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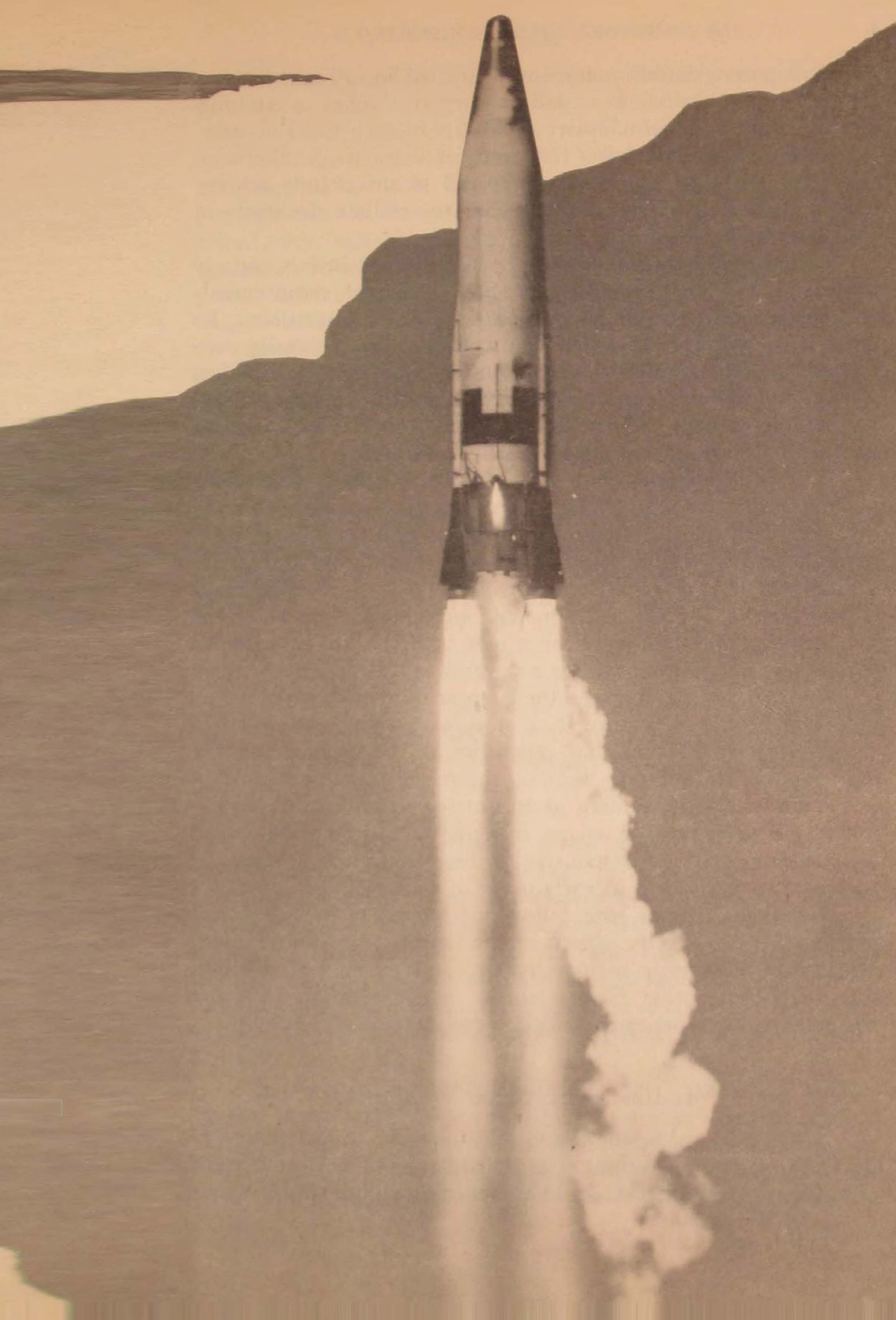


SAC and the Ballistic Missile

GENERAL THOMAS S. POWER

THE capability of the Strategic Air Command to accomplish its assigned mission both in the current cold war and a potential hot war is, essentially, the product of three factors—organization, men, and weapon systems. The quality of the over-all product is contingent upon not only the individual quality of each of these factors but also the degree and congruity of their interrelationship.

While these considerations apply to a greater or lesser extent to any organized effort, they are of particular importance to SAC because of the unique nature of its mission and the manner in which it must accomplish that mission. SAC is the principal deterrent to aggression in the free world today and undoubtedly



the most potent deterrent force ever created in military history. Its peacetime objective is actually a "negative" one: to establish and maintain a global offensive capability of such superior striking power that it minimizes the need for using it. At the same time SAC must be continually prepared to successfully achieve the "positive" objective of its mission: to retaliate decisively in case deterrence fails.

These seemingly contradictory objectives are in fact entirely compatible, although they entail unprecedented requirements with respect to the scope and character of SAC's operations. To meet these requirements SAC must maintain a centrally controlled, global organization possessing all the many diversified human and material resources needed in strategic air operations, yet flexible enough to be readily adaptable to any new weapon system or technique, no matter how revolutionary.

The interrelationship of SAC's three principal constituents—organization, men, and weapon systems—assumes particular significance with the introduction of ballistic missiles into the SAC inventory. The reason therefor is not merely the revolutionary character of the weapon systems involved. Even more significant is the fact that for the first time an operational element of the U.S. armed forces is integrating a new family of major weapons while these weapons are still in a research and development stage which, moreover, barely paces the current state of the art.

This radical departure from standard policy is designed to attain an initial operational capability at the earliest possible date. It was feasible only because the disadvantage inherent in the operational commitment of an untried weapon could be offset by the advantage of having in being a long-established and well-tried organization responsive to the effective employment of such a weapon, even in its early stages of evolution.

For these reasons, the following discussion will deal primarily with two specific aspects of the ballistic missile: its qualifications as a strategic weapon system, and its mutual relationship with those other factors which, in combination with the weapon system, represent strategic capability.

Missiles as Strategic Weapons

SAC's mission, briefly stated, is ". . . to be prepared to conduct strategic air operations on a global basis so that, in the event of sudden aggression, SAC could immediately mount simultaneous

nuclear attacks designed to destroy the vital elements of the aggressor's war-making capacity to the extent that he would no longer have the will nor ability to wage war."

With the emphasis on "global," "immediately," and "simultaneous," the ballistic missile represents a singularly attractive strategic weapon because of its three principal features: great range, very high speed, and quick reaction capability. As continued advances in missile technology alleviate, if not eliminate, initial deficiencies and further improve existing capabilities, the ballistic missile will assume rapidly increasing importance as an air offensive weapon system. It will then be capable of performing an ever-growing number of strategic missions which at present must be assigned to manned bombers.

characteristics and requirements

The most striking of the ballistic missile's characteristics is undoubtedly its high velocity, which, in itself, offers several major advantages in strategic operations. It reduces warning time to a maximum of a few minutes, permitting little if any preparation for defensive action. This poses an added problem for the defense which is already aggravated by the hypersonic speed of the vehicle and by the small size and toughness of the warhead once it has separated from the vehicle. Thus the short time of flight to the target enhances the possibility of destroying enemy bombers and missiles before they can be launched. In coordinated bomber-missile attacks, ballistic missiles can precede the bomber strikes and "degrade" the enemy's defenses.

The practically unlimited range of the ballistic missile is another characteristic of importance to strategic air operations, which by their very nature must cover great distances. Also ballistic ranges may vary from a few hundred miles to thousands of miles and eventually will extend to any desired point-to-point distance on earth. This provides considerable flexibility in locating launching sites and in the selection of the range best suited to meet specific demands for optimum yield, accuracy, and warning time.

Indeed it is technically feasible to develop a single ballistic missile configuration that could be used for any desired distance within the entire spectrum of strategic mission ranges. However, such a missile would be exceedingly uneconomical and create many operational problems. SAC's present approach entails the

employment of two distinct families of ballistic missiles—the Intermediate-Range Ballistic Missile (IRBM) and the Intercontinental Ballistic Missile (ICBM). These missiles were designed for optimum performance at the two ranges currently considered to be the strategically most desirable—1500 and 5500 nautical miles (NM), respectively.

The 1500-NM design range of the IRBM can be reduced considerably if, for instance, it is desired to trade distance for payload. Conversely, technological and operational improvements should make it possible to extend the IRBM's design range appreciably without reduction in payload. Similar reductions and extensions of the 5500-NM design range of the ICBM could ultimately provide such a wide choice of ballistic ranges as to meet almost any strategic requirement.

Any future operational requirements for ballistic ranges beyond those of even the improved ICBM would necessitate the development of a third ballistic missile family—the Global-Range Ballistic Missile (GRBM) with a range of over 10,000 NM—that is, sufficient to reach any target from any launch point on earth.

Added operational advantages of ballistic missiles include their quick reaction capability, which will be an invaluable asset to SAC's alert posture. Also they can be kept in continuous readiness with a minimum of maintenance. Passive defense is facilitated because missile launch sites are far more amenable to hardening than bomber bases and very suitable for extensive deployment. And, being unmanned, missiles reduce crew attrition suffered in combat.

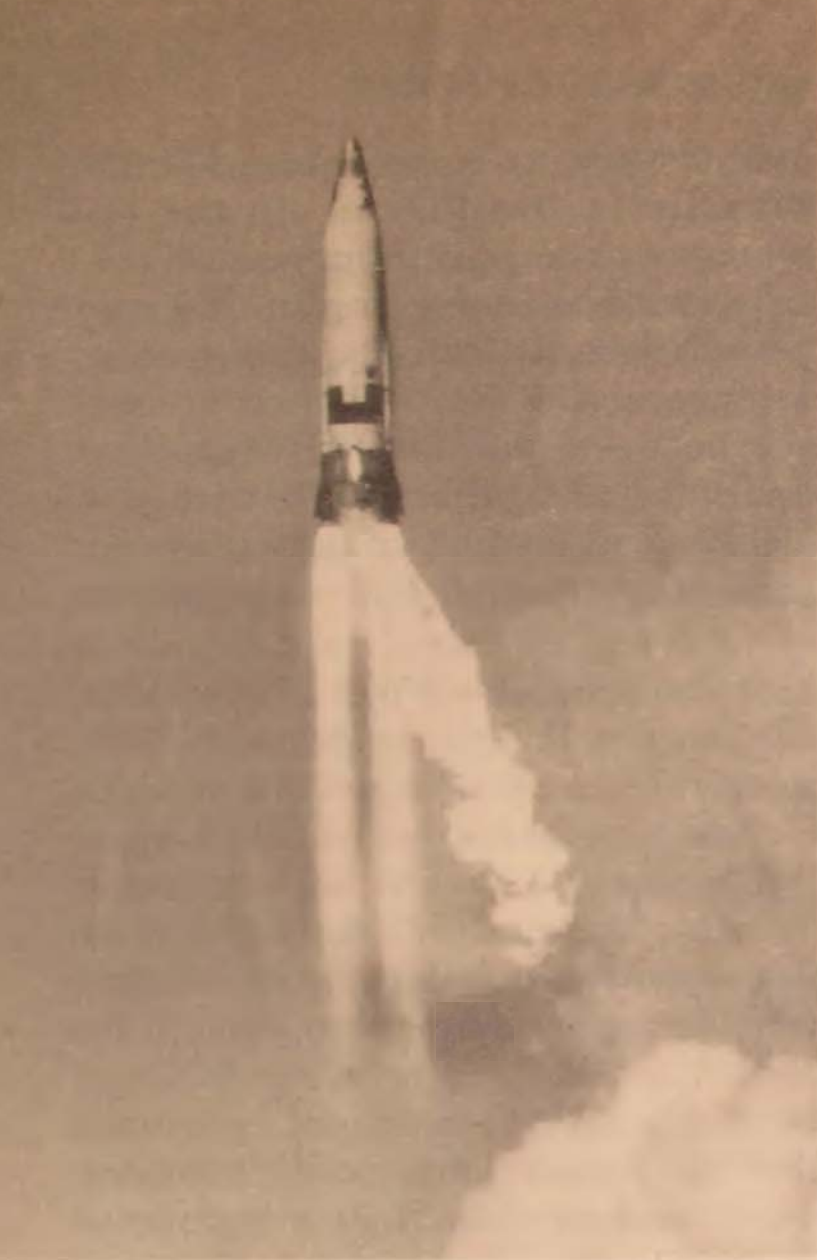
deterrent aspects

The unique characteristics of the ballistic missile may appear to be of greater benefit to the Soviets—or any other potential aggressor—in mounting a surprise attack against this country than they would be to us in deterring aggression. It is argued that the military advantages of the initiative coupled with those of a mass attack with advanced ballistic missiles could achieve a decisive victory within hours after initiation of the attack. But while such an attack would undoubtedly cause grave losses in lives and property, it could be decisive only if it succeeded in wiping out or seriously crippling our retaliatory strike capability.

As will be discussed later, various measures can and are being taken to ensure the survival of a sufficient percentage of SAC's

The Atlas ICBM

The 5500-mile Atlas, now in flight testing, is the first of the two Air Force intercontinental ballistic missiles that will enter the SAC inventory. Using a combination of liquid oxygen and jet-aircraft fuel, its rockets develop the equivalent of six million horsepower. Its apogee is hundreds of miles above the earth. Re-entry into the appreciable atmosphere—at 250,000 feet—is at a speed of about mach 25. Flight time at full range—just over 30 minutes. A more sophisticated ICBM, Titan, is in development about one year behind Atlas.



The Thor IRBM

The 1500-mile Thor intermediate-range ballistic missile will be the first operational U.S. strategic missile. It is scheduled for deployment overseas by December 1958, a remarkable three years since the contract for its development was let. Its flight tests have proven out its airframe and major systems, including propulsion and guidance. It has far exceeded its design range, has risen to altitudes greater than Sputnik I. With a re-entry speed of about mach 14, flight time for design range is 15 minutes plus.



strike forces—even in the face of a devastating surprise attack with bombers and missiles—to permit effective retaliation. In the retaliatory attack we would of course make optimum use of the most advanced strategic weapon systems available at the time aggression took place, including ballistic missiles. For this reason missiles will contribute increasingly to the maintenance of our deterrent margin—the difference between the Soviets' capability to wage aggression and our capability of countering it with decisive results. For the Soviets' decision to initiate an attack would be based on an estimate of the cost to them, which is measured in terms of our retaliation.

However, deterrence is a relative concept. What may appear to us as an unacceptable penalty may well be considered by the Communist dictators to be an entirely acceptable price for what they expect to gain. And once they have managed to build up a sizable stockpile of ballistic missiles, they may even be convinced that they can attack us with relative impunity. Therefore it is essential that we maintain the deterrent margin at the same convincing level which thus far has made aggression against this country appear too costly, even by Soviet standards. But as the Soviets' offensive capability grows, so must SAC's deterrent posture. Availability of a growing number of advanced and reliable ballistic missiles, widely deployed in hardened sites, will greatly enhance that posture.

employment

There has been too little experience with strategic ballistic missiles to establish hard and fast rules for their employment. During the present stage of initial evolution, their operational employment would depend on the status of missile technology at the time a war started, the quality and quantity of operational missiles available to either side, and similar factors. These factors will change rapidly and radically in the years ahead, requiring frequent reassessment of the prevailing conditions affecting both employment of and defense against ballistic missiles.

As with every other new weapon system, SAC must make optimum use of current missile capabilities by exploiting their favorable characteristics and minimizing their deficiencies. This means that the first operational ballistic missiles would be assigned to soft or large targets and as penetration aids to manned bombers. Additional targets and missions can be assigned as the

number and quality of operational missiles increase. Eventually the ballistic missile will probably become the principal weapon for destroying quickly those targets that pose a direct and immediate threat against the United States, as well as many other targets that contribute to an aggressor's ability to wage war.

Operational Aspects of Missile Technology

Discussions of ballistic missiles frequently point out that the first ballistic missile was launched when some prehistoric genius picked up a rock and heaved it at an adversary. The implication is that the art of ballistic missiles is a very old one. A somewhat similar cliché is used occasionally to emphasize the long history of rockets. Actually there can be no valid comparison between a projectile thrown or blasted in the general direction of a nearby target and the ballistic missile as we know it today, streaking at near-escape velocities out of and back into the atmosphere to hit a target thousands of miles away with fantastic accuracy and the destructive power of millions of tons of TNT.

The point is that the science of strategic ballistic missiles is very new. As in all new and revolutionary sciences it is subject to both many growing pains and rapid advances, especially in the very early stages. Operational employment of ballistic missiles during this period presents many problems, not only because of the lack of precedents in many phases of operation but also because of the constant changes resulting from day-to-day advances in missile technology. To exploit these advances to the utmost, there must be commensurate advances in the system created for the employment of the missile. A superior engineering product could well be militarily inferior unless it is properly applied and utilized.

Technological supremacy is established not by advances in some particular field or area but by correlated advances in all the many disciplines that contribute, directly or indirectly, to the state of the art. Similarly, strategic supremacy is established not merely by superior weapons but also by a superior system available for the operation, maintenance, and protection of these weapons. Indications are that, in such a comparison, SAC is still considerably superior to its Soviet counterpart. If the Soviets had in being a global and all-encompassing support organization equal or similar to that of SAC, it would be difficult—and illogical—to keep it secret.

To grow with the threat, SAC must make effective and immediate use of technological advances in strategic weapon systems, both manned and unmanned. This requires great flexibility in all areas of organization and operations so as to permit rapid and effective reorientation in planning, changes in procedures, and modification of support equipment.

The need for such flexibility is particularly apparent in dealing with advances in missile technology because there will probably be unpredictable technological breakthroughs which may result in dramatic improvements in performance. Even if no spectacular breakthroughs should occur, there are bound to be quantum advances in performance, greatly accelerated by the impetus and urgency given to the missile program, which must be reflected without delay in the operational support systems.

These advances will result in continuous improvements with respect to accuracy, range, reliability, maintainability, mobility, and other operational features which will have considerable bearing on the manner and scope of missile employment. Anticipating these far-reaching changes, SAC has established, as an integral part of its over-all organization, the nucleus of a missile capability which is responsive to all present as well as foreseeable future operational aspects of missile technology.

Operational Considerations

Fascinated by the spectacular nature of the ballistic missile, a space-conscious public tends to consider it as "the ultimate weapon." Three reasons, in particular, make it highly unlikely that there will ever be such a thing as an "ultimate" strategic weapon. The first reason is that as a weapon becomes more complex and sophisticated it takes increasingly longer to develop and thus allows more time for the development of defensive measures against it. Also it is no longer probable that any one country will be able to monopolize the use of a highly advanced weapon for any appreciable length of time, as we were once able to do with the atomic bomb. Therefore introduction of a revolutionary weapon or weapon technique should henceforth have little bearing on relative technological strengths but only raise them to a higher plateau. This means that use of a potent new weapon by an aggressor will invite retaliatory use of the same weapon by the defender, spurring a race for a still more potent weapon.

The possibility of an "ultimate weapon" is further mini-

mized by the fact that strategic operations entail a number of highly specialized missions that can best, or perhaps exclusively, be accomplished by a variety of specialized weapons or combinations of weapons.

Finally, any tool fashioned by the mind and hand of man has weaknesses and limitations. Some limitations may be inherent and best dealt with by avoiding those uses of the tool that would exaggerate the deficiencies.

The ballistic missile too has weaknesses and limitations. Most of these lend themselves to improvement, while some are inherent. Of immediate interest, however, are those deficiencies which have a profound effect on the establishment of SAC's Initial Operational Capability (IOC) in the ballistic missile field.

problem areas affecting IOC

Operational limitations and problems affecting the employment of ballistic missiles in their present stage of development pertain primarily to accuracy, reliability, limited payload, maintainability, and lack of operational experience. Improvements in missile technology and increasing experience in the operation and maintenance of ballistic missiles will gradually alleviate these deficiencies. Others may continue to impose operational limitations for some time to come.

For one, the ballistic missile will eventually be more vulnerable to active defense measures—such as an antimissile missile—than a manned bomber as long as its trajectory is fixed and therefore predictable. Of course this deficiency becomes an advantage in our own defense against hostile missiles. A similar two-way consideration applies to the fact that ballistic missiles, in contrast to manned bombers, cannot be used for flexible tactics designed to aggravate detection.

Another and possibly even more serious problem stems from the inability to recall a ballistic missile once it is launched. To cancel a launching, it would be necessary to destroy the missiles in some manner before they impacted, which, indeed, would be a very high, if not fatal, price to pay for an error.

Nor is it possible to divert a ballistic missile from one target to another while in flight or to compensate for insufficient knowledge concerning the exact location and nature of a target. No matter how ingenious, the missile's "brain" has no reasoning power to deal with unexpected situations but can only follow the

instructions given it prior to launch. Furthermore there is at present no positive and direct method of ascertaining whether and to what extent it followed these instructions.

All these elements inject a certain degree of inflexibility into missile operations which must be taken into account in their employment and the selection of compatible targets. The same consideration applies of course to manned bomber operations—except that bomber crews can frequently take corrective or alternate action in flight whereas missiles cannot.

To cope with these problems, it is important to assign missiles only to those missions which are within their capability at the prevailing stage of development. Some of the wide variety of strategic missions which SAC must be prepared to perform will permit the employment or assistance of ballistic missiles from the very start of their operational readiness. Other missions are still too far beyond present missile capabilities to make their employment feasible.

The first step, therefore, in exploiting SAC's Initial Operational Capability for ballistic missiles is to recognize and define their existing capabilities and deficiencies and to plan for their employment in such a manner as to make optimum use of the one and to minimize the other.

solution of problems

The problems which have been described are so varied that many different approaches are needed for dealing with them. Some of the solutions may be temporary, especially in cases of technical deficiencies which can be expected to be alleviated in the near future. Other approaches may have to be indirect, such as in preventing the inadvertent launching of ballistic missiles. Lacking reliable technological safeguards to deal with these and related contingencies, ballistic missiles would probably not be launched until and unless there is definite proof of aggression—proof perhaps as drastic as the actual detonation of hostile bombs or missiles. This operational factor in turn generates the urgent requirement for the extensive deployment and hardening of missile sites. Conversely, SAC's alert force of manned bombers could be launched immediately upon receipt of tactical warning, since "fail-safe" provisions permit their recall in case the warning should prove unfounded.

Pending improvements in the three most critical deficiency

areas in the first generation of ballistic missiles as compared to manned bombers—insufficient accuracy, yield, and reliability—the first characteristic which can be utilized in the Initial Operational Capability period is the missile's tremendous speed. With increasing experience in their maintenance and operation, ballistic missiles will soon permit the exploitation of an additional characteristic—their quick reaction capability.

To derive the maximum benefit from these two characteristics during the IOC period, it is necessary to analyze SAC's target system carefully and to use ballistic missiles only for those missions which stress quick reaction and speed but do not entail the stringent requirements for great accuracy and yields placed on manned bombers.

mission analysis

The purpose of a strategic mission is to inflict a specified degree of damage upon a specified strategic target. Unless both of these conditions are met, the mission cannot be considered fully accomplished and may have to be repeated. SAC's Emergency War Plan (EWP) covers the target system assigned to SAC and in turn assigns the accomplishment of specified strategic missions to the various elements of SAC's strike forces.

At present all SAC missions are assigned to either medium or heavy bomber units in accordance with the relative locations of launch point and target, mission requirements, tanker coordination, and similar factors. The Emergency War Plan is constantly reviewed and modified as necessary, at the request or with the approval of higher headquarters.

There are two principal types of strategic targets, the Specified Point Target and the Specified Area Target. A third type, which is assuming increasing significance, is the Specified Mobile Target.

The Specified Point Target is a strategic target in SAC's Emergency War Plan which is relatively limited in size and has sharply defined boundaries (missile launch sites, factory complexes, power plants, large permanent structures or buildings, etc.

The Specified Area Target is a strategic target in SAC's EWP which is fairly large in extent and normally has no clearly defined boundaries. The farthest reaches of the target area which are expected to suffer at least some predictable damage may, in the case of a high-yield weapon, be many miles from the Desired Ground Zero (DGZ)—that point within the target area above which the

weapon has been programmed to detonate. Examples of Specified Area Targets are airfield complexes, widely dispersed military or industrial installations, etc.

A Specified Mobile Target is a target in SAC's EWP which is, in effect, a point target but whose location is neither permanent nor always precisely known. Future targets of this nature could be mobile missile launching facilities mounted on a group of trucks, or possibly missile launching sites on ice floes.

Each of these general types of targets—specifically the first two—includes a great variety of categories, depending on the amount of hardening, size and shape of structures, concentration of built-up areas, nature and character of target, and many others.

Application of a weapon to any one of these many different targets is designed to achieve a specific objective. This objective could be the complete *destruction* of the target—normally a Specified Point Target—to the extent that it can no longer serve its military or industrial purpose and that its repair or rebuilding is not possible, at least during the decisive phase of the war.

Another objective of a strategic mission can be *disruption*—of communications, utilities, traffic, and similar activities or facilities essential to the continued conduct of the war. To be effective, disruption must be thorough enough to prevent resumption of useful operations for an adequate period of time.

A related objective is to *degrade*—that is, to reduce the effectiveness of—widely dispersed but coordinated military or industrial activities whose complete destruction is not possible or practicable. A typical example is the degrading, by means of missile salvos, of extended defenses against bombers in order to reduce the attrition rate in manned-bomber strikes.

Contamination of a large area by high-yield weapons can serve to *deny* that area to personnel who must use it in the performance of military or vital support duties. Finally the objective of a strategic mission can call for *devastation* of a large-area target, so as to weaken both the over-all war-making capability of the enemy and his will to continue the war.

It is quite possible that a successful strategic mission may accomplish not only its specified objective but secondary objectives as well. For instance, a mission programmed to disrupt the electric services in a particular area could at the same time deny a nearby airfield to its operating personnel and disrupt traffic over adjacent roads. A mission can be considered successful only if it has achieved its specified objective, regardless of what other objectives it may have achieved.

The large variety of strategic targets and of different objectives to be achieved in attacking these targets is indicative of the innumerable factors that must be considered in planning strategic missions. The factors of particular significance to this discussion are yield and number of warheads needed to attain specified objectives, and the vehicle or vehicles best suited to carry the weapons to the target. In the past SAC's choice of vehicles was limited to either medium or heavy bombers. The question, then, is what type of missions will be suitable for strategic missiles during both the initial and the advanced phases of their operational capability.

mission effectiveness of missiles

The scope and number of strategic missions which can be assigned to ballistic missiles are initially limited, first, by the small quantity of operational missiles available, and, second, by their still unfavorable accuracy-yield characteristic as compared with that of today's manned jet bombers. The relatively low yield of the nuclear warhead of current ballistic missiles prevents their use not only for those missions which require a warhead of greater yield but also for missions where an otherwise adequate smaller yield would demand greater accuracy.

Even marked improvements in the electronic guidance systems of ballistic missiles may not suffice to ensure commensurate improvements in their mission effectiveness. There are several other seemingly unrelated problem areas which affect the probability of reaching the specified target and achieving the specified degree of damage. Following are some of the early problems which may have a bearing on the mission effectiveness of ballistic missiles:

- Human error, from the calculation of the trajectory to the "keying" of guidance instructions into the missile. Once the missile is launched, errors cannot be corrected.
- Geographic error, resulting from inadequate knowledge of the exact location of a target or errors in the datum position used as a reference point.
- Misinformation pertaining to a target, stemming from misinterpretation of intelligence data or the enemy's deliberate deception.
- Inaccuracies in the calculation of the ballistic trajectory, caused by insufficient or erroneous data pertaining to

gravitational or magnetic anomalies, high-speed phenomena, elevation of the target, and similar factors.

- Effect of environmental conditions on the trajectory, such as extremes or unexpected variations in temperature and air density, meteoric dust, radiation, etc.
- Malfunctioning during flight of one or more of the thousands of delicate components.
- Effect of missile defenses.
- Inaccurate or erroneous information on the degree of target hardening.

While these factors may in themselves be of minor or debatable significance, they combine to reduce the probability that a ballistic missile will accomplish its specified mission. With further improvements in missile technology, with increasing knowledge of the data needed to calculate precise trajectories, and with growing operational experience, most of these problems may warrant no further consideration. For the time being, however, missions whose success could be jeopardized by relying on missiles must be assigned to manned bombers. Manned aircraft are normally not subject to such unprecedented operating conditions and can correct minor inaccuracies and deficiencies in flight.

the mixed bomber-missile force concept

As pointed out before, the coordinated use of both manned bombers and missiles will provide SAC with an invaluable flexibility in the assignment of each specific mission to the weapon system or systems best suited for it. But this flexibility is reflected in improved combat capability only if there is an adequate choice of advanced weapon systems to meet satisfactorily the requirements of any strategic mission SAC may be called upon to perform.

At this writing ballistic missiles are not yet combat-ready, and SAC must still rely on its over 2700 bombers and tankers to accomplish its mission. However, the B-47 medium bombers are gradually becoming obsolescent and may possibly approach the obsolete stage before they can be replaced by adequate quantities of operational missiles. While there are still years of service life left in the B-52 heavy bomber, the ICBM will probably not be ready to entirely replace this aircraft by the time that bomber too reaches obsolescence and must be phased out.

To prevent a serious gap in our strategic strength during the transition period, it is essential to modernize our bomber force

so as to keep step with the improvements in the Soviets' offensive and defensive capabilities. The B-47 must be followed by the higher-performance types like the B-58 and the B-52, and eventually by the highly advanced, hypersonic B-70 bomber. Concurrently, IRBMs and ICBMs will be phased into the SAC weapons inventory as rapidly as they become operationally available.

The Snark nonballistic, air-breathing missile, which is now in the final testing stages, will provide SAC with an intercontinental-missile capability even prior to the integration of the ICBM. Subsequently it will find use in long-range missile missions requiring evasive or deceptive tactics in support of, or in coordination with, bomber and ICBM strikes.

Just as the transition from propeller-driven to all-jet aircraft was a gradual one, so the transition from an all-bomber to a mixed bomber-missile force must be orderly and carefully programmed. To achieve the maximum benefit from this combination, every effort must be made to reflect the latest technological advances in all operational weapon systems, both manned and unmanned. Also, great care must be exercised in the assignment of missions to those weapon systems which promise the greatest probability of success. The development of the optimum strategy and tactics in the employment of a mixed bomber-missile force is facilitated by electronic computers, which are used by SAC's planning staff to conduct war games based on the many varied sets of conditions incident to strategic operations.

With continued improvements in missile technology and operations, the percentage of missions which can be assigned to missiles will increase commensurately. However, indications are that for the foreseeable future missiles will not entirely replace the manned bomber but rather will supplement and complement it. The manned aircraft offer certain advantages that would be difficult, if not impossible, to achieve with missiles. This applies particularly to missions which must cope with unknown contingencies or which necessitate the observation and analysis of results before deciding on subsequent action. Manned bombers will also remain superior to missiles for the accurate application of nonnuclear weapons to a series of small, widely dispersed targets, or the use of weapons with very high yield.

future aspects

There is little doubt that future developments will bring about rapid improvements in accuracy, yield, range, automaticity,

maintainability, and similar areas in which early ballistic missiles are deficient. Technological advances will also engender spectacular improvements in some of those areas which constitute inherent rather than initial weaknesses of current missile designs.

One of the most far-reaching improvements, as far as operational employment is concerned, would be the conversion from liquid to dependable and stable solid rocket fuels. Use of solid propellants would greatly facilitate maintenance and logistics problems, enhance movability, permit more extensive dispersal and hardening, reduce requirements for skilled technicians, and allow for greater automaticity. The relative simplicity of solid-fuel power plants would increase reliability and improve reaction capability. Moreover, it is anticipated that over-all cost of procuring and maintaining solid-fuel missiles will be considerably below that for the liquid-fuel type. For all these reasons solid-fuel power plants will undoubtedly find increasing use in future generations of ballistic missiles.

Another improvement which appears technically feasible concerns means for permitting a missile to deviate from its normal ballistic trajectory. Once perfected, such a means would add immeasurably to protection against antimissile defenses which, at present, can be based on the fact that after a ballistic missile has been detected its trajectory can be predicted expeditiously and accurately.

A profound impact on SAC's future operations would also result from the development of an operational Strategic Reconnaissance Satellite (SRS). Such a satellite would minimize one of the principal inherent weaknesses of unmanned weapon systems—their inability to report whether and to what extent they have performed their assigned mission. The Strategic Reconnaissance Satellite would also assist in accurately locating targets, facilitate missile guidance, and, possibly, provide countermeasures against missile defenses. Moreover, it would permit early detection of hostile missiles and thereby enhance both SAC's alert posture and missile defense.

Obviously the Soviets would use satellites for similar purposes. This may create the need for developing antisatellite defenses. Thus the Air Force may have to extend its operations ever deeper into space, with the prospect of actual space warfare in the more distant future.

Nontechnical aspects of the future include those for growing cooperation with the other services and the military establish-

ments of our allies in coordinating the assignment of ballistic-missile targets. The increasing availability of ballistic missiles, their tremendous scope of ranges, and their potential adaptability to mobile launching platforms on land, at sea, and in the air will eventually make the entire Soviet target system accessible to many organizations other than SAC. With adequate assignment of responsibilities and centralized control, the combined missile capability of the free world could represent a tremendous asset to its deterrent posture.

consideration of Soviet missile capability

In the employment of ballistic missiles the Soviets must cope with problems and deficiencies similar to those affecting our own initial operational capability. The question whether or not the Soviets are currently ahead of us in their missile technology is rather academic. They would not launch an all-out missile attack unless and until they have enough operational missiles to ensure the immediate and complete success of such an attack by neutralizing our retaliatory forces. Indications are that the Soviets have not yet reached that capability. By the time they have accumulated what they would consider an adequate stockpile of ballistic missiles, our own stockpile can, with proper effort, have grown sufficiently to offset any technological advantages they might possess at present.

There are, however, some factors in missile employment which represent exclusive advantages to the Soviets. They have more accurate and detailed information concerning the location and nature of strategic targets in this country. Also these targets are more concentrated, with many major target areas within easy reach of submarine-launched missiles. As the potential aggressor they can select the most suitable time and circumstances for a surprise attack. Thus they can cause severe damage even if our subsequent retaliatory action led to their ultimate defeat.

But while successful attacks on large, highly concentrated target areas can be undertaken with relatively poor missile accuracies, much better accuracies are required to seriously weaken SAC's combat capability, even with a large number of missiles. The Soviets, too, recognize the mixed bomber-missile force as mandatory to achieve flexibility in the choice of weapon systems for a variety of missions.

There are two approaches the Soviets could and undoubtedly would use in trying to neutralize SAC's strike forces and thereby

prevent unacceptable retaliation. The first approach would entail a surprise attack with both missiles and manned bombers, in which the missiles would be employed principally against area targets while the bombers would concentrate on SAC installations.

The success of such a surprise attack appears rather doubtful, at least at the present time. It is extremely difficult to time the attack in such a manner as to ensure the simultaneous arrival of all elements, manned and unmanned, and thereby to achieve a complete surprise. A small aggressive force would find it easier to delay detection but would not suffice to prevent retaliation. And the bigger the aggressive force, the less chance there is for a sneak attack. Radars have now been developed which can detect an ICBM at very great distances. Eventually they should be able to provide the minimum warning SAC will need to launch its manned alert forces before they could be hit on the ground. The previously mentioned hardening and deployment of missile sites will further enhance the survival of a missile capability adequate to retaliate effectively.

The Soviets' second approach in preventing decisive retaliation rests with continued improvements of their air defenses, especially against manned bombers. But as defenses become more sophisticated, they must rely increasingly on electronics, which, in turn, can be combated with electronics, generating a vicious spiral of countermeasures and counter-countermeasures of mounting complexity.

Future advances in missile technology and the techniques of missile employment will of course increase the Soviets' offensive capability and, therefore, the threat to us. However, as long as we grow with the threat and succeed in preserving our deterrent margin, we can at least maintain what is sometimes referred to as a "nuclear stalemate."

The concept of the nuclear stalemate seems to have a derogatory connotation which is not justified. As long as the Soviets threaten aggression, we must make every effort to prevent it, because in a nuclear war there are no winners, only different degrees of losers. The nuclear stalemate is preferable to open warfare even if we should eventually win the war, for we could win only at tremendous cost to ourselves. Therefore we must endeavor to maintain the critical balance in the hope that the fundamental issues can be resolved by future international and political developments which will, once and for all, end the threat to our security.

Integration of Missiles into the SAC Inventory

SAC is well prepared to integrate missiles into its inventory. Throughout its existence, it has had to phase in a number of new weapon systems—B-29, B-50, B-36, B-47, B-52—and has gained considerable experience in adapting its operations, organization, personnel, and support activities to the different conditions created by new weapon systems.

This flexibility and adaptability will be exceedingly helpful in the integration of ballistic missiles. Their revolutionary nature will require some major modifications of present operational concepts, training approach, weapons selection and employment, and related areas. On the other hand, integration of missiles will be fairly gradual, permitting the well-planned and cohesive conversion of the existing organization and support functions to mixed bomber-missile operations.

Lack of previous experience in the operational employment of ballistic missiles and the integration of these missiles into a combat command while they are still in the research and development stage will cause many unprecedented problems. There will be continuous changes and modifications resulting from technical improvements and growing experience. For these reasons the conversion to a mixed bomber-missile force is divided into two broad phases, namely the Initial Operational Capability (IOC) and the Advanced Operational Capability (AOC).

The IOC covers the period from initial integration and transition to a limited but combat-ready missile capability. The AOC begins at that point which, in effect, concludes the "experimental" phase. While there will be continued improvements and subsequent changes, their effect on organization and operations will be more predictable and less drastic.

It would be futile to speak of an "Ultimate Operational Capability," as there are still too many unknowns to chart a path beyond the achievement of an Advanced Operational Capability. In fact it will be impossible to tell exactly when the IOC ends and the AOC begins, as there is bound to be a considerable overlap of the two phases, not only for different families of missiles but also for each individual type.

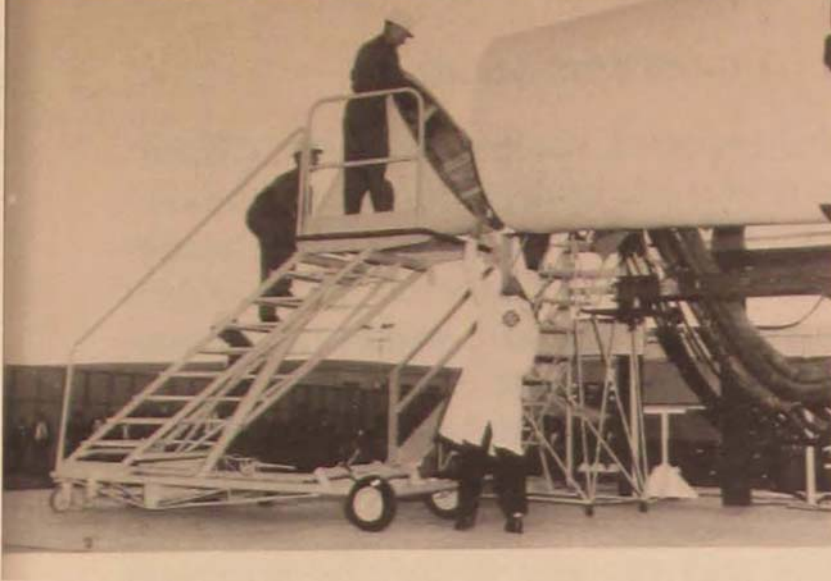
organization

The decision to expedite the achievement of a missile capability by committing ballistic missiles to operational employment while they were still under development required the added decision as to whether the responsibility for the establishment of the IOC should be assigned to the developing command or the operating command. After a careful weighing of all factors involved, it was decided to assign this responsibility to the Air Research and Development Command. However, subsequent considerations indicated that the achievement of Advanced Operational Capability for SAC could be accelerated by getting SAC into ballistic missile operations at the earliest possible stage. Therefore the 1st Missile Division, with headquarters at Cooke Air Force Base, California, was transferred to SAC on 1 January 1958, together with the responsibility for the IOC phase of both the ICBM and IRBM programs. The commander of the 1st Missile Division, which now occupies a position equal to that of a numbered air force in SAC, is responsible for the training and expansion of the strategic ballistic missile force.

Further organizational changes included the establishment of a Headquarters SAC extension—"SAC Mike"—in ARDC's Ballistic Missile Division at Inglewood, California. The Ballistic Missile Division, which previously had the IOC responsibility, will continue to direct the ballistic missile research and development programs. SAC Mike, headed by a SAC "Assistant Commander in Chief," serves as direct contact for either conveying the latest requirements or requesting up-to-date technical information. This is expected to speed the solution of daily technical problems and otherwise shorten communications channels.

Also during January 1958, SAC activated its first two IRBM squadrons, one for the Thor and the other for the Jupiter. IRBM squadrons are slated for overseas deployment after completion of training.

The ballistic missile force will initially be integrated into the time-proven SAC organizational concept and formed into divisions, wings, and squadrons. Development of an organizational structure to meet all foreseeable contingencies in future missile operations is now in process, using the most advanced concepts of management engineering. Unpredictable technical factors and operational problems, political considerations, or other exigencies may require modified approaches which cannot be anticipated at this early stage.



Missilemen in Training

Air Force personnel of the 1st Missile Division are now in training at the factory, learning the operation of the various systems in the Thor IRBM missile. Airmen (above) attach a dummy nose cone on a Thor missile under the supervision of a technician from General Electric, the nose cone contractor. When the Thor is assembled (right), it towers erect amidst its operational launching equipment.



personnel

As weapons become more complex and potent, more and greater skills are needed to operate and maintain them properly. The many diverse skills required in the employment of ballistic missiles are so advanced that present military personnel at even the highest technical levels will barely meet entrance requirements for many ballistic missile specialties.

Estimates and the development of manning tables pinpointing functional areas and job requirements are essential to ensure the proper training in specialties which were nonexistent only a very short time ago. Also, the personal characteristics of personnel who are to man the ballistic missile units will probably be quite different from those who fly manned aircraft. To define these characteristics adequately is a problem that still lies ahead.

Added personnel problems may result from the conditions

under which missile crews are expected to operate, such as isolation of launch sites, long hours of work underground, and the demanding alert status. These problems will aggravate already existing difficulties in retaining skilled personnel in the Air Force. Further reduction in the retention rate would be doubly harmful to ballistic missile operations because, unit for unit, missiles require one third more personnel in the electronics-technician category—the type most difficult to retain today—than does the manned bomber force.

Established SAC facilities and procedures for the selection and training of personnel to operate and maintain the advanced manned weapon systems can serve similar purposes in the ballistic missile area until sufficient empirical data have been accumulated to develop more specialized selection and training criteria. Initially emphasis will be on on-the-job training, both in the factories of the missile manufacturers and at the launch sites. More sophisticated training can be developed as soon as there is a nucleus of instructors with extensive operational experience, assisted by specialized training aids such as simulators.

On the brighter side of the personnel picture, SAC is in the position to select commanders for all echelons of missile operations from a large number of seasoned officers who are well versed in strategic operations and the employment of the highly complex, manned strategic weapon systems currently in use. Their versatility, experience, and familiarity with the concepts guiding SAC's mission will prove an invaluable asset to the early establishment of a combat-ready ballistic missile capability.

support activities

SAC's existing support activities were developed over a period of years for the operation of weapon systems which in complexity, technological aspects, support requirements, and purposes are not very different from ballistic missiles. Therefore integration of the missiles requires little if any conversion of most support activities, rather their gradual expansion and addition of specialized functions. This applies in particular to three of SAC's most advanced and extensive support activities—logistics, communications, and intelligence.

SAC's logistic system was developed to provide adequate materiel support to installations scattered throughout the world, and, in turn, it must support the global operations of SAC's

bomber and tanker forces. In spite of the huge quantities of diversified materials that must be moved over large distances, the system had to be designed for clocklike precision and immediate response to the widest fluctuations in demands so as to cope with any contingency.

This system is well suited for the logistic support of operational missile sites, although two aspects warrant special attention. As missile sites will normally be located in isolated areas, they must be quite self-sufficient. They must not only be capable of immediately dealing with any emergency but also be in continuous readiness to successively launch a given number of missiles. This requires a large stock of supplies and parts, tools, and other equipment whose exact specifications and quantity will have to be determined empirically for lack of any previous experience. As a result early operations of the first missile sites may be plagued by some materiel deficiencies affecting combat-readiness until adequate requirement data can be fed into the SAC logistic system.

Another problem will result from the location of the missile sites. While their wide dispersal in itself offers no unique difficulties, their isolated location may impede the steady flow of essential supplies and materiel, both over land and by air. This problem may have to be solved by the addition of helicopters to SAC's complement of cargo carriers.

Logistics for missile sites will be further enhanced by the availability of SAC's well-established, global communications network which is unequalled in scope, reliability, and reaction capability. Employing the latest advances in electronics, this foolproof communications system permits instantaneous and dependable contact with any SAC element in the air or on the ground throughout the world. The focal point is located in the vast underground control center of SAC's headquarters at Offutt Air Force Base, near Omaha, Nebraska.

From this control center the commander in chief of SAC and his staff direct the operations of the entire command. The communications network is in effect SAC's "nervous system" for the rapid transmission of information and action directives. Tied into this network, SAC's missile sites everywhere can be committed to action within a matter of seconds. Conversely, they can alert the entire SAC establishment just as rapidly in case they have been attacked.

Equally unique and indispensable to missile operations is SAC's highly developed intelligence organization. Its role is a vital one. Even the most perfect and potent strategic weapon

system, whether manned or unmanned, is of little value unless it is applied effectively and expertly to the achievement of a military objective. This entails the capability to ascertain exactly what that objective is and how best to attain it. The purpose of strategic intelligence is to provide that capability.

The manifold responsibilities of SAC's intelligence organization begin with the establishment of the target system—that is, determination of those targets which contribute to the war-making capability of a potential aggressor. The next step is to assign priorities, with top priority going to targets which in case of aggression would pose the most immediate threat to the United States.

Subsequent tasks serve to obtain all possible details concerning each target, such as precise location, size, shape, construction, defensive measures, vulnerability, and similar characteristics. While the Soviets' strategic intelligence can normally use overt sources to gather similar data in this country, SAC's counterpart must rely on experience, scientific methods, and much ingenuity in properly tying together bits and pieces of sometimes questionable information.

After the necessary target data have been obtained, another group must determine the specific objective to be attained in attacking a target. This information is then supplied to experts in nuclear weapons technology who must decide what number, type, and size of weapons to use and where to detonate them to achieve the specified mission objectives. Finally, recommendations must be made as to the type of vehicle or vehicles best suited to carry the weapon.

In addition to these tasks strategic intelligence must furnish detailed information concerning air defenses and, following a strike, must make the most rapid and accurate possible assessment of the damage inflicted.

It is obvious that these unparalleled intelligence facilities are not limited to the employment of manned weapon systems but are equally suitable for missile warfare. The only specialized functions that must be added are provisions for poststrike reconnaissance and facilities for the calculation of ballistic trajectories.

The latter requirement led to the recent activation by SAC of a Target-Trajectory Preparation Center whose personnel are presently undergoing intensive training. Equipped with the latest electronic computers to permit high-speed calculation of the complex trajectories, the Center will eventually be located at SAC

headquarters and become an integral part of the intelligence organization. Availability of this organization for missile operations will permit achievement of a combat-ready status at a much earlier date than would otherwise have been possible.

site operations

Several missile sites are now under construction in this country, and selection of additional sites is under way. Site selection is based on a number of criteria which are quite difficult to meet satisfactorily. Sites should be located in isolated areas for security and safety reasons, yet be close enough to active military installations which can provide administrative and related support. Added requirements include soil characteristics suitable for construction of hardened sites, climatic conditions permitting all-weather operations, a minimum of electric interference, and many other considerations.

Defensive measures for the protection of missile sites will in general parallel those taken for the protection of bomber bases. These measures include provisions for dealing with sabotage attempts designed to pin down SAC's retaliatory forces just prior to initiation of aggression, dispersal, and hardening of bases and missile sites against battle damage resulting from near-misses.

Dispersal of missile sites can be more extensive than that of bomber bases, especially in the case of sites employing missiles with solid-fuel power plants. The primary purpose of dispersal is to extend the enemy's target system to the point where it exceeds his capacity for destroying our retaliatory strike forces to the extent required to ensure the success of a surprise attack.

Hardening of launch sites is not only more practical but also strategically more important than hardening of bomber bases. As mentioned before, missiles would normally not be launched until after the initial attack. Their sites must therefore be so deployed and protected as to ensure the survival of an adequate percentage. By their very nature, missile sites lend themselves quite readily to a fair degree of hardening.

Bomber bases are more difficult to harden effectively in view of their expanse. Also too much hardening would tend to adversely affect the reaction capability of the alert force. Hardening of bomber bases will generally be limited to communications, fuel storage, and the like. On the other hand, survivability of SAC's manned strike forces is enhanced by an *offensive* measure for pro-



Cooke AFB—The First Missile Site

Cooke Air Force Base was chosen as the ballistic missile training base because it offered a combination of most of the features of an operational base and others peculiar to it as a training establishment. Now the scene of \$100,000,000 in construction to provide the IRBM and ICBM training sites and base facilities, Cooke will provide a limited operational capability even while training is underway.

tection—the alert system. Under this system a certain percentage of the strike force is kept on continuous alert, ready to launch a counterattack within minutes after receipt of tactical warning. The size of this alert force and its quick-reaction capability are the very backbone of our deterrent strength and will continue to represent a most potent deterrent to aggression even after ballistic missiles have been integrated into the operational inventories of both sides.

Missile sites will be kept in a similar continuous alert status. Although tactical warning may not necessarily be the signal for launch, they must be ready at any time to launch their first missile within minutes after receipt of the strike order from Headquarters SAC. Improvements in automaticity should greatly enhance their quick-reaction capability.

Achievement of this capability is also contingent on further improvements in reliability and maintainability. As malfunctions cannot be corrected in flight, missile components must possess even greater reliability than the components of a manned bomber. Maintainability must permit missile crews to keep a maximum number of missiles in commission under the limitations imposed

by the demands of self-sufficiency of missile sites. Equipment calibration, major repairs, and modifications will have to be accomplished by contractor or depot teams airlifted to missile sites.

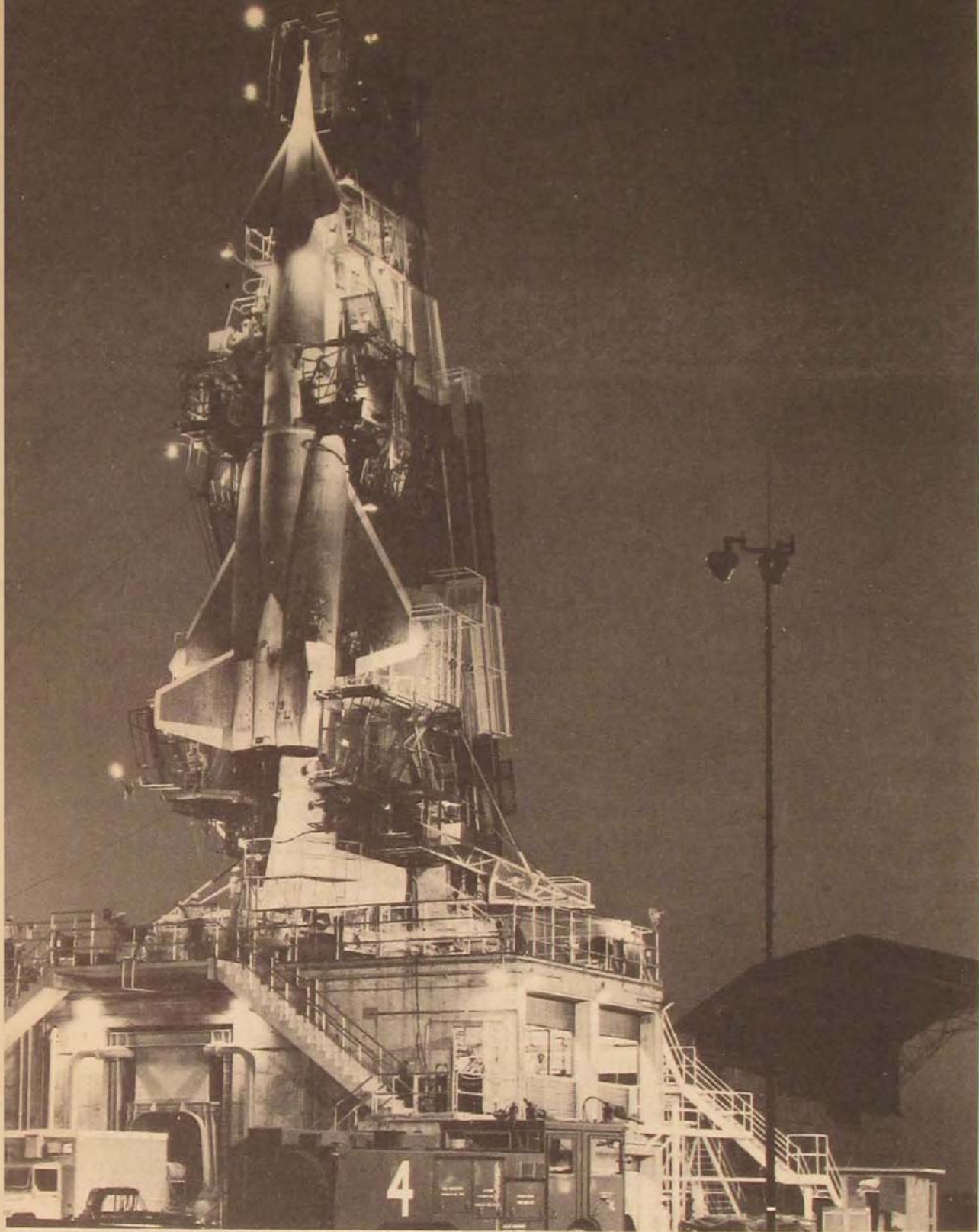
Missile crews must also be trained and equipped to make replacements required by deterioration or obsolescence of components and to perform regular checks and tests. These tests must include periodic launches of missiles against known targets in isolated areas to ensure the over-all reliability and accuracy of the entire missile weapon system and to maintain crew proficiency at the high level required for actual combat operation.

As HAS been shown in this discussion, SAC is utilizing its entire organization, facilities, and experience in strategic operations for the earliest possible achievement of an Initial Operational Capability in the employment of ballistic missiles. SAC is rapidly approaching that capability and, thereby, a capability for retaliation and deterrence still more advanced than it has now.

As ballistic missiles will improve our deterrent posture, so will they improve the Soviets' offensive posture. As a result there will continue to be a precarious balance between aggressive intent and deterrence, which is the best we can expect under existing conditions.

Whether or not that balance will be maintained hinges on our ability and determination to grow with the threat, and on the Soviets' continued respect for our retaliatory strength. Still, there is always the danger of a miscalculation on their part which would lead them to overestimate their strength or underestimate ours, or both. For this reason we must make absolutely sure that what we consider our deterrent strength is backed by our actual strength. For it is that strength which we must always be ready to apply decisively in fighting for our survival if deterrence fails.

Headquarters Strategic Air Command



Navaho Know-How

Putting the last Navaho to work for more advanced programs, Air Force missilemen at Cape Canaveral ready the 1900-mile-an-hour, low-altitude guided missile for its rocket-powered launch and twin-ramjet-driven flight. Know-how gained in the Air Force's Navaho program begun in 1946 made possible the early attainment of the reliable large rocket engines for Thor and Atlas and also for use in the Army's Redstone and Jupiter. Although the 700-million-dollar program was canceled in July 1957 in favor of ballistic rocket missiles, testing of unexpended components continues at the Air Force Missile Test Center for the benefit of more sophisticated systems. The U.S. satellite "Explorer" (1958 Alpha) was one Navaho payoff, since the power plant that put it in orbit was developed in the Navaho program.

Relationships Among Military Forces

BRIGADIER GENERAL S. F. GIFFIN

LET US begin by noting something uncontroversial. There is no full agreement on how to prepare for a war against the Soviet Union or on how to prepare for lesser war. There is not even agreement as to whether unrestricted war can remain a choice for U.S. action.

The argument which, more than anything else, has disturbed the cohesiveness of our military thought runs as follows: a nuclear stalemate is coming to exist because, as nuclear weapons in a struggle for survival will ravage both sides, the awfulness of the mutual threat will postpone or eliminate a final test of strength; meanwhile, the real danger may lie in piecemeal defeat through infiltration and through local wars launched by an aggressive enemy.

A most striking feature concerning this obvious argument and its several variations is the extent to which many Western military leaders have accepted its basic premise of nuclear stalemate, either explicitly, or tacitly by failing to offer counter argument. This is a situation which could rapidly lead to concepts of defeat and despair.

The fact is that any cohesive system of military thought must envisage a practicable approach toward victory in war. In the great contest between East and West military dynamism is essential even to a victory which may be achieved primarily through economic, psychological, and political means.

It is not necessary to decry the awfulness of the threat we face in order to support the thought that too much reliance on deterrence, unaccompanied by every appropriate preparation to win and survive a war if one occurs, is likely to deter from war only

ourselves, while the enemy's zest for minor aggression continues unabated.

The best way of discouraging an implacable enemy from war—any kind of war—is to be in a position to win it, to survive it handily, and to act with the confidence of this position. If war is then not prevented, this is still the position to be in; and from the military or, indeed, any rational point of view, no other position is acceptable. Under circumstances which now exist or can be foreseen, the military ideal of providing complete protection for the population and capital plant of the home base seems certain of compromise, but a system of thought can and must be accepted which envisages the attainment of victory in any kind of war, that is, a situation in which the enemy alone is rendered unable or unwilling to continue organized prosecution of the war.

Now if the leaders of our military forces are genuinely to agree on operational concepts for victory in war, it would seem there must be agreement upon basic relationships of modern military power, and it will come as no surprise when I submit that air power now supplies the primary basis for these relationships.

When I say "air power," however, I am not thinking solely about air forces or the United States Air Force but rather about those elements of power which, in the hands of Army and Navy as well as Air Force, fit properly into this bald and brief definition: "Air power is the hard core of any modern defense organization. It comprises those military resources, together with their effective command, control and employment, which enable a nation to use the air for its own purposes and to deny its effective use to an enemy."*

I think it is plain that the military resources involved in satisfying this definition of air power include resources of the Army and the Navy. By its increasingly effective antiaircraft defenses the Army can help deny effective use of the air to an enemy, and the Army has also been conceded certain means of using the air for essential Army purposes. The Navy is largely converted to the use of aircraft and missiles in accomplishing its own traditional missions, but it further contributes naval air power to assist in the accomplishment of Air Force missions.

Perhaps it is heresy to concede that U.S. air power resides elsewhere than in the Air Force. It may be even more heretical to concede that any wisdom lies in such a division of air power, which in some mystic sense is often regarded as organizationally indivisible. Nevertheless as we must maintain surface forces, and

*Definition developed by Evaluation Staff, Air War College.

as surface forces must, for the accomplishment of their own missions, possess indigenous resources capable of contributing to air power, it is proper that they be given those resources. The actual problem rests in determining how much they should be given—but the problem in preparing for war has always been one of determining priorities and allocating deficits.

air power and service relationships

Air power must be viewed as the dominant element in determining relationships among sister services. Air power in the first place is shared among the services; it is not the exclusive property of the Air Force, although the Air Force in law and in logic has the greatest responsibility in this respect. Air power is a common threat or benefit to all our fighting forces, for without its effective application none can operate successfully in war, and with its effective application any can. Air power provides the immediate determinant in a struggle for national survival, as well as the final sanction for the operations of surface forces.

Within a protective framework of air power, whether used or used in part or only poised for use, land and sea power may be employed to every advantage in furthering national interests which such employment can produce. Except in the pitched nuclear phase of a struggle for survival, these benefits may prove in the future hardly less considerable than they have in the past.

Because air power sanctions the use of land and sea power, any nation capable of doing so should today adopt a national strategy of air power, exactly as Britain in the appropriate circumstances adopted a national strategy of sea power. The analogy is exceedingly close between these strategies, each for its time; for each has the design of exploiting a medium of movement in order to dominate that medium and, to the extent necessary or desirable, any other medium of more restricted and laborious movement. It is easy to recall instances when the British Army was employed, never in large number and sometimes rather clumsily, like a fist at the end of a sea power arm. The Crimean and Boer Wars were such instances, as was the Peninsular action against Napoleon. Prior to World War I, in fact, modern England generally employed soldiers only as her sea power advantage might suggest, and admirers of the gallant Hornblower have had this concept dramatically illustrated by his creator, C. S. Forester.*

*[Adapted by permission from a recent review article: "A New Future for World War II?" by Brig. Gen. S. F. Giffin, in *World Politics*, IX, 2 (January 1957), 283-84.]

To speak of a national strategy of air power is not to talk about that "air strategy" which is frequently offered as the alternative to "surface strategy" in warfare. When we talk about "air strategy," we are usually discussing in essence a concept of aerial bombing with nuclear weapons. In an ultimate situation—a struggle for survival between national colossi—no choice is presented between an air and a surface strategy, because only through the air can there be achieved a decisive strategic advantage. The larger idea of a national strategy of air power of course includes this ultimate nuclear air battle at the head of the list of tactics available to the strategy. The degree to which we are prepared for this ultimate battle determines in great measure the choice of other tactics permitted us, as will be demonstrated shortly. Furthermore, if we do not possess, along with our friends, the air power with which to face an ultimate combination of enemies, we cannot have a strategy of air power, nor indeed can we have any strategy except one designed to minimize the consequences of defeat.

Since there is little question in any of our minds that we can, if we will, possess the offensive air power necessary to face any ultimate combination of enemies, the real question probably pertains to the degree of adequacy which we may attain for our defensive air power.

When we say that a determined air attack will always get through, we are stating a conviction derived from our own past experience and that of the Royal Air Force. Superior concept for the application of air power, plus a superior combination of men, machines, and leadership—the last of which should not be discounted—won for the British and ourselves the decisive offensive edge. Determined or not, no other air power ever consistently penetrated enemy defenses to achieve the results of success.

Beyond argument, U.S. air power can and must continue in future to hold for the attack a decisive measure of superiority over any defense enemies can offer. This will continue to require unceasing attention and first call upon our resources. Nevertheless it is, as it has to be, within American capabilities to retain. No enemy "first" can remain unchallenged by greater advances on our part.

But if only the offense can win, the defense can lose, as it did for Germany and for Japan in World War II. In the Battle of Britain, however, the air defense did *not* lose, and this provides the precedent to which we may look in approaching the future. The precedent is a valid one, because success for the Royal Air

Force was based on factors we also may count on if we but retain heart and drive: a tenable defensive concept, technical superiority, superior training and morale, and superior generalship.

A root problem, then, is to provide an effectiveness for our continental air defense such that an ultimate enemy attack can neither destroy our national integrity nor critically injure our capacity as a nation to support the war to a successful conclusion.

In order to accomplish this, our active continental air defense of course need not in itself possess superiority over the entire potential enemy offense. The enemy air offense should be blunted by our own superior striking forces in the rapid exchange following the enemy's initial attack. Again, some proportion of the enemy's total offensive air power will certainly be diverted from an attack on North America by the necessity he sees to deal with threats we and our allies offer closer to his home base of power. Moreover, our air defense is entitled to expect that the American people, although far too slow in getting off the mark, will assist in minimizing the destructive effects of enemy attack by energetic and improved measures of nonmilitary defense.

These favorable factors can reduce by some substantial amount—possibly by half—the total threat which our air defense would otherwise have to deflect. However our active continental air defense can count upon still another asset. This is the fact of a uniquely favorable North American geography, which interposes between the enemy and the industrial heart of North America vast expanses of wasteland useful for purposes of air defense and usable by agreement with Canada.

Even so, if we had still to rely as in the past on aircraft guns and antiaircraft guns for air defense, we should have little basis for optimism in facing the prospect of enemy nuclear air attack, even a small part of which we could ill afford to let through. But the guided missile sharply changes the prospects for achieving technical superiority, or at least adequacy, for our air defense as against the enemy offense. Despite the greater public emphasis on offensive missiles, it is defensive missiles which already exist in quantity and with real potential effectiveness.

Particularly in aerial warfare, technical advantages can be of overwhelming importance, and the prospects for gaining important American technical leads need not be foreclosed. It requires no excessive optimism to believe that we can devise an adequate defense against manned aircraft on the basis of air-to-air and surface-to-air defensive missiles, both of which should be well adapted to atomic warheads.

Ballistic missiles carrying thermonuclear warheads of course present a staggering threat, against which no effective defense has yet been contrived. On the other hand the long-range ballistic missile has itself not yet been operationally demonstrated, and all that is presently true is that there is no defense against an offense which, although perhaps imminent, as yet only threatens. Nevertheless the offensive ballistic missile appears certain to enter arsenals of air power before an effective counter system has been developed. But it cannot be believed that defense is impossible, and the prospects are not wholly unreasonable that an effective counter can be achieved by the time when long-range ballistic missiles become reliable and proven adjuncts of air power. Certainly during the initial period of their existence they will be primarily the tools of psychological warfare, weapons of terror but not of decision in war.

The repetition of these several things generally known about our problem of air defense is intended to emphasize the possibilities, rather than the difficulties, in creating a system of continental air defense to complement successfully a superior capability for strategic air attack. No one in the West will think positively about security problems unless we in the military do. Our motto here should be the words of West Point's famous old Wrestling coach: "There ain't no holt which can't be broke."

ultimate-war and limited-war forces

The inevitability of certain priorities and relationships between the kinds of military forces designed for total war and those designed for conflict less than total war may be suggested by the accompanying diagram.

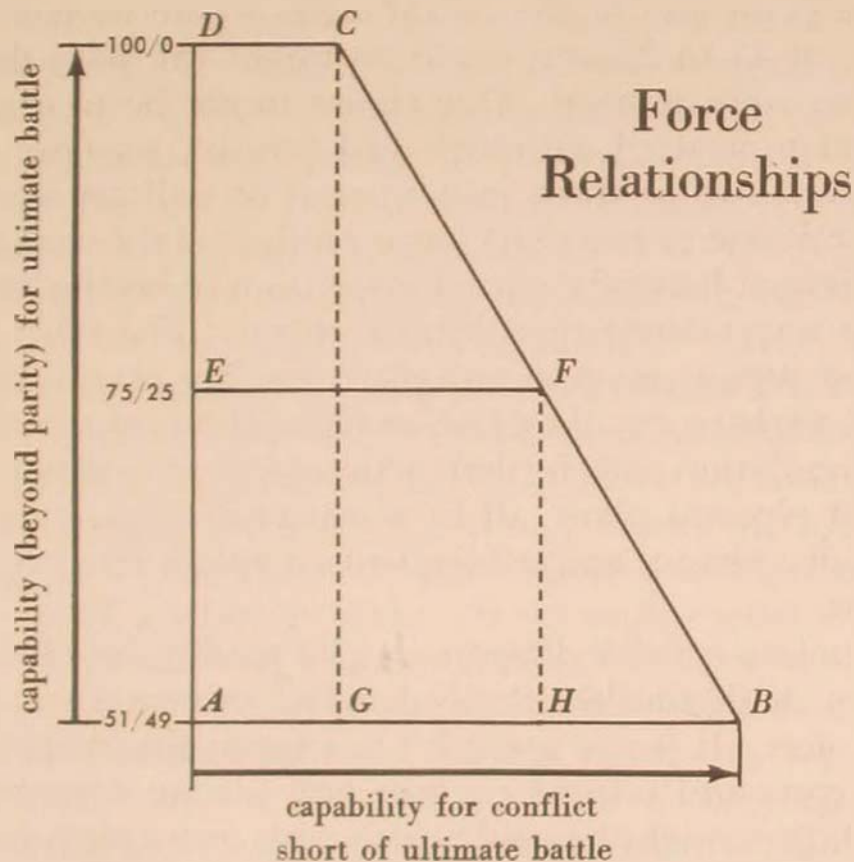
Assume that the U.S. and its allies at any particular time possess a degree of air power superiority over ultimate enemies running from an absolute 100 against the enemy's 0 down to a marginal 51 against the enemy's 49.

The one extreme of 100 to 0 at the top of the ordinate, which unfortunately we must consider improbable of attainment, signifies that we have the ability to destroy utterly any combination of enemies without ourselves suffering a single wound in the process. The lower extreme on the ordinate of this diagram, a 51 to 49 situation, represents little more than parity for our side against the total enemy capacity in nuclear warfare. This latter situation, any approximation to which is often referred to as nuclear stalemate, is actually a situation of perilous instability.

It is unlikely to remain static, for it is extremely dangerous to both sides; and any advance of technology or any weakening of morale on one side or the other can upset the temporary balance, perhaps in the end decisively. It renders local warfare very difficult to control, although not without imposing real restraints on the initiation of such warfare.

There is of course a negative quadrant implied by this diagram which it would not be profitable for us to consider.

Now, as the index of our capacity, or our preparedness, for



ultimate battle approaches the 100 to 0 point, we would be in a position to show less and less tolerance toward enemy aggression. In other words we would be in a position to accept very little of limited warfare before heavily assaulting the major aggressor itself, inasmuch as risks we would run by expanding the pace and scope of war would be decreasingly dangerous. The contrary is also true, and even with superior air power, assuming our air power were not *heavily* superior, we would probably be inclined to accept a considerable drain in limited warfare on the logical basis that unrestricted general warfare was even less acceptable. We might even be inclined to accept, in conditions approaching nuclear parity, about as much local warfare as the instigating

aggressor might wish to foment. This is not to imply that very frequent or intense local warfare would be likely to result, because quite the contrary could prove true. For one thing the fact that our policy gives the enemy the nuclear initiative in respect to total warfare should, paradoxically, inhibit his use of the initiative we also give him in respect to fomenting local warfare. He is likely to avoid any provocation the severity of which might suddenly impel us, with support in world public opinion, to take his strategic nuclear initiative away by ourselves launching all-out attack on the source of our difficulties.

At some point on the theoretical scale—where we had an advantage, say, of 75 to 25—our coalition might calculate that two logical choices were at hand. One choice might be to engage in extensive and protracted, although still limited, warfare, with a probable loss of two or three million men of military age and a probable cost of one or two years' gross product of the coalition, in order to achieve at best an eventual suspension of hostilities which would in no way remove the ultimate threat. The other choice might be to accept a resort to unlimited warfare against the ultimate enemy, perhaps entailing five or six million casualties across the Allied population and the destruction of some twenty per cent of the Allied physical plant, all in a matter of days, in order to achieve decisive victory and subsequent complete removal of the enemy threat.

Other points on the diagram might readily be offered for consideration, with similar wholly fanciful estimates concerning available choices. It is not intended to suggest that a simple calculation of costs and returns permits any precise determination as to what choices might be made, with whatever agony, in assessing an actual situation, but to indicate that the choice is increasingly clear as parity recedes or approaches.

Although tolerance of limited warfare could safely be decreased as air power superiority over ultimate enemies increased, not every situation could be solved by exploding a nuclear warhead, and enlightened self-interest in any event would dictate a choice of means. Nothing could be so shortsighted as the failure on the part of a leading power such as ours to provide itself with a flexibility of military means to meet any situation which might arise. Even at the 100 to 0 point, it would be necessary for a rational and moral people to retain forces designed for conflict short of ultimate warfare. The same forces would be useful in the exploitation phase of total warfare; for strategic nuclear assault, although decisive, would not necessarily be conclusive. The dia-

gram also suggests that with an absolutely superior capability for ultimate battle, represented by AD , there should exist for the wholly superior coalition the forces DC (or, by projection, AG) designed primarily for limited warfare.

Of course to suggest with a diagram that the forces designed for ultimate battle and those designed for something less than this are altogether different forces is overstating the case. So far as practicable, the limited-warfare type of forces should be designed also to assist in ultimate warfare, and vice versa. To the extent that this kind of duality can be achieved, the aggregate of all forces would be reduced. However there is a limit in design for dual purposes, particularly in that various weapons and forces of the Army and Navy will not adapt readily to the pitched nuclear phase of a general war. Also some impressive part of our Air Force would always have to be held back from use in limited war so as to preserve our posture for total war.

Only relatively small forces are therefore indicated on the diagram to be maintained for limited warfare if we should have an absolutely superior capacity for total warfare. With a capacity for total warfare little better than that of the enemy, we would have a political requirement to maintain very sizable forces available primarily for limited warfare, or at least a capacity for raising such forces without great delay. Again this requirement exists because total warfare in those highly unfavorable circumstances might lead to national disaster, and a showdown would therefore be postponed or avoided by the national political leadership, even though warfare short of total warfare became very prevalent. At the 75 to 25 level, because our tolerance of creeping military aggression could safely be reduced, we would be justified in cutting back the type forces suited primarily to limited warfare. In the unlikely case that a straight line relationship actually obtains, we might cut our preparations for limited war back from AB to AH .

It seems very evident, in fact, that there is an inverse relationship, if somewhat more complicated than has been suggested, between capacity for ultimate battle and preparations for anything less than ultimate battle in warfare. It also seems evident that the relationship AD to AG is the optimum relationship and the one we should be shooting for. Little merit attaches to the line AB . It would always pay to accept risks along the abscissa in order to move really significantly up the ordinate.

The very real questions which will haunt the makers of national security policy and economic policy from now on, perhaps for a very long time, include these:

- What is the limit of technical possibility in improving our "ultimate warfare" position?
- What degree of air power superiority can we attain from time to time?
- What best balance can be achieved in a division of resources for ultimate warfare between the offense and the defense?
- What resources should be put into nonmilitary defenses at what cost to active military preparations for total warfare?
- What degree of risk can we accept in curtailing our limited war preparations in order to concentrate on vital preparations for ultimate warfare?
- Finally, what level of sacrifice must the American people accept in order to achieve and maintain a satisfactory preparedness for whatever may come?

This last question is really the first question. There must be continuous calculation of what it will take to buy us preparation for genuine victory in warfare, and this bill will have to be presented our policy makers, together with the alternatives. It will be a staggering bill, but we should be able to pay it; and if we do pay it, the position of strength thus generated should tend to force Soviet imperialism out of business. The cost of maintaining a satisfactory level of preparedness, which is another and less fashionable word for deterrence, should then rapidly decrease until it becomes readily supportable. If this preparedness did *not* deter, we would then have to win an expensive war, but we should be in a favorable position to arrange along with our allies a satisfactory security system thereafter.

To digress for a moment about the matter of organizing for future warfare, it appears quite evident that the real questions to be answered, such as those just suggested, are the kind which generally must reach the President. The military leadership will have to provide facts, arguments, and recommendations, but the decision will generally be a civilian decision, if for no other reason than the enormous resources involved. There is no organization of the U.S. military which will avoid posing the fundamental questions for civilian, and generally Presidential, decision.

The priorities for forces required in the future will vary considerably as the situation changes, continuing to provide grounds for lively debate. No one can predict what systems of priorities will prevail, except that it is probably safe to say that securely

based strategic striking forces will have first priority, and should have first priority. Whether the defense against similar enemy striking forces takes priority with or ahead of maintaining those surface forces which we absolutely should retain, if only to deal with piracy or with border raiders, may well depend on the state of the art. Thus, where a tight defense is technically possible against aircraft and missiles, we must have this defense at almost whatever cost. If a tight defense against various means of enemy attack is not technically achievable in any particular period, we should buy only whatever defense will impose real difficulties and costs upon his attack. In this latter case preparations for limited warfare would presumably have to increase, because our statesmen would wish to buy added latitude for armed conflict short of total war. At the same time it might prove desirable to devote increased resources to purposes of nonmilitary defense. We might also hope to see maximum emphasis on research and development measures looking toward improvement of the active air defense position.

But in all cases security policy should proceed from the axiom that advantage accrues principally in the degree to which we are superior in capacity for ultimate battle. If for political or economic reasons we must accept marginal superiority or no superiority for total-war forces, the expanded preparations we may make for limited warfare will be designed only to ameliorate a very bad situation.

Regardless of the help certain types of forces can afford in deterring limited warfare, it therefore seems clear that the prime deterrent to any kind of warfare is a superior capacity for the conduct of ultimate warfare. There are those in the Air Force who would like to be able to say that TAC is to limited war as SAC is to total war. This cannot be, because SAC is designed to gain a decision in ultimate war, whereas neither TAC nor any other forces employed in limited conflict can achieve more than a local and temporary end, assuming that the U.S.S.R. is the real adversary. If the Russian accepts an adverse decision for his puppets in limited warfare, it will be because he fears the consequences of expanding the conflict in light of our capabilities for total warfare and not because he fears our capabilities for limited warfare. If he is deterred by fear from launching limited war, it will be because he fears our total military potential. Of course he may in many cases be deterred from encouraging limited warfare by a political or economic calculation of profit and loss which our local war abilities could affect, but this calculation will hardly be based on a consideration of vital security factors.

Short of a situation in which we have a very high degree of superiority in capacity for ultimate warfare, it seems we shall have to accept that in limited warfare only modest objectives can be attained and that decisive victory is of course not among these objectives.

Mr. Donald A. Quarles, writing as Secretary of the Air Force about small wars in the January 1957 issue of *Flying* magazine, said that we should and would employ atomic weapons—"our best weapons"—to win these wars quickly, and certainly one cannot disagree with what he said. In agreeing, however, one has to assume, for reasons already outlined, that Mr. Quarles was thinking of a situation in which we had very marked superiority in capacity for total warfare. The corollary to this thought, of course, is that we are likely to prove cautious in our use of nuclear weapons—even small ones—if at any time we have reason to believe that our position with respect to ultimate warfare is highly unsatisfactory. Atomic weapons in such a case might not be used freely and automatically in future limited conflict. Rather, careful consideration might have to be given to the consequences of their use in light of the over-all relative position with respect to ultimate warfare and the specific circumstances of each situation.

The Korean War was really the first war of the nuclear era, and before it was concluded our strategic air and nuclear advantage over the Communists was probably very great indeed. We chose to act as though we did not have a great advantage, but only *some* advantage. We probably came to possess something better than the 75 to 25 situation suggested on the diagram; yet two successive American presidents, one from each major party, decided that the issue posed by Korea did not merit accepting the risk of any severe wounds elsewhere in order to eliminate it. This again leads one to think that we may have to possess an obvious and great ultimate advantage over ultimate enemies in a very difficult situation before we will do what Mr. Quarles says we should do; that is, win a small war quickly through the use of our quality weapons.

One thing the Korean experience does tend to prove. This is that a strategy of air power is feasible even when a superior air power is not transcendently superior but only marginally superior. In Korea a superior air power established local dominance of the air, provided thoroughgoing protection of its own land and sea forces from air attack, and furnished extensive assistance to surface forces intent upon operations in their own media of movement. At the same time this air power maintained preparedness

for a general war which, perhaps only because thus deterred, did not eventuate. Whether enemy capabilities at the time might have permitted his resort to all-out nuclear warfare is beside the point. In its military undertakings the side with superior air power *acted* as a superior air power, although with restraints of the type that would normally be accepted if both sides possessed capabilities for extensive nuclear destruction. It appears reasonable to assume that a superior air power would accomplish no less in another situation of limited warfare when both sides definitely *do* possess extensive capabilities for nuclear destruction.*

relationships among the coalition forces

There is another aspect of relationships among military forces, which pertains to the relationship between our own military preparations and those of certain of our important allies whose geographic situation is much more precarious than our own. If there is room for modest optimism about the prospects for a really effective air defense of southern Canada and the United States, there is less room for optimism about achieving an effective air defense for industrially advanced Allied countries too close to the enemy in space, and hence in time. Their security must therefore be equated to our own security, because they will not be attacked in force unless the enemy believes that we can be successfully attacked. It is to *their* interest to assist, at the minimum by extending our warning system, in the air defense of our continent. If only to obtain this and other military benefits from their cooperation, it is in *our* interest to assure them, as of course we now do, that we will fight if they are attacked. So that our assurance of such support is unequivocal, it may be we must continue to station sufficient forces abroad so that no attack on close Allies can fail also to be an attack on American citizens.

We should shortly examine with our allies the possibilities in directing our aggregate preparedness efforts more and more toward effective support for a coalition strategy of air power. Our aggregate efforts are not fully aligned in this direction today.

As a speculative example perhaps it would be better in the over-all interest and also in the British interest if we could achieve such unity of purpose that the Royal Air Force might further concentrate its efforts on providing as effective an air defense as possible of the United Kingdom, and hence of SAC bases within it, instead of developing an indigenous force of manned nuclear bombers. As another example, there is questionable merit in a

*[Adapted from Giffin, "A New Future for World War II?" *World Politics*, IX, 2, 285.]

force of 1300 aircraft under the West German flag, half of which are interceptors, stationed only minutes distant from Russian short-range surface-to-surface missiles. The West Germans might contribute very considerably to a world-wide warning system, and I for one should be very happy to see them assist in manning and supporting active air defenses in Canada or the United States, or anywhere on our side where such active defenses could be truly useful. Of course any such measures would be politically very difficult and hence could be achieved only over a period of time, if at all. However the stupefying costs of preparedness as we look to the future suggest that every effort should be made to cut every corner at every level across our coalition. We should help friends like the British and the Germans to acquire nuclear IRBMs, possession of which could contribute greatly to deterring Soviet aggression in Europe and also to solving their domestic political problems in assisting a strategy of air power.

IT has been suggested that there are at least three new relationships emerging among military forces.

The first of these is the relationship based upon air power among land, sea, and air services, air power being shared to some extent among the American military services and being in any event the permissive factor in all forms of advanced warfare. Our national strategy, and even our coalition strategy, should henceforth frankly acknowledge this fact, but to acknowledge it does not imply the use only of aircraft and missiles for any and every purpose of conflict.

Second is the inverse relationship between a capacity for ultimate warfare and a capacity for less than ultimate warfare. As our over-all readiness for ultimate warfare remains or increases materially above that of all possible enemies, we may with prudence curtail our immediate preparedness for limited warfare. The reverse is also true. If our capacity for ultimate warfare is permitted to approach parity with that of the enemy, our statesmen may desire the ability to engage in virtually as much limited warfare as may be forced upon us. This would require, at the least, valid preparations for a rapid emergency expansion of existing forces suitable primarily for extensive limited warfare.

The third relationship is that which should now begin to develop between our own military forces and the military forces and facilities of our close, industrialized allies, for their exposed

position now means that they can find security from Soviet attack only as part of a powerful coalition which they must help render nearly invulnerable at the center of its strength in southern Canada and the United States. In order to help them accept and forward the new relationships of a new era, it seems wise that we should help them to develop rapidly their own offensive nuclear missile capabilities.

Finally, and most importantly, there is a relationship between military forces which is far from new. This is the relationship between the forces on our side and the forces on the other side. The thing that *is* new about this relationship is the prevalent idea, for which history provides no precedent, that this relationship, at its thermonuclear rock-bottom worst, is going to be one of stalemate. We cannot as military men accept as doctrine this defeatist view of the prospects. Rather we must envisage doctrinally, and strive to achieve, a situation in which our side maintains significant superiority in every military department concerned closely with a struggle for survival. If we settle for anything less as our military ideal, as the goal of security policy, we have come to the end of our road, and we should turn the job over to somebody else. There is an absolute necessity for stamina and breadth of vision among our military men. This we must regard as the first requisite to courageous national action in every arena of conflict, political as well as military, with an implacable, very dangerous, but by no means unbeatable enemy.

Air War College

In the Looking Glass

COLONEL ROBERT C. RICHARDSON III

AIR power is one of the cornerstones of national security. Its dominant role in modern war is now generally accepted. The effective discharge of this role depends, however, upon the men and machines that make up the air forces. While it is incumbent upon those of us who are supposed to understand the true worth of air power to explain and, where needed, defend its role in our national defense, it is also up to us to ensure that our air forces are so manned, organized, equipped, and trained as to accomplish their task effectively and economically. To do this we must, from time to time, critically examine our own house.

In this article I shall discuss certain trends and conditions which appear, at least to some of us, as unhealthy. I shall deal with these only in broad terms with a view to concentrating on general principles only—on the forest and not on the trees. I do not expect that all will agree, and this is good, for my purpose in writing this is to generate thought on the matters rather than to provide approved solutions.

are we losing our initiative?

There appears to be a growing tendency toward conservatism throughout the USAF. With the general recognition of the dominant role of air power following World War II, the Air Force's reputation as the source of young and new ideas, tactics, and de-

Where in a peacetime force does management of resources for the sake of resources end, and command for the sake of combat readiness begin? Colonel Robert C. Richardson III, Commander, 4th Fighter-Day Wing (TAC), feels that the Air Force has overstressed management, centralization, coordination by higher staffs, to the detriment of the commander's authority and the functioning of the command line. Conservatism and overperfectionism in administration take a heavy toll of the commander's authority to initiate positive improvements in his unit's efficiency and performance. "In any military force," Colonel Richardson concludes, "improvements in administration should not exceed the point at which their cost is greater than their resulting contribution to the basic mission of the force."

fense policies has steadily declined. There is a status quo attitude in the officer corps—a growing tendency to hold what we have rather than risk untested organizational or doctrinal changes. It is reminiscent of our Navy's attitude toward battleship and cruiser divisions in World War II. The Army with its recent reorganization of the combat division seems to be taking the lead away from the Air Force in forward thinking.

Some will say that conservatism in the Air Force is the natural outcome of maturity. We can agree that, since the Air Force carries a large share of the responsibility for the security of our nation, it cannot afford reckless or risky policies and adventures. On the other hand we are in an era of great change. The advent of the atomic bomb, radical changes in the hardware of war, and the inevitable changes that must follow in tactics, doctrine, and organization all suggest that survival in this age will depend to a large extent on our nation's ability to recognize and readjust to the new conditions. We must be sure that the Air Force is not falling behind in this respect.

the curse of bigness

Unfortunately the growing conservatism noticeable in Air Force thinking these last few years is not merely a question of attitude. Air Force leaders in both technical and operational fields would be the first to disclaim any intent to impede progress or oppose change. The real culprit appears to be the "system" fostered by bigness.

Managerial perfectionism, superior administration, and over-centralization are inherently in conflict with organizational and doctrinal flexibility. The more efficient a large business is, the more rigid it becomes. Changes of substance can only be made at the risk of upsetting carefully prepared procedures, plans, or requirements. The specialists in our services, who have spent years perfecting these systems, do not take kindly to their being upset. Thus potentially brilliant operational or organizational advances are all too often vetoed by special staff elements who will not or cannot readjust their areas of responsibility to accommodate the resulting changes.

More wars and battles have been won or lost by the quality of the leadership than by the administrative standards of the opposing forces. War itself is inherently inefficient. "It is an impassioned human drama, not a science or an art," said Jomini. The kinds of decisions that lead to victory cannot be made by

mutual agreement within staffs and committees. Commanders must be free to seize opportunities and exploit them. Organizations, tactics, and plans must be constantly revised if we are to get the most out of modern weapons. With the prospect, if not certainty, of short atomic wars these revisions must be made in peacetime.

Overperfectionism in Air Force administration tends to make it too difficult for commanders to modernize their forces. For instance our manpower experts have classified every officer and airman to such an extent that even a minor change in the make-up of basic units in any one command upsets personnel procurement, training, and budgeting throughout the air forces. Likewise budgeting and procurement are so efficiently centralized, programmed, and planned that lead time in the order of years is now generally required before we can change the type or number of units in the air order of battle. It would be interesting to know how the U.S. Army dealt with this problem in its recent reorganization to the pentomic division.

overcentralized authority?

Few constructive decisions are left to wing or even air force commanders, not because these men cannot be trusted to make proper decisions but because managerial and administrative perfectionism demands standardization throughout the USAF. This results in rule by regulations, manuals, and directives prepared by higher staffs who are all too frequently unfamiliar with or uninterested in the local situation. The average fighter wing commander today has ninety-six volumes of regulations, manuals, and directives to tell him how to run his station. The resulting rigidity kills command initiative, stifles new ideas, and results in our introducing, in some commands, World War III equipment into units with World War II organization and tactics.

A wing commander in one of our major commands summed up the prevalent situation by saying that he now had unlimited *negative* authority. He could stop anything from taking place on his base, but he could *not* build a ten-by-ten brick shed or make an unsatisfactory mechanic into a policeman without the authority, or at least collaboration, of staffs of higher headquarters. He is told not only what his mission is but how and when he will train and equip for it. The tactical unit commanders have no latitude to introduce or even test organizational or operational changes of consequence. Nothing of substance that is constructive or positive is left to their decision.

If this situation meant that higher and hence more qualified commanders were making the decisions, we would not need to be unduly concerned. This is not the case in most instances. The condition seems to extend up through the service structure, culminating in decisions being made by staff officers and civil employees, often junior and anonymous. This situation in the U.S. services prompted Field Marshal Montgomery to once remark that the main difference in U.S. and British staff procedures was that the Americans allowed the lieutenants to tell the generals what to do. In our system too many important decisions are arrived at through coordinated staff actions which in turn produce, by their very nature, the lowest common denominator of staff opinion. Alternatively they are the personal views of the action officers in the higher headquarters. In either case they lack the clear-cut, positive effect of on-the-spot command experience and judgment.

what is the objective?

Maximum efficiency in each and every subdivision of the Air Force does not necessarily produce maximum effectiveness in the service as a whole. This is particularly true under stringencies of a relatively fixed manpower and budget ceiling. It is a fact, however, that is all too frequently overlooked.

The taxpayer wants the most effective organization and equipment obtainable *to discharge the role of air power in national defense*. In the broadest sense we can say that this role involves flying aircraft or missiles in furtherance of varied objectives. This being true, it is equally clear that efforts or improvements that detract from this capability or fail to contribute in some measurable manner toward it are secondary. It is theoretically possible to obtain superlative management and administration in all areas of the Air Force and yet not be able to fly a single sortie. Today there appears to be too great a tendency in this direction.

Attempts to achieve peak administrative efficiency in every sector of the Air Force can be wasteful when results are measured in terms of the ensuing ability to carry out the basic objective. While improvement for improvement's sake is fine, it requires effort and resources. These have to come from somewhere. All too often the managerial improvements are paid for at the expense of new equipment and with manpower and effort withdrawn from operations or maintenance.

A certain wing was recently provided twenty-six spaces to initiate a base supply mechanization program. When the program

had been implemented these spaces were withdrawn, although no saving in personnel was realized by the program. The command was then directed to man this additional structure from its normal resources. As a result other functions suffered, particularly operations and maintenance, since these are the least protected by regulations.

Far too low a percentage of Air Force manpower is in the tactical or operating echelon. Far too many people are devoting time and effort to matters which would never come to their attention were it not for the centralization of authority inherent in the search for superlative administrative efficiency. This centralization of authority has two other detrimental by-products. It not only is wasteful in the best use of fixed resources toward a stated objective but also hinders the modernization of our air forces and loses us many qualified and highly trained men and officers.

Changes in tactics, doctrine, and organization can only be developed and tested by the units and commanders who have first-hand knowledge of the capabilities and limitations of the new aircraft and missiles. If sound adjustments are to take place, the tactical commanders not only must have the authority to introduce and test new techniques but must be encouraged to do so. It now appears that in the interest of so-called sound management policies higher headquarters have frequently, if inadvertently, discouraged and even prohibited commanders from making major adjustments at tactical level. Thus progress is arrested by the combined impact of regulations that restrict the use of initiative, and U.S. defenses suffer accordingly—all in the interest of good management!

For example the cost, performance, and firepower of fighter aircraft have gone up in hundreds of per cent over World War II models. The related organization structure and strength of the basic unit, the group or squadron, have hardly changed. There is something illogical in this. I know commanders who have repeatedly suggested changes in the strength and basic organization of certain fighter units. I suspect that the "system" is responsible for the limited progress made. Administrative efficiency does not like change.

The Air Force is losing highly trained young officers because our system will not allow them to shoulder responsibility commensurate with their training and ability. Participation or interference by higher staffs frequently leaves them no initiative and little authority. To illustrate, a graduate engineer at air base level is not trusted to determine if a new structure, even a garage,

should be accepted by the Air Force. Under existing policies, installation staffs representing several higher headquarters foregather to do this, at some cost in travel and man-hours. In one recent case three headquarters were involved in authorizing a contractor to paint parking lines diagonal, instead of perpendicular, to the curb in a new parking lot. While this is an extreme case, it is illustrative of one of the ills of overcentralization and overregulation.

what to do about it

It seems quite clear, from the wing level, that administrative and managerial perfectionism is being overemphasized. While necessary in a democracy and proper in big business, it is not the sole increment of a perfect military establishment. In any military force, improvements in administration should not exceed the point at which their cost is greater than their resulting contribution to the basic mission of the force. The aim should be not overall efficiency but the best combined application of all resources toward maximum efficiency in the basic objective.

Some centralized control and a reasonably high level of managerial efficiency must of necessity be maintained regardless of their impact on modernization of the forces or on operational effectiveness. This need stems partly from Congressional pressures, partly from interservice competition, but mainly from the very nature of democratic government in peacetime. I for one believe, however, that the military should not go overboard in this direction, as now appears to be the case. While radical surgery is not indicated as yet, positive steps to reverse the trend should be considered soon.

If we are to correct a condition, we must first agree as to the cause. In this case I suggest that one fundamental cause of excessive centralization, specialization, and administration within the USAF lies in the almost total delegation of authority in internal administration to staff divisions and committees. The senior commanders and their deputies have had of necessity to devote nearly all their attention toward representing the Air Force with the public, other services, the Congress, the National Security Council, Joint Chiefs of Staff, etc. If the Chief and Vice Chief face constantly forward, only Deputy Chiefs and staffs are left at Air Staff level to face back toward the troops. These by their very nature each represent some particular segment of administration or operations. Without over-all responsibility they can hardly be

expected to arrest progress in their particular field on grounds that the improvements are not justified in light of over-all objectives. This is a function that requires command attention at every level.

A first step toward ensuring the best possible air arm would be to organize the command section to the end that one individual therein can devote full time and attention to his internal administrative problems. Over-all direction, from a commander's point of view, must be re-established. The air staffs must be, in fact and in name, staffs, rather than each staff division assuming a command role in its particular field. The present trend, wherein subordinate staff officers now look more to their counterparts in higher headquarters than to their immediate commanders for guidance, direction, and reward, is deplorable.

A second step toward a more healthy and decentralized administration would in my opinion consist of a forceful reiteration of two generally known though largely discarded principles. First, the principle that all commanders will be expected to make decisions which are within their capabilities; and second, that all messages of any sort sent from one headquarters to another will be construed by the commanders concerned as specifically addressed to them. A third and related measure would be a review of all regulations and directives—by an ad hoc board of commanders, not staff officers—to eliminate all those which violate the first principle above.

I have frequently questioned commanders at various levels and have yet to find one who has ever had a query on any subject returned by a higher headquarters with the comment that he or his staff was considered competent to deal with the subject matter. On the contrary the tendency seems to be to solicit from subordinates requests for guidance and decisions wherever these are not already reserved by regulation to the higher staff sections.

The second principle that I propose, direct association of messages with the commander's concerns, aims at eliminating the command-subordinate relationships between staff heads at one level and their counterparts above them. A review of signals in and out of any headquarters, in light of the above principle, would perhaps cause some commanders to question their worth. It would uncover an amazing number of messages from Headquarters A to Commander B whose wording or subject matter would never clear either headquarters if they bore the by-line "personal from General A to General B." Yet in military correspondence this by-line is, and should be, implied—at least in all communications criticizing or directing an action.

While corrective action is difficult, the situation is by no means hopeless. The first step is to recognize the existence of the problems and the evils of overcentralization of authority or administrative control. Next, collective efforts on the part of commanders and cooperation by senior staff officers—who were or will be commanders—is indicated.

The first goal should be the revision or elimination of regulations that reserve a power of decision on any matter to a level at which the decision will in practice be made by individuals junior to and less qualified than the commander affected. The excuse that staff officers at higher levels are better qualified to decide because they "have the big picture" is, generally speaking, utter rot. Where centralized control is indicated to maintain over-all balance, then the commanders making decisions can be directed to report the action taken. The higher headquarters staffs would then monitor the actions, instead of approving them, and bring to the attention of their own commanders those areas of concern where redirection to subordinates seems indicated.

A second goal should be the elimination of the commander-subordinate relationships between staff chiefs at any level and their counterparts at lower levels. Staff officers should look to their commander for decisions and policy guidance. Anyone who would dispute this challenges the entire philosophy and concept of military command relations. A first step to achieve this goal is to eliminate the control by special staff chiefs over the assignment or rating of subordinates in their field. This is a function of personnel and should never be delegated, as is now the case in some commands. A second step must be insistence on the part of all commanders that their staffs look to them for guidance. If they allow themselves to be constantly bypassed, they lose both authority and control while still retaining responsibility.

It is easy to state goals, objectives, and principles but much harder to enforce them. Reiteration of the above truths and aims alone will not produce the desired result. I believe, however, that real progress can be made in decentralizing authority to the proper level by instituting temporarily the following simple procedure: Establish, on an ad hoc basis, a screening group of two or more senior officers in the Office of the Chief of Staff, USAF, and in each major command. These groups would scan incoming and outgoing messages, or sample segments thereof, on a daily basis. When they saw an outgoing message which appeared to violate the above principles they would call in the staff head concerned to explain why he arbitrarily overruled a major commander, or why

he interfered in a matter which could be handled at a lower level. Conversely, incoming messages which appeared to the recipient's screening group to ask questions the sender should answer, or to instruct the recipient in a matter which he considers to be his business, would be referenced by an agreed code word bringing it to the attention of the sender's ad hoc group.

The ad hoc screening groups, or individuals, would not change any action taken. They would, however, direct review of regulations, etc., that were quoted as the reason for the offending message. Also the mere calling up of the staff heads to explain would cause the latter to screen their own output for compliance with the stated principles and to make or propose changes in regulations on their own initiative, in order to avoid being "called on the carpet."

I suggest that the above procedure, if applied for a short period, would cause a noticeable reduction in interheadquarters communications. If so this should then be followed by a personnel cut in the staffs concerned.

Correct relationships are as depicted on all recognized organization charts—from one command to another. In the last few years there has been a growing tendency toward a relationship which puts commanders off in left field, observing and coordinating directives and policies flowing directly from staff chief to subordinate staff chief. This tendency is detrimental to the ultimate effectiveness and growth of air power. It results from the paralysis of initiative and authority created by overregulation. It leads to all levels losing sight of the main objective—air operations—while redoubling their efforts in administration.

I would see air power stand or fall by great decisions but never nibbled into oblivion by a multitude of little staff actions.

Headquarters 4th Fighter-Day Wing

The Ballistic Missile and Operational Capability

MAJOR ROY L. FERGUSON, JR.

MOONLIGHT glistens on the tall shape of a ballistic missile pointing to the night. The blockhouse is alive with activity as trained technicians, intent on lighted control panels, check the readiness of intricate electronic equipment. Automatic sequencing devices tick rhythmically. In a matter of minutes everything can be made ready for the countdown—to loose the fateful lightning of our time.

initial operational capability

Such is the operational readiness soon to be attained at any number of launching stations throughout the free world. Around the clock a variety of ballistic missiles will stand poised for retaliatory missions in the eventuality of enemy attack. This is the capability the United States must maintain with increasing vigilance, an integral element in a dynamic and flexible fighting force.

Much has been said about the acceleration of our missile development. Little has been said about the monumental effort required to place the ballistic missile in the field in large numbers and to incorporate this weapon into a system that will be operationally effective. For no matter how well a system is developed and engineered, it cannot be aligned with other strategic forces until enough people are trained in its use, unique support systems established, and facilities constructed. To meet this operational urgency, the Air Force has called for speed-up in the development of an initial operational force, to be known as "initial operational capability." To ensure that a militarily useful system will emerge on the close schedules established, the responsibility for developing this IOC was assigned to the Air Force Ballistic Missile Division of the Air Research and Development Command and recently transferred to the Strategic Air Command.

From the outset it was evident that AFBMD could not undertake a task of this magnitude without assistance from other Air

Force commands. Active participation of the Strategic Air Command, the Air Training Command, the Air Materiel Command, and ARDC Centers was essential. These commands responded and located well-staffed project offices within the Ballistic Missile Division complex. As changes occur in the development program, this group can evaluate their implications for every facet of the IOC.

Normally weapon system planning begins some years after commencement of the research and development effort, and only after it has been demonstrated that the weapon will be usable in the intended period of time. In the case of the ballistic missile, technical advances already assure its development success, even with the accelerated effort. The problem that remains is how to employ the forces using these weapons. Ways must be found of overcoming the many problems which arise during this shortening-up process. For example, acceleration plus the operational complexity of any new system makes training abnormally difficult. There are limits to personnel capacities for learning and retaining skills required to operate ballistic missiles, and these skills can be acquired only through adequate instruction and training aids. Accordingly operational planning for the IOC began concurrently with the accelerated development program.

Under existing Air Force regulations and policies which govern complete operational weapon system planning, much time is consumed in coordination among the development agencies, the using command, and Headquarters USAF. Although this method has normally proved desirable for weapon developments, the establishing of the Ballistic Missile Division as the USAF single focal point for ballistic missile management has made possible the combining of all efforts of the Air Force and the missile contractors, with appreciable benefit to IOC planning. In fact this unprecedented arrangement in USAF weapon development is highly essential if development-to-user schedules are to be effectively compressed. The need for close relationship to facilitate interaction and mutual feedback between the operational and development teams is, of course, magnified by the fact that production engineering is being done almost simultaneously with research and development.

weapon system planning

Because the ballistic missile is a new weapon, its concept of use, its support, its manning, and its facilities necessarily are also

new. Each element must be devised to exploit the full capability of the weapon itself. The task of developing the initial operational capability is therefore exacting, and to provide a unit capable of fulfilling its mission it is first necessary to examine in the smallest detail all phases of operations, logistics, personnel, and installations.

To ensure the most workable and optimum weapon system, compromises must be made in both developmental and operational programs. The operator wants standard equipment that is small, movable, yet easy to maintain. He wants rugged equipment that can operate in any temperature or climate, yet be reliable. He wants equipment that can react to any given situation, yet be foolproof. He wants precise instruments that can be operated without environmental conditioning. He wants simplicity, yet delicacy of operation. He expects long shelf-life. To provide a weapon system that meets these exacting requirements is the responsibility of both developmental and operational agencies.

For the past three years the Air Force Ballistic Missile Division has been engaged in establishing optimum operational, logistic, personnel, and installation needs and in translating these needs into detailed plans. These plans contain specific and exacting definition of every facet of the system. A brief description of each of these areas may provide a better appreciation of the task to be performed and of its status today.

Operations. The ballistic missile is designed to destroy an enemy target thousands of miles away in a few minutes. The supporting elements, i.e., equipment and facilities, must also be fast reacting. They cannot, because of limitations in design or construction, dictate to an operational commander how he must launch his missiles, but rather must be responsive to any tactical situation that might arise. The ballistic missile unit must be in readiness twenty-four hours a day, seven days a week. There can be no weak link. All portions of the system must be equally protected from either covert or overt aggression. Its communications likewise must be responsive and secure. Since there are many ways in which these operational objectives can be attained, each method has been explored and tied to the equipment and facility design. The operational objective plans for the ballistic missiles, now completed, state the desired system use, force requirements, reaction times, and communication ties to major command elements.

Personnel and Training. Sometimes in our admiration for mechanical miracles we lose sight of the man who must operate

and maintain them. We forget that these marvels are not a replacement, except in a very limited sense, for the human brain. Despite the talk of pushbutton warfare, it is the man who counts, not the button.

The single element of a weapon system that defies force acceleration and operational readiness more than any other is the personnel and training area. As the weapon system becomes increasingly complicated and more efficient, we find ourselves facing the paradox that with every increase in the synthetic skills we build in these systems a corresponding increase is required in human skill in making decisions and in the human ability to coordinate men and machines. This very coordination of manpower and machines is our most compelling concern as we advance into a new age of automation.

Yet a solution to this problem must be found before the operational units can be deployed. Toward this end, equipment to be used by the operational units is being designed to be operated by the "average airman." Airman training courses are being job-oriented. Identification of special skills and preparation of training handbooks are in progress. Each in its own way is attempting to ease the problem.

But what about personnel turnover, a problem not likely to be solved by human engineering or by tailoring training courses to the average airman? The personnel turnover rate in the Air Force is high and is not expected to decrease appreciably in ballistic missile units. It takes three years to give an aircraft airman the technical education and on-the-job experience required to bring him to the requisite level of professional skill, and we expect the same to be true of a missile airman. But after three years of this training we can call upon his services for only one more year. According to statistics he is likely to leave the service at the end of his fourth year of enlistment. This problem is of special seriousness in view of the fact that early ballistic missile units must have thoroughly qualified personnel trained in all phases and that our military resources in this type are limited.

Plans now envision standard work hours, good housing and messing accommodations, recreational facilities, and personnel incentive programs for the ballistic missile crews. All measures possible must be taken to relieve this critical factor.

Logistics. As much as any other area, logistics must be responsive to the operational plan of employment. The ballistic missile, with its fast-reacting system, requires an immediately responsive support system. It would be a serious waste if a missile

were to remain out of commission for a prolonged period of time because some part was not available. To meet this need the Air Materiel Command has instituted a new system of logistic control for ballistic missile units. This system, using electronic means, will ensure proper control and availability of high-dollar-value and critical short-supply items. Accessibility of missile components, methods of repair, and equipment required at the missile site are all being tabulated and evaluated as to their impact on the other weapon system areas.

Unit maintenance is now introducing changes into the basic missile design. Within the ballistic missile programs no special missiles are being designed purely for the purpose of research and development. The entire development effort is based around the missile configuration which will eventually be used in the operational program. Since this is the case, changes resulting from operating requirements are now being integrated into the development program, even at this early date. Even now, maintenance technicians can study each component of the system to be sure that each can be maintained in unit facilities with unit equipments.

The reverse is also true. Maintenance plans are now being drawn which will reflect types of people required and procedures to be used. Transportation needs, environmental conditioning, monitoring devices, and handling equipment are all a part of this.

Installations. Ballistic missile units, perhaps even more than other weapon systems, will be only as effective as their facilities will allow them to be. It is of little consequence how many missiles are produced or how fast, unless launchers, blockhouses, and associated ground facilities are in place to launch them. Strangely, the launcher then becomes the unit of force structure, the missile the bomb.

Facility design is well under way. The facilities now being designed will meet all operational objectives. They will also be capable of accepting expected growth potential of the missile and its associated equipments. The operational and technical requirements have already been placed in the hands of site selection teams who must select and recommend tracts of land most suited to this type of operation.

Even during the operational studies which precede site selection, the ballistic missile installation groups have been designing the operational facilities from equipment mockups. These facilities include storage, the technical facilities themselves, and the quarters and messing facilities for the personnel to be assigned to these units.

Allied areas which affect all phases of the operational units are also well into the formulation stage, areas such as security safety and support system maintainability.

The matrix, then, begins to form. All these items affect each other; all must be weighed and their over-all implications determined before this force can be ready. This planning and equipment design, which is the first step in attaining an operational force, is well under way.

implementation

The second step is the marriage of the man to the machine in an operational environment. Our survival may well depend on how well he does his job. For missiles, using as they do automatic devices of bewildering complexity and capability, will make heavier demands than any other weapon system in history on the human element, requiring human ability to act resourcefully, responsibly, and speedily with the equipment. Although the necessity to man a large number of missile bases is some time removed, the problem of implementation is of such immediate importance that the nation's first ballistic missile training center has already been activated at Cooke Air Force Base, California.

Cooke AFB uniquely lends itself to the over-all ballistic program. It is situated in close proximity to the Ballistic Missile Division and many major contractor establishments. It is of sufficient size to accommodate even the most ambitious training programs of the ICBM and IRBM, and it has existing buildings that can be readily converted into billets and classrooms. Cooke is a base of many functions but its most important is the training and evaluation of crews and equipment to ensure that both are welded into a true fighting potential.

Personnel will enter Cooke as a group who have completed basic Air Force training. Then, depending on individual aptitudes and preferences, these personnel will complete extensive training in industrial plants in fields specific to missile operation—fields such as electronic computers, guidance systems, rocket engines, automatic flight control systems, and thermonuclear war-head handling.

These individuals must learn to work with their unit. Before their arrival at this base they have seen only their own part of the job. At Cooke they will learn where they fit into the over-all scheme, the precise functions they must perform, and the time allotted for performance.

Their training will be rigid and exact. Upon completion they must be professional men in every sense of the word. One slip or hesitation in the launch sequence, during which many actions are taking place almost simultaneously, could result in disaster. Mental demands will be exacting. Crews must perform their assignments with the knowledge that a single mistake may cause the failure of the entire mission. If the order to launch were given, there would be no time for deliberation and no margin for error. Once the need for launching a missile arises, our very hope of survival will depend upon each man's ability to react in a prescribed manner.

The achievement of an effective operational force is well begun. The 1st Missile Division is now far into the task of implementing the plans outlined in this discussion. Although many problems remain to be studied and new decisions are yet to be made, the framework of an effective initial operational capability has already been fashioned. We may have every confidence that our fateful lightning of retaliation will be swift and terrible in the face of aggression by the enemy.

Air Force Ballistic Missile Division, Hq ARDC



Nation's First Ballistic Missile Base

LIEUTENANT COLONEL JOHN J. LEE

NEVER IN the history of military weaponry has there been the sense of urgency that today characterizes America's effort to create an effective and early operational capability in ballistic missiles. The dramatic scientific advances in both nucleonics and electronics that have materialized since the end of World War II, coupled with Soviet cold war tactics and technological progress, have made it all too evident that the "missile weapon" must be realized soon if this country's security is to be assured.

If defensive retaliation by means of the ballistic missile is to be measured in terms of minutes and not hours, then it becomes necessary to revise drastically downward the time period previously permitted in classic development-to-inventory cycles of new weapon systems.

It is therefore fortunate that the creation of missile weapon systems has lent itself to an approach wherein the classic steps (study, development, test, and introduction into military inventory, all in sequence) could be compressed and combined. By using the development-management approach, the Air Force has taken development, production, and operational actions concurrently. Even while the IRBM and the ICBM are yet in development and testing stages, the development-management approach permits industry

to keep pace in the creation of the necessary production facilities that can produce inventory items at a moment's notice.

For example, Douglas Aircraft Company, now producing a developmental Thor (IRBM), has geared its tooling departments to begin a runoff of the final article once the missile has satisfactorily completed all testing phases and is ready for operational use. The same holds true for Convair and its work on the Atlas (ICBM). In like manner this manufacturer is equipping production lines so that the 5500-mile-range missiles will become an end product without untimely and costly delays.

Yet the complexities of this program are not limited to the purely research and development aspects. There are the many corollary problems of support equipment, facilities, and manpower. Just as the marvels of the jet age failed to minimize the importance of all the elements of support—human and material—so the age of missile warfare has brought into even sharper focus the infinite part played by the thinking mind in ensuring that our country gets and maintains a missile capability. Unfortunately the F-104 or B-52 crew chief, skilled as he is, cannot draw entirely on experience to be a missile man of the future. He must receive new and lengthy training. Some of this he will receive right at the plants where the missiles are being manufactured; some he will receive at an Air Force base not yet completed.

Cooke Air Force Base, located on the Pacific coast of central California, will be to the missile force what Randolph, Chanute, Maxwell, or Keesler Air Force Bases have been to the airplane. Cooke Reservation, which in World War II and again in the Korean war echoed to the rumble of tanks and howitzers, will soon echo to the sound of multi-thousand-pound-thrust rocket engines; the cadenced count of the foot soldier will be replaced by the countdown in launch blockhouses.

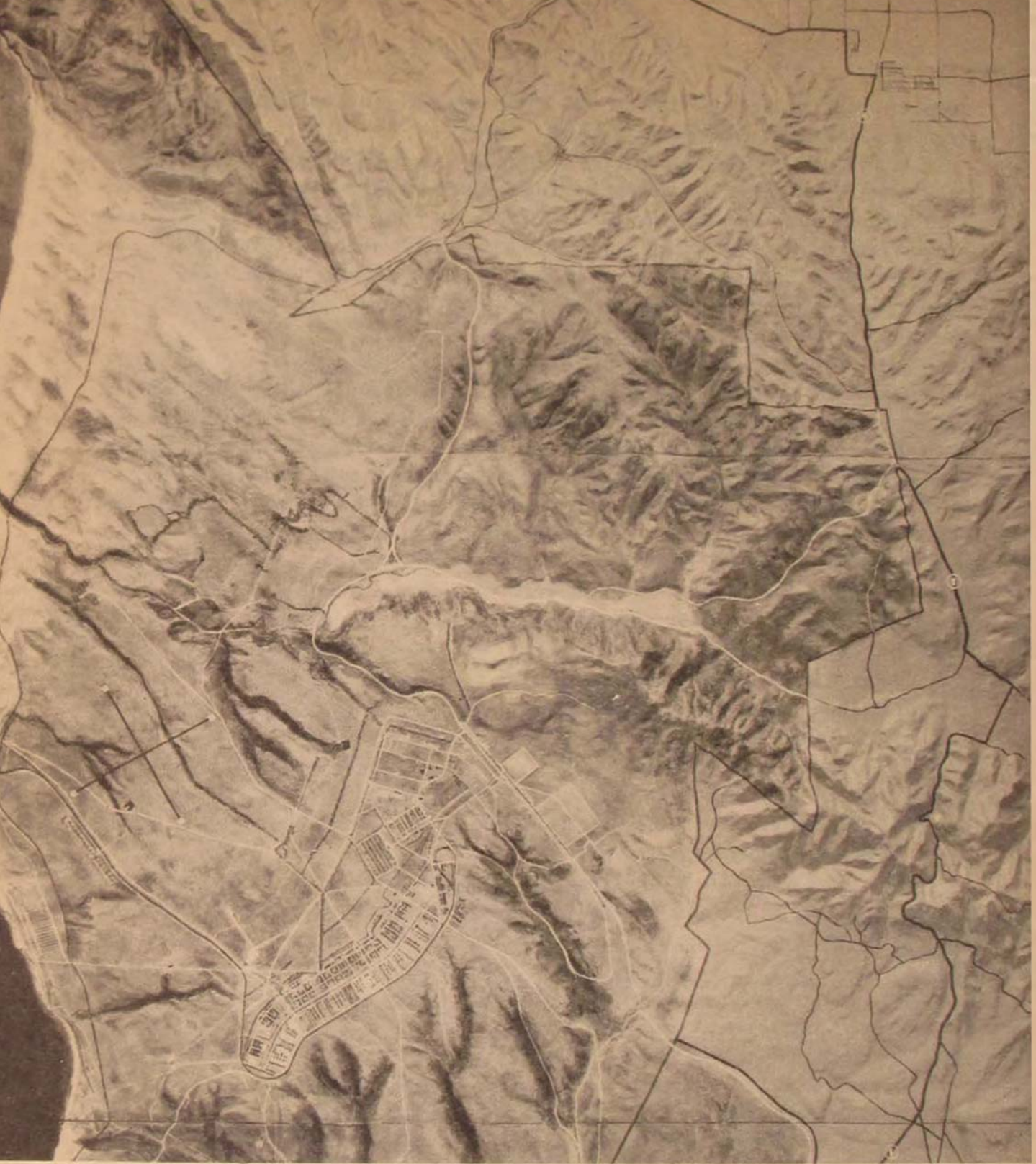
Here at Cooke Air Force Base a \$100,000,000 construction program, started less than a year ago, is forging ahead to provide a facility to house and train Air Force personnel in the intricate "hows" of assembling and firing the intermediate-range and long-range ballistic missiles. Among more than 64,000 acres of scrub pine and mesquite, heavy construction equipment is now building launch pads, guidance tracking stations, and bunker-type control rooms. Within a year and a half even a Buck Rogers will feel at home here.

Already activated at Cooke is the 1st Missile Division and the 704th Strategic Missile Wing. The division is planning and preparing for future operational ballistic missile units and bases. The 704th will be the center for training in both the ICBM and the IRBM programs. Separate squadrons are even now being formed to conduct the different types of training.

Actual starting date of the crew training program has not been determined. The airmen will be given extensive training directly related to missile operation. This will include electronic computers, guidance systems, large rocket power plants, automatic flight control systems, handling of liquid oxygen, and other allied subjects. From the first of these trainees will come the nucleus of instructors for the training of missile crews at Cooke AFB.

The second phase may be conducted in industrial training facilities. Graduates of these in-plant training programs would then be individually skilled technicians ready to take their places as members of a ballistic missile crew.

Some of the nation's top men in rocket propulsion, electronics, and



The significant portions of Cooke AFB that will be used in construction of the Air Force's missile training base are here shown. Of the 86,000 acres that comprised the original Cooke Reservation, the Air Force has taken over some 64,000, including seven miles of Pacific Ocean frontage. Inland from the ocean promontory the black cross marks the guidance range for the ICBM training site. Location of the ICBM launching training platforms is indicated by three small squares north of the guidance range. To the east of the guidance range are the former troop housing area and administrative buildings. Much of this old construction is being renovated and is to be supplemented by the 880-unit Capehart housing project.

other allied fields will be stationed at Cooke to assist with the crew training program.

Construction of the many technical facilities is well under way. When completed there will be one ICBM complex and one IRBM complex. Each of the sites includes a guidance center, an operations launch building, and several launching pads. While it is intended to conduct only captive firing exercises in connection with the training program, the capability to conduct actual launchings will always exist in case of a national emergency.

Steel structures rise skyward in the construction of two RIM buildings. These will be used to Receive, Inspect, and Maintain the missiles as they arrive at Cooke. Here will be performed a complete checkout of all components of the missile. Then the missile will be transported to one of the various launching complexes and utilized in the training of crews—or be kept operationally ready for firing at a moment's notice.

In the area where thousands of troops were housed and fed in World War II and during the Korean conflict, equally startling changes are taking place. Construction crews are now swarming over many of the 1800 barracks and administration buildings to rehabilitate or entirely replace them. Nothing is being overlooked to ensure the comfort of our modern airmen. Exteriors of usable buildings are being re-covered with either white or pastel-colored asbestos siding. The interiors are being completely remodeled.

The "good old days" barracks that housed 74 men at one time are being converted into "good new days" dormitories of two-man rooms, each with its individual television outlet, to have a total capacity of 34 airmen. Wooden

This view of Cooke Air Force Base shows the former Army cantonment area in the foreground now being renovated; the relatively flat land beyond, where the Atlas and Thor launching sites will be located; and the Pacific Ocean in the background.

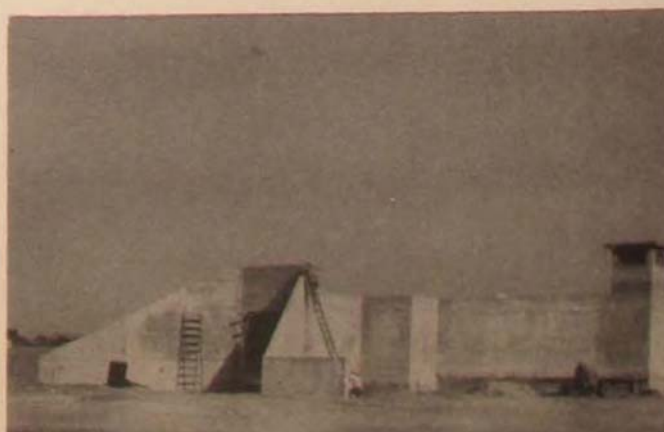
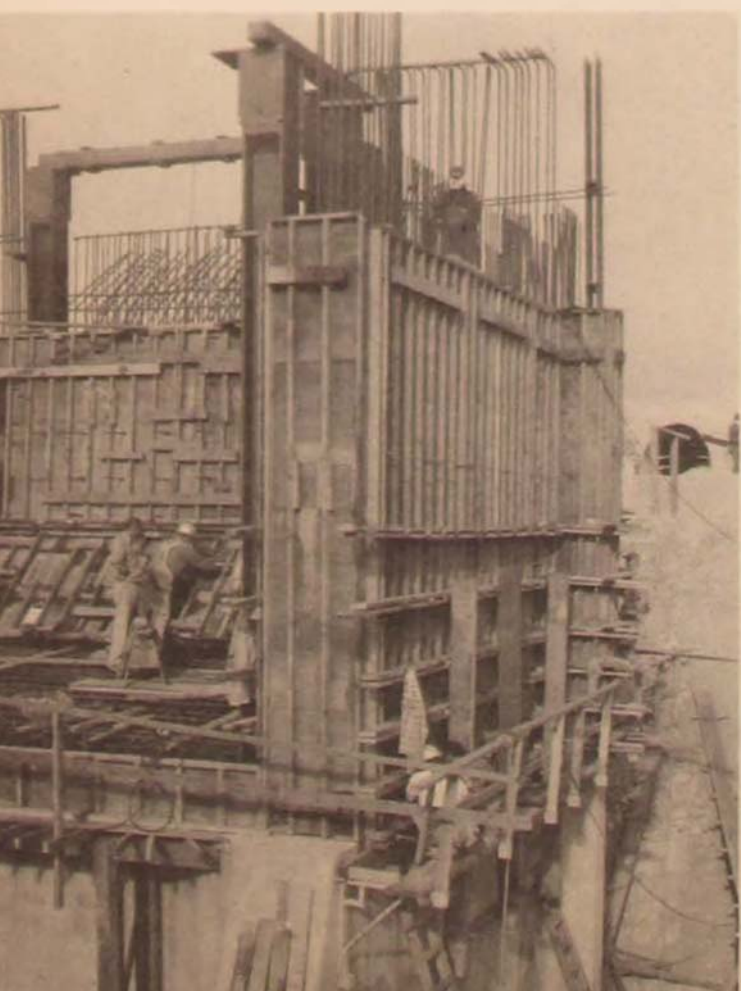


or steel wall-lockers with doors that usually either sagged or stuck are being replaced with sliding-door closets and built-in dressers. The old-style latrine where privacy was never the order of the day has been removed. In its stead today's airmen will use a home-style bathroom with ceramic-tile flooring and walls, counter-top wash basins, tiled shower stalls, and private commodes. Drafty heating systems are being supplanted by thermostatically controlled heat-conditioning facilities.

All this does not mean that the Air Force has suddenly gone de luxe. It is just one more reflection of the hard fact that the long-range success of this multi-billion-dollar defense program is entirely dependent upon the availability of skilled manpower and the ability of the Air Force to retain these trained personnel. Only by providing them with advantages similar to those that they could demand on the outside can the Air Force hope to retain them.

The married airmen and officers will also find an improved lot at Cooke Air Force Base. On 23 October 1957 a ground-breaking exercise signaled the start of an 880-unit on-base Capehart housing project. Modern in design (California style), the smallest house will contain over 1000 square feet of living space and a minimum of three bedrooms. Recognizing that the "little woman" plays an important part in whether the husband re-enlists or not, a dream kitchen consisting of range, refrigerator, and garbage disposal is being provided in these homes. And, just to keep the male of the house

Construction of the massive underpinnings of the launching platforms for training the Atlas ICBM missile crews is well under way. At left are some of the footing, the forms for the flame bucket chamber, and the lacing of steel reinforcing. To the right above is the same scene after concrete has been poured and forms removed. At bottom right is the launch control building, nerve center of the launch site.





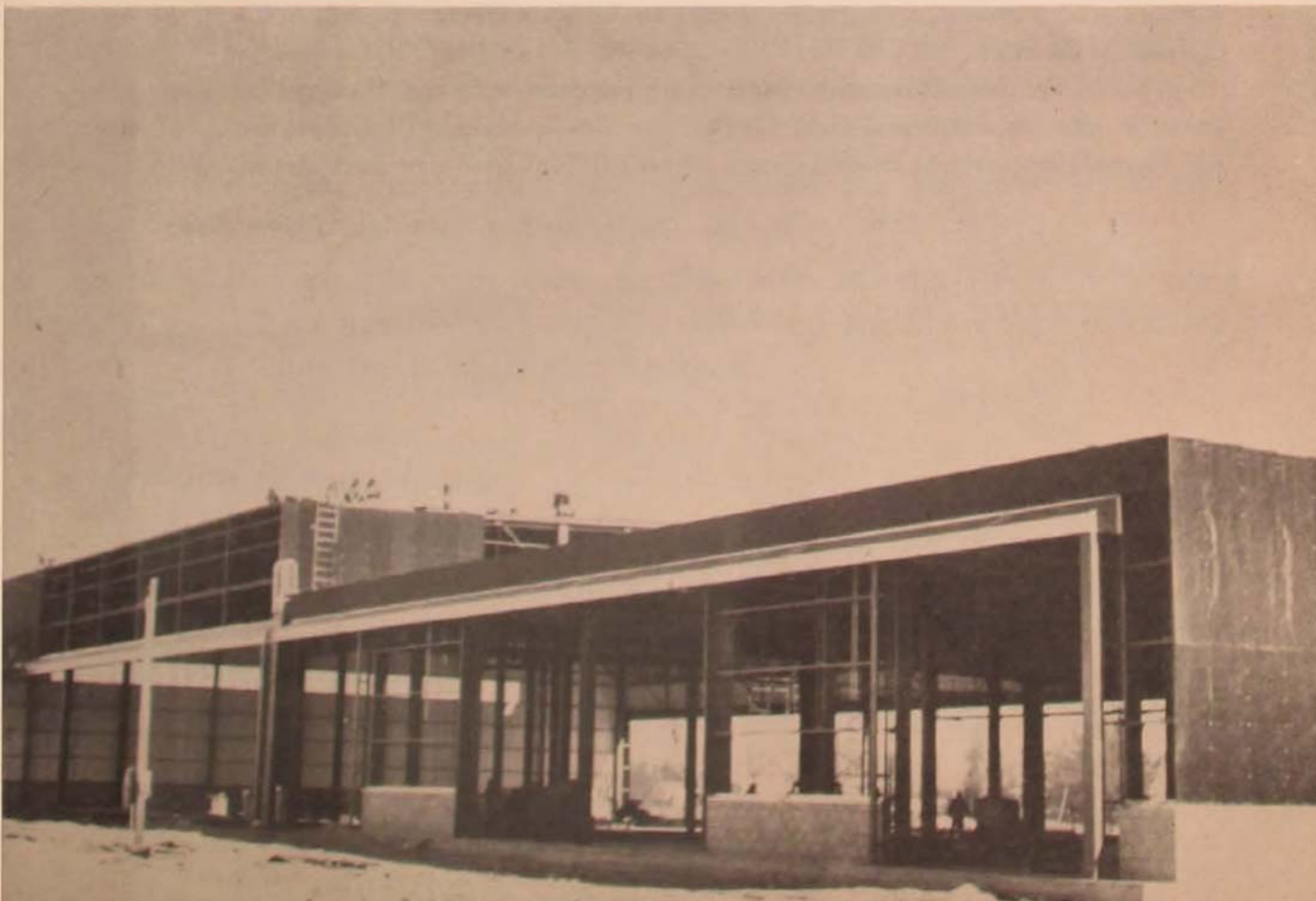
The training range guidance building (left) for the Atlas ICBM nears completion. A part of the support facilities under construction are the water storage tanks (right) that must provide the launch stands with large volumes of water during rocket engine firings for cooling the flame bucket and dousing any incipient fires.

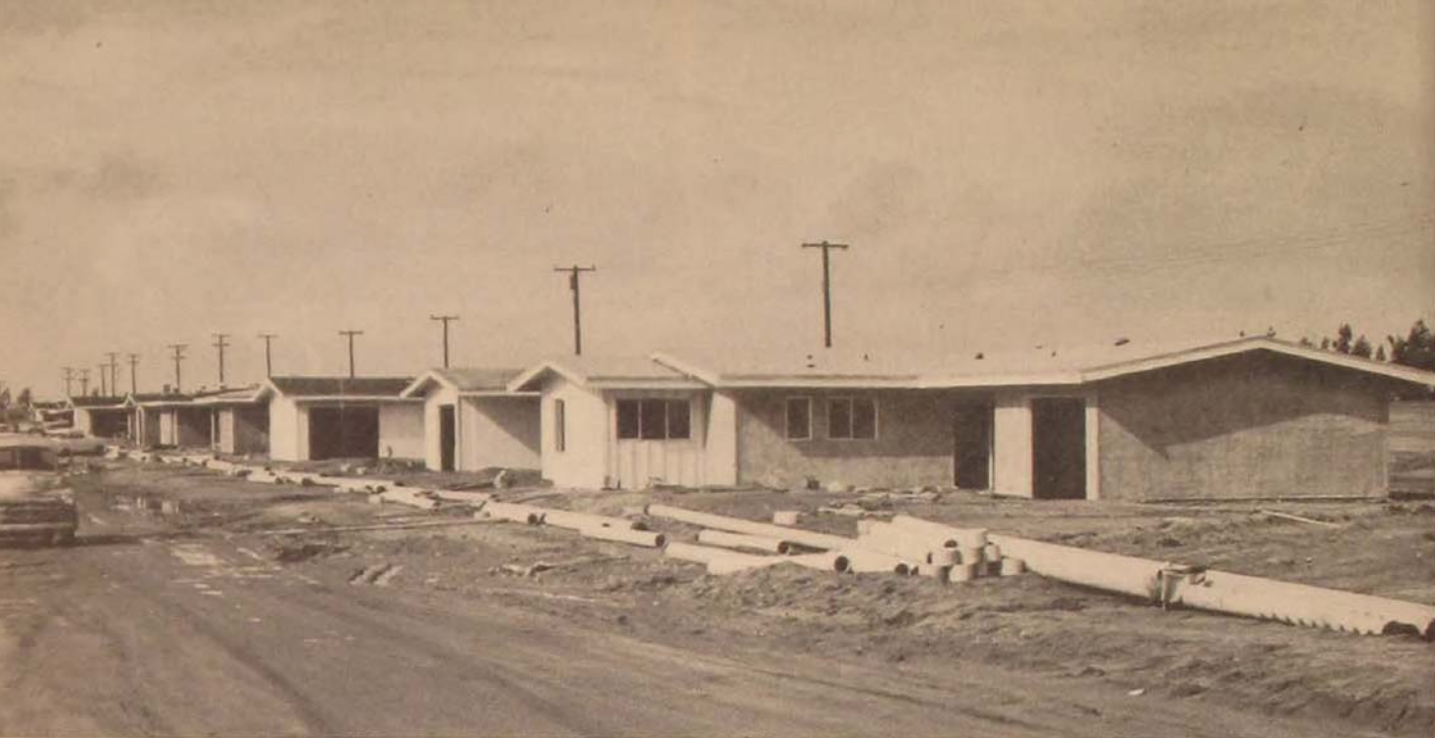
happy, each kitchen will have a dish washer. Six hundred and seventy of these units are slated to be assigned to airmen—the first of these will be available in March 1958—while the remaining 210 units are earmarked as officer quarters.

But if housing is important, so too are the spiritual, educational, and recreational side of military life. A chapel and religious educational center is also a part of the current rehabilitation construction program. The local school district has approved plans for the construction of an on-base school adequate to take care of the educational needs of dependent children. Pending construction of the permanent school—scheduled to be available in 1959—temporary classrooms will be established for the 1958 school year.

Good hunting, fishing, golfing, swimming, and other types of athletics

What the hangar is to the airplane-Air Force this RIM building is to the missile force. Now under construction, the commodious RIM building will have facilities for receiving, inspection, and maintenance of ballistic missiles at Cooke AFB.





The first units of the 880-unit Capehart housing development at Cooke AFB are now near completion. All units in the \$11,000,000 project are scheduled to be ready for occupancy by September 1958. These are individual three- or four-bedroom homes equipped with stove, refrigerator, dishwasher, and a garbage disposal.

are close at hand in the towns of Lompoc and Santa Maria. In addition water skiing is available in a lagoon adjacent to the base. A look at future recreation plans reveals that the base will have an inclosed, heated swimming pool for airmen, ten bowling alleys, and two field houses—one in the airmen's area and the other in the base housing project. Both will be fully equipped for all outdoor activities. All types of sports ranging from football to baseball are being planned.

Although present population of the base numbers approximately 600 officers and airmen, eventually 5000 to 7000 military personnel will be assigned to Cooke.

With an ambitious development program moving forward at a steady pace, it can be expected that Cooke Air Force Base will become one of the Air Force's important installations when all facilities are completed.

Cooke Air Force Base

Who Will Lead Tomorrow's Air Force?

COLONEL JAMES S. SMITH

ON 14 October 1943, Brigadier General Curtis LeMay led 291 B-17's toward Schweinfurt. The 228 that arrived over target spilled 483 tons of bombs. The strike was one of the largest in World War II in which the entire attacking force was under complete control of a single air commander. General LeMay at that time had some 15 years of Air Corps service. He was 37 years old, had led numerous other raids with sizable forces under his personal direction, and had all the attributes needed in a World War II air commander.

Today a lieutenant with two or three years' service, flying a century series aircraft, can toss a bomb over his shoulder that has such destructive power as to relegate the Schweinfurt raid's tonnage to a firecracker grade of pyrotechnics.

The years between these examples unfortunately have seen the United States Air Force take but token recognition of three fundamental propositions inherent in the comparison:

- That the result of the decisive phase of any major conflict in which modern air forces are engaged is largely predetermined.
- That the traditional role of the air commander is one that belongs primarily to history.
- That the first two propositions are tightly interlocked and neither is properly reflected in Air Force organization and training techniques.

decision in nuclear war

To probe the implications contained in the first proposition it is necessary to put the General LeMay-led attack into its proper perspective. The attack could probably be called one of the opening blows of the decisive phase of World War II, at least as applied to Germany. So it is significant that the raid occurred 22 months

after the United States had declared war against Germany and that it involved more B-17's than the United States probably had in total on the day war was declared. For almost two war years, and for at least another year prior to the actual declaration, the United States had been in the buildup phase of the conflict. Here the traditional pattern of war is strongly evident. First the long, relatively unmolested buildup phase. Then the decisive phase, followed at some point in time by the exploitation phase.

This traditional pattern has been completely shattered by the staggering increase in weapons and delivery capabilities since the last war. Air Force thinkers have been joined by influential civilian and military leaders throughout the world in recognizing that the forces-in-being concept is essential for national survival. It is the cornerstone of United States military policy.

But this concept has not been permitted to proceed to its logical conclusion: that the decisive phase of any future major conflict will be largely decided prior to the first hostile move. Such a conclusion is valid under today's considerations and will become irrevocable under tomorrow's. Many factors produce the conclusion but the primary ones are modern weapons and the ever more efficient delivery capabilities. Never before in history has a single major world power possessed the capability to totally destroy the entire political, economic, and military systems of another major power with one blow. Indeed it is conceivable that even a "minor" power could use all its resources in weapons construction and become a threat to world peace out of all proportion to its normal economic, cultural, and political role.

This tremendous destructive power now possessed by the major nations is no longer geared to the broad war plans which previously were the pattern and which set forth the opening moves of major conflicts and visualized gradual progression to the decisive phase. Plans that outline only the rough strategic direction for the armed forces of a nation will no longer suffice. Previous conflicts gave time for error. Mistakes in strategic direction and target selection could be compensated for as the conflict entered the decisive stage. A staff breakdown in planning could be accepted and new staffs hammered into shape. There was time to learn from experience, time to train staffs, time to assemble all the elements of the problem, time to commit bobbles, time to pick "targets of opportunity"—a long-outmoded phrase with which Air Force thinkers are still too much in love.

Time has been compressed. The B-47 squeezed it. The B-52 tightened the pressure. The Atlas and Titan will constrict the

years into minutes. Today's planning means a critical examination of a potential enemy's fundamental elements: economic, political, psychosocial, and military. From this critical examination come definitive target systems. And from the target systems specific targets take their place and priority.

A factor seldom considered—but a most essential one—in this targeting cycle is what are the broad objectives being sought by the nation applying its military force. Military planners must be provided a clear statement of the national objectives as they pertain not only to the conflict itself but also to the peace that will so quickly follow. The time-honored approach of “win the war and then decide about the peace” is threadbare. In a modern application of military force the using nation must relate its wartime objectives to the type of posthostilities policies it intends to establish and apply.

All these targeting factors combine to reject the familiar “target of opportunity” philosophy. With the forces-in-being concept the destructive capability of the attacking force must be sufficient to meet the decisive phase when hostilities commence. Once that force is committed the time-compression factor prohibits diversion from previously conceived plans. Once a target flight plan is programed into the electronic mind of an Atlas or Titan the vehicle is committed. The situation differs only slightly with manned aircraft. For all practical purposes the delivery vehicle has no latitude in target selection, whether its flight is under human or electronic control. Latitude cannot be permitted when each target becomes a vital cog intermeshed in a fantastically complicated plan of operation. Such plans do not call for destroying one target or target system and then moving on at a later period in time to another system. The plan must use as its basic departure point the need for a force capable of neutralizing completely the enemy nation's will and ability to engage in conflict. Only after the enemy's offensive forces have been eliminated can the plan contemplate gradations of pressure compatible with the national war objectives and peace terms.

Once such a plan is set in motion it becomes an entire World War I or World War II compressed into a relatively brief moment in time. Deviation from the plan, therefore, is out of the question. Failure of one segment of the outcome visualized in the plan could chain-react against completion of all tasks. If the attacking force can eradicate the selected targets, then the decisive stage of the war is successfully concluded. *Provided*: that the preplanning was of sufficient competence to ensure proper target selection.

The outcome of the conflict for which the plan was designed, then, is no longer at the will of the actual elements engaged. It is largely predetermined by the completeness and accuracy of the plan and the ability of the attacking force to follow that plan. Inasmuch as the attacking elements set in motion by the plan possess the destructive capability militarily to eliminate the opposing nation, it follows that the outcome of the decisive stage of the conflict is also predetermined. This represents a major shift in primary emphasis—from combat to preplanning. Surely our organization and our selection and training of air leaders should reflect this shift.

the air commander in nuclear war

In examining the second proposition, that the traditional role of the air commander is one which belongs primarily to history, we can again use as a departure point the General LeMay-led Schweinfurt raid.

General LeMay was a product of a "traditional" pattern of development of air commanders. On his record were, among other things, graduation from the old Air Corps Tactical School, extensive experience in heavy bombers, substantial flying hours, and proven combat leadership. In the air his decisions were final. He could direct course and altitude changes, switch to an alternate target, abort the entire mission, or make any change that he—and only he—considered necessary. This development of the air commander and trust in his decisions were a natural product of Air Corps doctrine and weapons delivery capability which existed at that time. Out of the 1930's had come the theory of precision industrial bombing. Here were spawned the tactics of high-level, daylight, formation bombing of vital, pinpoint targets as epitomized by the Schweinfurt raid. These tactics, to produce the desired effect on the target, required substantial bomb tonnage. To get that tonnage the "state of the art" demanded great numbers of bombers. To protect those bombers during deep penetrations in daylight hours, formation flying for mutual protection was vital.

From all this, and much more, emerged the requirement for the air commander. Upon his judgment, courage, and skill rested in large measure the success or failure of the precision bombing principle, and to a somewhat lesser degree the acceptance or rejection of the basic doctrine of the decisiveness of air forces.

It is worth mention that the Army-Air Corps doctrinal squabble during the 1920's and 30's may have had an impact on develop-

ing the requirement for the air commander. An oft-heard cry in those days was for leaders who could understand and help develop air doctrine. Great and valid importance was given to the demand that air leaders be airmen and not transplanted officers from other corps of the Army.

Since World War II the basic premise of the decisiveness of air forces has remained valid, but tactics in applying this decisive force have shifted rather violently. There has been little corresponding shift, however, in the philosophy toward the air commander. Some of the reluctance to change this philosophy to meet weapon and delivery system changes could be a throwback to the old Army-Air Corps feuding days. Nostalgia may play a part, as the World War II days of massed formations are called to memory. But perhaps the strongest obstacle is the natural tendency to stick with a system that has served well in the past. Unfortunately this ignores the fact that the past is outmoded.

The tactics of concentration and mass in World War II and even Korea depended on assembly of substantial numbers of delivery vehicles. Only through such formations could the required target destruction be obtained. In any future major conflict the tactic of concentration will come from the weapon system and not the delivery vehicles. The assembly of a substantial number of delivery vehicles in any one location, whether on the ground or in the air, will be unthinkable. Today the most serious threat to air forces is their vulnerability when concentrated on the ground. It is inconsistent to believe that similar vulnerability would not exist, considering modern weapons capabilities, through concentration in the air.

If this principle applies to the attacking force it must of course apply to the air defense force as well. Employment of air defense force is largely dependent upon the tactics of the attacking force. As the attackers disperse because of modern weapon capability, the air defense force must also disperse to meet the threat.

A further and important point is that this principle applies not only to manned vehicles but to missiles as well. The inventory of all modern air forces will soon be shifting to unmanned vehicles. This shift will accelerate and at some point in the next decade all modern air forces will find themselves with a preponderance of missiles as opposed to manned combat aircraft. Those air forces which resist the shift will find themselves hopelessly outclassed.

Time also plays a part in outmoding the traditional role of air commander. In past conflicts the crucible of the air com-

mander's learning process was the air engagement. The concluding test was his ability to lead effectively under the hammering stress of combat. There may be neither time nor need to undergo this test in future major conflicts. Rather the air commander's testing ground will lie in his ability to prepare for hostilities. As we have seen, his decisions and leadership in the air can have little if any effect once the actual engagement occurs.

We find therefore that several factors—elimination of massed formations, improved manned and unmanned delivery vehicles, improved weapon systems—all converge to force the traditional role of the air commander back into history.

The air commander's primary attribute was his capability to lead in the air. With the disappearance of tactics that require such leadership, the air commander disappears into limbo. Any attempt to link air leadership in the traditional sense with the increasing missile inventory is ludicrous.

Yet throughout all this discussion one central point remains unshakable—the decisiveness of air forces. Only the tactics and techniques of employment have altered. Leadership and command by airmen who understand the doctrine of air forces and the strategy of applying them to ensure national survival are more essential today than they were during the arguments of the Air Corps' founding days.

In those founding days doctrinal and roles-and-missions arguments were largely hypothetical. Air Corps doctrinarians had developed the precision bombing theory in a vacuum, for no capability existed to test or apply the theory. The perpetual "defense" policy and posture of the United States even acted as a restraint against efforts to develop and produce an acceptable vehicle. Not until World War II was the doctrine tried and found sound and valid.

Airmen who went through that trial or who understand its implications recognize that national survival and well-being are inexorably welded to air forces and the decisive balance they hold in any military encounter. It must rest upon such airmen, then, to continually perfect the doctrine and employment techniques of the force to accrue maximum national benefit. Only through such airmen can full utilization of air forces be exploited.

have we acted on our knowledge?

The third proposition, that the first two propositions are tightly interlocked and neither is properly reflected in Air Force

organization and training technique, is implied throughout the previous discussion.

Prior to the arrival of modern air forces, the outcome of a single battle or engagement proved the staff's ability to plan and the commander's ability to lead. In any future major conflict in which air forces are engaged the outcome of the entire war will rest on the staff's ability to plan and the commander's ability to so prepare his force that the objectives contained in the plan are met. Both requirements must have been fulfilled long before D-day.

Here rests the basic interlock between the propositions of a predetermined decisive phase and of the air commander's role belonging to history. For the traditional air commander, no matter how well he plays his role, could have little effect on the final outcome of any future major engagement. His judgment, ability, and skill must be developed and applied before the engagement occurs. This is particularly true of the attacking forces. Within the defensive forces more latitude may exist. Yet even here the mark of success will not be generalship in the air. Rather it will be in the planning, preparation, and training for the engagement, followed by the successful employment of the force. Time, particularly in the missile era, will never permit any substantial change in disposition of the defensive force nor any sort of battle-hardening or training process. The defensive force may well have but one chance to fight successfully, and it is likely that parts of it may never be engaged.

Where the success of the decisive stage in the over-all encounter formerly rested in large measure with the air commander, it now rests primarily with the preplanner and with the commander's ability to prepare his force for the encounter.

This conclusion, however, has had little effect on Air Force organization or training techniques. The organization which tailored the World War II Air Corps structure still dominates. It was based in large measure on the destructive limitation of any single delivery vehicle. Single capability was measured in hundreds of pounds of TNT. Therefore organizations took their shape around a hypothetical number of aircraft which a single commander could control and operate effectively as a unit in the air. Largely ignored were such factors as size and complexity of the aircraft and support equipment, base facilities and launch capability, state of training and proficiency of air and ground crews, supply adequacy and source locations, etc. Despite lack of consideration of these factors the concept worked and the job

was done. But when a single vehicle could deliver the equivalent of thousands, then millions of tons of TNT, the concept lost most of its validity. When the speed of the vehicle increased so as to compress years into hours the concept should have been discarded.

This concept linked the air commander to the delivery vehicle and his development was a natural product of the organizational system. The leader of the Schweinfurt raid was an exceptional example of such development. This too, as has been discussed, is no longer valid. The commander's role has been forcefully altered and by necessity his development must be altered.

conclusions and their implications

From the discussion thus far certain conclusions can be drawn:

- The underlying concepts supporting the present organizational structure have altered and the structure should be re-aligned.
- The planning function is paramount in determining the outcome of the decisive phase.
- Modern air forces demand change from the traditional role and development system for commanders and leaders.

Such conclusions call for recasting and revising the existing structure and system. A thorough probe of the specific changes to be made was not the intent of this discussion. Certainly, however, some thoughts should be expressed and some parameters drawn. (Of interest here is the Summer 1957 issue of the *Air University Quarterly Review* which was devoted entirely to "The Air Force Ballistic Missile." Several articles contained comments on organization, training, and other aspects pertinent to the ballistic missile.)

In examining the conclusions which have been reached let us look at them one at a time, while accepting the fact of their deep interrelationship. As each is examined some points will be made. There is no attempt to cover all ramifications, but merely to indicate broad possibilities.

First: Structural realignment

- The structure should recognize that three basic elements are involved which can be applied equally to function, to personnel, and to organization. Applied to function the three are: planning, performance, and sustenance. Applied to individuals they are the planners, the performers, and the sustainers or supporters.

Applied to organization they are the planning level where total plans are developed, the performance level where the plans are executed, and the support level where personnel and logistical sustenance are provided.

- There must be greater centralization of task determination. Yet there should be greater autonomy, authority, and responsibility for commanders in their preparation to carry out the task. Such autonomy would exist only in the preparatory phase. Task direction and execution can only originate at the highest national level.

- Intermediate headquarters between the level which determines the specific mission and that organization which carries it out must be ruthlessly reduced. Need for such intermediate headquarters should be based on a clear efficiency gain in providing necessary personnel administration and logistical support.

- The delivery vehicles assigned to organizations cannot be tied to a "magical" number specified for all similar organizations. Rather the number must be compatible to geographical location, base support capability, state of training, etc. The number of delivery vehicles in a squadron is inconsequential if, for example, the base cannot launch within a specific period of time.

- The combat communications system must be instantly responsive between the "director" and the performer.

- The structure must recognize that preplanning is decisive. This also calls for appropriate placement of the intelligence, reconnaissance, and information-gathering elements. It is worth noting in this connection that only recently Headquarters USAF realigned its organization to establish a new Deputy Chief of Staff, Plans and Programs, plus a new Assistant Chief of Staff, Intelligence. Here is concrete evidence of recognition of the planning function and one of its corollaries, intelligence gathering.

Second: Pre-eminence of planning

- Broad planning at the highest level with intermediate levels of uncoordinated planning down to the performing level is no longer acceptable. Total planning is demanded. Such planning must be adjusted not only within services but between allied nations. Without such adjustments the specter appears of an allied nation's manned bomber disappearing in the fireball of a USAF missile, or a TAC missile slamming into an area a few minutes after a SAC bomber eradicated the target.

- The need is for men who in advance can think through the next war, not those who can only think through the next engagement. A system must be designed to identify, train, and utilize individuals with the broader capability.

- Several fields of interest may exist within the broad planning area. These could logically take the form of engagements in which the forces might be employed, ranging from peace to cold war to limited war to total war.

- Both the officer training and professional education systems must recognize the planner and his function.

- The officer career structure should be revamped to establish the planning field as distinct from other occupational areas.

- Planners must be supported by a technical element which possesses intimate knowledge of the capabilities of weapons and delivery systems. Such knowledge must be welded together and be available at the planning level.

- Doctrinal development and influence should be exercised at the planning level and not be conceived and prepared in a vacuum away from the application of that doctrine.

- The intelligence and reconnaissance activities must be joined to the planners.

Third: Role and development of commanders

- The professional education system, the heart of commander development, may need re-examination. The present broad curriculums of all general service schools are roughly similar, varying only in level and degree of sophistication. All emphasize developing the individual's capabilities in a command or staff capacity. A shift in emphasis may be needed whereby early professional education remains within the present objectives, with later education adding some sophistication to the basic offering but concentrating on the more specific interest areas of planning and command.

- The commander must be able to adhere rigidly to specific objectives of a plan. Yet he must also possess sufficient independence to exercise great flexibility in preparing for execution of the task.

- Commander development must not be confined to operational lines. Assumption of command should be preceded by experience in the support and planning fields as well as the performance elements.

- The commander's ability to prepare an organization for combat—as opposed to leading in combat—must be dominant in selection for command positions.

- Experience by the commander in the air vehicle which his unit employs must lose its present importance. The advent of missile units makes such “experience” philosophy archaic.

Headquarters Air University

Air Power and Soviet Strategy

DR. RAYMOND L. GARTHOFF

THE Second World War provided everywhere an impetus to the re-evaluation of the role and potentialities of air power. Paradoxically in the Soviet Union the war also served indirectly to retard development of air doctrine by the virtual canonization of the "Stalinist" military doctrine of 1945. Intemperate and uncritical praise for Soviet wartime operations—which featured almost exclusively air support of ground forces—inhibited constructive criticism and innovation.

The period from the end of the war until 1953 was consequently dominated by the dogmatization of World War II doctrine limiting air power to the role of supporting the ground forces. Belatedness in recognition of the significance of new weapons and the new world geostrategic picture was born of the "freeze" on doctrine during Stalin's lifetime and of the retardation caused by excessive devotion to the doctrine that had succeeded for the Soviets in World War II. A natural impetus for re-evaluation of the role of air power, for seeking new perspectives in doctrine, and for speculation on atomic and other new weapons existed in 1946 but was silenced and curbed from mid-1947 until mid-1953. For this reason it is useful to begin by looking back briefly at the few premature expressions of a "new look" in air doctrine which appeared in 1946 and then at the Stalinist postwar period as background to the developments since 1953.

The main focus here will be on the development of Soviet views of strategic air power because the missions of support to the surface forces and of air defense have in general been less affected both by the Stalinist freeze and subsequent thaw. But it is quite important to realize that the Soviet development of a strategic air doctrine and capability has not been at the expense of a steadily modernized and large air establishment to provide support capability for the ground forces, airborne troops, and the navy and an increasingly important and strong air defense force. Soviet strategy continues to regard these air power missions as crucial, as well as now recognizing a greater role for long-range air forces.

Soviet Air Doctrine under Stalin

Major General of Aviation Tatarchenko, former Imperial Army flyer and prewar neo-Douhetist, was the author of a thought-provoking article entitled "Some Problems of the Development of Air Power," which appeared in the Air Force journal *Herald of the Air Fleet* in mid-1946. In this unusual article he surveyed (albeit superficially) recent developments in atomic energy, radar, jet propulsion, aerodynamics, and missiles and sought to raise the problem of revision of doctrine on air power in the light of these developments. In his survey Tatarchenko assumed a greater role would be given to strategic bombing:

. . . it has now become an indisputable fact that along with operational-tactical aviation, the main task of which consists of direct support to the operations of ground troops, *there must also exist strategic aviation.*

It would appear that contemporary air forces are capable of deciding not only tactical, but also operational and *strategic tasks, which no arm other than aviation can fulfill.*

Concerning the form of future war the following thoughts suggest themselves: *in future engagements the place of application of the main force will be not so much the front as the rear of the enemy.**

General Tatarchenko, although unique and unsuccessful in his ambitious attempt to suggest that the meaning of new technological developments for Soviet air doctrine was a reorientation of strategic concept, was not alone in recognizing an increased role for strategic air power. A General Staff officer, Major General Korkodinov, in a contemporary article surveying the "Operational Art of the Red Army," wrote that while usually air (and sea) operations were "component parts" of strategic operations by the ground forces, in some cases air or sea operations might have "strategic significance, that is be [independent] strategic operations." As example he cited the Allied strategic bombing of Germany in 1944-45. Another author, in 1946, in surveying Allied air operations also recognized the increased role of air power: "In the course of the Second World War it [aviation] proved able to solve a series of operational *and even strategic missions* both in combined operations with other arms and the fleet *and independently*, and its combat operations assumed an unprecedented scale." Nonetheless he also repeated the doctrinal dogma upholding the primacy of the combined-arms team: "Of course, its in-

*Here and elsewhere in this article the italics in quotations have been added by the author.

Evolution of Soviet Long-Range Aviation

thirties

TB-3



23,000 ft. alt.
600-1260 mi. rg.
115 mph cr. spd.

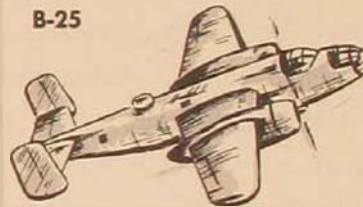
forties

TB-7



29,000 ft. alt.
2500-3500 mi. rg.
186 mph cr. spd.

B-25



24,200 ft. alt.
1200 mi. rg.
190 mph cr. spd.

Pe-8



29,000 ft. alt.
1250-2500 mi. rg.
210 mph cr. spd.

Tu-4 (Bull)



40,000 ft. alt.
2330-2600 mi. rg.
330 mph cr. spd.

fifties

Badger



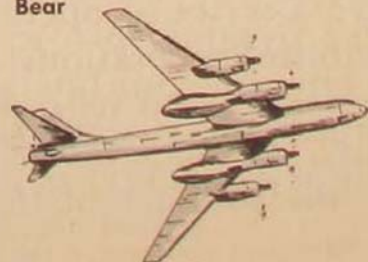
43,950 ft. alt.
2500-3000 mi. rg.
520 mph cr. spd.

Bison



44,000 ft. alt.
3000-4200 mi. rg.
545 mph cr. spd.

Bear



creased relative standing does not at all provide grounds for considering aviation an exceptional or the only means of combat and victory. Of this the experience of the Second World War eloquently bears witness, showing that victory can be achieved only as the result of the combined forces of all arms of ground troops, aviation, and the navy." Marshal of Aviation Skripko, then deputy commander of the Long Range Air Force, also declared in *Red Star* (11 August 1946): "One of the means of active operations against the military potential of the enemy is strategic aviation. The threat of its massed operations alone compels the enemy to hold large forces in his air defense system, diverting them from the front. . . ."

It would not be correct to conclude that these few statements from the early postwar period (all the statements cited above are from 1946) marked a prevailing trend toward full recognition of the increased importance of strategic air power. The statements above, moderate as they are, nonetheless are exceptional. More typical was the comment of the Soviet Air Force reviewer, writing in the authoritative journal *Military Thought*, of General Spaatz's article in *Foreign Affairs* in 1946.* He attributed to General Spaatz a "hyperbolic exaggeration of the role and significance of strategic aviation."

In tracing the integration of strategic bombing into Soviet air doctrine in the postwar era, it is necessary to bear in mind the persistence of conservatism. We shall later review the continuity to the present of the doctrinal rejection of reliance on any one arm and reaffirmation of the concept of the combined-arms team. Moreover strategic bombing has often been expressly held to a supplementary role. An Air Force officer, Colonel Volkov, writing in the General Staff publication *Military Thought* in 1949 flatly stated that "no independent actions of aviation can play such a role as operations conducted in the interests of the ground troops." But this judgment did not mean a lack of interest in long-range bombing.

A comprehensive statement of the Soviet doctrine in the postwar period appeared in an article by Colonel General of Aviation Nikitin in February 1949 in *Military Thought*:

Soviet military science holds alien any form of the one-sided theory, widely prevalent in the capitalist countries, which considers aviation as the most important factor of contemporary war, capable practically independently of deciding the outcome of war. Our military science recognizes that victory in modern war is

*"Strategic Air Power," by General Carl A. Spaatz, Commanding General, Army Air Forces, in *Foreign Affairs*, Vol. 24, No. 3, April 1946.

achieved by the combined efforts of all forms and arms of the armed forces, that no one arm can replace another, and that each of them must participate on the basis of able employment of all their characteristics and combat capabilities. On the basis of this deeply scientific principle, *Soviet military science considers that the outcome of war under contemporary conditions is decided on the field of battle by means of the annihilation of the armed forces of the enemy*, and that one of the most important tasks of aviation is active assistance to the ground and naval forces in all forms of their combat activity. *This definition of the fundamental mission of aviation is not contradicted by the need to employ part of its forces to strike the deep rear of the enemy, on his military-industrial targets, but our military science does not consider such blows an end in themselves, but only a helpful means of creating favorable conditions for the success of the combat operations of the ground and naval forces.* The structure of our military air forces is established on the basis of the scientific definition of the role and significance of aviation in contemporary war.

Thus we see that in the postwar Stalinist era strategic bombing came to be accepted as a supplement to, or perhaps a new member of, the essentially ground-oriented combined-arms team.

other indications

Before we examine the post-Stalinist period, it is useful to note two other signs of the rising role of strategic air power in the Stalinist period. One is the way in which Soviet military men described their own long-range bombing of World War II; the other is the actual construction of a fleet of long-range bombers.

The great emphasis placed on the study of the experience of the Soviet-German war, as we have noted, affected doctrinal development relating to air power. However there was recognition of the need to give a greater, even if only complementary, role to strategic aviation. Consequently an interesting characteristic of the postwar attempt to integrate the strategic aviation mission into the established doctrine has been the retroactive ascription of strategic bombing to Soviet operations in the Second World War.

The tendency to "make history" the easy way, by sleight of writing hand, had begun during the war. Lieutenant General (later Chief Marshal) of Aviation Golovanov, wartime chief of the Long Range Air Force, wrote in *Red Star*, November 1942, of his force: "Its aircraft, from the first day of the war, made mass raids on the deep rear of the enemy, making attacks from the air on political and economic centers of Fascist Germany and its satel-

lites." This statement was quite false. After a number of attempts which ended in complete failure Berlin had finally been bombed by a regiment of bombers of the Baltic Fleet air arm under naval Colonel (now Colonel General of Aviation) Preobrazhensky on 7 August 1941. There were no further long-range raids on the enemy's political and industrial centers until 1943.

In the early postwar period, however, Marshal of Aviation Vershinin, Marshal of Aviation Skripko, Colonel General (now Marshal) of Aviation Sudets, and others had quite correctly stated (in Sudets' words) that "long-range aviation in the course of the war worked predominantly in the interests of the [ground] front operations." Marshal of Aviation Skripko, in addition to noting that "our heavy bombers operated predominantly in the interests of the front operations," also provided the interesting information that "approximately one-third of the sorties of long-range aviation were conducted in attacks on the enemy's *troops* and his tactical deployment." The remainder were almost all interdiction missions, with some also for supply of partisans in the enemy's rear.

In the period since 1949 there have been a number of statements retroactively exaggerating the wartime role of strategic bombing in Soviet operations. For example, in 1950, Colonel General (now Marshal) of Aviation Rudenko declared: "Long-range bomber flights against strategic targets in the deep rear of the enemy occupied a significant place in the operations of Soviet aviation. These flights were begun in the very first months of the war." But the limitedness of this doctrinal revision is also apparent in the tenor of Rudenko's article. He was quite critical of what he termed "the pseudo-scientific theory that a war can be won by air bombing alone," which he attributed to the United States in World War II and which he said had "proved itself worthless." All these statements discuss long-range and strategic bombing as a supplement or complement to the basic and decisive combined-arms operations on the battlefield.

The true nature of the Soviet wartime bombing strategy, allegedly "completely confirmed" by the war, was described in July 1954 in the *Herald of the Air Fleet*, official Air Force organ, by an air force colonel:

The 1941-45 war completely confirmed the *correctness of the views of Soviet military science on the place and role of bomber aviation in contemporary war*. In the Great Fatherland War our bombers, together with fighters and attack planes, were widely employed to secure the operations of the ground troops, operating in close combined action with them.

Nonetheless it is clear that by 1949 strategic air power was being allotted a higher role than previously. In the years following, the retroactive attribution of a strategic or long-range bombing history to the Soviet air forces of World War II has continued. One of the recent accounts is also of interest for the emphasis on missions for the disruption of enemy economy and morale. Colonel General Kurochkin wrote in *Military Thought* in mid-1955:

The Soviet command, even in circumstances of an unfavorable relation of forces in the air, was able to organize and to conduct a number of air attacks on targets in the strategic rear of the enemy, including his economic centers such as sources of oil. These blows weakened the military-economic potential of the enemy, undermined the morale of his people and troops, and made possible raising the morale of our army and people.

Thus the Soviet military leadership has, throughout the post-war period, sought to integrate long-range aviation into its air power establishment within the basic framework of the continuing strategic concept. Bombing of the enemy economy in a general nuclear war would complement the actions of the Soviet long-range air force and all other military forces against the enemy military forces, ranging in their deployment from "front lines" to SAC bases in the United States.

adding hardware

As Soviet military thinking evolved toward these views on the role of long-range air power, a strenuous effort was under way to provide the long-range capability to correspond to the emerging doctrinal requirement.

The wartime decision by Stalin in the spring of 1942 to establish an independent long-range air force shows that he realized such an arm had potentialities. It is quite likely that Marshal Golovanov impressed upon him the need for better bombers with which to equip this force. The obsolete TB-3 heavy bomber of the mid-1930's, which the Soviets still had in 1941 when war broke out, was ineffective. The TB-7 and Pe-8 which replaced it were, while an improvement, not adequate to the needs of the time and no match for the German fighters of the day. Consequently the backbone of the Soviet "long-range" air force was the American twin-engine B-25 bomber, provided in substantial numbers under lend-lease aid. The Soviets insistently requested B-24 and B-17 heavy bombers, but only a single B-24 and no B-17's were provided.

In 1943 at Teheran, according to General Arnold, Stalin asked "innumerable and very intelligent questions . . . about our long-range *bombers*," although "he was just beginning to learn something about strategic bombing." It is probable that this attitude—placing the weapon ahead of the doctrine—has characterized much of subsequent Soviet development. By chance four American B-29A aircraft crash-landed in Siberia in 1944, giving to the Soviets an unexpected major gain in their efforts to construct a heavy bomber. The Soviets publicly unveiled the Tu-4, General Tupolev's copy of the B-29, in August 1947, precisely three years after acquiring the American bombers.

But again history is not permitted to stand in the service of truth when it can be distorted to Soviet advantage. And so we read as early as 1949 in the *Great Soviet Encyclopedia*: "In the period of the Great Fatherland War, Tupolev created a bomber superior in its tactical flight characteristics to aircraft of a similar class in Germany, England, and the U.S.A."*

Subsequently while producing the Tu-4 in quantity and training a resuscitated and enlarged long-range air force in its use,** the Soviet aviation research and development organization worked toward the attainment of modern jet bomber aircraft suitable for long-range operations. The talent of German scientists and engineers was exploited to prepare parallel aircraft designs and even prototypes. But German scientists were not permitted to work on the actual jet bombers developed by the Soviet design bureaus headed by Lieutenant General A. Tupolev, Lieutenant General S. Ilyushin, and Major General V. Miasishchev, all of the Aviation Engineering Service. In May 1954 the twin-turbojet medium Badger and the four-turbojet heavy Bison bombers were publicly flown in Moscow. A year later the Badger and Bison were flown in operational-unit numbers, and a new multi-turbo-prop long-range bomber, the Bear, was disclosed.*** The Soviet air force is rapidly closing the gap in aircraft types available for long-range employment and in available heavy jet and turboprop bombers, although for the next few years the United States will continue to have a substantial lead over the Soviet Union in numbers of medium jet bombers.

So we see that beginning in the Stalinist period efforts which have since borne fruit were under way to develop modern long-

*In 1946 Marshal of Aviation Skripko had admitted that the American B-29 was "the most powerful long-range bomber participating in the recent war." (*Red Star*, 11 August 1946.)

**The wartime Long Range Air Force (ADD) was converted into the Eighteenth Air Army of the Air Force of the Soviet Army in December 1944. In early 1946 it was re-established as an autonomous Long Range Air Force (now termed DA).

***"Badger," "Bison," "Bear," are Western designations to identify these aircraft. The Tu-4 is called "Bull." In Soviet parlance, the heavy four-jet "Bison" is called the "Sledgehammer" (*Molot*). The "Camel" is the transport version of the medium bomber "Badger."

range bombers. A former Soviet air force officer who defected to the West reports that Stalin gave increased attention to strategic bombing after he had been in Potsdam in 1945 and personally observed the destruction in Berlin caused by the strategic aviation of the Western Allies. Lieutenant Colonel Tokaev, a former Soviet air force technical officer, has reported that the long-range bomber force was being given special attention by the Politburo at the time of his defection in 1948. In any event it is evident that Stalin gave his approval to the development of this new arm, the West's primacy in which, as with the atomic bomb, he may have envied for reasons of prestige as well as for its undeniable military utility. But it is equally clear that Stalin did not permit Soviet military doctrine to be basically altered by interest in strategic bombing. He was providing a useful arm for this purpose to supplement the decisive action of the combined forces on and over the battlefield.

This policy was Stalin's because at the least he gave it his approval. But it was not Stalin's alone. The post-Stalin Soviet military leadership has continued to adhere to the essential doctrine of combined-arms action in implementation of the strategic concept of destruction of the enemy's military forces. But can this mean that strategic bombing remains but a "supplementary" arm in the thermonuclear era?

Soviet Air Doctrine since Stalin

In discussing Soviet views on the role of strategic air power in the postwar Stalinist period we have noted no reference to an obviously crucial aspect: the influence and effect of nuclear weapons. Similarly there was no sign of attention to the geo-strategic problems posed by intercontinental combat ranges. It is quite likely that technical and operational aspects of these issues were considered by the Soviet general staff and air and naval staffs, although no indication of this is to be found in the published data.

Now let us turn to the post-Stalinist period. It has been characterized by explicit awareness of the influence of nuclear capabilities on the significance of strategic bombing. This is evidenced in an article in *Red Star* of August 1955:

The creation of atomic bombs has significantly increased the striking power of bombers. The utilization of turbo-jet propulsion led to a growth in speed and practicable ceiling of flight. As a

consequence, the significance of heavy bomber aviation with a large operational radius, as a means of air attack for the destruction of important strategic targets in the deep rear, has been raised.

With the development of air science and technology, strategic bombers have become all the more powerful and effective a weapon for air attack. However, the means of air defense have been perfected simultaneously.

And, less explicitly, an article in *Military Thought* in early 1955 marked as "an important task" of Soviet military science "the further working out of new forms and means of crushing blows against the enemy."

Thus the Soviets have been developing a greater understanding of the implications of nuclear weapons. Nonetheless Marshal Zhukov asserted, both in 1955 and 1956, "One must bear in mind that one cannot win a war with atomic bombs alone" and "Air power and nuclear weapons by themselves cannot determine the outcome of an armed conflict." And again in 1957 he re-emphasized his point: "*In the postwar construction of the armed forces we are proceeding from the fact that victory in future war will be achieved only by the combined efforts of all arms of the armed forces and on the basis of their co-ordinated employment in war.*"

And an air force officer, Colonel Pshenianik, wrote in *Soviet Aviation* in March 1957: "No one arm or component of the armed forces can replace another, and cannot decide the outcome of an operation, much less of war as a whole. . . ."

strategic bombing's role

Several Soviet accounts for general popular reading have described the role of "long-range bomber aviation" (presumably the enemy's, but also possibly their own) in terms including economic and city bombing. For example, a civil defense manual (in 1953) stated:

Long-range bomber aviation is intended for attacks on targets deep in the rear of the enemy with the objectives of undermining his military-economic power, affecting the morale of his armies and population, disorganizing communications, and gaining air supremacy. Long-range aviation is the main threat to the rear.

Nonetheless long-range striking capabilities continue usually to be discussed in terms of attacks on enemy military forces deep in the rear, in indirect combined action with the main combined opera-

tions forces in the theater. Lieutenant General Tsvetkov wrote in the authoritative *Military Thought* in 1955:

The great operational radius of contemporary aviation creates the conditions for the conduct of independent air operations seeking the destruction of important targets or groupings of the enemy deep in the rear. Such an operation as air operations to destroy strategic military targets of the enemy, and also the disruption of naval and airborne operations, may not be connected directly with operations of the ground forces or navy. Positive results of such air operations can show significant influence on the general course of the armed conflict and thus predestine the subsequent success of the operations of the land and sea forces, and especially if they are properly harmonized with one another.

“Strategic bombing” is variously construed in the West, sometimes as all the operations of the Strategic Air Command, sometimes as a strategy of massive destruction of the enemy’s economic and political-morale base by bombing in order to win a military decision. The importance of strategic bombing in the first, general sense has greatly increased in the Soviet Union. At the same time Soviet military thinkers continue at present to reject reliance on a strategy of destroying the enemy’s economy, assigning to economic-population bombing an important role complementary to the main military effort by combined military forces seeking a decision by destruction of the enemy’s military forces in-being. In a general nuclear war, this “combined action” to destroy the enemy’s military forces includes of course a major and indeed crucial role for the long-range air forces: destruction of the enemy’s strategic striking power—SAC, the British Bomber Command, and probably U.S. and U.K. fleet carrier forces. And in a general nuclear war we can expect additional direct bombing of selected economic targets, in view of the Soviet recognition of the value of “simultaneous action against the army and the economy of the enemy.” Colonel Denisov, an air force writer, stated in 1953: “Our air thought considers necessary the action of air power against military-industrial centers and communications of the enemy, evaluating this action as a means *complementing but by no means replacing* operations conducted by the combined efforts of all the armed forces.” Thus within an over-all strategy of military action directed primarily against the enemy’s military forces-in-being the Soviets recognize the value and even necessity of bombing military industry, and even the economy in general “with the aim of undermining the economic potential of the country” (as Colonel Maryganov wrote, also in 1953).

The most authoritative Soviet statement on the "conventional" target status of industrial and transport centers was made by Marshal Vasilevsky in January 1957. The context of his remarks related to defensive actions by the Soviets, and hence they reflect the Soviet attribution to the United States of an economy-and-population-bombing strategy. But Vasilevsky seems to go beyond that, too, with words that imply Soviet attacks on the same targets:

It is well-known that in contemporary circumstances the distinction between the front and the rear has been lost. Industrial centers, cities, installations [sic], transport, and the rear of the country are targets for enemy attack as much as troops on the front.

But while now giving conscious and explicit recognition to the increased importance of bombing the enemy rear with high-yield modern weapons, the Soviets, as we have seen, have continued to reject a strategy based on this action at the expense of "counterforce" missions against all enemy military capabilities. Major General Khlopov, writing in *Military Thought* in 1954, described as "defective in its foundation" the American reliance on "the theory of [strategic] air war, exaggerating the potentialities of this one form of the armed forces" and erroneously assuming that "powerful flights of strategic bombers can so effectively and quickly undermine the military-economic might and morale of the enemy that his will and ability to resist will be broken." How then is a major war today to be won? In the nuclear era as before, according to the General Staff organ *Military Thought* in 1955, "the defeat of the enemy will be achieved above all by means of the annihilation of his armed forces."

It may be significant that the Soviet long-range heavy and medium bomber force is titled the "Long Range Air Force" rather than the "Strategic Air Force." The former designation reflects simply the capability which distinguishes the weapon system—range of striking power. The latter may imply by inference the target system of strategic capabilities for war. Marshal Zhukov, in his speech to the Twentieth Party Congress, mentioned various categories of aviation including both "strategic" and "long range," suggesting that part of the Long Range Air Force may secretly be designated as the "Strategic Aviation" and be assigned missions of strategic bombing of the enemy's economy and cities.

We can at present only speculate on the influence which Western views on strategic air power may in the future have on Soviet doctrine. The new tendency to study more seriously bour-

geois military science should acquaint Soviet airmen with views previously not expressed in the Soviet Union. One illustration was the translation and publication in the official *Herald of the Air Fleet*, in June 1955, of a published address by General Curtis LeMay on the mission of the Strategic Air Command. There were no comments or "corrections," and there was no refutation, except for one statement introducing the translation, which claimed: "LeMay obviously exaggerates the condition and combat potentialities of U.S. strategic air power." Earlier there had been published in translation at least one volume of the *United States Strategic Bombing Survey* (The War in the Pacific), in 1949, reissued in 1956. It is perhaps of interest that this translation was made and published by the Soviet Navy, rather than by the Air Force of the Soviet Army. The introduction to the translation contained a *caveat* that the data was not entirely trustworthy and alleged that the purpose of the USSBS was to prove superiority of the air force, by fair means or foul, as a bargaining tool of the USAF in inter-service budgetary competition. Nonetheless the translation of the volume (and perhaps others) was hardly undertaken to "demonstrate" this propaganda point.

Belated recognition of the strategic implications of the greatly enhanced striking capabilities of long-range air power came from Marshal of Aviation Rudenko (First Deputy Commander in Chief of the Air Forces) in 1955:

Under conditions of contemporary war, when atomic and hydrogen weapons are in the armament of armies, and jet aircraft are capable of covering great distances, the role of the air forces has still further risen. They must be prepared not only to annihilate any hostile aircraft which appears in the Soviet sky, but also to deal crushing blows to an aggressor.

In his speech at the Twentieth Party Congress in February 1956, Marshal Zhukov stressed the increased importance of air power:

In the composition of our armed forces the relative weight of the air forces and air defense forces have significantly grown. . . .

The Central Committee of the Party and the Government devotes particular attention to the development of the air forces, as a most important means of maintaining the security of our Motherland. At the present time we have first class jet aviation capable of meeting any tasks which are placed before it in case of attack by an aggressor.

And a few months after Marshal Zhukov's statement, Chief Marshal of Aviation Zhigarev commented more specifically:

The relative weight of aviation in the composition of the armed forces has significantly grown in the postwar period. And this is entirely understandable since weapons of enormous destructive power are now part of the armament of contemporary armies, and in order to guarantee the security of our country it is necessary to have strong and perfected means of air defense, and also our own powerful aviation ready at the call of the Party and Government to fulfill any mission in the interests of our state and our people.

Though these are but statements of an obvious truth, they are unprecedented and unsurpassed as "air force self-assertion" in the U.S.S.R.

Perhaps the most significant signs of awareness of the potentialities of a long-range nuclear and thermonuclear striking capability have been displayed by the post-Stalin *political* leadership. Their evaluation of the value and necessity of such a capability is implicitly in terms of its effectiveness for *deterrence*, and possibly also for aggressive political purposes of threat or blackmail. It is important to realize that such a view is quite consonant with the strategic concept for winning a war without reliance upon strategic bombing. That is to say: While long-range air and missile attacks on the enemy's long-range striking power would be crucially important in a general nuclear war, if any limitation on use of nuclear weapons were found advantageous and possible the Soviet deterrence employment of this capability could be extended into war to enforce restrictions to a nonnuclear or limited nuclear campaign. Since the Soviet strategy and force structure are not based upon a necessary reliance on strategic air power, the Soviets thus retain the choice on nonuse of this weapon system, Soviet superiority in other forms of military power being assumed to ensure a high probability of success in achieving the objectives of a nonnuclear or even limited (tactical) nuclear war.

In the Soviet view, even in a general nuclear war, the role of strategic air power while absolutely necessary and crucial is not "decisive" in the sense of fully determining the outcome of the war. Great as the importance of long-range striking power would be in such a war, the use of massive ground forces to seize and hold territory after destroying the balance of the enemy's military forces is considered ultimately decisive.

The earliest Soviet allusions to intercontinental weapon systems appeared in late 1953 and early 1954. The first appeared in a Soviet government statement commenting on President Eisenhower's "atoms for peace" address to the United Nations in De-

cember 1953. Similar statements were repeated by Khrushchev and Bulganin in 1955. These statements have referred primarily to the "state of the art" of weapons development rather than to specific achieved Soviet capabilities. On the other hand, ever since the early 1950's the Soviets have declared themselves "ready to deal a crushing rebuff to any aggressor." These statements have continued to appear frequently in the post-Stalinist period and have been characteristic of both the Malenkov and Khrushchev administrations. During the past several years the Soviets have on a number of occasions alluded publicly to their growing intercontinental aviation and missile capability.

In military writings, in political statements, and in their weapons procurement program, the Soviets display their increasing interest in developing a long-range striking force. The objectives of this weapon system are, first, to serve as a deterrent (and perhaps as a threat) in peacetime or limited war, and possibly extending into a major war; and secondly, in a general nuclear war, to form one important weapon in the total effort to destroy the enemy's military strength. To destroy the key enemy weapons launched from another continent, it is necessary to have and to use an intercontinental capability. Under the Soviet strategic concept long-range bombing forces would be employed primarily against distant enemy military capabilities, especially bases of the Strategic Air Command located in the United States and advance areas overseas, and possibly also against key military-industrial targets.

Since it is generally accepted that the priority target of long-range bombing forces of each side is the enemy's long-range bombing force, one may question the practical significance of the distinction between the strategic concept of destruction of the economy and population and the concept of destruction of the military forces of the enemy, especially with the employment of multi-megaton weapons of extremely large destructive radius. But the distinction remains very great. In the American concept use of SAC to neutralize the Soviet Long Range Air Force is essentially a necessary prior *diversion* of effort from strategic bombing. The way to *win* a war is still seen as the subsequent destruction of the Soviet economic-population structure; or, at the least, the threat to do so followed if necessary by its fulfillment. In the Soviet concept the use of the Long Range Air Force to neutralize SAC is not a diversion but the primary mission of that force. The way to *win* a war is still considered to be the subsequent destruction of the rest of the enemy's military forces, of all arms, wherever they may

be, and the physical seizure and control of territory and its resources.

Strategic bombing of the economy and population thus has not been adopted as the foundation of Soviet strategy in the nuclear era. In a general nuclear war the role of the Soviet long-range air forces and missiles in neutralizing the enemy (American and British) strategic air power by powerful strikes would be of crucial importance. But in the Soviet view, while crucially important, long-range air power remains one of several broadly complementary key elements in total military power, all of which are essential. And in a nonnuclear or limited war, the role and significance of strategic aviation would clearly be less, although it could perform important missions complementing the combined operations of theater land, air, and possibly sea forces. The current Soviet military and political leadership do have a clear awareness of the need for powerful long-range bombing (and, later, missile and possibly other intercontinental) capabilities to attempt to neutralize SAC, either by stalemate or by its destruction.

The mission of conducting the struggle for air superiority or supremacy has other aspects too in an atomic war. The highest priority in time would, as we have implied, be given to attacking the enemy's air-atomic delivery forces. Colonel Safonov (in 1954) made a rare specific mention of this obviously key target, "*airfields on which atomic-carrying aircraft are based.*" Soviet air doctrine on the gaining of air superiority and supremacy has, however, ever since the prewar period, emphasized that a combination of measures is required: attacks on the enemy's airfields, bombing of the aviation industry, and especially air battle by fighter-interceptor aviation. Even as recently as 1956 it is said in the *Handbook for Civil Defense*: "Fighter aviation is the most powerful means of combat with the enemy's air force." Similarly, at least until 1955, Soviet air force writers explicitly denied that attacks on enemy airfields or aviation industry could be the major means of gaining air superiority or supremacy. Nonetheless some of the most recent statements emphasize attacks on enemy airfields as well as fighter interception, reflecting awareness of the increased importance of this mission. Lieutenant General Tsvetkov stated in 1955 in *Military Thought*:

In the course of the recent war it became quite clear that the ground and sea forces can successfully operate only with dominion in the air of their aviation. In winning this superiority the main role is played by air forces destroying the enemy's aviation on its airfields and in air battles. Dominion in the air is achieved by a

series of air engagements and blows on basing points of the enemy's aviation, which taken together are an independent operation of the air forces.

Thus in the Soviet view air supremacy in contemporary war is achieved by a combination of air interception and attacks on the enemy's air bases. According to the *Great Soviet Encyclopedia* (in 1956) attacks may also be made on aviation industry, petroleum stocks and facilities, and even aviation training centers. This year a Soviet air force colonel has summed it up in *Soviet Aviation*:

Aerial superiority has enormous significance for success of an operation and the conduct of war as a whole. It is achieved by aviation in combined operation with rocket weapons, artillery, airborne troops, and means of active air defense. Without achievement of aerial superiority one cannot think about a swift seizure of the strategic initiative in the beginning period of a war, and of successful development of combat operations on land and sea.

In a general nuclear war, the main objectives presumably would be: (1) attacks by Soviet bomber aviation on Western atomic-air bases, above all SAC, and (2) attacks by Soviet fighter aviation and anti-aircraft conventional and missile artillery on Western air formations which succeed in avoiding destruction on their bases. This action by Soviet long-range bomber aviation, which would require attacks on bases located both in the United States and around the world, would thus be "an independent operation of the air forces." It would continue to implement the strategic concept of destroying the enemy's armed forces, as indicated by another writer in *Military Thought* (in late 1955): "Supremacy in the air has the objective not only to resolve the tasks of the air force, but *above all* to create favorable conditions for the operations of the ground forces, and on the coastal sectors for the navy."

Among other important targets of long-range aviation are army and navy bases and concentrations and interdiction targets such as major rail and road junctions, and ports. Finally, as we have noted, selective bombing of military-industrial targets such as aviation and munitions factories would probably complement direct action against the enemy's air and other armed forces.

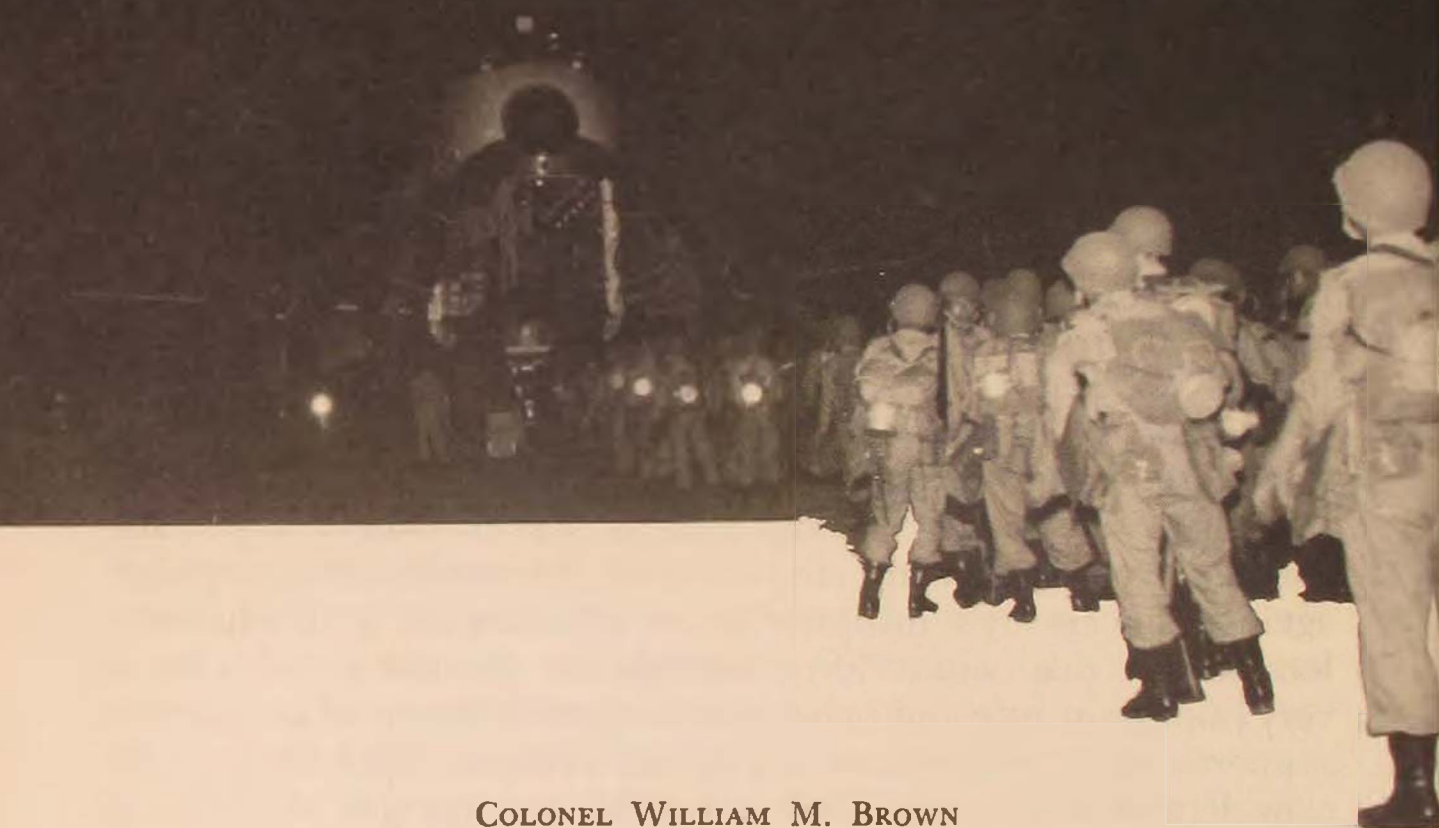
Throughout the postwar period the Soviets have developed several generations of modern fighters for general purpose, and in recent years all-weather interceptors also. Those models standardized (like the Mig-15, 17, and 19) have been procured in very large quantities. Similarly jet light bombers and attack bombers

have been provided in substantial numbers to meet the requirements of tactical close support and interdiction in support of the ground forces. Two thirds of Soviet aircraft strength continues to be assigned to support of the surface forces. These indications underline the significance of doctrinal expressions of the importance of combined-arms operations.

IN conclusion, we see that the role of air power in Soviet strategy is distinguished by a number of characteristics differing from our own. Soviet recognition of the implications of nuclear weapons was delayed during Stalin's time. It has since developed and may further change in the future. The crucial importance is attributed to nuclear strikes to destroy the enemy's nuclear delivery capabilities in a general war. Destruction of the enemy's economy and population, of the sources of his warmaking capacity, is not considered the basis for a strategic concept ensuring victory, although in a total war this is certainly seen as one extremely important element complementing the over-all counterforce campaign against the enemy's military forces of all arms and wherever located. In this counterforce strategy the ground forces play a very important role and hence are assigned substantial tactical air support. Air defense, including fighter aviation, is similarly given considerable importance. Air power has not become the cornerstone of Soviet military strategy, but it has been recognized as a key element of increased importance in the nuclear era and has been provided with the resources to develop what the Soviets consider to be the necessary capabilities to perform its missions.

Washington, D.C.

Operation Olive Branch



COLONEL WILLIAM M. BROWN

OPERATION Olive Branch was unique in the 315th Air Division's varied history in that the actual physical airlift of 548 Indonesian troops and their 91,424 pounds of equipment from Djakarta, Indonesia, to Beirut, Lebanon, was undoubtedly the smoothest and longest airlift accomplished in the Far East.

From the outset the problems encountered were unusual since they had little or nothing to do with airlift per se, its capabilities or limitations. First, it was only a few days before Christmas of 1956 when the airlift requirement was levied on the 315th Air Division. The departure dates from Tachikawa Air Base were projected to fall within the first ten days of the New Year. It was during this critical period of annual holiday inertia when the obvious question arose whether there was enough time to obtain the necessary 170 passports and visas for crews by the planned departure date of 6 January 1957.

Second, there was little or no clear-cut evidence of what prior action the United Nations had taken with the eight countries involved for expeditious handling or waiving of the customary and time-consuming diplomatic clearance procedures for entry, departure, and flyover for our crews and troop passengers.

Third, even a most casual or optimistic observer had to concede that

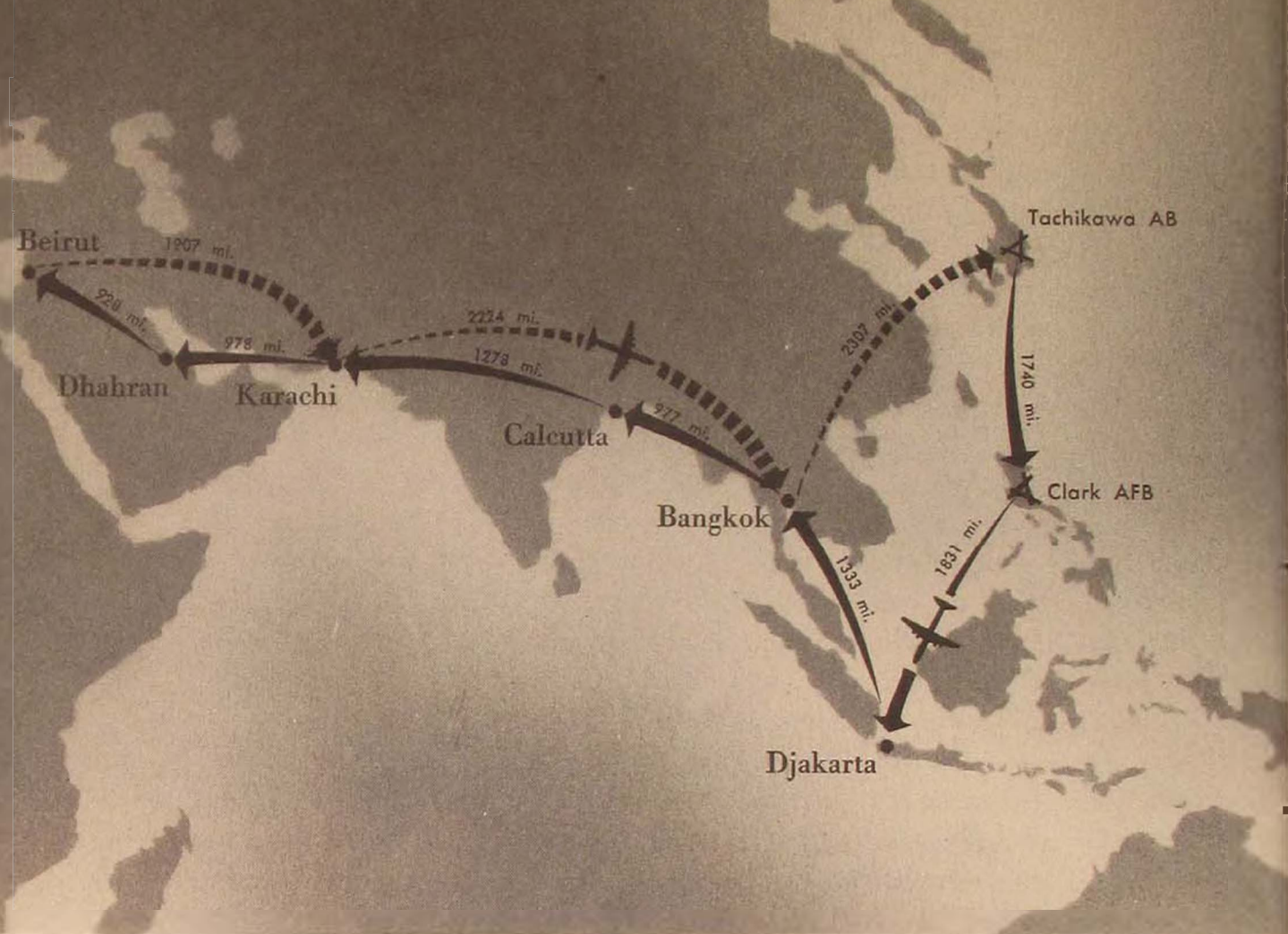
the usual precise and up-to-the-minute aircraft contact and control would suffer because of communication inadequacies along the air route.

A few precious days were consumed on the first problem when our headquarters received three requirement messages spread days apart and out of their proper sequency. By 27 December all the available requirements were received and acknowledged and the operations orders were passed on to the 374th Troop Carrier Wing on 28 December committing nine C-124's and one C-119. Departure dates from Japan were set for 4 and 6 January 1957. On 4 January the C-119 would proceed to Djakarta to obtain loading information and then pass along the air route and drop off liaison officers at refueling and crew rest points. Also on 4 January the combat airlift support unit (CALSU) commander and his movement control center (MCC) specialists were scheduled to depart in one C-124. On 6 January the remaining eight C-124's were to follow, blocking out at one-hour intervals.

On 27 December, after crew and key personnel lists were finalized by name, the American Embassy in Tokyo was presented an urgent request for 170 passports and visas for travel to and through the eight countries involved. But holiday inertia also pervaded the State Department. After a conference with the consular officials, it was finally agreed that 27 passports would be issued. These were to go to the advance-party liaison officers, the CALSU commander and his staff, and each aircraft commander. At this time a blanket mission clearance waiving the normal diplomatic requirements of all nations on the air route was requested for other personnel.

On 4 January, although neither complete route clearances nor all the passports had been received by time for departure from Tachikawa, it was

Another unobtrusive chapter in the story of the USAF's use of airlift to support the foreign policy and national objectives of the United States in the cause of peace was written in late 1956 and early 1957. The issue of the control and operation of the strategic Suez Canal had boiled over in October with armed intervention by Israel, France, and England. The case came immediately before the United Nations Organization, and sides formed quickly and ominously. On 5 November the U.N. General Assembly voted to establish the United Nations Emergency Force to secure and enforce a settlement of the armed conflict. Some twenty small nations in all quarters of the world agreed to contribute troops to the 6000-man force. One by one the belligerents consented to the military intervention, but France and England made the withdrawal of their forces from Egypt conditional on the arrival of the U.N. Emergency Force. Clearly the situation would remain precarious until the Emergency Force could take up positions and interpose itself between the belligerent forces. Since most of the force was made up of small contingents from nations geographically remote from Egypt, assembly by surface transportation would consume months when hours were at a premium. At this point the United States offered the facilities of the United States Air Force to **airlift** the U.N. troop components to the assembly areas. Colonel William M. Brown, Commander of the 315th Air Division (Combat Cargo), reports on one of the resulting series of air movements—Operation Olive Branch, the improvised air movement of the Indonesian contingent of the United Nations Emergency Force.



decided to proceed with the mission as planned, on the hope that complete clearances would be granted by the time all the aircraft reached Bangkok on 9 January. We were particularly anxious to receive confirmation of our messages to the air attachés along the proposed route.

problems on the way

After completion on 4 January of two uneventful flight legs to Djakarta via Clark AFB, Philippines, by the advance C-119 and the one CALSU C-124, some critical points were still in doubt.

Although excellent, the MATS route briefing at Clark AFB did not fill in all the information missing from the foreign clearance guide. For instance the briefing covered the flight only to Saudi Arabia; the firm medical shot requirements for crews and Indonesians were not specified; night operations in and out of Bangkok were not described; no acknowledgments of receipt of our itinerary messages at anticipated stopping points were given; no assurance was made that our planes could overfly New Delhi, India, ordinarily a compulsory port of entry, on the return flight; and no permission was received to overfly Burma during hours of darkness.

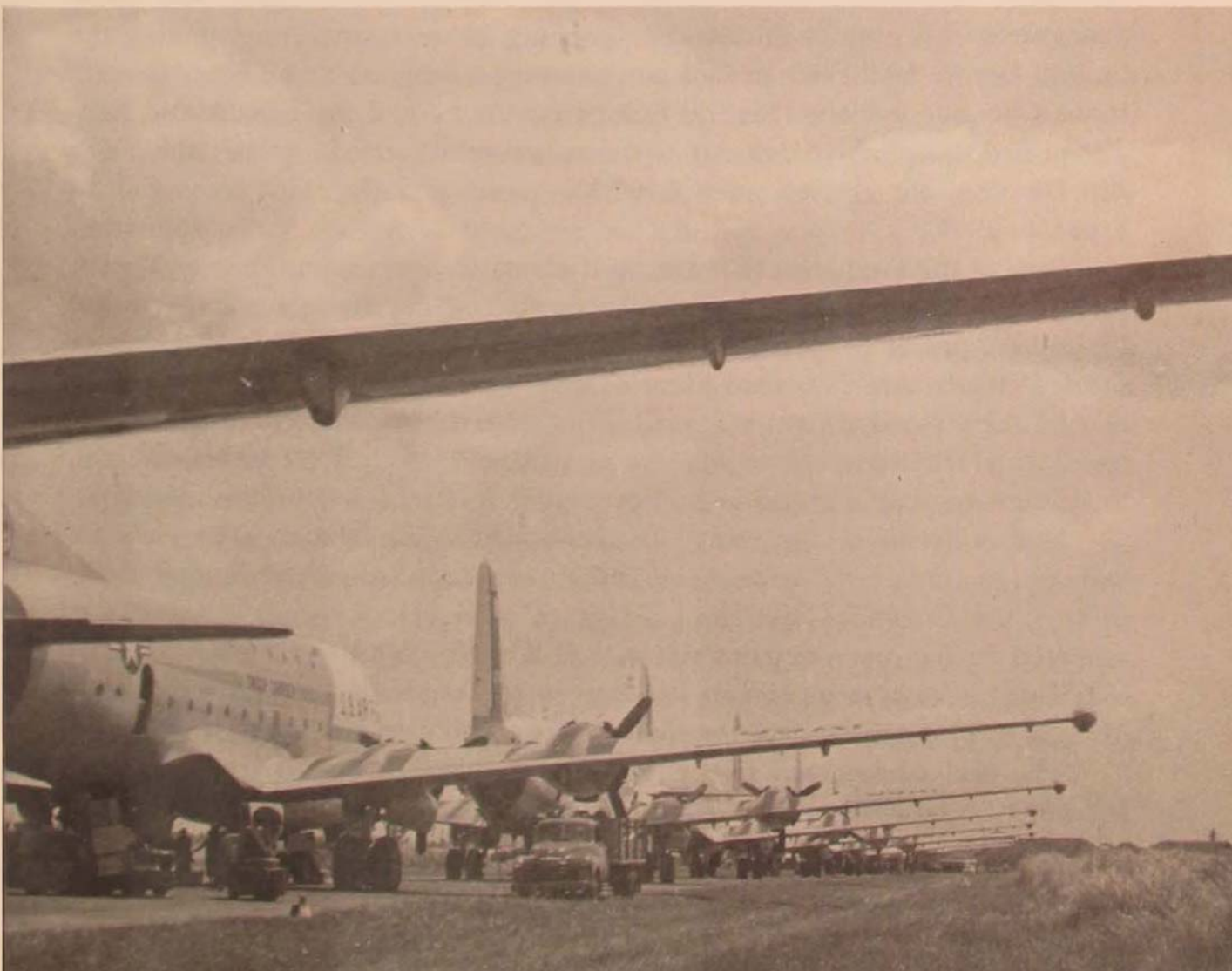
At Djakarta we found that the Indonesian government assumed the United Nations had made or was making all the necessary arrangements for their troop clearances in and out of countries en route. Washington ap-

parently considered this to be an Indonesian responsibility. This was later confirmed by a message to the CALSU commander from higher headquarters, received one hour prior to landing at Calcutta, stating that troop clearances were strictly a concern of the Indonesian government! At the risk of losing our "customers," steps were immediately initiated through our embassy to urge the Indonesian government to notify their en route consular officials of our proposed itinerary and to request that they obtain necessary Indonesian troop clearances.

The aircraft-handling facilities at Djakarta commercial airport were very satisfactory because of the airport's relative isolation. Prompt refueling was accomplished. The transportation, billeting, and general hospitality shown to us by the Indonesian Army were outstanding. The billeting for our officers was at the Des Indies Hotel; that for the airmen was at the Parliament Guest Houses. These were by far the best facilities available in the city. The excellent conveniences afforded us at Djakarta can be attributed primarily to the untiring efforts of our air attaché.

At Djakarta the kilos-to-pounds conversion of the basic weight of each Indonesian soldier made them each approximately forty pounds heavier than we had been advised in our preplanning. (The Indonesians had erred on the light side in converting.) And most important, the question of accepting and handling of ordnance equipment manufactured by six different nations com-

Eight C-124's load at Djakarta



pounded the difficulties of loading. We most certainly could have used an ordnance expert to make the final decisions in this matter. Every effort was made to airlift as much as possible, the breakdown being shown in the accompanying chart.

the mission

The actual airlift started on the morning of 9 January with the first elements of the Gardua I Battalion loading in the CALSU C-124's at 0300, Djakarta time. The Gardua I Battalion consisted of three companies totaling 548 men. The Indonesian officers used the public address system of the C-124's to identify each soldier by name and assign him a specific seat. This was the first and last time a roll call was necessary for the remainder of the trip! This prompt loading procedure took less than thirty minutes at each stop and thus provided additional rest time for the troops, as it eliminated the usual two-hour advance "show time" before each take-off. Because the troops were loaded on the first six aircraft, with the remaining three devoted to troop materiel and maintenance equipment, loading times were further reduced.

On the leg to Bangkok, 1333 nautical miles, all questions concerning the airworthiness of our passengers were answered. Practically to a man none had ever been in the air before and the big question, of course, was how many would get sick? It was a very pleasant surprise to find that only one or two became slightly and temporarily airsick shortly after the initial take-off. Other surprises were in store for us as the trip progressed. There was little or no horseplay, no littering of the aircraft from ration debris (at each stop every man carried his own trash out after policing his seat area), no jamming the limited latrine facilities. In fact our passengers were no trouble whatsoever. It soon became evident that the Indonesian Army had the neatest and best-disciplined troops the 315th Air Division had ever carried. (Note: the 315th Air Division has carried over 4,500,000 passengers since its activation in Japan in 1950.)

During the long hops that averaged about 10 hours each the troops spent their hours playing chess and checkers and reading from a seemingly unlimited supply of pulp magazines. Their pleasant and restrained behavior showed clearly that each man knew exactly what was expected of him. They carried their international responsibilities with dignity and restraint. It was certainly gratifying to us to observe at firsthand a relatively unknown and, to us, remote people rising to occupy a vital international role so efficiently.

Our twelve-hour crew rest at Bangkok started immediately after a simple Indonesian ceremony between the Indonesian consular officials and the officers of the Gardua I Battalion. This colorful ceremony of greeting was repeated during our next crew rest-stop at Karachi, Pakistan. At each location excellent bivouac arrangements had been made, enabling the troops to march directly from the aircraft to the bivouac area adjoining the landing strip.

The twelve-hour crew rests that were scheduled at Bangkok and Karachi left much to be desired for certain crew members. The twelve hours started

when engines were shut down and terminated at block time exactly 12 hours later. It was soon obvious that the crew chief and his scanners, in taking care of the refueling requirements, were not going to obtain adequate rest because of fuel-truck delays and the limited refueling rates. Instead of going into town to a hotel for their rest some crews hoped to gain additional time by sleeping on the aircraft. But this attempt to save up to two hours traveling between the airport and the hotel proved to be a minor fiasco because of the heat and the mosquitoes that were prevalent in large numbers in spite of mosquito bar.

Leaving Bangkok at 0300 on 10 January we made our next stop and ate breakfast at Calcutta, India. We had provided seven days' rations for each crew member, a supply which proved ample. To everyone's surprise each Indonesian soldier carried a three-day supply of canned rations that included canned cooked rice; it was the first time any of us realized that this staple food could be a canned commodity.

It was amazing how through our U.N. status and our liaison officer and his opposite number, the MATS liaison officer, the normal, anticipated customs difficulties that we are prone to associate with en route stops in India did not materialize at Calcutta. After a quick refuel at Calcutta the flight across India to Karachi, Pakistan, where we were scheduled for another 12-hour crew rest, took only seven hours. Arrival time was 1500 local time, which afforded some crew members a few hours of sightseeing and purchases from the bazaars. After a ceremony with their ambassador at the airport, the Garuda I Battalion immediately set up camp at the edge of the Pakistani Air Force flying field.

From Karachi, where wheels were up at 0300 on 11 January, to Dhahran, Saudi Arabia, 978 miles away, the trip took a little longer than planned because of excessive winds. The weather became cloudy, damp, and very chilly, and started to bother the summer-uniformed troops; and it remained with us right into Beirut. From take-off at Dhahran, made immediately after refueling and a wonderful breakfast, to landing at Beirut took five hours. The Royal Canadian Air Force with light blue U.N. colors on its American-made C-119's was waiting at Beirut for the Indonesian troops. Little time was expended in getting the Indonesians into trucks, after another ceremony with their ambassador, and to their camping site for rest prior to their departure for the Suez Canal Zone the next day. With one slight delay to change a cylinder on one aircraft at Karachi, all the troops were delivered to Beirut within 90 minutes of the original troop-movement control plan.

Our return to Tachikawa could not be the leisurely trip we would have liked because the aircraft and crews were urgently needed for theater airlift. Since we returned without payload we were able to gross out with fuel and made stops only at Karachi and Bangkok. Except for the one aircraft left at Beirut awaiting parts, which we subsequently had to fly from Tachikawa in a C-119, all aircraft touched down at Tachikawa some 6 hours ahead of our movement table.



Troops play chess in flight



Inspection at Bangkok

Indonesian troops load at Karachi



Welcome for Olive Branch, Beirut

communications difficulties

Communications, both in the planning phase and during the entire trip, proved to be an ever-present snafu that almost defied a reliable daily working solution and capability. Six radio crystals had to be made on the last Sunday afternoon before leaving Japan. This outstanding service was made possible by close supervision and liaison with indigenous material suppliers. Prior to departure vital messages had to be sent repeatedly (one particular message had to be sent 23 times) before confirmation was received. And quite frequently messages received were so garbled as to defy interpretation. This confusion was due, in some part, to the fact that our 315th Air Division messages sent out before leaving Japan to all the air attachés en route were in some instances actually received in advance of their official policy notification from Washington. Adding to the confusion were procedures that sent messages from Saudi Arabia to "next door" India via Washington circuits.

In addition to carrying two long-range Collins transmitters in the CALSU aircraft to anticipate and ease the communications bottleneck, the following actions were taken:

- All Military Affiliated Radio System (MARS) stations in the Far East and Middle East areas were alerted. These facilities were to be utilized by a commercial type of short-wave phone transceiver in the CALSU aircraft. It was hoped that the MARS facilities could handle the more routine messages and provide an additional relay capability.
- Clark (Philippines) Airways arranged to cover two additional long-range bands for coverage as far as Calcutta.
- Existing airway radio facilities were to be used, especially in requesting relay back to Tachikawa of all arrivals and departures for Olive Branch aircraft.
- The regular Air Force administrative teletype circuit was to be used.

Our MARS plan did not live up to its desired potential. With only one radio operator per aircraft, including the CALSU lead ship, it was impossible to monitor adequately the basic airway frequencies and work the MARS stations at the same time. This was especially difficult for the lead CALSU aircraft, which had to keep in constant touch with each aircraft in the operation. Added to this were other difficulties: only two adequate long-range aerials are available on the C-124 Globemaster; MARS stations did not have enough advance notice and information to render even token service; atmospheric conditions at that time of year had little or no effect on radio reception, but they played havoc with our efforts to establish and maintain a long-range transmitting capability; the lone radio operator was overworked, with long hours and the additional job of having to transmit practically all the routine position reports ordinarily done by the pilot or copilot; and our Collins transmitter for MARS contact interfered with our Loran reception, forcing us to cease transmission at the navigator's request.

In general the communications other than between the CALSU commander's aircraft and the aircraft "stream" are best described as unreliable and spotty. The inability to receive prompt confirmation of messages sent ahead was probably the most disconcerting part of the whole trip. These frustrations become doubly ludicrous when it is remembered that Olive Branch was an unclassified mission and all messages were sent in the clear.

maintenance

The bulk of the maintenance specialists was purposely carried aboard the last aircraft. A breakdown of specialists by type shows that we had six engine-conditioning specialists, four propeller specialists, two instrument specialists, four electrical specialists, two hydraulic specialists, one machinist, and one supply specialist.

CALSU and movement control center personnel augmented the aircrews in their individual specialties. The squadron maintenance personnel, in addition to accomplishing all line maintenance, assisted the scanners and loadmasters in their assigned duties. This augmentation provided in effect a double crew aboard each aircraft. Deploying the personnel throughout the aircraft in this manner provided the best possible maintenance coverage and the full utilization of all personnel in their flying specialties.

Actual maintenance difficulties encountered were minor. The one exception was the grounding of one C-124 at the destination, Beirut, Lebanon, for a double propeller change, caused by cracked propeller gears. Obviously it was imperative that the crew remaining in Beirut to make the two propeller changes have unrestricted daily access to their C-124 Globemaster. Because they were billeted in hotels in downtown Beirut and because the aircraft commander possessed the only passport and visa, their presence and daily movements presented a major dilemma to the Lebanese customs officials. Through an unprecedented cooperation between customs, airport management, and our embassy, a perfectly workable arrangement was settled on that was completely satisfactory in all respects. The above arrangements were only made possible by the outstanding relationships the MATS liaison office had established with the local customs officials.

The number of maintenance personnel in comparison to the amount of maintenance actually performed indicates an apparent overage of personnel to accomplish the job. But on a mission of this scope the maintenance workload would be expected to be many times greater than that actually experienced. As an example the present average engine life of the R-4360 engine would indicate two engine changes within the number of hours flown for Olive Branch. Happily none were experienced. Although two built-up engines and one prop were to be carried, an increase in the number of troops to be moved reduced this load to one engine and no spare prop. We returned to Tachikawa without having used the spare engine. Also there were eight jug (cylinder head) changes. Based on a 250-hour life span per jug, twenty-four extra cylinders were carried. Past experience has shown that

cylinder rows 1, 2, 6, and 7 on the R-4360 engine have a tendency to "carbon up" at the exhaust port, resulting in rigidity and subsequent cracking at the port attachment. (New techniques developed since Olive Branch by the 374th Troop Carrier Wing have extended jug life to an average of 700 hours.) In addition a thorough 60-hour post-flight inspection was accomplished on each aircraft at either Beirut or Bangkok in line with the 374th Troop Carrier Wing maintenance SOPs in the 150-hour periodic inspection schedule.

lessons learned

As a result of its experience on Olive Branch the 315th Air Division has obtained assistance from FEAF that will result in the issuance of passports for all C-124 crews, 50 per cent of our C-119 crews, and a reasonable number of specialists in the medical, aircraft and engine, communications, and

Operation Olive Branch

Statistical Breakdown

Passengers and cargo

Trip No.	Acft Type	No. of PAX	Weight of PAX	Weight of Cargo	Total Weight
1	C-124	92	21,896 lbs	0	21,896 lbs
2	C-124	90	21,420 lbs	7,639 lbs	29,059 lbs
3	C-124	92	21,896 lbs	6,259 lbs	28,155 lbs
4	C-124	92	21,896 lbs	8,186 lbs	30,082 lbs
5	C-124	92	21,896 lbs	7,616 lbs	29,512 lbs
6	C-124	90	21,420 lbs	9,240 lbs	30,660 lbs
7	C-124	0	0	29,970 lbs	29,970 lbs
8	C-124	0	0	20,462 lbs	20,462 lbs
9	C-124	0	0	2,112 lbs*	2,112 lbs*
		Total	130,424 lbs	91,484 lbs	221,908 lbs

Airlift personnel

Trip No.	Aircrew Personnel	Sq Maint Personnel	Press	Comm Pers	7th A.P.	CALSU & MCC	Liaison Officers
1	7	3	3	2	2	7	
2	10	3		1			
3	11	3		1			
4	10	3		1			
5	10	3		1			
6	10	3		1			
7	11	3		1			
8	10	3					
9	9	5		1			
10 (C-119)	7	2		2			5
Total	95	31	3	11	2	7	5

*This does not include approximately 20,000 lbs. of maintenance equipment and the spare engine.



C-124 returns to Tachikawa from Beirut

traffic career fields. This will improve reaction time as far as passports are concerned, although it does not eliminate the visa problem. Fortunately most of our stops did not require visas if they were less than 24 hours or in some cases less than 72 hours. Because visas for Saudi Arabia cannot be obtained in Japan, they would have had to be obtained at Calcutta or Karachi. Obviously it would not have been feasible to plan on obtaining them while en route. The most feasible solution would be for our U.N. representative to require as a condition to accepting a similar commitment in the future that U.N. member nations waive all diplomatic requirements for U.S. aircraft, crews, passengers, and gear involved in U.N. emergency-force movements.

The advance delivery of liaison officers at each scheduled stop proved to be invaluable, even where MATS liaison officers were available. Our liaison officers had reasonably accurate aircraft-load breakouts with them, which materially aided in the efficient ground handling of both passengers and aircraft. This information could not have been provided at en route stops through communications facilities available to us at Djakarta. In most instances the MATS liaison officers, where available, were superb in aiding our smooth progress toward mission completion, as were also our air attachés.

Radio facility charts, supplementary flight information documents for India and the Middle East, as well as approach and letdown charts were reproduced locally at considerable expense and inconvenience since only 4 copies of each were available in Japan and in the Philippines.

Point-to-point communications deficiencies have been described in some detail. Almost every attaché en route indicated that our diplomatic clearance requests were received with many garbles in aircraft serial numbers and in the date-time groups contained within the proposed itinerary. These garbles made it most difficult for the attachés to process clearance requests. This is

particularly significant when it is considered that no encoding or decoding was involved. The entire mission was unclassified. Had this not been the case it is doubtful that communications could have functioned well enough for the mission to have proceeded on schedule.

Shortly after the CALSU headquarters was established at Djakarta we were dismayed to find that none of the Indonesian troops had ever received yellow fever shots and that no serum was available in all of Indonesia. The Indonesians were supremely undisturbed and even slightly amused over our obvious concern. Calcutta and Karachi are notorious for their rigid enforcement of a requirement that all U.S. personnel arriving in India and Pakistan must have had yellow fever shots not less than 15 days nor more than 6 months prior to arrival. Violators have either been inoculated and held in quarantine for two weeks, sometimes in a jail, or have been held aboard the aircraft under guard until departure. Indonesian officials indicated that there had never been a case of yellow fever in Indonesia and that Indonesians traveling to India had never had difficulty on this score. Happily they were right, and the issue was not raised at Calcutta or Karachi, much to the surprise of our MATS briefing team. Had all inoculation requirements listed in the foreign-clearance guide been enforced, Olive Branch could not have started on schedule.

Bivouac areas for the Indonesian troops were provided at Bangkok and Karachi. Thailand and Pakistan queried the U.S. air attachés as to who would foot the bill, and on our return trip Thailand officials asked me whom and how to bill. Our Washington instructions were not particularly appropriate, since they suggested that foreign governments should submit cost estimates of proposed facilities direct to the U.N. for advance approval prior to provision of services and facilities. But after Olive Branch the 315th Air Division was instructed to pay en route bills from our normal operating budget. This amounted to approximately \$1000 for landing fees, fleet service, and boiled water; approximately \$44,000 for the POL bill; and \$24,000 for TDY per diem costs. At the time we were directed to initiate this troop movement, we were advised that it would be accomplished on a reimbursable basis. Instead the flying time used has of necessity been charged against our normal theater airlift allocation with a consequent reduction in our capability for the remainder of the fiscal year.

315th Air Division (Combat Cargo)

The Door to the Future

Understanding the Barriers to Creative Thinking

ORON P. SOUTH

IN HIS final report to the Secretary of War on the World War II activities of the Army Air Forces, General H. H. Arnold forecast that

. . . the problems which may have to be faced in 1975 or 1985 will require boldness, and the utilization of available skills, manpower, resources. . . . Any Air Force which does not keep its doctrines ahead of its equipment, and its vision far into the future, can only delude the nation into a false sense of security.

The development of the Strategic Air Command to its high state of readiness and effectiveness and operations such as the Berlin Airlift indicate that the Air Force has made vital contributions to the security of the country. But . . . has the Air Force made the best of what it has had? And is it prepared to face the problems of 1975 and 1985 confident that it has made the *wisest* use of skills, manpower, and resources?

To answer these questions it is necessary to examine some of yesterday's, today's, and tomorrow's problems and the *system* used for solving these problems, especially those of tomorrow. The ability to visualize what will be needed in the future and to keep doctrine ahead of equipment is not one that previous military organizations have developed with any notable degree of success. In *The Direction of War* Air Vice-Marshal E. J. Kingston-McCloughry says ". . . the biggest lesson which emerges from this review is how the military mind had, in fact, only groped its way toward progress in the art of war and the adoption of new weapons and methods made available by technological progress and experience."

If the Air Force is to do more than "grope" toward progress, a strong effort must be made to develop in it an atmosphere conducive to critical and creative thinking. In the final analysis the understanding of problems and the worth of the solutions to them

are determined by the extent to which Air Force people are free to use their maximum critical and creative capacities.

Considerable assistance in reviewing and examining Air Force capabilities and possibilities in the field of critical and creative thinking can be had by referring to Arnold Toynbee's *A Study of History*. In this work Mr. Toynbee is concerned with analyzing why civilizations grow and decline. Since the Air Force is a social entity in many respects, his conclusions may be applied with profit to the Air Force situation.

Growth takes place in a society, Toynbee says, when the masses are convinced by a creative minority that certain moves should be made. "All acts of social creation are the work either of individual creators or, at most, of creative minorities; and at each successive advance the great majority of the members of the society are left behind."

This fits well with what happened in the Air Force during the 1920's and 1930's. The creative minority during this period was relatively small. Names like Mitchell, Arnold, George, Chennault, Walker, Kuter, Wilson, Sherman, Milling, Gorrell, Foulois, Patrick, Knerr, and Webster come to mind, but when we add the names of others who assisted in the development of air theory and helped create air power, the list is still not large.*

We can also note that the enthusiasm and interest generated by this minority were sufficient to carry along the majority associated with air activities. This enthusiasm and interest were contagious enough to infuse with the same spirit the younger men who came into the Army Air Forces in World War II. The great majority of the members of society that were left behind, of whom Toynbee speaks, were in the Army and Navy.

It is important to note, however, the conditions under which this creative minority of the 1920's and 1930's worked. In the first place the minority was not responsible for the defense of the country. Generally responsibility breeds caution; the more responsibility, the greater the caution. Second, any changes in doctrine made by this minority would not obsolete expensive weapons in any appreciable quantity. The investment in materiel was not large, and all the aircraft on hand could have been scrapped without dealing the nation a grievous blow. Third, the men involved were for the most part young, without any of the conservatism which so frequently comes with age. They were not by any means convinced that what was good for grandpap was

*Additional names will be found in *The Development of Air Doctrine in the Army Air Arm, 1917-1941*, USAF Historical Studies: No. 89; and *History of the Air Corps Tactical School, 1920-1940*, USAF Historical Studies: No. 100, both published by Air University, Maxwell Air Force Base.

good enough for them. Fourth, the point of departure for their thinking was not a force in-being but rather a force that was at least ten years in the future.

In discussing why civilizations decline, or fail to be creative, Toynbee selects three factors as being the decisive nemeses of creativity. These are "Idolization of an Ephemeral Self," "Idolization of an Ephemeral Institution," and "Idolization of an Ephemeral Technique."

idol no. 1: the self

In developing the idea of "Idolization of an Ephemeral Self," Toynbee says that the same creative minority seldom responds successfully to two or more successive challenges. "Indeed, the party that has distinguished itself in dealing with one challenge is apt to fail conspicuously in attempting to deal with the next."

As an example to prove his point Toynbee cites the course of events in Virginia, South Carolina, and North Carolina. Virginia and South Carolina were southern leaders before the Civil War, but "twentieth-century Virginia or South Carolina makes the painful impression of a country living under a spell, in which time has stood still." In North Carolina, on the other hand, "the visitor will find up-to-date industries, mushroom universities and a breath of the hustling, 'boosting' spirit which he has learnt to associate with the 'yankees' of the North." The reason for this difference is not hard to find, says Toynbee. North Carolina had nothing before the Civil War, so her people had little to lose and were not inhibited after the war by "the idolization of a once glorious past."

If we now turn to a consideration of the effect of idolization of an ephemeral self on military societies, some interesting observations emerge. In World War I the armies and navies of the West were confronted with three new weapons—the tank, the airplane, and poison gas. Since gas has not been used since that time, we cannot determine the extent to which the challenge it posed has been met. With the airplane and the tank, however, the story is quite different.

The Germans in World War II showed a great appreciation of the possibilities of the tank and some appreciation of the possibilities of the airplane. But in their higher direction of the war they never were able to cut loose completely from the concepts of the past. Sir John Slessor put the matter well: "The Germans in the late war were land-minded; they did not understand air power,

and in the main tied their air force to the support of their Army."

The same observation, some contend, holds true of Allied leadership between the wars and in World War II. In naval warfare, for example, the airplane was not used extensively as a submarine hunter until the supply problem became acute. Tactics for using aircraft to seek out and destroy submarines had to be worked out *after* the war started.

Early in World War II an argument developed between the "deep setters" and the "shallow setters" over the depth setting for underwater explosion when depth charges were dropped from airplanes. The RAF Coastal Command had used ordinary bombs against submarines but found them ineffective unless a direct hit was obtained. At this point the switch was made to depth charges, and the argument arose as to the proper fuze setting. The problem was finally resolved when scientists in operations research recommended exploding charges at a depth of 25 feet. Within a few months the actual effectiveness of aircraft antisubmarine attacks more than doubled.

The story of the development of the tank between two world wars is an extremely interesting one. The reception accorded this new weapon was almost identical to that given the airplane. During World War I the United States completed only 26 tanks. By borrowing from the British and the French, the AEF was able to field one tank brigade. Its commander was a young colonel, George S. Patton, Jr. In 1919 the General Staff of the Army abolished the tank corps that had been established in 1918 and assigned tanks exclusively to the infantry. These two acts were, by General Staff action, incorporated as law in the 1920 National Defense Act. "The purpose was," in the words of Army historians, "to prevent the Tank Corps from ever being reconstituted to plague the Infantry and other arms as a separate mechanized force comparable to the Air arm."

In March 1921 the Ordnance Department requested a formal policy statement on tactical requirements for tanks. In reply the Adjutant General's Office, in April 1922, said: "The primary mission of the tank is to facilitate the uninterrupted advance of the riflemen in the attack. Its size, armament, speed and all the accessories for making it an offensive force must be approached with above mission as the final objective to be obtained in development." This principle established the basis for tank development for the next decade.

In 1927 the Army Chief of Staff, General Charles P. Summerall, issued a four-word directive which eventually helped force a

revision of the 1922 stand. His directive said: "Organize a Mechanized Force." In 1931 General MacArthur, then Chief of Staff, directed that "every part of the army will adopt mechanization and motorization as far as practicable and possible." But eight years later, when the Germans invaded Poland the armored force of the U.S. Army consisted of one brigade with a conglomeration of light tanks, armored cars, and undefended half-tracks.

Basic changes in the 1922 doctrine did not come until 1940 when the Armored Force was created and the infantry ceased to dominate the development of tanks. The views of the cavalry began to prevail and consideration was given to building armor and firepower into tanks. From the low point of 1939, thousands of tanks were built in the next five years for use in all theaters in World War II. Walter Millis, in his *Arms and Men*, says: "The central weapon of World War II was the tank, the armored and mobile weapons carrier which dominated most campaigns and which more often than not found all other arms—the air and even the infantry, the traditional 'queen of battles'—supporting it rather than being supported by it."

Despite the importance given the tank, when the supreme test came the tank was held back. After the breakthrough at St. Lô, General Patton's Third Army tanks rolled across France at an unprecedented speed. As American armies approached the Moselle, supply lines were extended and supplies became short, especially ammunition and gasoline. At this juncture a decision was made to hold Patton's forces on the defensive while supplies were stockpiled for an offensive in the north where Field Marshal Montgomery would attempt to breach the German lines through Belgium and northern France.

General Patton vehemently opposed this plan, contending that, given support, his armored forces could penetrate to the Rhine, possibly beyond, and end the war much sooner. General Omar Bradley in his book *A Soldier's Story* notes that "until the day he died Patton never recanted on his contention that had priority in supply been given him instead of Monty [Field Marshal Montgomery] and Hodges [General Courtney Hodges, First Army Commander], Third Army could have broken through the Saar defenses to the Rhine."

The decision made in this case has been discussed and argued about for several years and probably will be discussed for many more. The interesting point is that neither the tank nor the airplane was ever given the chance in World War II that their most outspoken proponents asked for.

The story of the fight for acceptance of an individual independent mission for air power is too well known to be recounted here. Suffice it to say that in this case too the Army leadership which had helped win World War I rested on its oars and did not rise to meet the challenge.

Today some contend that the Air Force, the Army, and the Navy are faced with a new challenge—the missile. If this view is valid, and if Toynbee's thesis is correct, then the question for the Air Force becomes: Can the creative minority which surmounted the challenge of the airplane also rise to the challenge presented by the missile?

Some see the chief significance of the answer to this question as being whether the Air Force will continue as a separate arm of the defense establishment. The extremes of this view have been stated by Mr. Jim G. Lucas in a syndicated article entitled "Life of Air Force at Stake in Interservice Missiles Row," which appeared in the *Birmingham (Ala.) Post-Herald*, 2 April 1957, as well as other newspapers. Lucas argues that as the day of the piloted warplane nears its end the Air Force is fighting for its existence. He says that this explains why there is such ugly bitterness in the interservice rivalry over control of missiles. The Air Force cannot afford to lose. Although Secretary Wilson's order of November 1956 gave the Air Force first claim to the long-range and intermediate-range ballistic missiles, this order is not irreversible. Army and Navy men, says Lucas, know that the final decision on missiles will determine whether the Army and Navy will become "second-class citizens" in the defense setup. With the Air Force, says Lucas, the question is more basic. "It is a question of whether we have an Air Force at all—as they know it—10 or 15 years from now."

Unfortunately Mr. Lucas apparently assumes that the only real issue is the struggle among the services for first position in national defense. He overlooks one of the crucial points in the debate over the missiles—How shall they be used? Are they to be considered as artillery and used in the artillery role (support of infantry), or are they to be considered as separate weapons capable of independent missions?

From another point of view the furor over missiles is but a tempest in a teapot. The real challenge of today in this field is not the missile but rather another symptom or part of a continuous challenge. To understand this view, we must look back to the turn of the century.

The development of a practical internal combustion engine

opened the road to the tank, the automobile (and truck), and the airplane, all instruments designed to revolutionize warfare. The engine itself was the product of the industrial revolution which started in the 18th century in England. This revolution produced other products that could have been used in war, but by and large most of them were neglected. Of more importance is the fact that by 1900 the industrial revolution had reached the point where many possibilities existed for the development of new weapons, but the opportunities were not seized.

This line of reasoning leads to the conclusion that one of the real challenges of the last fifty years has not been the airplane, or the tank, or any particular instrument of war but rather the accommodation to an accelerated industrial revolution which some have called the technological revolution.

At the turn of the 20th century military planners might have seized on the internal combustion engine as a potential for revolutionizing war. They might have said to themselves, "This development will make possible conveyances that can travel over ground much faster than the horse, and it may make possible machines that can fly through the air. If such advances are possible, we should make all speed to investigate the feasibility of constructing horseless conveyances and flying machines and determine how they can best be used in war."

If such thinking had taken place, if there had been an ability to visualize that wars might be fought differently than they had been in the past, military planners might have provided the impetus for the development of the truck, the tank, the airplane, and other vehicles. We know, however, that such thinking did not take place or that if it did it was not discernible among those with any authority.

One explanation for why this thinking did not take place is that *it was outside the concept of what war is like*. Wars are fought by infantrymen with their feet on the ground. Wars are fought to defeat an enemy force, *on the ground*. As long as this concept is held as the eternal law of war, it is difficult to visualize weapons that will put war in a different perspective. The holder is in a conceptual strait jacket. He cannot seek weapons other than those that support the infantryman, because to do so upsets all his calculations about war.

Between World War I and World War II Army concepts did not change enough to allow for the development of new weapons and new methods of fighting. Vertical envelopment, for example, was not seriously considered until after the Germans had demon-

strated its feasibility, although younger officers such as Major William C. Lee urged investigation.

Air Force planners in the between-the-wars years were not as bound to conventional war concepts as were their brothers in the Army. In fact it was their ability to go outside the conceptual framework then existing that allowed them to consider the possibilities of air war. In the field of weapons development, however, the picture is not so clear.

During the 1920's and 1930's little serious work was undertaken on guided missiles, rockets, jet engines, and new explosives. There are several possible explanations for this state of affairs. A primary factor was that of cost. New airplanes of the type wanted by Air Force planners were expensive, and not enough money was available for either research or manufacturing, much less for both. If the desire existed to exploit the possibility of jet engines, for example, this desire had to be balanced against the certain knowledge that funds were not available for both conventional and unconventional engines. Moreover the most experienced turbine experts would probably have advised against any extensive experimentation. The same situation existed with regard to the development of rockets and other new devices that appeared toward the end of World War II.

Today the Air Force appears to be caught in the same conceptual and doctrinal strait jacket that has bound the Army and Navy for so many years. There is a fixed opinion of what war is like, and air power has a certain relationship to war and this opinion.

What this means is that the starting point of thinking today dictates that future developments will be evolutionary rather than revolutionary. Future differences will merely be differences in degree but *not fundamental differences*. The early creative thinkers in the Air Force contemplated a violent departure from accepted concepts. The starting point of their thinking was of an entirely different order from that of today.

This leads to the second observation: in part the challenge of today is to develop a new concept of war. Such concepts as we have are entirely of foreign origin. Most of them we got from the Germans, who thought quite a bit about the subject. Of necessity they tailored their concepts to fit their needs and their time.

To a certain extent our ideas have been modified in recent years by the Russians, who have conceptually visualized a different type of war than the Germans did. And it is this conception that is giving us so much trouble. We have been trying to operate under

Clausewitz' dictum that war is an extension of politics. Today, however, we do not have the clear distinction between peace and war that existed in his time. Yet our forces and our strategy are designed for the type of situation in which the distinction is clear.

Some recognition of the inadequacy of the Clausewitz concept has brought into military language two relatively new terms—cold war and limited war. Unfortunately we have no strategy or weapons designed specifically for either type of war. Our weapon systems, our doctrine, our strategy, are designed for an all-peace or all-war situation.

Our "hot" war machine is used to keep the cold war "cold," but further than this it cannot go. Supposedly limited war is the answer to the problem of intermediacy, as it is somewhere in between no war and total war (how it relates to "cold" war is not quite clear). But the difference is one of degree and not of kind and for this reason is unsatisfactory. In many instances we have been—and may be in the future—confronted with situations (as in Indo-China and Suez) where our objectives could not be attained either by going to war—limited or otherwise—or by refraining from going to war. With tremendous power we were relatively powerless. Clearly this is not a happy position in which to find oneself.

Of course it may be argued that in both instances, Indo-China and Suez, our deterrent power kept the situation in hand so that it did not spread. But the fact remains that we would have desired an outcome other than the one that came about.

In any given situation short of war (limited or otherwise), we can bring to bear the national power of the United States. This power we can consider as being economic pressure, political pressure, psychological pressure, and the implied use of military force. At some point along the line, however, we run out of ability to apply any more force of any kind. At this point we may or may not have reached our objective. If we do not reach our objective we are faced with only two alternatives—we can go to war or we can refrain from war. If we decide not to go to war, all we can do is stand by and watch and hope that the outcome will be one somewhat to our liking. After the dust settles we can then again step in and try to improve the situation to one more to our liking.

The challenge of today, or at least part of it, is to find some means by which the gap may be closed, that is, the gap between the point at which further application of the kind of force we have today is useless, and the objective. We need a new kind of military power. We need a new kind of force. To get these we need to re-

consider the problem of war and peace and derive concepts that can be used today, concepts that are not based on the black-and-white distinctions offered two and more generations ago.

It is not difficult to visualize that as the underdeveloped nations of Africa and Asia intensify their efforts for independent governments and increase the economic well-being of all their people, the desire to have all things at once may trigger future struggles of the Indo-China or Suez types, or many conflicts of the Oman type. According to all observers the people of Asia and Africa are determined to have full bellies and clothes on their backs and better places to lay their heads. The West is in full accord with these objectives, *as long as they can be attained without violent means*. Assuming that we continue with the lines of development now laid down, will we in the future be in any better shape to forestall violent action than we have been in the past?

idol no. 2: the institution

The second "Nemesis of Creativity" Toynbee mentions is "Idolization of an Ephemeral Institution." As an example of such an institution and the worship thereof, Toynbee cites the British Parliament—"the unique success of the Parliament at Westminster in outlasting the Middle Ages, by adapting itself to the exigencies of the 'modern' (or once-Modern) Age now concluded, makes it less likely to achieve another creative metamorphosis to meet the challenge of the post-Modern Age which is now upon us."

In the Air Force setting the suggestion has been made that the Ephemeral Institution is the Air Force itself. For years airmen in the Army fought for independence for the air arm and finally this independence came. But did it come too late? Some say it did.

One who suggests this is Henry A. Kissinger in an article in the April 1957 issue of *Foreign Affairs*, "Strategy and Organization":

It may well be that the separation of the Army and the Air Force in 1948 occurred two decades too late and at the precise moment when the distinction between ground and air strategy was becoming obsolete. Instead of making the Army Air Corps independent it would probably have been sounder to mix the two organizations more thoroughly. The separation of the two services was achieved to the detriment of both; different service academies, training schools and war colleges inevitably emphasize a particular aspect of strategy instead of an over-all doctrine in which traditional distinctions should be disappearing, in which the Army

should begin to approach the mobility of the Air Force and the Air Force to develop the relative discrimination of ground warfare.

Kissinger continues by saying that with unlimited war less of a possibility than in the past and limited war more in prospect, the Army and Air Force make a better team than do the Air Force, the Army, and the Navy. Others have a slightly different solution: they would combine all three services into one. Theoretically such a move would eliminate "waste and duplication" in the Department of Defense, and reduce interservice feuding.

To gain some understanding of the point at issue, we must undertake to determine why any change is desirable and what is to be accomplished by any specific change. A good case can be made, for example, for the contention that the present ephemeral institution is not the Air Force or the Army or the Navy, but rather the organization for national defense. Present dissatisfaction with the defense establishment seems to stem from two sources. First, we may note a lack of what might be called *national doctrine*. Before and during World War I we had Army doctrine and Navy doctrine. Since the two operated in different spheres of interest, almost no conflict developed between the two. With the addition of air power, however, the equation changed. Real differences began to emerge when a choice of strategy was offered.

One answer to this problem would have been to create a general staff to determine national doctrine, policy, and strategy. Americans have always shied away from this solution because of fear that a general staff might develop into some monster like the German General Staff. The result of this fear is that we now have a number of agencies working on the problem with none really satisfactorily performing the function which needs to be performed.

As mentioned earlier, we adopted the German ideas about war, but we failed to adopt the machinery by which the Germans planned war and waged war. This was done despite the fact that there is a very close relationship between the two. The German government created the conditions favorable to the employment of the forces which that same government had already decided to develop. The German government laid down the guide lines for the General Staff to implement. We have confused the one with the other: the German General Staff could never have planned two world wars without the active support of the government and the people. Because of our mistaken idea of what happened in Germany we condemned the general staff type of organ-

ization but tried to accept the ideas about war and make them work with a system in which ideas came from the bottom, so to speak, and worked their way to the top.

The second cause of dissatisfaction with the defense establishment derives from a financial inability to support multiple unlimited strategies. That is, we cannot afford to prepare to fight a war on land, sea, and in the air. What in effect has happened is that the American people through their representatives in Congress have chosen to devote most of their resources to preparing to fight through the air. This decision has not been understood nor its ramifications appreciated.

If relatively unlimited funds existed for building up the Army, Navy, and Air Force, and if men could be found to man these establishments, there would still be disagreement as to the over-all strategy to be pursued in many situations; but there would not be the persistent criticism of the Air Force nor the questioning of Air Force doctrine. But since funds are not unlimited and since it is not popular or politic to advocate raising the amount of money budgeted for defense, the only area left for a showdown and attack is that of strategy.

The foregoing considerations must be kept in mind when trying to decide whether the Air Force as an institution is an "ephemeral institution." No one with any authority has ever subscribed to the view that the Air Force should be independent merely for the sake of being independent. The desire for independence grew out of the desire to exploit a weapon—or its development—to the fullest. In the airplane airmen saw more than an instrument for extending the observation and artillery of the Army and Navy. They saw a weapon capable of waging war on its own. Because administrative and command arrangements were such that the full capabilities of the airplane could not be explored, airmen wished for and fought for independence.

The question to be answered today, then, is whether the need for the function which an independent Air Force performs has disappeared. Unless some substitute for the general staff is developed, it is difficult to see how any good purpose would be worked by a mere amalgamation of the three services, or by merging the Air Force with the Army or Navy. Such a merger would still leave unanswered the question of who decides what is to be done. Without direction from above a merger would merely transfer present differences to new fields. It would by no means resolve them.

What has been called another ephemeral institution in the

Air Force, at least in the eyes of many within and without the Air Force, is the primacy of the pilot. In the early days of flying, airmen had considerable difficulty with commanders who did not understand the problems connected with flying and maintaining aircraft. For this reason they fought for and got accepted the idea that only rated officers could command flying units. From this it was but a short step to the conception that all important jobs should be held by pilots. This has resulted in a pilot's rating being the road to opportunity, preferment, and promotion.

It has also resulted in a lack of appreciation of the part others play in developing and maintaining a modern air force. For many years the Army furnished to airmen many of the services required to keep a military organization operating—medical services, personnel services, logistic services, and so forth. Under these conditions the flying officer was really the most important member of the flying organization because the organization was relatively small and many essential services were performed by someone else. Although this condition does not exist today, attitudes developed during an earlier period are much in evidence and are responsible for the feeling that the rated officer is much the more important member of the Air Force team.

At a time when Air Force recruitment pitches emphasize the Air Force need for scientifically trained men, younger men (and many older men too) feel that there is in the Air Force little real appreciation of scientific talents. One skilled engineer has written: "The path to advancement is not through scientific and engineering experience and understanding. There is little place for technical men on the military 'management team,' yet military technology is inherently a part of the team's decisions." He continues: "Technical competence is often a handicap. . . . I know of other officers who have had technical qualifications removed from their official records, because they felt they were a handicap to good assignments and thus advancement."*

The Air Force is hardly likely to be as creative as it might be as long as this condition exists.

Since the system has given the command positions to pilots, it is inevitable that for the next decade or more Air Force leadership must continue to come from pilots. They will constitute the only group in the Air Force which has been trained for command. But as the missile age inexorably begins to reduce the role of the combat pilot and puts more and more of a premium on the tech-

*Colonel O. G. Haywood, USAFR, "Technology and Military Men," *Air University Quarterly Review*, VIII, 1 (Summer 1955), 85, 86.

nical competence of a commander, the young men will need to see clear demonstration that the Air Force is tailoring its command structure to the realities of its weapons.

Over ten years ago General Arnold said, "The time has passed when the Air Staff can be composed exclusively of command pilots." Failure to abide by this observation has cost the Air Force a wealth of talent. The loss and cost will increase each year until the situation is rectified.

idol no. 3: the technique

Toynbee's third Nemesis of Creativity is "Idolization of an Ephemeral Technique." The history of warfare contains many examples of this type of idolization. Goliath, for example, felt absolutely secure when he saw David advance against him. Since David was not clad in the then accepted battle dress, Goliath felt sure David was not versed in the technique of which he was the master. Because of this variance Goliath felt somewhat insulted, and angrily asked: "Am I a dog, that thou comest to me with staves?"

During the battle of New Orleans in the War of 1812 a British subaltern expressed somewhat the same kind of anger. Accustomed to the more gentlemanly tactics of the Continent, he confided to his diary his anger at the American tactic of slitting sentry's throats at night, and the uncouth practice of putting old chains, nuts, and bolts in a cannon and firing the conglomeration at sleeping British soldiers. One decidedly did not fight in such manner in Europe. But the attempt to transfer European techniques to New Orleans failed, and the British were defeated.

The idolization of a technique can take many forms. The Air Force, for example, has been accused many times of being concerned only with the technique of bombing. This contention asserts that during the 1930's bomber enthusiasts could not see the need for fighters and other type aircraft. The result of this was that we entered the war in Europe committed to a daylight bombing strategy that nearly failed because fighters were necessary. The overemphasis on bombers led to a failure to develop fighters with the needed capabilities.

The same accusation that the Air Force is interested only in bombers and bombing came in 1950 when scientists of the Lincoln Laboratory at the Massachusetts Institute of Technology advocated spending more for air defense. Since some proponents of strategic air power questioned spending the amounts that were

said to be needed for air defense, the charge was made that air power enthusiasts were not interested in anything but long-range bombers. The truth was that this questioning represented a knowledge that there was a limit to funds available for defense. With only so much available, it was apparent that any gross change in expenditures could only be made at the expense of an existing program. Here the Air Force was trapped by the same predicament responsible for ensnaring the Army and Navy.

In the Berlin airlift the Air Force showed that air power does not necessarily equal bomb power. The same point has been made many times by Air Rescue Service and various other activities in the Air Force, but still the interest-only-in-bombers charge is made.

Considering all the factors in the situation, however, it is difficult to understand how the Air Force can escape from its preoccupation with bombing, *as long as the concept of what war is like remains the same*. When two nations or power blocs go to war, each is trying to impose its will on the other or persuade the other to accept its terms. At present the only way we conceive that we can persuade people to accept our will is to threaten them with death. The more overpowering our threat of death is, the more persuasive we can be. And at present the best way to kill the most people and to destroy the most property is through the air. And being the air arm the Air Force must of necessity concern itself with the most persuasive means available.

Furthermore it is difficult to understand how this preoccupation with bombing will change radically. The manner in which concepts and doctrine are produced discourages any change more radical than minor updating of paragraphs. Under the present system the operating commands and the Air Staff try to integrate strategy, tactics, and concepts into some sort of a framework that resembles doctrine. The guide lines produced are then taken by the Evaluation Staff of the Air War College and hammered into a formal statement of doctrine, which in turn is submitted to the Air Staff and the operating commands for approval.

The system is a necessary one for the forces we now have, because forces in-being are useless without a clear idea of how they are to be employed; but the system by its nature is given to creeping advances. To produce something basically different or new, the starting point of thinking cannot be the weapons we now have. This limits the problem drastically from the start and almost ensures that the end product will be something only slightly different from what we have now.

To understand how this works out in practice, we have only to turn to the 1930's and take a look at the Air Corps Tactical School and the Army Command and General Staff School. At Fort Leavenworth students and faculties were tied to a conceptual framework that envisioned war as a struggle between two or more opposing ground armies or forces. At Maxwell the students and faculty were not limited by such preconceptions. They had freedom to strike out in any direction and to consider new types of warfare. They took advantage of this freedom.

Because of the success of the Air Corps Tactical School the Air University was set up on the same hallowed ground. Great things are hoped for from Air University as the inheritor of the Air Corps Tactical School traditions, but it is well to point out that the faculties and students are not today operating under the same ground rules as did the Tac School. The rules of the game have been changed, and the present rules, which are the same that have governed other major military organizations in the past, have always acted to stifle any initiative that dared to venture beyond the immediate horizon.

If the Air Force is to keep its doctrine ahead of its equipment, as General Arnold recommended, it must strive to eliminate all discernible barriers to critical and creative thinking. The system set up for the production of new ideas and new concepts must give the thinker freedom—freedom from the present and the past.

If men are to change the perspective with which they view the effort to persuade others, these men must be free of administrative pressures, they must be free of censure for departing from conventional concepts, they must live in a climate that promotes creativity. But this alone is not enough. If their work is not to go for naught, efforts must be made to increase throughout the Air Force the receptivity to new ideas. As Toynbee noted, if a group is to meet successive challenges the majority must accept the ideas of the creative minority. One of the apparent limitations of the human mind is that it does not labor fruitfully when it must be half conformitive and half creative. The balance must be tipped much more toward creativity than toward conformity if productive changes are to be made. Indeed one of the strongest arguments that might be made for the creation of a separate Missile Force in the Department of Defense would be that its officers would then have the freedom to create concepts and doctrine for missile employment unfettered by mutters that this is not the way the Army used artillery at the Siegfried Line or the way Ploesti was bombed. The analogy has already been made many times of

the position of the Air Force and the missile being similar to that of the Navy when it had to face up to the obsolescence of the battleship. Perhaps the same strong sense of self-preservation that compelled the "battleship admirals" to espouse the carrier will lead the "bomber boys" to clear-sighted employment of missiles.

The Air Force has made great efforts to encourage its people to be creative. These efforts, however, have been mostly in the direction of renouncing doctrinal concepts held by the Army and Navy. At the same time the Air Force has renounced these concepts, it has adopted the *system* which produced the Army and Navy concepts. If the past holds any key to the future, it indicates that the heart of the matter is the system. Change it and the concepts change automatically. Leave it and the concepts change not at all. The door to the future cannot be opened until the system for creating ideas is changed.

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"Limited War"—What Is It?

COLONEL THOMAS L. FISHER II

DEPUTY Secretary of Defense Donald A. Quarles once stated that the study of deterrence of both big and little wars is "one of the foremost questions in our defense business today." He went on to suggest that the Air Force needs to study the distinctions between all-out, or global, war and "little wars." And finally he stated that we need to define what kind of little wars we are talking about. In an effort to contribute to understanding of this political and military problem, let us first attempt to define the kinds of nonglobal "little," or "limited," wars with which the USAF may be most concerned. Secondly, we will examine their distinctions from total war. In other words, what are limited wars and what are the limitations under which we must be prepared to deter or to win them?

There are at least two pressing reasons why the problem of limited wars is of special importance to the Air Force today. The first is that the relative probability of the occurrence of limited wars as compared to total wars is generally considered to be increasing. This reasoning is based on the approaching parity and sufficiency of nuclear weapons and their means of delivery by the U.S. and the U.S.S.R. and the belief that they will continue to deter both sides from risking total war. Because of their growing capacity to neutralize our threat of "massive retaliation" the U.S.S.R. or its allies may feel freer to initiate smaller military adventures. They may decide that they can safely continue to "nibble us to death" because we may be unwilling or unable to take measures that will cause such adventures to cost them more than they will gain.

The second reason why limited wars are of current importance to the Air Force lies in a possible national unwillingness or inability to deal effectively with them. Such a possibility stems from our apparent growing dependence on nuclear weapons and the feeling of many people that these may be inappropriate to the small war or that their use may entail excessive risk of expanding the war. Or we may be inhibited from using them by the United

Nations or our allies because of the success of Communist propaganda. The USAF is under attack, especially by Army leaders and their supporters, for allegedly placing too many of our national eggs in the one basket of nuclear capability and thereby depriving the national military establishment of funds, forces, and flexibility to fight all kinds of war by all methods. The Air Force is too much linked in public understanding with the "massive retaliation" policy in terms of SAC's strategic bombing capability. Too little consideration is given to its capability for measured counter action, or a policy of "graduated deterrence." Thus it is important to the Air Force to recognize and prove its capability to do what is necessary in limited wars.

narrowing the field

But which of all the variety of military actions that might be called limited war need we be primarily concerned with deterring? It appears that many possible actions do not present any new or very vital problem to us. Among such actions would be minor border disputes between free states, civil wars incident to political revolution, or small-scale, continuing guerrilla warfare as in Malaya or the Philippines. The measure of our concern should be their cost to us, either material or in terms of our national objectives. Although ideally we would like to deter all war, there is other conventional machinery in existence today to handle most of these problems under international agreements and the United Nations.

So we narrow our area of concern to those wars in which we have a direct treaty commitment to act, as a nation rather than through the U.N., or in which some important territory is in danger of disappearing behind the Iron Curtain. The two cases are generally synonymous. It is hardly conceivable that there will be a major war between any of our allies under present world

"Planning for limited war," an officer commented wryly, "is like looking at yourself in a roomful of crazy mirrors in a carnival fun house. In this one you're fat and happy. In that one you're stretched mighty thin. In the one over there you're just a shapeless blob." How, goes the cry, can one plan a war when nothing—the location, the bases, the weapons, the objectives, even the specific enemy—is known at the time of planning? Colonel Thomas L. Fisher II, while a student at the Air War College, replies that limited war does in fact have known parameters that can be used at least to provide a family of practical and valid responses.

conditions. Therefore only a war between a free or would-be free nation on one side and a member of the Soviet bloc or one of its stooges on the other remains for our consideration as a type of limited war vital to our interests. Such a war might include attack by Communist-controlled forces from outside the geographical boundaries of the nation or "volunteer" or pro-Soviet subversive groups already within a free-world, neutral, or even Titoist "independent socialist" nation. In other words the limited wars we are discussing are those in which international Communism controls the opposition.

WHAT, then, is the meaning of the term "limited" in the limited war that is becoming relatively more probable and with which we must deal? The term is hazy, intangible, and relative, visualized differently by each individual according to his experience or imagination. The concept has many names within the spectrum of hot or shooting war, such as *small*, *part-way*, *local*, *peripheral*, or *restricted*. All convey slightly different connotations; in order to get any sort of clear picture, we must look deeper into their nature. The term "limited war" seems to have the broadest connotations and widest acceptance in public print, and therefore is the one chosen to express the subject of this discussion.

It is well to bear in mind that all these terms are relative, or so-called point-of-view terms. The same war would be limited, local, or peripheral from the point of view of one nation, usually the larger, more powerful, or distant, while it might be total from the point of view of a smaller nation in which it was centered and whose more restricted resources were wholly involved. The viewpoints of the United States and the Republic of Korea on the recent Korean War are an example. In that struggle many U.S. Reserve and National Guard units and individuals were mobilized for the express object of keeping regular units uncommitted and ready in case of total war involving the United States. But for the Koreans, how could anything be more total? There was very little that was limited in the destruction of their country. We shall be speaking of limited war from the point of view of such a larger power.

Even authoritative definitions vary in almost every military document. The new Air Force Dictionary distinguishes between limited and restricted war:

Limited War—1. A war looked upon by one or the other of the contestants as not involving its own sovereignty, and as being

limited in one respect or another, as, for example, to a particular geographical area, to the employment of only certain resources, or to number of contestants. 2. A war considered by a detached observer as relatively limited in some respect, especially with regard to political objectives.

Restricted War—A war in which the contestants impose upon themselves certain restraints in the choice and use of weapons.

Another authority has it that:

Between the two extremes of cold war and total war there is only one other kind of war: employment of premeditated firepower under conditions which are manageable and which permit negotiation, retreat, termination, or armistice. Perhaps the terms *limited* or *restricted* are as appropriate as any.

And Headquarters USAF uses the equivalent term "local war" in its planning and directives. Its meaning appears to be war not directly involving the regular armed forces of the United States with those of Soviet Russia.

common elements

To get a clearer picture of the nature of limited war, let us analyze the common elements of these various concepts and our experience with them. The sense of the wording used makes it apparent that we are dealing with an active military effort against an enemy by means that are not all-encompassing but, rather, are restrained to some degree. The first possible element of limitation mentioned in the dictionary definition was the degree of involvement of national interests or sovereignty, also translated as political *objectives*. Another commonly considered limitation deals with resources involved, or, more narrowly, weapon systems. To broaden the scope of the latter from merely physical objects, let us use the term *methods*. Methods encompass the choice of means or weapons and the ways in which they are used—the choice of strategy and tactics, including targets, tempo, and manpower involved. A third and even more obvious limitation lies in the geographical *area* involved. Area means space, both on the surface and in the air above it, and may be continuous or intermittent. Although its features may determine methods, or vice versa, both methods and area are limited by objectives. To recapitulate, we find that the three major elements of limitation in these various definitions involve the war's objectives, methods, and area.

Limited wars have been analyzed in a recent study to deter-

mine their common characteristics. Although the term has only been commonly applied in the past decade to such conflicts as those in Greece, Korea, and Indo-China, there were many similar examples in past history. They appear to have been characterized by certain factors in common:

- the area being contested was limited geographically;
- contestants did not commit their total military resources;
- the sovereignty of contesting states—for whom the war was "limited"—was not at issue;
- political objectives were limited;
- political factors were controlling over military decisions.

These elements boil down to the same list derived from the above analysis of definitions: limitations in objectives, methods, and area. What is needed now is a further analysis of these elements of limited war to determine the probable scope or limitations of each category and which of these in combination differentiate such a war from total war.

Objectives. The major distinction between limited and total war from the United States' point of view appears to be in the degree of involvement of our national interests. In the former neither our national sovereignty nor that of the U.S.S.R. is directly at issue. In such a case we would not attempt to gain all our national objectives through the medium of this war. Rather we would attempt to gain certain objectives or to change for the better certain temporary situations. We would hope through mutually acceptable psychological restraints to keep the conflict within cost limits commensurate with the value of the objectives; and we would hope that the war might be terminated favorably to us by negotiation.

There are many ways by which possible objectives in limited war are expressed. They may be spelled out positively in terms of advances in our own national interests or negatively in terms of enemy gains. They are often expressed as actions to be taken or goals to be accomplished because of changes in the situation. It is very rare, however, that one finds a complete blueprint laying out in advance the end position that is desired. This is particularly true for the contestant under aggression. Hence our objectives in the past have sometimes been vaguely understood as "victory," further delineation of this term being obscured by the goal of reduction or cessation of physical violence, as was partially true of the Korean War.

But can we not do better than that in the future? We must

if we are to determine how to act within desirable war limitations. One of the chief sources of confusion is the great variety and lack of agreement in the expression of objectives—if, indeed, they are expressed at all. What both the statesman and the military leader or planner need is a clear idea of the situation that it is desired to establish as a result of war action. That is, what is the minimum demand that can be imposed upon the enemy to produce an acceptable situation in terms of degree of conflict, residual capabilities, and adequate deterrents or safeguards for the future? We also need to know how much beyond the minimum it might be desirable to go at any given time if opportunity arises. This calls for expression of objectives as a spectrum, from minimum to maximum. Objectives should encompass the form of enemy government, its actions, capabilities, and promises; and the control, inspection, or police arrangements needed by us to safeguard our objectives. They may be summed up in the words of Air Chief Marshal Sir Charles Portal, “to bring about a change in temper” of the enemy, or in those of Stefan Possony, “to change the behavior of the enemy nation.”

It is peculiarly characteristic of limited war that if it is to be terminated short of unconditional surrender the objectives for which we are willing to settle must at some point be clearly formulated and presented as terms to the enemy. Spencer Wilkinson, a leading British military historian, states the object of such wars as “not victory necessarily, or conquest, or unconditional surrender—the usual maxims—but ‘peace upon acceptable terms.’” This requirement raises a whole series of problems. First, determining objectives sufficient to achieve our minimum aims, including a future deterrence factor. Second, obtaining agreement and support for the objectives among the interested parties on our side, especially in an allied effort. Third, determining the best timing for presenting our terms to the enemy, usually the sooner the better and sometimes even before taking any action—difficult in the case of surprise attack. And fourth, negotiating face-saving procedures, deciding on “asking” and minimum terms, and providing flexibility in our position as the situation develops. William W. Kaufman sums up the problem succinctly:

The alternative is to define the minimum political objectives that we would find acceptable, and the enemy tolerable, and create the military and other conditions that will make them acceptable to him as well.

The expected objectives of limited wars, then, might lie along a spectrum somewhat in this order:

1. To withdraw at the least cost and in the best order possible, as was the eventual outcome in Indo-China.

2. To stabilize along the lines reached, if the world situation so dictated at the time; i.e., to reduce the degree of conflict back to cold war by military armistice agreement, as was done in Korea.

3. To return the situation to the *status quo ante*, by defeating opposing military force in the current battle area—a basically negative and probably illusory objective.

4. To reduce opposing capabilities relative to our own so as to diminish the degree of conflict necessary or possible, by denying to the enemy some resources, such as his air power. This alone is not a complete objective. It must be tied to agreement through negotiation as to his future actions, with adequate safeguards for us.

5. If such agreement with the existing enemy regime is impossible we must go further, either to change its mind and actions or to change the control structure to one more amenable and acceptable to us.

Methods. Although the possible variations in means or methods of carrying on limited war are infinite, we can examine some of their limitations that have been considered probable or desirable. There are two courses of action that will help to impose our will upon the enemy: the denial of resources with which to carry on the war and the inflicting of such punishment that the enemy recognizes the cost not to be worth the possible benefits and so gives up his objectives. Resources—also including in this case forces, bases, and maneuver area—may be denied to him in only three ways: by blockade, by capture or occupation, and by destruction. Any of these actions may also constitute punishment, but punishment can be more subtle, sometimes accomplished in less clearly military ways. It is only effective when directed against the controlling power of the enemy and recognized as such by that power, and when carried out in an unimpassioned manner as an announced expedient. Punishment as used here means inflicting unacceptable costs on the enemy, not the emotional exacting of vengeance based upon any moral standard.

We have suggested two basic methods, denying resources or inflicting punishment, that may be resorted to if we reject both withdrawal and a stalemate armistice. What are the probable limitations on carrying out these courses of action and what range of means may be possible? Here we plunge into the quagmire of generalizing about widely varying situations, the specifics of which must finally determine the answers for any given limited war situ-

ation. Even so perhaps we can identify some of the major questions as to limitations on methods or weapons that have emerged from past discussions.

First there is the choice between the two basic methods: the traditional military strategies of blockade, capture, or destruction of resources, and the newer atomic-age concept of measured punishment. It is difficult to draw clear lines between them, as one may assist in the other or be a part of it, and both depend on choice of weapons and on political or psychological conditions at the time. The clearest and sharpest current distinctions are drawn by Colonel R. S. Leghorn, whose concept of nuclear punishment tailors the punishment to fit the crime. This is generally parallel to what has come to be called the counterforce strategy and it appears to be gaining adherents and acceptance, especially for limited war. Nuclear punishment would destroy surface forces in the immediate battle zone, permit hot pursuit to destroy on their bases any opposing air forces involved, and destroy nuclear stockpiles at the first instance of their use. It would not bomb cities or population centers unless the enemy started to do so, and it would not blockade or attempt to capture any area. And, most important, it would announce all these restrictions in advance.

This first choice cannot really be made until we decide whether we can use nuclear weapons in a limited war. The major argument against such use is the fear that to do so would cause the conflict to expand into total war. Some persons feel that the use of even one nuclear weapon would cause progressive retaliation and that growth into total war would be uncontrollable. The apparent reasons for such growth would be irrational anger or fear of losing the limited war. But we have seen that Communist doctrine and practice are calculating and flexible; they preach caution and they authorize tactical retreat if this is necessary to live to fight again another day or in another way. The decision to use a nuclear weapon or any particular weapon system would be made by men who ostensibly recognized the desirability of limitation and would not want to spread the war. If the contrary were true, why would they start a limited war in the first place, thus sacrificing their enormous advantage of surprise and giving us an advantage in total war? Since the enemy wanted only limited war, he must be ready to accept our use of nuclear weapons as long as this use is not aimed at his sovereignty or total resources. As to fear of losing the war, if the use of nuclear weapons becomes uncontrolled the enemy will lose far more than a small, limited war. The danger of accidental spread is also cited, but the de-

cision to dispatch atomic bombers against opposing heartlands cannot be accidental. Mr. J. F. Loosbrock, writing in the November 1956 issue of *Air Force* magazine, noted the inconsistency of the argument for accidental spread:

History furnishes no specific clues in this matter, for nuclear weapons have never been used in such a role. But if our possession of nuclear weapons combined with the ability to deliver them now deters a major war, it is difficult to see how this advantage could be erased in a twinkling merely because some of the weapons were used on a local target.

Still another argument states that the use of nuclear weapons is not moral, that they are "too terrible." This probably is a rationalization based on fear and lack of understanding. Are nuclear weapons any less humane than the flame-throwers, high-explosive shells, or massed fire-bomb raids of the last war? An Air Force chaplain, W. E. Ferguson, has answered these scruples effectively:

Power itself is amoral. Man in control of power is moral or immoral. What he does with it is far more important than what the power is. . . . Passive containment is wrong. . . . We are morally bound to do what we can to preserve freedom and to create a climate in which freedom can prosper. . . . We are morally bound to refuse any limits that will deny victory *with a minimum sacrifice of American lives*. We must never let limited war cause us to sacrifice lives needlessly. Rather than let the enemy draw unacceptable limits, we must use airpower, equipped with the most advantageous weapons, to strike those targets that would prove costly to him. . . . Full application of airpower with its best weapons is less brutal than alternative ways of fighting modern wars because it is decisive, sure, and swift. Prolonged torture is immoral when swift victory is possible.

On the other hand, will refusal to use nuclear weapons insure against expansion of the war? It did not keep Communist China out of the Korean War. We can fairly ask, can we afford *not* to use nuclear weapons in any future war? The answer is, only when we are sure of satisfactory termination of the war at a reasonable cost to us in men, money, and our national security position. In other words, usually only in wars in which the major resources of international Communism are not available to the other side. These are the small wars, such as the recent Suez affair, with which this paper is not particularly concerned. There may be political reasons for not using them, as in the Korean War. Such reasons

are usually expressed in terms of psychological effect on our allies and neutral nations. These effects are intangible, and the corresponding effects of the courageous use of necessary force toward publicized moral objectives might outweigh them among the millions who understand and respect power. This would be especially true among our enemies! The Honorable Donald A. Quarles recently commented on the use of nuclear weapons in limited war in *Flying* magazine:

One hears that the use of our quality weapons in limited war would result in excessive casualties among military and civilians alike. This is not necessarily so. The Korean conflict resulted in millions of casualties. Most of these casualties occurred in the last two years of the war. Had that war been ended quickly, the total casualty lists probably would have been smaller regardless of the weapons used.

The basis for decision apparently lies in the extent to which our public and the world are informed of the issues at stake and the possible courses of action open.

A major reason advanced for the use of nuclear weapons is the preponderance of conventional surface forces possessed by the Communist bloc and their callous use of manpower en masse with little regard for human life. Under these conditions, it is argued, it would be too costly and too uncertain for us to attempt to match them man for man on the ground. Only our superior technology and strategy for its use can overcome this handicap. In spite of this, one circumstance remains in which our use of nuclear weapons should be questioned: that is when our forces are clearly more vulnerable to a decisive nuclear blow than are those of the enemy.

The same sorts of questions apply generally to the use of other "unconventional" weapons, such as biological and chemical warfare, where lack of knowledge and understanding is even more prevalent. It would seem on the face of it that most of the same arguments would apply, particularly with respect to the morality and humaneness of these weapons.

There are types and sizes of unconventional weapons appropriate to most military tasks in limited war. Conventional means may be available only at much greater cost in manpower, materiel, time, and effort. Secretary Quarles, in *Flying* magazine, commented on this point:

But the doing of these military tasks by non-atomic defense is less than the most effective; it is apt to take a larger toll of casualties if war occurs; and it increases the likelihood of an aggressor resort-

ing to war. . . . If we foolishly allowed the Communists to believe they could engage in aggression on their own timetable, in the place they choose, and with assurance they would meet only the type weapons *they* elect to employ, we would encourage local aggression everywhere. . . . The best way to prevent a local war from expanding into a total war is to end the local war quickly and decisively.

Thus we see that the range of methods applicable to limited war should be limited only by circumstances—by the physical features of targets and terrain and by the psychological effect that we wish to produce. The only distinction here from total war is that means and methods cannot reach the magnitude of total war without extending the war to the Soviet heartland, as there is no foreseeable occasion for such a massive attack elsewhere. It is even more important than in total war to consider effects of actions on objectives, and to avoid "overkilling." We must not use a bulldozer to cultivate a flower garden if we expect to make the enemy believe in our professed objectives. With respect to limitation of methods for limited war, Sir John Slessor, in *Strategy for the West*, sums up the situation nicely:

Any action must always be subjected to two acid tests—will it pay us tactically and will it achieve the strategic result we want from it? . . . One cannot draw a blueprint for these hypothetical future campaigns, cannot say definitely in advance, this or that should or should not be done; it will entirely depend on the circumstances at the time and whether it will help to achieve our object or not. . . . There is no basic reason why we should not use atomic weapons, subject only to the two acid tests to which I have just referred.

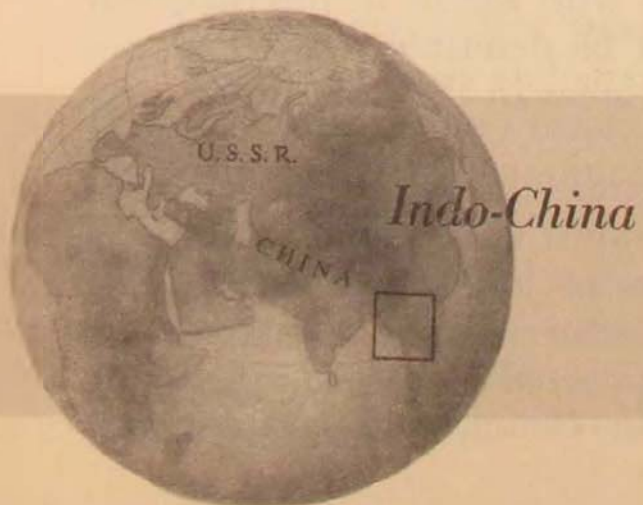
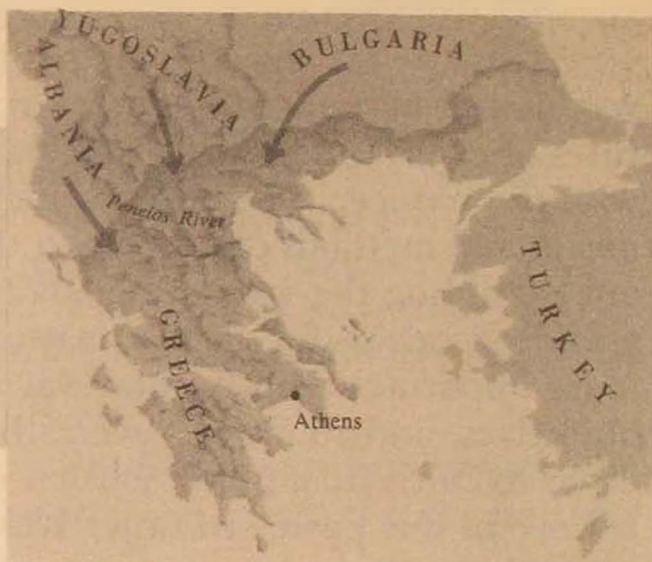
Area. The term "global" is often used synonymously with total war. It is not literally accurate, of course, but sufficiently so to constitute a clear distinction from limited war. Limited war connotes a war restricted in geographical area to an important degree. What can we expect to be the restrictions on area that will be characteristic of the limited wars with agents of international Communism? Perhaps this can best be determined by first considering where the probable danger areas in the near future may be.

Danger areas can be deduced primarily from the capabilities, actions, and statements of the Communist bloc. Communist capabilities, although buildup continues of long-range strategic air power, sea power, and infiltration techniques, are still based primarily upon massive *land* forces supported by *tactical* air power and short-legged transportation. The Communists lack a major

Examples of

global context

geographical limits



Limited War

involvement

After World War II, Greek Communists, aided with arms and supplies from Albania, Bulgaria, and Yugoslavia, attempted a coup with guerrilla bands operating out of mountain fastnesses in northern Greece. Greece began to combat the menace with British help. On 24 February 1947 the British announced that they could no longer afford the large-scale aid necessary to ensure the victory of Athens. On 12 March the Truman Doctrine went into effect whereby the U.S. assumed responsibility for preventing Communist domination of the eastern Mediterranean. In addition to \$350,000,000 in economic and military aid, an American Military Mission under Gen. James Van Fleet lent command assistance to the Greek army. Despite open intervention by Washington and covert intervention by Moscow, the actual fighters were Greeks. The Greek political situation stabilized in 1947, and the Communists found increasing difficulty in supporting the guerrillas. Once it became apparent that the U.S. would stay to the finish, they ceased this support and abandoned the guerrillas to their fate.

In 1945 the Potsdam Conference had temporarily designated the 38th parallel as a dividing line between Soviet and American occupation troops until Korea could be united by free elections. The Communists soon showed that elections would not be allowed. By 1949 both sides had withdrawn their troops. On 25 June 1950 the Soviet-trained-and-equipped North Korean army attacked South Korea. U.S. troops and planes moved in from Japan, the U.N. mobilized a force against the aggression. The Communist objective was the taking of Korea, principally as a springboard against Japan. U.N. objectives were to halt aggression, protect Japan. Both sides had sanctuaries, the Communists in Manchuria and the U.N. in Japan, through which the war was supplied. After the Communist Chinese entered the war in November 1950 the only prospect for clear-cut victory for either side was massive air attack on the opponent's sanctuary. Both considered this an unacceptable risk of spreading the war. Truce negotiations dragged on for two years, finally compromising on status quo conditions.

A loose agglomeration of three native states with varying cultural and racial backgrounds, Indo-China had been a French colony since 1885. Isolated Communist guerrilla bands had terrorized small sections since 1945, trying to prevent the resumption of French authority. In 1950 the fighting became a war. Action shifted to northern Vietnam, with Communist China training, supplying, and advising Vietminh forces. Communists sought more territory, a gateway to the riches of Southeast Asia, and a huge morale victory over Europeans and colonialism. The French fought to maintain control of a rich colony. The U.S. supported the French with money and arms, mostly to oppose Communist expansion. In 1954 the U.S. seriously considered armed intervention. This never occurred, partly because of the political situation in Indo-China, partly because conventional surface or air operations would have had to be on a considerable scale to succeed. The only alternative, air-atomic operations against Communist bases in southern China, was deemed an unacceptable broadening of the war.

methods

The war was fought by the Communists along classical guerrilla lines. Mountainous terrain offered numerous strongholds; raiding and terrorizing whole communities provided subsistence; adjacent Communist satellites furnished arms and munitions. Under U.S. General Van Fleet the Greek army waged unrelenting war. Said he: "In 1948 the Communists lost 33,000 men by death, capture, desertion. . . . It is a first-class war of international Communism . . . a war of annihilation with no respect for the rules." The struggle had two military objectives for the U.S.: to rout completely the Communist Greeks and to bring about the economic rehabilitation of Greece. Against 21,000 guerrillas the Greek army pitted 250,000 men, trained and supplied by the U.S. This large Greek army was made necessary by the virtually impregnable strongholds of the rebels in the Pindus Mountains. Communist nations gradually lessened their support as hope for a coup diminished. The Communists lost Yugoslavia's support in mid-1949 when Tito defected. By October 1949 the guerrillas were completely routed.

The Korean war was not a case of Communist guerrillas against Allied troops but army against army, tanks against tanks, air forces against air forces. The controlling strategy was a surface one. After initial success by surprise invasion, the North Korean army was cut up by U.N. air attack and the Allied offensive sent it reeling back to the Yalu. Intervention by Chinese Communist armies was also temporarily successful, but U.N. forces rallied and for the two last years stabilized the battle line near the prewar demarcation zone. In the air war Communist supply bases and air forces were protected by their sanctuary in Manchuria. Hoarding their newly acquired jet air force, they committed it only for training and probing of U.N. air readiness. With SAC poised in the U.S. to prevent extension of the war, U.N. air savagely interdicted Communist reinforcements and supplies, so persistently and successfully that the Communists could never stockpile the necessary reserves for an all-out offensive. This slow strangulation was a major factor in their eventual acceptance of United Nations peace terms.

Ho Chi Minh's 300,000 Communist Vietminh forces waged guerrilla warfare, flashing countless hit-and-run attacks from the cover of the jungles. French-Vietnamese forces, numbering 500,000, based their operations on a series of strongpoints and forts. Their efforts to chase down the raiders became a backbreaking job of clearing the same areas over and over again, frustrated by mountains and rain forests and by lack of support—even opposition—from the inhabitants. French intelligence networks dwindled and the guerrillas merged with the populace and lived off the land. Dense jungle cover and lack of concentrated targets meant that French air forces could not be effective for close support or reconnaissance; they were used for bombing of highways and small supply dumps. U.S. C-119's furnished airlift. Having drained the French by seven and a half years of this phantom warfare, the Communists on 13 March 1954 mounted a mass offensive against the key fort at Dienbienphu. The French held until 8 May, then with the loss of this fort gave up control of northern Vietnam.

overwater capability. All this leads to the logical conclusion that any major Communist military moves must be over land on the Eurasian continent or into contiguous areas. This conclusion is supported by the recent history of Communist actions. The only new wrinkle is the concept of hopping "volunteers" over intervening areas; the only nations apparently willing to receive them in the near future are in the same part of the world. Mr. Finletter, former Secretary of the Air Force, believes the Communists are concentrating their military pressures and possible moves upon the "gray areas" of the Middle East and Southeast Asia. Henry A. Kissinger goes further to list the areas of greatest danger as Iran, Afghanistan, Burma, Thailand, Indo-China, and possibly Indonesia. To these we might add Syria, Yemen, Egypt, Nepal, Malaya, Taiwan, and Korea, in view of recent events. All have the common characteristic of being peripheral to the Communist main base.

The possible range of limitations on the area involved in the type of limited wars we are considering is fairly obvious. Korea provided a much-discussed object lesson. Depending upon political restrictions, objectives, and methods determined to be appropriate to the situation, the war might possibly be limited entirely to the territory of the friendly nation transgressed upon. It might more likely extend some distance on both sides of the border, if contiguous; or into a specified zone within the aggressor nation, including its supply points or staging bases for the operation, if the countries are not contiguous. It might include certain types of areas scattered within the aggressor nation, or the entire nation. Finally, it might extend to either side's adjacent supporting area including certain areas or points within the Communist home base, the U.S.S.R. itself. It is assumed here that the limited war is likely to be started by some satellite of or proxy for the U.S.S.R., although Soviet "volunteers" might be the agency and even small forces or areas of Soviet Russia itself might be involved, as in the fighting with the Japanese along the Manchurian border in 1938 and before.

the nature of the beast

It must be apparent by now that there is no clearly defined set of limitations that constitute the parameters of limited war. Instead there appears to be a whole range, or spectrum, of possible degrees of limitation. Indeed it may logically be doubted if there could ever be a truly unlimited war. The purpose of a nation in

limited war is to change to its advantage the elements of limitation that we have discussed. That is, we may bring about a desired change in the enemy's objectives (or modify our own); we may cause a shift in his methods to ones more acceptable to us; or we may reduce the area or vigor of conflict. Conflict is a continuum, from minimal friction to total violence. The end result then is to decrease the existing degree of conflict, or, expressed differently, to increase the limitations on necessary involvement. Limited war is not a "problem" susceptible of "solution," but a complex, continuing situation in which everything done or left undone produces a new situation and in which the means employed affect the end achieved. Admiral Hayes says: "Limited wars never seem to get settled or settle anything. But man's affairs never get settled anyway. Life is a process of living with problems, not of settling them . . . we must be ready to accept a corollary: negotiated settlements."

Thus we may conclude that limited war is distinct from total war in that its objectives aim at negotiated settlements rather than unconditional surrender, that political restrictions are put upon total violence, and that the area involved is peripheral to present Communist nations rather than global and does not envisage major attack upon heartland targets of the U.S. and U.S.S.R.

We have seen that we are concerned primarily with limited war in which international Communism controls our opposition. Its limitations, its distinctions from total war, are found in its range of objectives, methods, and area. Let us review the probable limits of the spectrum of these variables in limited war. We are concerned with a war in which our opponents are not directly threatening the sovereignty of the United States but probably are threatening that of some less powerful friend of ours, or of a neutral area. Therefore our own political objectives do not extend to the overthrow of the Soviet Communist regime, nor necessarily to that of any major ally of hers. Rather they range between bringing an immediate end to the fight or restoring the prior status, as one extreme, and changing the actions or if necessary the political structure of the opposing regime to one acceptable to us, as the other extreme. Our national interest and resources are not fully involved, if for no other reason than that we must hold in reserve whatever is necessary to deter or win total war. Our actions and methods may range from blockade or minor conventional military assistance to major efforts with any or all modern weapon systems to deny the aggressor his resources (primarily military) to carry on the war or to punish him severely enough so that he gives

up his efforts. The area involved might vary from a narrow strip of isthmus such as northern Malaya to widely separated parts of one or more continents, including even parts of the U.S.S.R. itself.

In summary, a useful definition of limited war against forces of international Communism, which we must be prepared to deter or win, might be stated: armed conflict carried on primarily by significant trained military forces in which the sovereignty of the U.S. and U.S.S.R. are not at stake and the objectives, methods, and area are limited for political or other reasons to less than their potential maximum.

Air War College

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