. As of April 1967 only nine of the announced seventeen volumes had appeared.
23. General Major V. G. Reznichenko (ed.), *Tactics* (Moscow: Military Publishing House, 1966, first printing 40,000 copies, cost 1 ruble 61 kopeks [$1.77]), 408 pp.
24. General Lieutenant V. Davidenko, *Red Star*, 14 December 1966.
25. Colonel V. V. Larionov, "New Weapons and the Duration of War," *Red Star*, March 1965.
26. Colonel A. A. Strokov (ed.), *The History of Military Art* (Moscow: Military Publishing House, 1966), p. 616. The manuscript of the book went to press in 1965. The book is one of the "Officer's Library" series, with a first printing of 35,000 copies.
27. Colonel I. P. Prusanov, "The Work of the Party in the Strengthening of the Armed Forces in Terms of the Revolution in Military Affairs," *Communist of the Armed Forces*, No. 3, February 1966, p. 10.
28. General Lieutenant I. G. Zavyalov, "On Soviet Military Doctrine," *Red Star*, 30–31 March 1967.
29. Samuel B. Griffith, *Mao Tse-tung on Guerrilla Warfare* (New York: Praeger, 1962), p. 21.
30. *Ibid.*, p. 20.
31. *Ibid.*, p. 24.
32. Quoted by Lin Piao, *op. cit.*
33. Sushko and Tyushkevich, *op. cit.* Chapter Two of the book is entitled "The Social Character and Types of Wars in the Modern Era," pp. 69–113. Also see V. V. Zagladin, "The Leninist Course of Foreign Policy of the USSR," *Communist of the Armed Forces*, No. 9, May 1966, pp. 12–20.
34. Sushko and Tyushkevich, p. 104.
35. Zagladin, p. 13.
36. "Reliably Guarding the Achievements and Security of the Nations," *Red Star*, 9 May 1967.
37. "The Cause of Vietnam Is Just," *Izvestia*, 24 February 1967.



THE AIR FORCES OF TROPICAL AFRICA

Dr. Ross K. Baker

Considerable effort has been expended recently on analyses and descriptions of the armies of Tropical Africa.[1] There has not, however, been any extensive treatment of the air forces of these new states. The reason for this has undoubtedly been that Tropical African air forces, virtually without exception, are weak and essentially embryonic components of a military establishment dominated by the army. In Tropical Africa only Ethiopia, Ghana, and most recently Nigeria have air forces of any size. It is understandable, then, that observers should consider only the armies. Recent events in Africa, however, have indicated that the role of air power may not be as negligible as was once assumed.

In the Nigerian civil war, for example, the presence of two B-26s in the air force of the secessionist state of Biafra was, at the outset, a major psychological weapon. Opposing Biafra, the Federation of Nigeria initially employed its German Do-27 trainers and German-trained pilots to some advantage in the conflict. In mid-August 1967, the balance of air power drastically changed in favor of the Federation when it acquired 2 Mig-15s and 8 Mig-17s from the Soviet Union and 6 Delfin L-29 jet trainers from Czechoslovakia. In the continuing strife in the Congo, the decision by the U.S. government to supply logistical support in the form of three C-130s to the Kinshasa government for the purpose of ferrying troops has proved to be a major military and morale factor in combating mercenary and separatist forces.

That so few aircraft should have such a considerable impact is indicative of certain military realities in Tropical Africa. Initially, ground communication and transportation are intermittent and unreliable. Long rainy seasons and the lack of hard-surfaced roads mean that military operations must come to a virtual halt after the dry season. Road and rail networks are not extensive and do not adequately cover most countries. Few intercolony roads were built by the Europeans, who were

more concerned with internal traffic than with access to neighboring colonies. Airports, on the other hand, are usually well dispersed and, although subject to the vagaries of weather and lack of navigational devices, can be used by light planes and medium transports most months of the year. Modifications on aircraft are usually required, however, in order to allow them to operate from dirt or grass landing strips.

The level of military training and discipline varies from country to country, but as a rule standards are not high. Most enlisted men are country people with no combat experience, and for them to face something as terrible as aerial bombardment (even on a modest scale) is likely to be demoralizing and destructive of discipline.

Air power in Africa, as modest as it is, has far outpaced air defense. Even those countries involved in conflict have been hard pressed to come up with a meaningful civil defense program in the urban areas. Some states, notably Nigeria, possess antiaircraft batteries, but military procurement as a whole has been characterized by the acquisition of mortars, light artillery, and ordinary automatic weapons. An aircraft, once aloft and competently piloted, has virtual sanctuary in the sky.

Given these obvious advantages which accrue to air power, why have the air forces of Tropical Africa been of limited size and importance? A number of factors contribute to this situation. First, aircraft are costly and most African states cannot afford them. Even prestige-conscious leaders have thought twice before buying military aircraft. As a prestige symbol, the airplane frequently loses out to the aluminum plant or the hydroelectric facility. Second, several African states, notably the former French colonies, have entered into bilateral and multilateral defense agreements with their former metropolitan power to provide military assistance in the event of invasion or internal unrest.[2]

Third, the main aircraft producers and vendors have been fairly restrained in their sales activities in Africa, and military aid in the form of aircraft has not been notable. There seems to be a tacit agreement among arms suppliers that expensive, high-performance military aircraft are not suitable or desirable for African states. The principal exception to this is Ethiopia, where the U.S. has provided significant training and equipment to the Imperial Ethiopian Air Force (IEAF). Aside from the recent shipment of Migs to Nigeria, surprisingly few Soviet military aircraft have appeared in Tropical Africa, although this situation is not expected to continue.[3]

Another factor militating against large and powerful African air forces is that while most former colonies inherited armies, there were no colonial air forces per se to be transferred from colony to independent state. It was not until several years after independence that Ghana, for example, created an air force, although the colonial army, the Gold Coast Regiment, became the Ghana Army upon the attainment of independence. Given the choice of building up either military and police units or air forces, most African leaders opted for the former.

The problems of pilot training and aircraft maintenance also work against the growth of Tropical African air forces. A man reared in a basically nontechnological culture has difficulties in apprehending the sophisticated scientific principles involved in piloting a modern aircraft. Principles of physics to which most Americans and Europeans are exposed at an early age are unfamiliar and bewildering to a young man reared in a rural African village. That there is a significant number of African pilots is a tribute to the intelligence and ingenuity of those who have overcome these cultural limitations.[4] The same problems that cause difficulties in pilot training also hinder standards of maintenance, which as a rule are not high. This deficiency too can be overcome by patient but ambitious training of ground personnel.

Despite the factors operating against large sophisticated air forces, some small, useful air forces have evolved. These air forces are based primarily on light short-takeoff-and-landing (STOL) aircraft, training planes, and medium transports, almost all piston-driven. The main exceptions to this are Ethiopia and, to a lesser extent, Ghana.

Cameroon has several small Broussards and a C-47. — Congo-Brazzaville has several single-engine aircraft, a DC-3, and a helicopter; and its neighbor, Congo-Kinshasa has about 6 DC-3s and a half-dozen light aircraft. — Ethiopia, with 70 aircraft, has a large inventory by African standards: a squadron of F-86s, 5 T-33s, 10 C-47s, 7 F-5s, and 20 Saab-17s and 91s. — Gabon has a helicopter, a DC-3, and several Broussards. — Ghana has more than 70 aircraft, mostly of Commonwealth origin: over 25 Beavers and Otters from Britain and Canada, 8 Caribous, 12 Chipmunk trainers, 1 Heron VIB, a half-dozen Westland Whirlwind helicopters, and several Wessex and Hughes helicopters. In the early 1960s when an Indian mission was training the Ghana Air Force, a number of Hindustan HT-2 trainers were acquired. Eight Aermacchi M.B. 326Fs were sold to Ghana by Italy; only 3 are presently operational. — The neighboring Ivory Coast has a small number of Broussards and Pilatus Porters. — Libya began its air force in 1959 with 2 Egyptian Gomhouria fighters and later acquired 2 U.S. T-33s. — Nigeria, as previously mentioned, has some Dornier Do-27s and a Heron transport, 6 Delfin L-29s, 2 Mig-15s, and 8 Mig-17s. The secessionist state of Biafra has 2 B-26s, although at least one of these was said to have been destroyed in recent fighting. — Kenya is receiving 6 Chipmunks, 11 Beavers, and 4 Caribous from Great Britain. — Senegal has 2 C-47s, light aircraft, and several Mig-15 trainers. — The Sudan has 20 light transports and British Provost training craft.[5]

If Africa's new states are not troubled by international wars or internal disorders, the trend in acquisition and utilization of aircraft will continue along the lines already followed. There will be small, versatile air forces that concentrate on logistical support, patrol, and disaster duty. There is a strong case to be made for air force civic action to parallel the civic-action programs pursued by some African armies. The Imperial Ethiopian Air Force has already become involved in this sort of program. The small air forces can be used in crop spraying and insect eradication. The Ghana Air Force has used helicopter sprayers to combat mosquitoes in the Accra area. The Imperial Ethiopian Air Force has sent graduate pilots to the East African Locust Service, and it participated in the Somali Flood Relief Operation in 1961. The air forces could also be used to carry livestock to market. In many African states the cattle-raising areas are remote from the main population centers where most beef is consumed. Cross-country cattle drives in the dry season through areas infested by tsetse flies decimate the herds. Livestock lifts on a large scale, however, would be difficult in light of the number of aircraft now available. The small air forces could also be used for disaster relief and relocation of game animals threatened by fire and flood. There is a significant role for the Tropical African air forces, and it need not be a combat role.

In the event of conflict, however, there will probably be great pressure exerted on the aircraft-producing countries to provide combat aircraft or at least trainers that can be fitted out with guns, rockets, or other ordnance. The U.S. may well be called upon to provide either aircraft, pilots, or supporting services as in the Congo recently. It will be difficult to refuse a beleaguered nation, even though our better judgment tells us that expensive aircraft are inappropriate for a struggling and financially burdened state. If the U.S. finds itself in this position, it would be better to provide the African air forces with multipurpose craft that could be used in a practical civilian role after their military utility had ended.

It is well to mention briefly the role of civil aviation in Africa. Many of the qualified African pilots obtained their training as second officers on the national flag carriers. The national airlines established shortly after independence, in most instances, were originally more useful as sovereignty symbols than as profitable enterprises. Many of these flag carriers are still heavily subsidized by the governments, but others have moved in the direction of paying their own way. Improved management practices and abandonment of unprofitable routes have helped the financial position of Ghana Airways. Air Afrique, a cooperative venture of several French-speaking West African countries, has the reputation of being an exceedingly well-run enterprise.

Future political events in Africa will probably determine, more than anything else, the future of military aviation. The necessity of maintaining territorial integrity and national cohesion may well call for military operations in which the role of air power—even a modest level of air power—will be a decisive factor.

The Brookings Institution

Notes

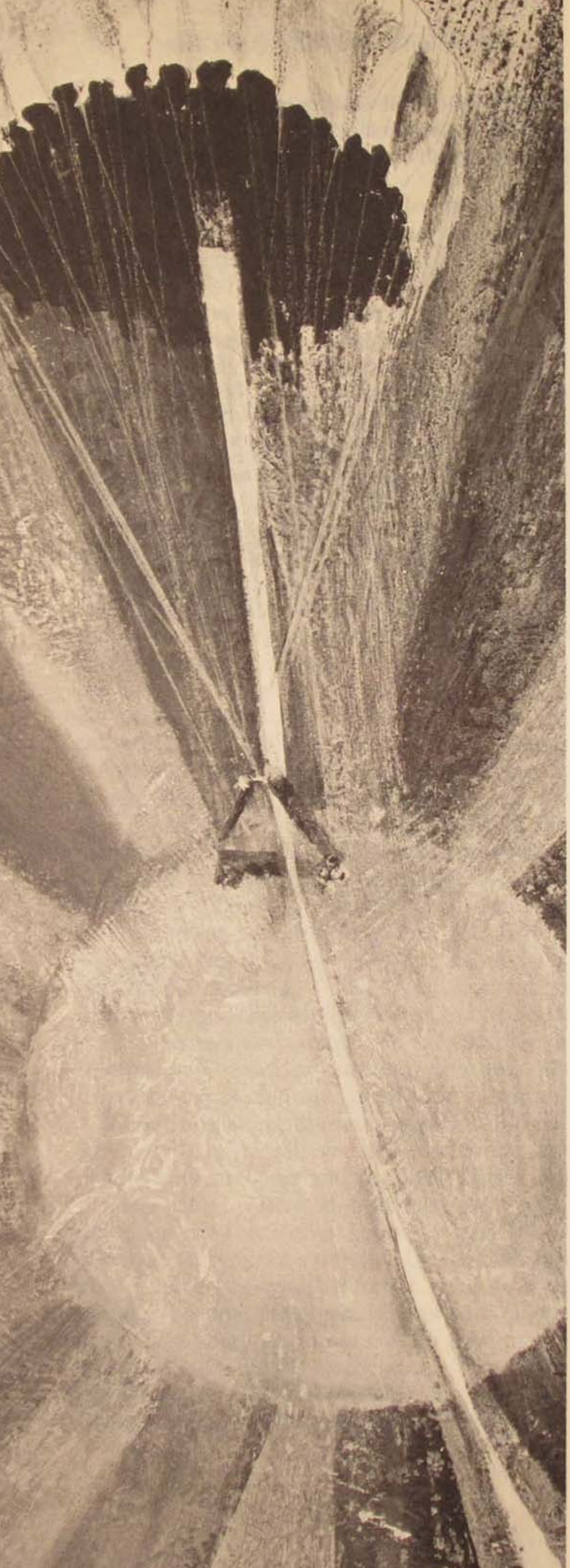
1. See, e.g., *African Forum* (Summer 1966); W. F. Gutteridge, *Military Institutions and Power in the New States* (New York: Frederick A. Praeger, 1965); Morris Janowitz, *The Military in the Political Development of New Nations* (Chicago: University of Chicago Press, 1964).

2. See "France's Military Role in Africa," *West Africa* (n.d.), reprinted in *Africa Report*, Vol. 9, No. 1 (January 1964).

3. U.S. military aid to Ethiopia is discussed briefly in "Who's Armed Whom?" *The Economist*, 25 March 1967. The IEAF inventory includes one squadron of F-86s and 7 F-5s.

4. The Russians had promised the former president of Ghana, Kwame Nkrumah, that they could train Ghanaian pilots in fixed- and rotary-wing aircraft in six months. When a group of these trainees returned from the U.S.S.R., it was discovered that the Soviets had not succeeded and that the Ghanaians would have to be completely retrained by the British. Both of the antagonists in the Nigerian civil war have had to rely mainly on mercenary pilots.

5. These data were derived from Neville Brown and W. F. Gutteridge, *The African Military Balance*, Adelphi Papers No. 12 (London: Institute for Strategic Studies, August 1964), *passim*; and George Weeks (comp.), "The Armies of Africa," *Africa Report*, Vol. 9, No. 1 (January 1964), pp. 5–21; and John L. Sutton and Geoffrey Kemp, *Arms to Developing Countries: 1964–1965*, Adelphi Papers No. 28 (London: Institute for Strategic Studies, October 1966). It was reported on 9 August 1967 in the *New York Times* that the Sudan was in the process of acquiring Mig-17s from the U.S.S.R., although 12 Sudanese cadets were being trained in the U.S., two as jet pilots.



THE GREAT JAPANESE BALLOON OFFENSIVE

MASTER SERGEANT CORNELIUS W. CONLEY

ON 4 NOVEMBER 1944 a United States Navy patrol craft spotted something that looked like a large fragment of tattered cloth floating on the sea, 66 miles southwest of San Pedro, California. A sailor tried to drag the fabric on board the craft but discovered that a heavy undercarriage was attached to it. When the fabric was hauled on board, it was found to be a rubberized-silk balloon.

The apparatus connected to the undercarriage of the balloon consisted of a small radio transmitter with an on-off vibrator circuit to interrupt the transmitted signal periodically, giving a characteristic signal that could serve for identification purposes. The transmitter had a small variable condenser (actuated by an aneroid bellows), which caused the transmitted frequency to vary between 6.2 and 6.6 megacycles, depending upon the altitude of the balloon. Under reasonably favorable conditions, the transmitter would have a range of approximately 1000 miles.

There was also an aneroid bellows controlling the operation of a ratchet contact switch, which was designed to make contact successively with its seven switch points as the atmospheric pressure varied. The switch established contact when the external pressure went up and broke contact when the pressure went down. Contact was then made on the next successive point when the pressure went up again.

The purpose of such a device was to change the transmitted signal for each cycle of the balloon's ascent and descent. In addition, the ratchet device was used to drop sand ballast automatically from the hopper type of undercarriage when the balloon fell to a predetermined level.

All the equipment bore Japanese markings and indicated that something new and mysterious had been introduced into the struggle that was World War II.

After the finding of the first balloon, it was two more weeks before other fragments were salvaged from the ocean. At 1000 hours on 14 November 1944, the Coast Guard at Kailus, Hawaii, saw an airborne object descend into the sea, five miles out. The object was reported to be a paper balloon 30 feet in diameter. A fragment of the envelope and some of the attached gear were recovered from 20 feet of water.

Around 15 November, a balloon floated silently across Cape Flattery on Washington's rainswept northern coast. Finally, unseen, unheard, it buckled gently into a heap near Kalispell, Montana, 475 air miles east of the Pacific Coast. After its discovery by two puzzled loggers on 11 December 1944, men of the Federal Bureau of Investigation and the Army Air Forces investigated to determine its origin and purpose. The amount of snow on the balloon when discovered indicated that it had landed between 11 and 25 November.

The balloon had presumably been launched from an offshore submarine, as had been the small seaplane, piloted by Nobuo Funita, which on 9 September 1942 had dropped about 165 pounds of fire bombs near Mt. Emily, Oregon, causing small forest fires. But why these unarmed balloons?

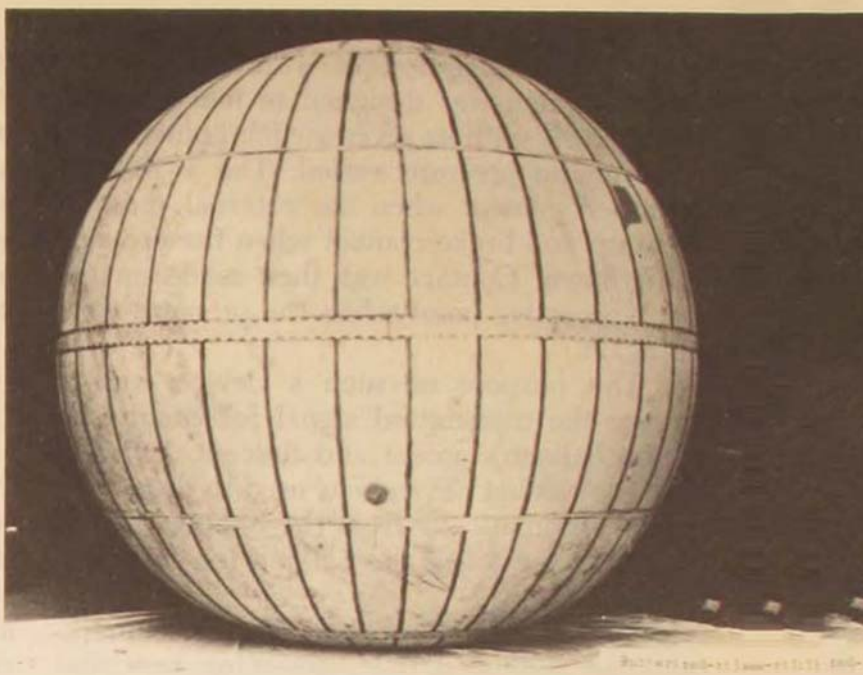
Though its appearance was quaint, the balloon was a practical and effective one. The FBI soon discovered that the Japanese had obligingly printed a good deal of information on the bag. It had been completed only a few weeks before, on 31 October 1944 to be exact, at a Japanese factory. Japanese characters also revealed the number of hours spent in its manufacture and data regarding work shifts.

The Rising Sun's V Weapon

The use of balloons as a weapon of war was conceived by the Japanese Military Scientific Laboratory in 1933, when study and research projects were started on the use of a 4-meter (13.12-foot) balloon with a flying range of 100 kilometers (62.14 miles). The study continued until 1935, when the research group of the lab started studying the theory of long-range balloon warfare, utilizing winds at altitudes of 3 to 6 km. They investigated methods of keeping balloons airborne for long periods of time and tried to determine if the west wind continued to blow the entire 10,000-km distance across the Pacific Ocean. For some unknown reason the project was discontinued. Either the experiment was completed or, with no apparent need for this type of weapon at that time, the whole idea was shelved until some future date.

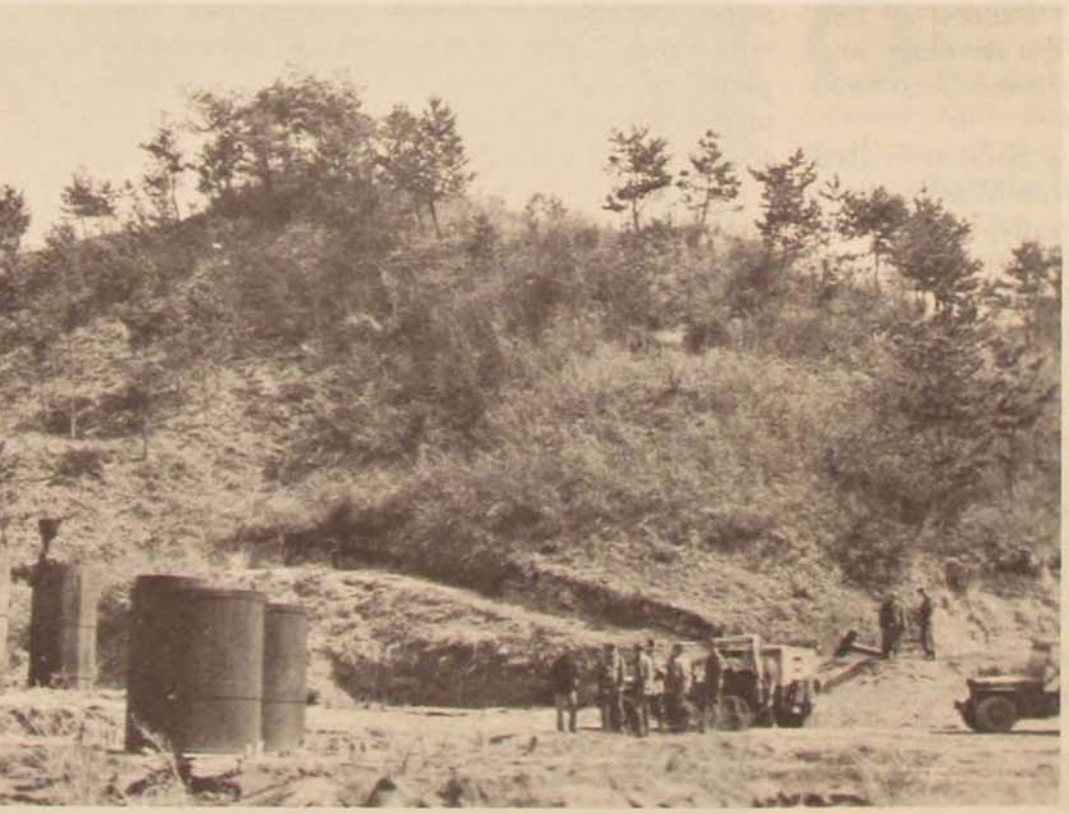
That date turned out to be 7 December 1941 when Japan entered World War II. At this time Major General Sueyoski Kusaba requested that the research group be given permission to conduct full-scale development of a long-range balloon. In addition, he requested that a 1000-km area be reserved for manufacture and test. But his pleas fell on deaf ears, and he found little if any support for his idea. The project remained a closed subject until a single event took place on 18 April 1942 and shook the Japanese military empire, dispelling once and for all the Japanese militarists' boast that their zone of inner defense was impregnable against air power.

The event was the Doolittle raid on Tokyo, by sixteen carrier-based B-25 medium bombers.



Technical Major General Sueyoski Kusaba, director of Japan's long-range balloon program, wears a medal on his right breast pocket for his leadership of the project. . . . The fully inflated rubberized-silk balloon is like one found off San Pedro, California, and used by the U.S. in testing.

Hydrogen-filled balloons were launched from site near Otsu, located in northern Shiga prefecture, Japan. When it was discovered by the U.S. Army in 1947, the area was overgrown with weeds, and the equipment was rusty. . . . A Japanese balloon in eastward flight over the Pacific Ocean.



Apparently the attention given to the Japanese home defense had been secondary to that given to efficient operations in the war theaters. In spite of at least one radio message Tokyo received, the Japanese were unprepared for the attack.

In seeking reprisals for the Doolittle raid, the Japanese conceived the first transoceanic automatic-balloon campaign in history. It was to be their V-1 weapon. The Ninth Military Laboratory was immediately ordered to study various balloons capable of carrying bombs to the American continent.

It was first intended that the balloons would be released from submarines off the West Coast of the United States, and in March 1943 a 6-meter (19.6-foot) balloon with a desired range of 300 km (186.4 mi) was developed which flew 1000 km (621.4 mi) between the west and east coasts of "Japan proper." Later it was found that this model could stay in the air for more than 30 hours at an altitude of 8 km (4.97 mi).

By this time, however, the Japanese Navy was so depleted that ships and submarines necessary to carry on such an attack were no longer available, and therefore further investigations were necessary to invent a balloon capable of traversing the expanse of ocean between Japan and North America.

So the Ninth Lab was ordered to develop a balloon with a range of 10,000 km, to be released from the Japanese home islands. The research was started in August, with the emphasis on two objectives: maintaining the balloon aloft for a long period of time and determining whether the west wind was continuous for 6200 miles across the Pacific. They began by studying what were termed the "A" and "B" types of balloons.

The materials of the "A" type balloon consisted of handmade and handpatched integumentary paper. The raw, handmade mulberry paper had a standard weight of 15 g/sq m. With four pieces of paper pasted together lengthwise and breadthwise alternately, the balloon section began to take shape. The next step was to soften the paper panels by first dipping them into a solution of soda ash, then washing them with water, and finally dipping them into a solution of glycerine.

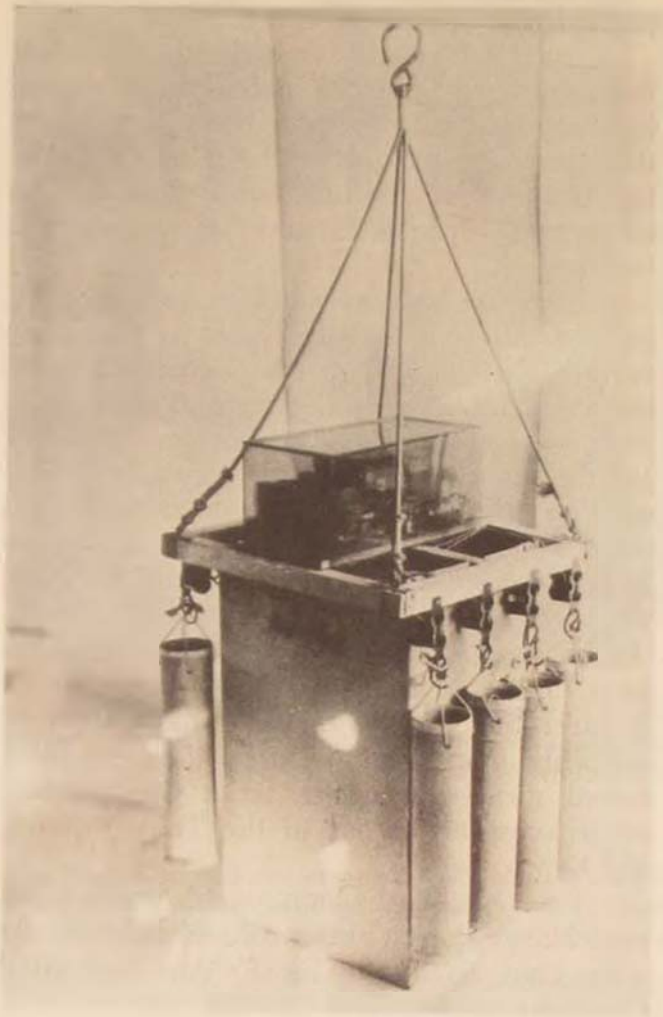
After the panels were dried, the edges were trimmed and the panels were pasted together on a spindle form, the top part first, then the lower part. After the relief valve was installed, the suspending band was attached to the two hemispheres, and they were pasted together.

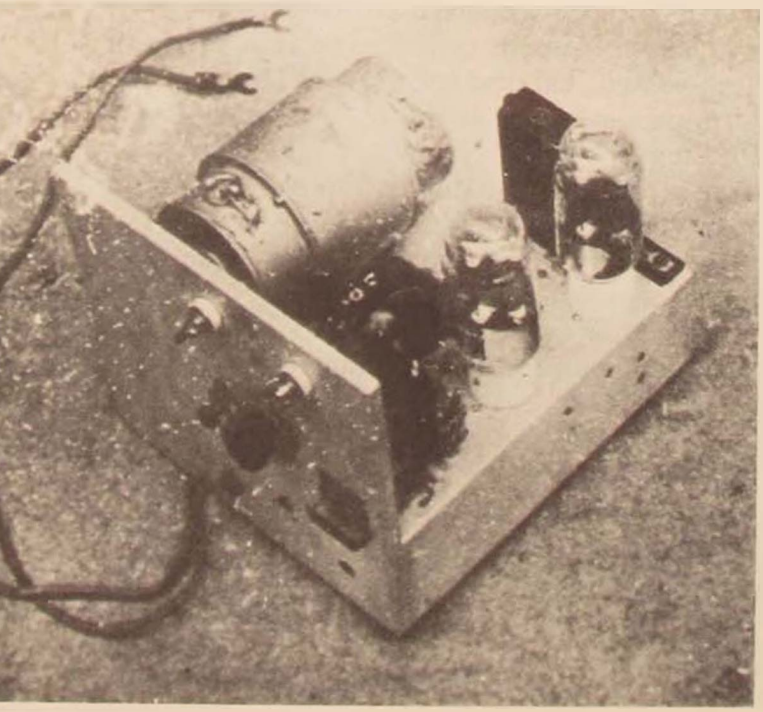
Then the balloon was filled with gas for test purposes and coated with a protective varnish. The earlier paper balloons were made in factories, but when the demand reached its peak, the factories merely processed the paper and made the majority of the panels. The panels were then sent to subcontractors, who assembled the panels into the finished product. Some of the industrial firms connected with the operation were the Mitsubishi Saishi (Paper Factory), the Nippon Kakokin Company, and the Kokuka Rubber Company. It is interesting to note that the major share of assembly work was performed by Japanese school girls working in large theaters and sumo wrestling arenas in the Tokyo, Osaka, and Kyoto areas.

The type "B" balloon, which was a Japanese Navy project, was made of habutai silk with gum coating. The Fujikur Industrial Company impregnated the silk with the rubber type of gum. The balloon had a standard weight of approximately 170 kg.

These balloons consisted of four sheets of gum-coated habutai silk pasted together to form panels for the bottom half and five layers for the top half. After the two halves had been formed, they were put together in spherical shape. The connecting parts were sewed together with a wide, overlapping seam, and cotton tape sealed the seams. Then the balloon was inflated and tested, and any leakage was stopped by a gum concentrate with benzol as the solvent.

General Kusaba had many other obstacles to overcome before the harmless-looking balloon could be turned into an effective weapon. The variability of atmospheric phenomena was at first regarded as the chief problem. After several meteorological observations, however, it was concluded that as long as the weather was not too bad the atmospheric pres-





sure should remain fairly constant across the ocean at a given altitude. It was recognized that there were some ascending and descending air currents, though, even at 10 km (32,000 ft), as a result of weather conditions on the earth.

Probably the greatest problem was in developing a radiosonde that could operate at length under the varying stratospheric conditions. The responsibility for development of such a system went to the Japanese Fifth Army Technical Laboratory. The primary purpose of the radio equipment would be to test the balloon's flying course and its altitude, to indicate the balloon's inside pressure. In addition, it would provide data on the balloon's ascending and descending flight and indicate when the ballast was being dropped. The first tests were conducted from the Chiba prefecture area.

At the time, there was no known radiosonde that could operate for the desired length of time under stratospheric conditions. The most trouble was encountered in the development of a power source of adequate durability and the selection of frequencies. In order to check the function of the radio equipment during these experimental flights, various models of the radiosonde apparatus were developed and suspended from the balloon instead of bombs.

After considerable effort, the lab finally succeeded in building a set. It was attached to a balloon, and the balloon was released on a free flight. For 80 continuous hours the set continued to operate, relaying valuable flight information. The radio fell silent when the balloon reached a point 130 degrees west longitude. Based on theoretical calculations, a balloon could cross the Pacific in three days during the winter period of November to March.

The San Pedro balloon carried this "hopper" type of automatic ballast-dropping mechanism, with the radio transmitter mounted on top of it. Radio shown below.

The radiosonde system developed for monitoring the balloon's flying course was one that produced a continuous wave, moderated by a multivibrator. This piece of equipment had a power output of 2 watts with an A & B frequency which worked on an alternating cycle. "A" would operate 10 minutes and rest 10 minutes; while "A" was resting, "B" was operating, and vice versa.

In October 1944, 50 hours of flying records were obtained on a type "A" balloon and 80 hours on a type "B" balloon. Charts that were plotted on both balloons showed that the type "B" maintained a more constant and stable altitude.

From the results of the 200 experimental balloon flights conducted from February to March 1944, it was concluded that if more improvements were made in the future, the objective would be reached.

To investigate the weather conditions, lab scientists tried to collect all available material and information from the Central Meteorological Observatory and from the Military Observation Bureau, but at the time there was little information or reference material concerning altitudes above 500 meters. They obtained some data about the upper regions over Japan and the American mainland, but nothing about the Pacific Ocean area. Since they were unable to obtain information about the west wind in the stratosphere, they had to analyze the data available from the Tateno Aerological Observatory.

Average winds aloft were plotted for each month beginning in January 1943. These were used to forecast wind velocities and directions. By September of that year maps had been completed, but they indicated a sharp curve of the airstream on the west coast of the American continent. This new discovery became the subject of many interesting discussions. By November 1943 the theoretical calculation had been verified to a small degree by the radio observations of the experimental balloon flights. These flights showed that the calculated routes were accurate as high as 300 km.

It is interesting to note how the predicted route charts were drawn up. First by supposing that the decreasing ratio of the temperature effected by the altitude was fixed, then by calculating the air pressure of this particular altitude, they were able to draw an aerological isobar. By calculating the inclining degree between the isobar and the speed of the wind from the latitude charted, they could draw a line to a point on a chart.

On the basis of this conception, they analogized the flying course of the balloon, its speed, and its diffusion; and thereby they decided where to launch the balloons. It was noted that the upper airstream which reaches the American continent is a winding one; that the airstream in the American continent area tends to flow southward. The time required for a balloon to fly the complete course was estimated from 30 to 100 hours; the average time was 60 hours.

The Japanese also had a minor problem in determining a launch site. If Hokkaido had been the starting point, the balloons would have entered the Soviet Union; so Choshi in southeast Honshu was chosen as the best launch site. Another reason for selecting this area was its proximity to the hydrogen supply.

In determining when to launch a balloon, the Japanese used a simple process. If a high atmospheric pressure front had just passed the area, then it was most suitable for balloon launching; but if a high pressure front was approaching or if a low pressure front had just passed, then it was unsuitable for a balloon launching.

Another equally difficult problem resulted from the changes in temperature which the balloon encountered during its flight. A sudden change of temperature from 20 degrees in the day to —50 degrees after sunset would cause the balloon to drop. The Japanese Eighth Technical Laboratory was assigned to help solve the temperature and contraction problems.

Since the "B" type balloon had a greater inside pressure (35 mm Hg), there was little difficulty with the temperature contraction problem. This was determined by analyzing the radiosonde equipment which recorded the amount of ballast dropped. The "B" balloon proved to be a better balloon, but due to a

shortage of materials only 300 were made.

In regard to the "A" type balloon, the problem was to determine how much sand should be carried, how much to drop at one time, and how many feet and how often the balloon would fall at night. Inasmuch as the duration of a flight was limited by the quantity of sandbags aboard the balloon, it was estimated that 35 sandbags, each weighing approximately 3 kilograms, would be needed. This quantity could keep the balloon flying for four days if it dropped approximately 25 kg of ballast per day.

It took a year's research and experimenting before both forms of the balloon were ready for practical use. It was decided that the first armed balloons would be launched on 3 November 1944. The balloons were released by a crew usually during the calm periods of evening or early morning. When the wind velocities were greater than five meters per second, the balloons were launched by one of two methods.

When the wind velocity was two miles per hour or less, the inflated and loaded balloon was secured with doubled ropes passed through the loops in the catenary rope at the equator of the envelope. One end of each holding rope was released simultaneously, permitting the balloon to rise free. When the wind velocity was greater, up to ten miles per hour, a different method was used. First, the ballast-dropping apparatus and load were placed on a stand several feet above the ground. The envelope was then filled upwind from the stand and loaded equatorially with sand ballast in special containers designed to open when pulled from below. The balloon was then "walked" into position and attached to the ballast-dropping mechanism. The ballast release ropes then were pulled, allowing the balloon to rise. It is presumed that this method was used to minimize the shock and oscillation that would have occurred if the balloon had been released abruptly. Launching normally required a crew of 30 men and could be done in 30 minutes. On days with favorable weather conditions, as many as 150 balloons were released.

The Japanese maintained launching points at Nakoso, Fukushima prefecture, with two companies of launching crews and six launching stations. In addition there were the same number at Ichinomiya, Aichi prefecture, but at Otsu, Shiga prefecture, there were three companies and nine stations.

In order to track the flights of the radio-carrying balloons, they had direction-finding stations at Shikoku, Furukawa Iwanai, and one near Ichinomiya.

For What Purpose?

After the first preliminary studies had been made, it was believed in the United States that the paper balloons were weather balloons or antiaircraft barrage balloons used by Japan to combat B-29s that were attacking the Japanese home islands. It was surmised that if this were the case the balloons must have strayed to the United States by accident. The Japanese were apparently unaware their balloons had reached this country.

Then on 23 December 1944, a paper balloon was recovered 15 miles north of Marshall, Alaska. This balloon, like the Kalispell one, did not have any undercarriage, but two sandbags were recovered, and the relief valve had a large "26" inscribed on it with chalk.

Another paper balloon was discovered at Estacada, Oregon, on 31 December 1944. It was similar to both the Kalispell and Marshall balloons in its basic construction features.

These incidents were brought immediately to the attention of the Commanding General, Western Defense Command, who initiated staff studies to determine the origin of the balloons, the purpose for which they were being directed toward the United States, and their capabilities.

The War Department was also kept fully informed of each reported balloon incident, and on 4 January 1945 the Chief of Staff designated the Commanding General, Western Defense Command, coordinator for all balloon intelligence activities in the Seventh, Eighth, and Ninth Service Commands. Concurrently, the Commander, Western Sea Frontier, was designated coordinator for balloon intelligence activities over ocean water areas.

One of the first objectives which the air defense organization had to consider before it could establish an effective defense was the purpose behind the Japanese balloons. Japan's subjection to bombing attacks and her inability to retaliate against them was undoubtedly of deep concern to the Japanese government.

After extensive studies were made, it was concluded that "ranging shots" were one of the most probable uses for the balloons. The prevailing winds over the North Pacific were of such velocity and direction that it would be possible to send balloons from Japan to the United States at the most favorable altitudes, which were between 20,000 and 25,000 feet. Reliable meteorological texts reported that at an altitude of 25,000 feet there is an air current that crosses Japan from the west, veers southward toward Hawaii, then swings to the north crossing California and part of Montana where it again veers southward. Our B-29 bombers had verified the existence of these strong westerly winds at high altitudes over Japan. A balloon at 25,000 feet could be carried eastward from Japan at a speed of from 30 to 60 mph, perhaps even faster. January and February would be the most favorable months of the year for the launching of the balloons. In addition, the latitude of Tokyo would provide the most favorable release point. From here an average wind flow at 20,000 feet could carry the balloons across the United States between Vancouver and southern Oregon. At 30,000 feet, velocity would be higher by 15 to 20 percent, and a balloon launched from the same latitude could land in Canada.

Very few accurate tracks (or series of plots) of the point of origin of the signals had been obtained because of technical difficulties, but the tracks that had been obtained showed movements of the transmitters along the general course of the upper winds and at speeds that might be expected from free balloons. A direction-finder net for the purpose of obtaining accurate fixes was organized.

The signals were generally of the same type, pulsed continuous-wave transmissions of varying frequency and with marked transient characteristics. The pulse rates usually ranged between 20 and 150 pulses per minute. The frequencies usually ranged from about 5000 kilocycles to over 12,000 kilocycles, with individual transmissions varying in some cases by more than 250 kilocycles. In many cases the frequency fell and rose several times during the period of monitoring, as if the balloon were losing altitude, dropping ballast, and rising again. In a number of cases the frequency dropped quite rapidly, and then the signal stopped suddenly as if the balloon fell into the ocean.

As additional information became available, the Western Defense Command estimated that the balloons were being released from an airfield near Sendai, 180 miles north of Tokyo, on the island of Honshu. From this information, it had to be assumed that the balloon episodes to date were Japanese "ranging shots" in preparation for mass launchings of such balloons.

On the assumption that these "ranging shots" would provide the Japanese with the flight course of the balloon and the point at which it landed, we had to do everything possible to prevent the Japanese from obtaining this valuable information. It was almost certain that any news, if published, would be picked up by the Japanese. Furthermore, it was not considered advisable to alarm the U.S. civilian population until such time as the balloons might become a menace.

On 4 January 1945 two men working in a field near Medford, Oregon, heard a loud explosion and saw a spurt of flames 20 to 30 feet high, followed by a cloud of yellow smoke in a nearby field. When they arrived on the scene, they found a hole in the ground about 6 inches in diameter and 12 inches deep. The sides of the hole appeared to have been baked. Further investigation revealed a burned metal casing, cylindrical in shape, and pieces of molten metal, which indicated that the object was very likely an incendiary bomb. A hook, identical to those used on the shroud lines of the balloons, was also found. No planes were overhead at the time of the incident, nor were any other objects seen in the air. It was presumed likely that the bomb dropped from a balloon. On the same day, the U.S. Office of Censorship requested that all news agencies

refrain from publishing news of the Japanese balloon operations. After the request had been issued, the commanding generals of the various commands personally presented the intelligence aspects of the problem to the various news agencies in the United States, Canada, and Mexico.

Thus the defense of silence was undertaken to prevent the enemy from gaining the information he desired. From now on the Japanese balloons would be referred to only by the code name "paper."

The second most logical purpose of the balloons would be to carry and introduce various types of bacteriological warfare (BW) agents. The intense cold (—20 to —50°C) at the altitude of the balloon flights would facilitate the transmission of bacteria, and disease germs affecting humans, animals, crops, and forests could be transported. It should be emphasized that before BW agents could be effectively dispersed, technical difficulties had to be overcome. The following speculation was based on the assumption that the enemy had overcome all or part of these difficulties.

Despite the lack of specific evidence to prove that the two balloons carried BW loads, it nevertheless was well within theoretical limits for such vehicles to carry and disperse bacterial agents. The type of agent chosen would depend upon the degree of accuracy with which the balloons could be sent. In the event that the landing was within city limits, effective agents would be either those epidemic in character (e.g., pneumonic plague) or nonepidemic agents easily transmissible via the respiratory tract (e.g., psittacosis). If inaccurate dispersal were attempted, insect-borne agents or those affecting livestock would be an obvious choice. In the insect-borne group the mission might be accomplished by distribution of properly prepared bait or by infection of animals upon which the mosquito feeds. It would be theoretically possible to infect the vast U.S. culicine (mosquito) population and establish a permanent endemic focus of an agent.

In the meantime, to combat the possibility that the balloons would be used to shower pestilence in the form of plant-disease spores, animal plagues, or even human disease germs, the government enlisted the services of the state health officers, veterinarians, county agricultural agents, 4-H Clubs, and agricultural college authorities in the defense program.

Decontamination squads were trained; stocks of decontamination chemicals, suits, and masks were made ready at strategic points. Farmers and ranchers were urged to report the first signs of any strange disease in their cattle, sheep, or hogs.

In order to obtain material for study, the closest possible liaison had to be maintained with all agencies that might spot the balloons. The War Department specifically prohibited mentioning the possible use of the balloons for bacteriological warfare, not only to the public in general but to anyone other than those individuals whose duties actually required that they have knowledge of this type of warfare.*

Other possible uses of the balloons could be for the transportation of enemy agents and for Japanese propaganda purposes. It was considered unlikely that the balloons could be used to transport personnel from Japan, since the long trip through the stratosphere would require extensive equipment. The fact that the balloons had an automatic ballast-dropping device suggested that they were not intended to carry personnel. However, a partially inflated balloon launched from a submarine could conceivably make a relatively short trip inland with a person aboard.

The first reference to the balloons in Japanese propaganda was heard on 17 February 1945 in a Domei News Agency broadcast beamed to the United States in English. The Japanese claimed that 500 casualties had been inflicted in the United States and that numerous fires had been started. The broadcast also announced that government authorities in the United States had found it necessary to issue general warnings against attacks by the Japanese balloons and thus had agitated the people. It was emphasized that these occurrences

*Author's note: When I was in Japan, I talked to Mr. Kusaba about this subject, and he confirmed the fact that there was no intention to use the balloons for the carrying or spreading of BW agents.

had shattered the American feeling of security from attack by the Japanese. This broadcast was the first of a series designed as a war of nerves against the United States. Subsequent Japanese broadcasts beamed to Europe, Southeast Asia, and China repeated this same theme and in one instance added that several million airborne troops would be landed in the United States in the near future.

In the meantime, information concerning the hazards of the Japanese balloons was prepared for public dissemination, but by word of mouth only. It was distributed only within the areas affected by the balloons and was not published or broadcast over radio. Release of additional information did begin on 14 May 1945 through state educational systems and civic organizations such as Rotary, Kiwanis, Lions, and Chamber of Commerce.

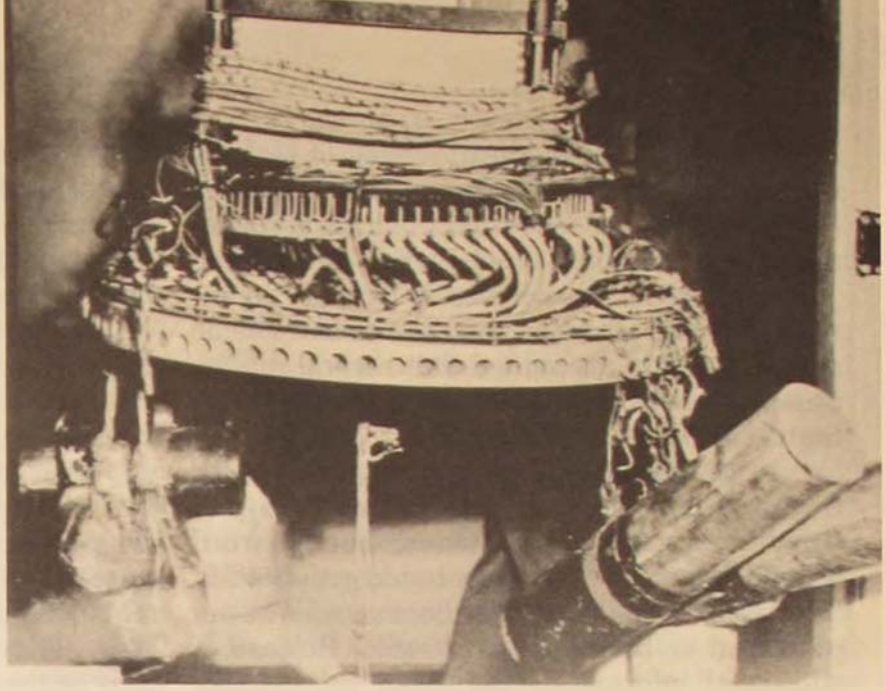
Then a press and radio release concerning the balloons was authorized for 22 May 1945. This was preceded by a confidential note to all editors and broadcasters that a prepared public release for publication was forthcoming and would outline the policy desired. The editors were requested not to report specific balloon incidents of any type and to report balloon activities in very general terms, in order to deny the Japanese useful information concerning the landing dates and places.

The first Japanese reaction to the American newspaper and radio publicity was a Domei radio broadcast, in Romanized Japanese, datelined Lisbon, Portugal, 22 May 1945. This broadcast was directed to Greater East Asia. The broadcast was practically a repetition of the U.S. press and radio release. Later a brief Japanese report, dated 23 May 1945, was also heard. It, too, was just a repetition.

Then a broadcast in English from Singapore (radio station Nampo Domei) was recorded on 4 June 1945. The broadcast was

Balloon and valve attachment (shown inverted from rod) were recovered eight miles west of Holy Cross, Alaska, January 1945. . . . Sandbags for ballast were suspended from the paper balloon found near Marshall, Alaska, December 1944.

The Holy Cross balloon had this altitude device suspended from it. The section linking two knotted portions of rope shrouds is composed of numerous light rubber bands, to act as shock absorber.



A paper balloon found near Hayfork, California, had four unexploded 10-lb incendiary bombs attached. . . . The standard Japanese 33-lb antipersonnel bomb could cause casualties within a radius of 300 ft.

based on statements made at a press conference by Lieutenant Colonel Nakajima Shozo, a spokesman for the Imperial Forces in the Southern Area, who had been associated with press and propaganda activities since August 1943. He claimed that the balloons were causing havoc in the U.S., even though thus far they had only been released on an experimental scale. He also predicted that when the experimental period was over, "large-scale attacks with death-defying Japanese airmen manning the balloons would be launched."

Japanese propaganda then started asserting that such attacks by "death-defying Japanese airmen" would be launched soon. It was believed that the 32-foot balloon would be incapable of carrying a man from Japan to this continent with the necessary survival equipment at 30,000 feet. However, a balloon 62 feet in diameter, believed to be the largest practicable size, could carry a useful load of about 2600 pounds at 30,000 feet. According to the Army Air Force Materiel Division, such a balloon would require 1350 pounds of ballast for a 100-hour trip. The minimum weight of a man with survival equipment (pressurized gondola, oxygen equipment, food, water, and clothing) was estimated to be 640 pounds. On the basis of this weight, it was believed possible to transport an agent from Japan to this continent by a 62-foot balloon.

Japanese propagandists continued their efforts to inspire terror and divert forces in the United States. They also tried to convince their Japanese audience and others that the United States mainland had been successfully attacked with a new and ingenious weapon.

As a follow-up to the propaganda, Shimuzu Rikuro, a former press attaché of the Japanese Embassy in Argentina and manager of the Domei News Agency in that country, stated that the bombing attack by balloons on the United States had produced more damage than the Americans had admitted. He said that the balloons were a "prelude to something big."

Was this "something big" to be one-way suicidal attacks by long-range Japanese bombers? There were certain remote references to this possibility in some of the Japanese propaganda broadcasts. Yet the statements did not suggest that the balloon activity was a prelude to one-way attacks by long-range bombers; in fact, such attacks could be carried out whenever sufficient information was obtained on wind currents. The Japanese were known to have planes which, loaded only with the necessary gasoline and bombs and flying with favorable winds, could make such a flight over the shortest route—from Paramushiro to Seattle, or even to San Francisco.

No evidence indicated that enemy agents were being transported by balloons, and long-range bombers seemed impractical. Both were only remote possibilities.

The last possible use of the balloons which had to be considered was their ability to transport incendiary and antipersonnel bombs. These bombs could be dropped during flight by means of the ballast-release device designed to operate whenever the balloon descended below certain altitudes. Widespread dispersal of incendiary bombs in heavily forested areas, where most of the balloons were discovered, would have serious effects during the dry season. Incendiary bombs dropped during the wet season might have a delayed-action device that would ignite only after the surrounding ground had dried.

Gas bombs could also be dropped from the balloons, but this method would be an extremely ineffective one for gas warfare, since it lends itself neither to accuracy nor to building up the requisite lethal concentrations. It was unbelievable that the enemy would resort to such a random and futile method.

Incendiaries, on the other hand, presented a different picture. They required neither accuracy nor a large concentration to be effective. A single incendiary bomb might do as much damage as a dozen if it struck an area of combustible dry materials. Thus fires in forests and grain fields could readily be started over widely scattered areas during periods of dry weather by means of the balloons. This use of incendiaries appeared most logical, since the payload of the balloons was limited. Incendiaries would probably do more damage per unit of bomb-weight than any other type

of light bomb, particularly against an indiscriminate target area. Antipersonnel bombs would probably be employed as a harassing device and would also have some incendiary effect.

Intelligence considered it highly improbable that the Japanese would attempt to employ incendiary bombs to start forest fires during the winter months, when the forests were covered with snow. It was necessary, however, to revise this opinion when information was received that a bomb had landed from a balloon near Minton, Saskatchewan, 12 January 1945. It was reported that the balloon had descended 6 miles north of the U.S.–Canada border and released a 20-pound bomb and two flares or incendiaries. One flare or incendiary exploded; the other and the bomb did not. The balloon then rose and disappeared.

So far no evidence had been obtained to disprove the theory that the balloons were being used to carry bombs and incendiaries, although the unusual radio signals heard from the Pacific area indicated that ranging might still be the primary purpose.

U.S. Defensive Measures

The unsolved mystery of the purposes of the balloons only hastened the preparation of defense plans. The uncertainty of the enemy's intentions and the possibility that the balloons might eventually become a real menace probably stimulated the development of countermeasures. On 17 January 1945, a conference was called to evaluate the situation, present to the various representatives the evidence that had been collected, and discuss the nature of the balloon threat and possible defensive measures.

A description of the balloon incidents that had occurred during the preceding three months and the status of the defense forces on the West Coast were outlined during the meeting. It was explained that since early 1944 the primary mission of the Fourth Air Force had been training, with little attention given to air defense readiness. Nearly all the early-warning radar stations had been placed on a caretaker basis; the Ground Observer Corps had been inactivated, and the Information and Filter Centers had been closed. With no aircraft warning service in operation, the Fourth Air Force was unable to guard the West Coast against a surprise air attack of any kind. No combat planes were kept on ground alert, and a defense force could be organized only after several hours' warning. Antiaircraft defense was likewise on a very limited basis.

During the course of the conference, the Fourth Air Force was assigned the following missions to counteract the balloon menace:

(1) To direct all its installations to observe and report all unidentified free balloons, or similar airborne objects, as well as any suspicious objects on the ground.

(2) To establish such measures as may be necessary to intercept unidentified balloons or similar airborne objects, so as to make ground recovery possible.

(3) To prepare plans and initiate action for the visual or electronic detection of unidentified objects in the Western Air Defense Zone.

(4) To coordinate with the Western Sea Frontier to secure and study meteorological data affecting free balloon flights in the north Pacific area.

(5) To request the Pacific and Alaskan wings of the Air Transport Command and the Western Flying Training Command to instruct their personnel to report balloon sightings.

(6) To request the Civil Aeronautics Authority to instruct personnel of commercial airlines and pilots of private planes to report balloon sightings.

Of these responsibilities, the two most important were the second and third: interception and detection of balloons.

The Fourth Air Force established a warning system based on the use of meteorological data to provide as much as three days' advance information of weather conditions favorable for a balloon attack.

As balloon incidents persisted and more information became available, two major conferences were called by the Ninth Service Command at the request of the Commanding General, Western Defense Command. The first

conference was held 9 March 1945 at the Presidio of San Francisco for the purpose of fully acquainting representatives of the Western Defense Command, Ninth Service Command, Western Sea Frontier, Central Pacific Command, Alaskan Department, and the Dominion of Canada with the possibilities of bacteriological warfare. The second conference was held 23 March 1945 at Fort Douglas, Utah, to inform interested state and federal agencies of the balloon incidents. At the meeting Western Defense Command representatives took an active part in the proceedings. One of the major topics discussed was the relationship of Japanese balloons to forest fires. As a result of this meeting, the War Department authorized the Army to assist the Forestry Service in fire control. A plan, the "Firefly Project," was immediately and jointly initiated by the Western Defense Command, Fourth Air Force, and Ninth Service Command.

A complete, detailed plan known as the "Joint Western Sea Frontier–Western Defense Command Plan covering defense against Japanese Free Balloons, Short Title 'BD-1'" was completed on 15 August 1945 but not published. All previous plans, with a few minor changes, were incorporated in BD-1 as a final consolidated plan covering all phases of balloon defense.

In April 1945 an experimental program known as "Sunset Project" had been conducted by the Fourth Air Force under supervision of the Western Defense Command. The purpose was to determine the effectiveness of radar in detecting balloon arrivals and to study the possibilities of bringing the balloons down at sea or in open land areas with machine-gun fire from fighter planes using a new experimental ammunition known as the headlight tracer. If the balloons were effectively downed, their potential danger could be minimized. Six sites along the coast of Washington and in the vicinity of Seattle were selected for the installation of ten radar units. Their coverage extended along the coast from Cape Flattery in the north to the mouth of the Columbia River.

All equipment required for the project, however, was not immediately accessible for the Fourth Air Force. The operations of the project were to include search for balloons by radar and interception by fighter planes guided by VHF ground equipment. Radar plots were to be reported to the Silver Lake Region Control Center, where it was expected that balloon targets could be recognized by their speed, altitude, and relation to known wind currents. P-38 and P-61 aircraft were to be kept on an alert status at Paine Field, Quillayute Naval Air Station, and Shelton Naval Air Station. Detailed weather information indicating the probable courses of the balloons was to be furnished the control group by the weather officer of the Fourth Air Force.

In the opinion of several radar experts, the balloon envelope would not be radar-visible. The steel relief valve would be visible, but its small size would probably allow it to pass unnoticed through a radar search zone. The chances of detection at 10,000 feet would be small and at higher altitudes nil. These conclusions were checked out by sending aloft a facsimile of the valve. Radar-visibility tests of the metallic structure of the balloon were made to determine at what ranges it would be possible to detect the balloons in flight.

It had now become apparent that the Japanese balloons were being directed toward the continent of North America, rather than arriving by accident. The increase in the number of recoveries and sightings indicated that the experimental phase was over and that the balloons were being launched for effect. Although only a relatively small number had been recovered, it was likely that for each one recovered or sighted a large number had landed unseen in remote, uninhabited areas. Furthermore, those that had been recovered were ones which had failed to function properly.

The only known fatalities on the United States mainland from enemy attack during World War II came on 5 May 1945 ten miles northeast of Bly, Oregon, when five children and one woman were killed from the blast of a bomb that had been carried by a balloon. The cause of the tragedy was verified by forest men who said it appeared that the victims had clustered around the balloon and someone curiously tugged it enough to detonate one of

the bombs carried underneath. The only publicity permitted on the incident at the time was that an unidentified object had exploded, killing six people.

Investigations of free balloon incidents disclosed three types of explosive ordnance. The first type is the standard Japanese Army 15-kilogram, Type 92, antipersonnel bomb. The danger radius for this bomb (weighing 33 pounds) on open terrain is 150 feet; casualties may result within a radius of 300 feet.

The second type was a new 12-kg thermite incendiary, fuzed for instantaneous function but crudely constructed. None of those examined contained explosive charges.

The third type was the 4.46-kg incendiary bomb. Recovered bombs of this type varied in weight from 10.5 to 11.1 pounds.

Monument to the only American casualties from the Japanese balloon bombs, ten miles northeast of Bly, Oregon

At the end of April 1945, the balloon barrage ceased. Had the Japanese called it off as a failure? Or was this a deceptive lull before a greater barrage? Weeks and months passed with no resumption.

The reason why was not solved until after the war. In 1947 Brigadier General W. H. Wilbur (now retired) visited Japan and conferred with General Kusaba. According to this foremost authority, the Japanese had figured that at least ten percent of the balloons should have reached the United States and Canada. Word of the initial landing in Montana was the only information that the Japanese received until they picked up the report of the six deaths near Bly, Oregon. With only one reported landing on the American continent, the Japanese General Staff began to doubt General Kusaba and his project. More than once he was reminded that he was wasting the fast-dwindling resources of the country. Finally, toward the end of April, General Kusaba was told to cease all operations. The paper balloons cost originally about 10,000 yen each, roughly $2300 at the prewar rate of exchange, but the cost was reduced somewhat by mass production. More than 9000 balloons were built, and over 6000 were launched.

The project in a sense failed because a wall of silence was formed by the American people. The success of the security measures is indicated by an Associated Press release of 2 October 1945 which contained the following comments: "The Japanese listened eagerly to radio reports, hoping to hear of the bombs' effectiveness. But American editors voluntarily kept the information to themselves and so discouraged the Japanese that they abandoned the project."

The campaign of silence was abandoned by the War and Navy Departments following the tragic incident on 5 May 1945. On 22 May the War and Navy Departments issued a joint statement describing the nature of the balloon

bombs and warning all persons not to tamper with any such objects they might find. The balloon weapon was said to constitute no serious military threat to the United States because the attacks were "so scattered and aimless." The statement continued: ". . . the possible saving of even one American life through precautionary measures would more than offset any military gain accruing to the enemy from the mere knowledge that some of his balloons actually have arrived on this side of the Pacific."

The balloon project was a complete failure as far as damage to military installations was concerned. Nearly all the balloons that landed on the North American Continent did so in open country or in wooded, mountainous areas, far from centers of population and military establishments. It is possible that some bombs caused forest and brush fires, but no evidence was ever discovered to indicate that any of the balloons were armed for bacteriological warfare. Balloons were reported over an area stretching from the island of Attu to the state of Michigan and from northern Alaska to northern Mexico, in all some 285 of them. This fact points to the greatest weakness in the free balloon as a military weapon: it could not be controlled.

The balloon attacks ceased before the radar stations of Sunset Project had an opportunity to detect any balloons. Numerous reports of balloon sightings reached the Seattle control group, and 68 interceptions were actually attempted. However, none of the sightings were verified, and practically all were identified as weather balloons, blimps, or the planet Venus, which was often mistaken for a balloon. It became increasingly evident that Japan had ceased balloon launchings, and the lack of activity stateside led Continental Air Forces to terminate Sunset Project on 1 August 1945.

Thus in the same month that saw the end of World War II came the finale of Japan's balloon offensive.

1989th Communications Squadron

Books and Ideas

FROM CHAOS TO CONFUSION: THE CHINESE RED ARMY IN THE LAST FORTY YEARS

DR. KENNETH R. WHITING

ON 1 August 1967 the Chinese People's Liberation Army (PLA) celebrated the fortieth anniversary of the Nanch'ang Uprising, which it regards as its birthday. In that forty years it had grown from a number of small rebel bands wandering about southern China into a multimillion-man military force with the beginnings of a thermonuclear capability. The saga of its growth and development has long been in need of a comprehensive treatment in English. This does not mean that there have been no works in English dealing with the Chinese Red Army. Ralph Powell filled in the gap for the 1895–1912 period, i.e., the necessary background, and F. F. Liu has provided an excellent work on the Nationalist military forces. (See Bibliography.) There are also a number of eye-witness accounts of the Red Army in the late 1930s and early 1940s by Edgar Snow, Nym Wales, Agnes Smedley, Harrison Forman, Evans Carlson, and others. These are valuable accounts, but each covers only a few years of the total span, and furthermore some of these witnesses were, to put it mildly, predisposed to find an inordinate amount of wisdom, virtue, and courage in the Red Army of the Yenan and the Japanese War periods. Chalmers Johnson, General Chassin, the State Department's "White Paper," and Rigg, to mention only four works, cover the period of the Civil War (1946–49) in some detail. As for the Chinese activities in the Korean War, there are numerous general and specialized studies ranging from the official histories, such as those of Appleman and Futrell, to the vividly written books of "Slam" Marshall. For the late 1950s and early 1960s, there is a plethora of books and articles by Alice Hsieh, Morton Halperin, Powell, Gittings, Joffe, Garthoff, and many others. What was lacking up to 1967 was a good solid book covering the entire forty-year history of the

armed forces of the Chinese Communists. Now at long last Samuel Griffith has given us that book.†

General Griffith devotes the first hundred pages of his book to the development of the Chinese Red Army up to the end of the Civil War and the establishment of the Communist regime in Peking in late 1949. He then describes the Chinese intervention in the Korean conflict in some detail, about a quarter of the book, which is sound planning, since that is the only open military confrontation between the United States and the PLA up to now. The rest of the book is a description of the PLA: its organization, armament, problems, and even a chapter on its impact on the nations surrounding China.

General Griffith's style is lively, and he shows an admirable familiarity with a wide range of source materials, thus insuring the scholarly credentials of the work. But the general reader is not slapped in the face with a continual flaunting of the scholarly apparatus, as it is either in the fifty pages of notes or in the three excellent charts on the organization of the government, the Party, and the PLA (in a pocket at the end of the book).

After the long drought, moreover, it now seems to be raining a downpour of books about the PLA. John Gittings, of the Royal Institute of International Affairs in London, also published an excellent book in 1967.†† Gittings' book deals in depth with the PLA between 1946 and the mid-1960s, with emphasis on the political side of things—the Party control of the armed forces and the role of the latter in the government of Communist China. Unlike Griffith's book, this one is arranged by topic, with sections on strategy, mobilization, political controls, professionalism versus revolutionary fervor, the militia, and two excellent chapters on the military leadership. He also has seven tables, in an appendix, which deal with military strengths, controls, and organization.

It would be hard to overpraise Gittings' book. It is well written, more than adequately documented, and, if anything, cautious to the point of being overcautious in evalutions; in short, he refuses to speculate beyond his evidence. Like General Griffith's book, this one should be read by anyone interested in the Chinese armed forces, or even in the history of China in the last two decades.

A third book on the PLA was also published in 1967, that of Alexander George of the RAND Corporation.††† In spite of its somewhat misleading title, the book is almost entirely a study of the Chinese "G.I." in the Korean conflict, filling some 200 of the 225 pages which make up the book. Its "aftermath" consists of the 25 pages tacked onto the end, a brief survey of events since 1953. George analyzes the results of interviews with Chinese prisoners and comes up with a Chinese Communist military model, within which he discusses leadership, morale, political controls, and other topics. It is a far more specialized work than those of Griffith and Gittings, but far less interesting to the general reader—and, one suspects, even to the specialist.

Unfortunately for the three authors of the books under review, their *opera* were published right in the midst of the utmost confusion in Communist China. All three authors seem to be in some awe of the tight political controls that characterize the PLA's organizational structure, or seemed to until 1966. Mao

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†Brigadier General Samuel B. Griffith II, U.S. Marine Corps (Ret), *The Chinese People's Liberation Army* (New York: McGraw-Hill, 1967, $10.95), 398 pp.

††John Gittings, *The Role of the Chinese Army* (New York: Oxford University Press, 1967, $8.50), 331 pp.

†††Alexander L. George, *The Chinese Communist Army in Action: The Korean War and Its Aftermath* (New York: Columbia University Press, 1967, $6.95), 255 pp.

Tse-tung's oft-repeated injunction—that although political power comes out of the barrel of a gun, nevertheless, politics must always be in command of the gun—seems less impressive in the autumn of 1967 than it did a few years ago. The question now seems to be: Whose politics?

Both Gittings and George ignore the "great Proletarian Cultural Revolution," which was really just getting under way when their books went to press, while Griffith did manage to get in an "Epilogue: January 1967," in which his bewilderment over what is going on in China is manifest. The reviewer is not being critical of the three authors but is merely expressing his own distress: Now that we finally have three solid works on the PLA, why did Mao, Lin Piao, and that "witch" of the Great Cultural Revolution, Chiang Ching, have to tear up both the Party and the PLA?

Information on recent happenings in China is scarce and not very reliable, but that the PLA is playing a central role in the swirl of events is beyond question. When Mao fired his Minister of Defense, P'eng Teh-huai, in the fall of 1959 and gave the job to Lin Piao, he was apparently in the process of trying to insure the PLA as a reliable bulwark in the intra-Party struggle upon which he was about to embark. Lin Piao spent the next seven years drumming the thought of Mao into the military at all levels. When the Great Proletarian Cultural Revolution got under way in early 1966, the PLA was in the forefront of the attack upon all elements in the Party and the government opposed to the line favored by Chairman Mao. By August 1966 a new instrument for carrying out the Maoist revolution had been created, the Red Guards, composed of millions of teen-agers, who were encouraged to assault anybody they felt to be anti-Maoist in thought and deed, or even not pro-Maoist enough. As General Griffith points out (p. 299), mass movements just do not start spontaneously in Red China, and he is certain that the PLA was in charge of the initial recruitment and training of these juvenile delinquents.

By early 1967, however, things had gotten so out of hand that Mao and his small clique called on the PLA to preserve order throughout China, a pro-Mao "order" to be sure. But at this point the situation became very sticky when the reliability of the PLA turned out to be somewhat questionable. How could this be? As our three authors point out in great detail, the Party controls in the PLA have always been all-embracing. Furthermore, Mao's closest comrade-in-arms (to use the jargon) and heir apparent, Lin Piao, has been working assiduously at improving them over the last seven or eight years. But a good deal of evidence has been accumulated in the past few months that a number of military regions have been either indifferent or actively opposed to Mao's Great Proletarian Cultural Revolution.

It seems to this reviewer that there are several reasons for the "unreliability" being demonstrated by segments of the PLA. First, the political control system in the armed forces was fundamentally a *Party control system*, and it is the Party *apparat* itself that Mao is attacking, especially its top leadership as exemplified in the head of state, Liu Shao-ch'i, and the Secretary-General of the Party, Teng Hsiao-p'ing. The military leader in any area therefore has to determine whether he is to be faithful to the Party per se or to Mao's clique within the Party. Loyalty now involves a choice: Loyal to whom?

Second, the thirteen military regions of China are enormous areas, some far from Peking, in a land not celebrated for effective transportation and communications systems. Many of the commanders of these military regions have been there for a decade or more and have built up a close relationship with the government and Party bureaucracies of their regions. It hardly seems strange that these military commanders resent both the Red Guard attacks on top civilian personnel of their regions and the chaos engendered by the irresponsible gangs of young thugs.

Finally, in the period following the Korean War the officer corps as a whole became quite professional. It had to if it were to cope with the new weapon systems being introduced into the PLA. But in the last few years the officers have been humiliated, first by the "to the ranks" movement, whereby all officers, even generals, had to spend a month

or more in the ranks doing close-order drill and even cleaning latrines, and then in 1965 by the complete abolishment of all rank and insignia of rank within the PLA. In addition, personnel of the PLA spend as much as a third of their time in nonmilitary economic activities such as farming and construction work. If one combines all these legitimate gripes with the inordinate amount of time the troops are forced to spend listening to the political claptrap purveyed by the political cadres, it is easy to see why there should be antagonism among some of the military commanders.

Regional autonomy, usually under a military leader, was the curse of China as early as the aftermath of the Taiping Rebellion in the second half of the nineteenth century and reached ridiculous proportions during the era of warlords between 1916 and 1928. Even Chiang Kai-shek was never able to completely eradicate the evil and had to compromise with various regional warlords between 1928 and 1949. Thus the tight Party controls within the PLA from 1949 until recently seemed to herald an end to the military regionalism that had plagued China for almost a century. The events of the last year, however, would seem to indicate much less than monolithic civilian control of the armed forces and instead ever growing difficulties in Peking's authority over the military satraps in many regions. Although one hesitates to prophesy a revival of warlordism in Communist China, a nation that is now entering the thermonuclear era, nevertheless, the present situation—or our ignorance about it—leaves the field of speculation wide open for even far-out scenarios.

The purpose of this brief exegesis on the current chaos in China is merely to warn the reader that the three books here reviewed are descriptions of a People's Liberation Army that seemed the embodiment of political reliability as late as 1965. Then came Mao's nihilistic "cultural revolution," and even the stolid, politically faithful PLA was caught up in the confusion engulfing China. Never were three books published at a more inopportune time—and they are such good books, too!

Aerospace Studies Institute

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MYTH OF THE MONOLITH

MAJOR NICHOLAS P. VASLEF

THE nearly 300-year-old history of Sino-Russian relations has seldom been marked by cordiality. At best, these relations were characterized by the desire of both countries to establish a *modus vivendi* with respect to numerous territorial questions; at worst, they were beset by problems of ideology and nationalism that threatened to disrupt the military and political status quo. With the establishment of the People's Republic of China in 1949, the Communist bloc, led by the Soviet Union, was successful in building up an image of the Communist World as an invincible monolith stretching from Eastern Europe across the vast expanse of Asia to the People's Republic of China.

The exposure of the Sino-Soviet rift to Western eyes has turned that monolithic image into a myth. It is this myth of the monolith that serves as the underlying theme for the scholarly and readable anthology, *Sino-Soviet Military Relations*,† edited by Raymond L. Garthoff. Dr. Garthoff is Special Assistant for Soviet Bloc Politico-Military Affairs in the U.S. Department of State. He also teaches at the School for Advanced International Studies of Johns Hopkins University and is the author of several military studies, including *Soviet Military Doctrine, Soviet Strategy in the Nuclear Age,* and *Soviet Military Policy.*

The volume consists of ten essays by eight authors. Dr. Garthoff contributes a concise Introduction and three articles: "The Soviet Intervention in Manchuria, 1945–46," "Sino-Soviet Military Relations, 1945–66," and "Politico-Military Issues in the Sino-Soviet Debate, 1963–65." The other essays consider such topics as "Armed Conflict in the Chinese Borderlands, 1917–50," by O. Edmund Clubb; "Soviet Military Aid to Nationalist China, 1923–41," by James C. Bowden, Jr.; "The Eruption of Sino-Soviet Politico-Military Problems, 1957–60," by Harold P. Ford; "The Limits of Alliance: The Quemoy Crisis of 1958," by John R. Thomas; "The Sino-Soviet Nuclear Dialogue: 1963," by Alice Langley Hsieh; "The Soviet Generals' View of China in the 1960's," by J. Malcolm Mackintosh; and "Sino-Soviet War in 19xx?" by O. Ferdinand Miksche.

Many of these articles overlap in subject matter, but they provide, in their totality, a chronological and detailed examination and analysis of their respective subjects. Although they emphasize military relations, they do not ignore the overriding political considerations and decisions leading to the military aspects of Sino-Soviet relations. A recurring theme is that Sino-Soviet military relations were never free of mutual mistrust, that the U.S.S.R. gave grudging aid to its huge but impotent Communist neighbor, and that China resented more and more its dependence on the aid being doled out by the U.S.S.R. The impression is that the Sino-Soviet treaties of friendship and alliance of 1945 and 1950 were military and political expedients not unlike those signed during World War II between various

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†Raymond L. Garthoff (ed.), *Sino-Soviet Military Relations* (New York: Frederick A. Praeger, 1966, $7.50), xii and 285 pp.

Western countries and the U.S.S.R., notwithstanding the possibility that at war's end the Soviet Union could well turn upon its erstwhile allies with impunity.

The Introduction of this volume briefly traces the high points of Sino-Soviet relations since the Treaty of Nerchinsk in 1689 and investigates the "decade of American misunderstanding of the nature of Russo-Chinese relations." (p. 5) Now that the Sino-Soviet rift is out in the open for all to see, the time has come when "it is both possible and necessary to recognize, to analyze, to understand, and to act on the basis of national distinctions and differences among the Communist states—above all, on the differences between the Soviet Union and Communist China." (p. 6) This, then, is the purpose of the studies in this anthology: an analysis of the role of military and politico-military considerations in Sino-Soviet relations.

O. Edmund Clubb, retired Foreign Service Officer, who was the Consul General in Peking when the Chinese Communists took the Forbidden City and is author of the well-known *Twentieth Century China*, analyzes conditions in northern China and Manchuria after the Russian Revolution, as well as the conflicting White Russian, Chinese, and Japanese interests in these areas, and discusses anti-Bolshevik factions in Siberia, the Allied intervention, and the creation of the Soviet Far Eastern Republic. He contends that the present status of Outer Mongolia as an independent country was due to China's weakness and failure to protect it, and he concludes that China lost it by default. (p. 16) Mao Tse-tung and others have, of course, stated on several occasions that Outer Mongolia would eventually become an integral part of China, and while the status quo has been preserved until now, there is no doubt that the Chinese consider Outer Mongolia to be territoria irredenta.

After the abortive efforts of the Soviet Union to establish footholds in China by signing treaties with various factions, relations deteriorated and by 1929 were at low ebb, with Soviet and Chinese nationalist armies facing each other on the Amur and Sungari rivers. The results were to affect the United States in the Far East more than a decade later, for the Japanese had witnessed the quick defeat of the Chinese troops and saw that the U.S.S.R., not China, was their prime adversary in the Far East.

In July 1937 the Sino-Japanese War began, opening the way for a new era of friendship and cooperation between the U.S.S.R. and the Chinese Nationalists. Combining his personal knowledge with information not easily accessible to the general reader, Mr. Clubb describes the confrontations of the three major powers in Asia, assesses the military strengths of the Chinese, Japanese, and Soviet forces, recounts the Japanese forays into Soviet territory, and analyzes the political implications affecting the major world powers. The Molotov-Ribbentrop Pact and the rapid turn of events leading to the start of World War II crushed Japanese designs on Soviet territory. The subsequent signing of the Soviet-Japanese nonaggression pact of April 1941 "permitted each to pursue its own national ends unhindered by the other." (p. 40)

In the first years after the war the Chinese Communists began to win control of mainland China, and Moscow was anxious to establish relations with the new Central People's Government. By 1950 the situation had stabilized, but only temporarily, for now it was the Chinese who looked "across their frontiers with the idea of reincorporating the Mongolian People's Republic into the Chinese empire, and of making good various claims on the Russian borderlands. . . . The Chinese borderlands have clearly taken on a new aspect, and will never be the same again." (p. 43)

Lieutenant Colonel James C. Bowden, Jr., U.S. Army, covers the crucial period between the wars. He has included numerous facts, some major and some relatively minor, but did not expand sufficiently on two points that are of great significance: the Borodin mission to China and the establishment of the Whampoa Military Academy under Chiang Kai-shek. These two events were very important for the Chinese Nationalists, since they

heralded the real beginning of the unified and united Kuomintang Army and defined its relationship with the Soviet (Borodin) mission. Too, the disputes of the Soviet Union and the Comintern on matters of military aid to China should have received at least a cursory mention.

When in 1927 Chiang Kai-shek purged the Kuomintang of all Communists, Soviet advisers left China, all Soviet consulates were closed, and relations between the Soviet Union and the Kuomintang Nationalist government were severed. At this point, an interesting comment is made, which very possibly identifies the first seeds of dissension between the Russian and Chinese Communists:

> The Soviet Union made no effort to come to the aid of the Chinese Communists, and George Kennan maintains that the ruthless destruction of the Communists by Chiang Kai-shek marked a crucial turning point in Sino-Soviet relations. From that time on, Mao Tse-tung was "an ally, but not a satellite." (p. 53)

By 1937 the situation had reversed itself, and a nonaggression pact and a barter agreement for weapons were signed. American efforts to aid the Chinese unofficially in their war against Japan with the famous Flying Tigers were indeed meager, if Soviet reports are to be believed. A Soviet military historian is quoted as stating that by 1940 "986 Japanese planes were destroyed. More than 100 Soviet hero-pilots . . . were killed in these battles." (pp. 54–55) The U.S.S.R. supplied over one thousand aircraft to China by 1940, and two thousand Soviet pilots had rotated through the air units.

The author believes that at the same time Soviet aid to the Chinese Communists was greatly limited, in keeping with the Russian policy of playing the two Chinese factions against one another in the hope of maintaining a weak and disunited China. In fact, however, the substantial aid to the Chinese Nationalists, with virtually none going to the Communists, makes it rather evident that the U.S.S.R. was favoring the Nationalists only because it had no hopes for the success of Mao Tse-tung's forces. It should also be noted that in 1940 the U.S.S.R. itself was not in a very strong military position, having undergone purges of its top military leadership and frantically sued for time on its western frontiers. Its immediate purpose, then, was to create a strong Nationalist China that could hold off Japan. Its long-range goal, in this case diametrically opposed to the immediate one, was to look after its traditional national interests and to promote Communist ideology insofar as the two did not contradict one another.

Dr. Garthoff's two chapters on the postwar years are excellent for authoritative information on the Soviet Far Eastern campaign and its aftermath, liberally footnoted from official U.S., Soviet, and Japanese sources.

The immediate postwar stage of the Soviet occupation of Manchuria involved the systematic looting and dismantling of Manchurian plants, factories, and other hardware left there by the Japanese. Coupled with this project was one that was not as clear-cut or as well understood, involving Soviet aid to both the Chinese Nationalist army and Mao Tse-tung's rapidly growing Communist forces. The author believes that the Russians "had initially overestimated the strength of the National Government, and underestimated that of the Communists." (p. 77) If there was any initial vacillation on the part of the U.S.S.R. after World War II, by the middle of 1947 the Soviets clearly saw that the Nationalists were being defeated. Continuing their play of one faction against the other, the Soviets in January 1948 offered to act as mediators in the civil war. Dr. Garthoff questions the Soviet Union's intent in this offer, wondering if its real purpose was to have an impotent neighbor on its eastern frontier. This is, perhaps, wishful thinking on his part, as there is nothing to indicate that this was the Soviet rationale. Indeed, there was no reason for the U.S.S.R. not to act as mediator: the United States, which was seeking peace in China through a number of missions, would have been satisfied; the U.S.S.R. expected to obtain major concessions from the Nationalists for the Chinese Communists, including prime government and military positions; the Kremlin did not anticipate any difficulties with the Chinese

Communists in obeying orders from Moscow; and Stalin counted on the Chinese Communists to carry out a coup d'état after a short period of coalition government with the Nationalists. In short, there was every reason to believe that China would become a satellite on the eastern frontier of the U.S.S.R. just as a number of countries had become Soviet puppets on its western borders.

On Valentine's Day, 1950, the U.S.S.R. and the People's Republic of China signed a Treaty of Friendship, Alliance, and Mutual Assistance. The honeymoon of the two Communist giants did not last long, and initial vows of eternal friendship were soon replaced by mutual disillusion and mistrust. History has yet to give a final evaluation of the events in China from 1945 to the present, but without key Soviet and Chinese Communist documents, a complete analysis of Soviet intents and actions is obviously impossible. Reading through these chapters, however, one gains a clearer concept of the Sino-Soviet rift and detects Soviet duplicity in dealings with the two Chinas. For example, the case of the U.S.S.R. "handing over" Manchuria to Mao Tse-tung is countered by Dr. Garthoff, who points out that "if that were the case, why destroy the major part of the great Mukden arsenals which could have given the Chinese Communists the wherewithal to fight?" (p. 83) On the other hand, there is no denying that the Chinese Communists reaped the majority of the benefits derived from Soviet occupation, including not only captured Japanese arms and artillery but also the first tanks and aircraft to come into the possession of Mao's forces. Too, it has been generally assumed that both China and the Soviet Union fully supported North Korea during the Korean War without bickering over costs or policy. Dr. Garthoff, however, reveals that the Chinese Communists had to pay for all the Soviet aid, which amounted to some two billion dollars in the years between 1950 and 1957, and it was not until 1965 that the Chinese finally paid off the debt.

The Soviet looting of Manchuria, the Korean War, the Twentieth Congress of the Communist Party of the Soviet Union (1956) at which Khrushchev denounced Stalin, and Russian refusal to cooperate in the development of a Chinese atom bomb—all apparently made the Chinese doubt the basic solidity of Sino-Soviet relations. Consequently, ties between the two countries began to dissolve slowly, for the most part unnoticed by Western eyes, while the presses of both Communist nations still paid lip service to the Communist monolith.

In April 1960, Sino-Soviet disagreements were finally brought out into the open by the Chinese. Thereafter the situation deteriorated rapidly with the withdrawal of virtually all 1300 Soviet economic and military advisers and technicians. Dr. Garthoff concludes his chapter with an analysis of Chinese-Soviet relations in 1965 and 1966, stating that since 1960 "there has been almost no Sino-Soviet military relationship." (p. 94) At the time the article was written (late 1966) this may have been true, but a new phase of Sino-Soviet cooperation relative to Vietnam apparently began in the spring of 1967.

A detailed account of the beginning of the open rift is given by Harold P. Ford. Quoted are numerous Chinese sources on the importance of modern military training, including the use of nuclear weapons, and on the proposed new training program that collapsed because of Soviet reluctance to cooperate. Increasingly vitriolic Chinese attacks on Soviet foreign policy, especially in regard to the U.S.S.R.'s halfhearted backing of Chinese claims to the offshore islands and Taiwan, show the new Chinese attitude toward the Soviet Union.

The rift is further examined by John R. Thomas in his chapter on Quemoy. The day-by-day summary of this crisis reveals the almost casual attitude of the U.S.S.R. toward a problem that the Chinese Communists considered most vital to their national interests. The now famous official Chinese Government Statement of 1 September 1963, in which the Chinese scorned Soviet claims of support during the Quemoy crisis, is quoted in full in the appendix.

Alice Langley Hsieh, Far Eastern expert with the Foreign Service and the RAND Cor-

poration, provides a narration on the increasing hostility between the U.S.S.R. and China and an analysis of Mao Tse-tung's futile attempts to acquire the atom bomb from the U.S.S.R. She discusses Khrushchev's reminder to the Chinese in 1962 "that the United States was a paper tiger with atomic teeth" (p. 151) and the gradually worsening Sino-Soviet relations which grew even more frigid with the Chinese denunciation of the partial nuclear test ban agreement.

The author analyzes the problem of Chinese possession of nuclear weapons in three vital points: (1) the proliferation of nuclear weapons; (2) China's need to possess an independent defense potential; and (3) the alternative of reliance on the Soviet Union's nuclear deterrent. (p. 160)

The Russians had previously tried to assure the Chinese that, with Soviet help, China need not develop its own nuclear weapons but should instead concentrate on strengthening her domestic economy. Having experienced Soviet reluctance in other instances, Foreign Minister Chen Yi categorically stated that Soviet assurances were worthless (p. 163), and the Chinese went ahead with their nuclear program. Since this chapter was written (December 1963), the Chinese have produced both an A-bomb and an H-bomb (detonated in June 1967). Their next steps are to accumulate a stockpile and develop an effective delivery system. Meanwhile, the possibility of even a partial nuclear ban treaty with China seems remote.

Raymond Garthoff's next contribution is based on an October 1963 article in the Soviet journal *Voennaya mysl'* (Military Thought) entitled, "The Peking Version of 'Total Strategy,'" by a Soviet politico-military affairs expert. This journal was marked "For Generals, Admirals, and Officers of the Soviet Army and Navy Only," and the articles published therein are allegedly much more frank than those found in open sources. Basically, the Soviet article is an attack against the Chinese claim that their military science is based on Marxist principles, and it introduces historical "evidence" to support its argument. Concerning that article, Garthoff writes:

> Internal pressures and shortcomings are said to contribute to Chinese "petty bourgeois" and "anarchist" views on revolution everywhere. The Chinese callous indifference to what would be the enormous sacrifices of nuclear war is also said to contribute. . . . On the basis of this Chinese readiness for nuclear war which the Russians dialectically interpret as *desire* for nuclear war, the *Military Thought* article goes so far as specifically to accuse the Chinese Communist leaders of supporting genocide. (p. 175)

With respect to Chinese military science, the Soviet article concludes that

- —the Chinese view on military science is "pure adventurism";
- —the view of the West as a "paper tiger" is illogical and erroneous;
- —the result of a protracted *military* conflict would be defeat, not victory;
- —the adventurist "total" strategy of the Peking style is pregnant with indescribable calamities for all peoples, including the Chinese people. (p. 175)

The Soviet article further points out that the Chinese "consider that world thermonuclear war is inevitable and [are attempting] to hurry it along . . . they evidently suppose that the Chinese people will have the best chance since they are the most populous people on the earth." (p. 176) The Soviet position is, predictably, peaceful coexistence on all planes with the eventual collapse of the capitalist system of its own weight.

Now that the rift has pushed ideology aside and nationalism and *Realpolitik* are in the ascendancy, it may well be that this Soviet appraisal of Chinese politico-military policies is rather honest. At the same time, being cognizant of rapid Soviet policy shifts, we should accept it not as a new, definitive, and "permanent" Soviet line but rather as the present Soviet view which is meant, at least in part, to answer the numerous Chinese charges of collusion with the U.S., fear of the West, and revisionism of the basic concepts of Marxism.

J. Malcolm Mackintosh, British expert on Soviet military affairs and author of many articles as well as the book *Strategy and Tactics of Soviet Foreign Policy*, discusses the Sino-

Soviet frontier and the problems of defense faced by the Soviet Union. He makes some calculated guesses on what the Soviet General Staff is likely to recommend in terms of manpower and firepower, in the army, navy, and air forces, and considers the problems of logistical supply, in view of the great distances involved, and the limited capability of the Trans-Siberian Railroad. Sinkiang Province and Mongolia are mentioned as potential trouble spots, as are numerous undemarcated areas stretching from the Soviet Maritime Province to Soviet Central Asia. His conclusion that the U.S.S.R. and the West may "find some unexpected common ground" based on mutual distrust of Red China (p. 192) is similar to a view which is currently being expounded by the Red Chinese and which is putatively finding sympathy among leaders in Western countries and in the Soviet Union.

The last contribution to this volume, "Sino-Soviet War in 19xx?" by Lieutenant Colonel O. Ferdinand Miksche (Retired), is a rather speculative piece of writing, even though it is based on "some of the fundamental underlying geopolitical and strategic factors" (p. 193) that would allegedly contribute to any such war between China and Russia. The argument for a possible Sino-Soviet war centers around the Chinese need for *Lebensraum* and the impossibility of feeding the rapidly increasing Chinese population. The author discusses the potential aggression of China in all directions, citing the advantages and disadvantages of each area as to natural and agricultural resources, and the expected opposition to such expansion by the U.S.S.R., U.S.A., and the countries directly involved. Aside from geopolitical and economic considerations, the entire chapter is too "iffy." It is a well-known weakness of Kremlinologists and China-watchers to engage in speculation, and certainly there is room for speculation in a field in which relatively little is known from open sources. Yet this chapter is misplaced in a work that is otherwise scholarly and well documented.

THE VOLUME contains extensive notes, an index, and appendices giving the full texts of two Sino-Soviet treaties (1945 and 1950) and related documents, the complete Soviet article on "The Peking Version of 'Total Strategy,'" and the "Chinese Government Statement on Sino-Soviet Politico-Military Relations."

Since publication of *Sino-Soviet Military Relations* in December 1966, China's relations with the U.S.S.R. have further deteriorated, and the internal Chinese struggles—the outcomes of which will undoubtedly affect relations with the U.S.S.R.—are not yet resolved. The most recent events, however, do not outdate the book. One possibly new aspect involves Soviet aid to North Vietnam. The *Peking Review* of 10 March 1967 (p. 25) carries a violent attack against the U.S.S.R. in an article entitled "New Disciples of Goebbels" by "Renmin Ribao," commentator. References are made to a Soviet bulletin which allegedly disseminated

> a whole lot of fantastic fabrications such as that Soviet supplies for Vietnam have "often just disappeared" in transit through China, that Red Guards "disassembled" some of the Soviet equipment and " 'forgot' to return some of the important parts," that "Chinese characters took the place of Soviet trade marks" on Soviet equipment, that "the latest types" of Soviet equipment "were replaced . . ."

This same article (p. 33) defends the Chinese by stating that they have always transported all material through China and warns that "such rumours and calumny will only make people see more clearly to what low depths this group of Soviet revisionist renegades have sunk. No good awaits them."

It is difficult to assess the degree of Chinese harassment, but there was apparently some truth in the Soviet charge. Last spring, though, according to several sources, including the *U.S. News and World Report* ("New Turn in Vietnam—A 'Deal' Between Russia and China," 24 April 1967, pp. 42–43), the Russians and the Chinese have concluded a "deal" whereby "free and complete passage of Soviet military equipment across China to North Vietnam" is assured. In the article one U.S. official was quoted as saying:

> Ho Chi Minh in Hanoi finally put a gun to Peking's head, threatening to open negotia-

tions with the US unless China accepted an agreement guaranteeing no interference with the movement of Soviet war supplies overland and by air across China.

If this report is true, a new phase in Sino-Soviet military relations has begun, which has yet to be confirmed, defined, and evaluated.

Whether or not the United States of America accords some degree of diplomatic recognition to Red China is in itself irrelevant. What must be recognized is the fact of China's existence as a potential major nuclear power in the next decade. Soviet relations with Red China will most certainly have a strong bearing on U.S. policies in the Far East and, of course, with the U.S.S.R. itself.

The Sino-Soviet rift has exposed the many fissures of the mythical monolith, and Dr. Garthoff has compiled an excellent anthology isolating the important military aspects of Sino-Soviet relations. It is a work that should not pass unnoticed by military observers interested in keeping current on the decisive events in that troubled part of the world.

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AWARD

The Air University Review Awards Committee has selected "Tactical Air Employment—Current Status and Future Objectives" by Lieutenant Colonel Edward O. Stillie, USAF, as the outstanding article in the November-December 1967 issue of *Air University Review*.

ATTENTION

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